

2.3.1 Student Centric Methods

Practice-Based Learning:

1. Capstone Project Description – Accounts
2. Sample Capstone Projects – Accounts
3. Capstone Project Description – Financial Management
4. Sample Capstone Projects – Financial Management
5. Capstone Project Description – IAPM
6. Sample Capstone Projects – IAPM
7. Capstone Project Description – Predictive Analytics Using R
8. Sample Capstone Projects – R
9. Lab Based Learning
 - B Plan Competition
 - List of Subjects where lab-based pedagogy is followed and its syllabus and session plans
 - Webinar Series
 - Advanced Machine Learning and Deep Learning
 - Deep Learning Using Tensor Flow
 - CNN



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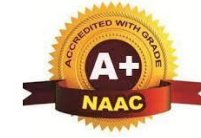


- 10.Seminar on Human Anatomy
- 11.Stress – De Stress
- 12.Workshop on Food and Nutrition
- 13.Workshop on General First Aid
- 14.Surya Namaskar Challenge
- 15.Har Ghar Dhyaan – Meditation Activity





RASHTREEYA SIKSHANA SAMITHI TRUST
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21MBA311: MANAGERIAL ACCOUNTING

1st Semester 2021-23 Batch

Section: A

Capstone Project on Measuring Financial Health of Selected Company

Sl. No	Student Name	Company Name	Industry
1		ACC Ltd.	CEMENT & CEMENT PRODUCTS
2		AU Small Finance Bank Ltd.	FINANCIAL SERVICES
3		Aarti Industries Ltd.	CHEMICALS
4		Adani Enterprises Ltd.	METALS
5		Adani Green Energy Ltd.	POWER
6		Adani Ports and Special Economic Zone Ltd.	SERVICES
7		Adani Total Gas Ltd.	OIL & GAS
8		Adani Transmission Ltd.	POWER
9		Aditya Birla Capital Ltd.	FINANCIAL SERVICES
10		Aditya Birla Fashion and Retail Ltd.	CONSUMER SERVICES
11		Ajanta Pharmaceuticals Ltd.	PHARMA
12		Alembic Pharmaceuticals Ltd.	PHARMA
13		Alkem Laboratories Ltd.	PHARMA

14		Amara Raja Batteries Ltd.	AUTOMOBILE
15		Ambuja Cements Ltd.	CEMENT & CEMENT PRODUCTS
16		Apollo Hospitals Enterprise Ltd.	HEALTHCARE SERVICES
17		Apollo Tyres Ltd.	AUTOMOBILE
18		Ashok Leyland Ltd.	AUTOMOBILE
19		Asian Paints Ltd.	CONSUMER GOODS
20		Astral Ltd.	INDUSTRIAL MANUFACTURING
21		Aurobindo Pharma Ltd.	PHARMA
22		Avenue Supermarts Ltd.	CONSUMER SERVICES
23		Axis Bank Ltd.	FINANCIAL SERVICES
24		Bajaj Auto Ltd.	AUTOMOBILE
25		Bajaj Finance Ltd.	FINANCIAL SERVICES
26		Bajaj Finserv Ltd.	FINANCIAL SERVICES
27		Bajaj Holdings & Investment Ltd.	FINANCIAL SERVICES
28		Balkrishna Industries Ltd.	AUTOMOBILE
29		Bandhan Bank Ltd.	FINANCIAL SERVICES
30		Bank of Baroda	FINANCIAL SERVICES
31		Bank of India	FINANCIAL SERVICES
32		Bata India Ltd.	CONSUMER GOODS
33		Berger Paints India Ltd.	CONSUMER GOODS
34		Bharat Petroleum Corporation Ltd.	OIL & GAS

35	Biocon Ltd.	PHARMA
36	Bosch Ltd.	AUTOMOBILE
37	Britannia Industries Ltd.	CONSUMER GOODS
38	Cadila Healthcare Ltd.	PHARMA
39	Canara Bank	FINANCIAL SERVICES
40	Castrol India Ltd.	OIL & GAS
41	Cholamandalam Investment and Finance Company Ltd.	FINANCIAL SERVICES
42	Cipla Ltd.	PHARMA
43	City Union Bank Ltd.	FINANCIAL SERVICES
44	Coal India Ltd.	METALS
45	Coforge Ltd.	IT
46	Colgate Palmolive (India) Ltd.	CONSUMER GOODS
47	Container Corporation of India Ltd.	SERVICES
48	Coromandel International Ltd.	FERTILISERS & PESTICIDES
49	Crompton Greaves Consumer Electricals Ltd.	CONSUMER GOODS
50	Cummins India Ltd.	INDUSTRIAL MANUFACTURING
51	DLF Ltd.	CONSTRUCTION
52	Dabur India Ltd.	CONSUMER GOODS
53	Dalmia Bharat Ltd.	CEMENT & CEMENT PRODUCTS
54	Deepak Nitrite Ltd.	CHEMICALS

55		Dhani Services Ltd.	FINANCIAL SERVICES
56		Divi's Laboratories Ltd.	PHARMA
57		Dixon Technologies (India) Ltd.	CONSUMER GOODS
58		Dr. Lal Path Labs Ltd.	HEALTHCARE SERVICES
59		Dr. Reddy's Laboratories Ltd.	PHARMA
60		Eicher Motors Ltd.	AUTOMOBILE

1st Semester 2021-23 Batch

Section: B

Capstone Project on Measuring Financial Health of Selected Company

Sl. No	Student Name	Company Name	Industry
61		Emami Ltd.	CONSUMER GOODS
62		Endurance Technologies Ltd.	AUTOMOBILE
63		Escorts Ltd.	AUTOMOBILE
64		Exide Industries Ltd.	AUTOMOBILE
65		Federal Bank Ltd.	FINANCIAL SERVICES
66		Fortis Healthcare Ltd.	HEALTHCARE SERVICES
67		GAIL (India) Ltd.	OIL & GAS
68		Gland Pharma Ltd.	PHARMA
69		Glenmark Pharmaceuticals Ltd.	PHARMA
70		Godrej Consumer Products Ltd.	CONSUMER GOODS
71		Godrej Industries Ltd.	CONSUMER GOODS
72		Godrej Properties Ltd.	CONSTRUCTION

73		Grasim Industries Ltd.	CEMENT & CEMENT PRODUCTS
74		Gujarat Gas Ltd.	OIL & GAS
75		Gujarat State Petronet Ltd.	OIL & GAS
76		HCL Technologies Ltd.	IT
77		HDFC Asset Management Company Ltd.	FINANCIAL SERVICES
78		HDFC Bank Ltd.	FINANCIAL SERVICES
79		Havells India Ltd.	CONSUMER GOODS
80		Hero MotoCorp Ltd.	AUTOMOBILE
81		Hindalco Industries Ltd.	METALS
82		Hindustan Aeronautics Ltd.	INDUSTRIAL MANUFACTURING
83		Hindustan Copper Ltd.	METALS
84		Hindustan Petroleum Corporation Ltd.	OIL & GAS
85		Hindustan Unilever Ltd.	CONSUMER GOODS
86		Hindustan Zinc Ltd.	METALS
87		Housing Development Finance Corporation Ltd.	FINANCIAL SERVICES
88		ICICI Bank Ltd.	FINANCIAL SERVICES
89		IDFC First Bank Ltd.	FINANCIAL SERVICES
90		ITC Ltd.	CONSUMER GOODS
91		Indiamart Intermesh Ltd.	CONSUMER SERVICES
92		Indian Bank	FINANCIAL SERVICES
93		Indian Hotels Co. Ltd.	CONSUMER SERVICES

94		Indian Oil Corporation Ltd.	OIL & GAS
95		Indian Railway Catering And Tourism Corporation Ltd.	SERVICES
96		Indian Railway Finance Corporation Ltd.	FINANCIAL SERVICES
97		Indraprastha Gas Ltd.	OIL & GAS
98		Indus Towers Ltd.	TELECOM
99		IndusInd Bank Ltd.	FINANCIAL SERVICES
100		Info Edge (India) Ltd.	CONSUMER SERVICES
101		Infosys Ltd.	IT
102		InterGlobe Aviation Ltd.	SERVICES
103		Ipca Laboratories Ltd.	PHARMA
104		JSW Energy Ltd.	POWER
105		JSW Steel Ltd.	METALS
106		Jindal Steel & Power Ltd.	METALS
107		Jubilant Foodworks Ltd.	CONSUMER SERVICES
108		Kotak Mahindra Bank Ltd.	FINANCIAL SERVICES
109		L&T Finance Holdings Ltd.	FINANCIAL SERVICES
110		L&T Technology Services Ltd.	IT
111		LIC Housing Finance Ltd.	FINANCIAL SERVICES
112		Larsen & Toubro Infotech Ltd.	IT
113		Larsen & Toubro Ltd.	CONSTRUCTION

114		Laurus Labs Ltd.	PHARMA
115		Lupin Ltd.	PHARMA
116		MRF Ltd.	AUTOMOBILE
117		Mahindra & Mahindra Financial Services Ltd.	FINANCIAL SERVICES
118		Mahindra & Mahindra Ltd.	AUTOMOBILE
119		Manappuram Finance Ltd.	FINANCIAL SERVICES
120		Marico Ltd.	CONSUMER GOODS

1st Semester 2021-23 Batch

Section: C

Capstone Project on Measuring Financial Health of Selected Company

Sl. No	Student Name	Company Name	Industry
121	AARON GOES	Maruti Suzuki India Ltd.	AUTOMOBILE
122	ABHIRAM.K V	MindTree Ltd.	IT
123	ABHISHEK SALAGERI	Mphasis Ltd.	IT
124	AKASH M S	Muthoot Finance Ltd.	FINANCIAL SERVICES
125	AKASHGOWDA G	NATCO Pharma Ltd.	PHARMA
126	AKSHAYKUMAR HADAGALI	NMDC Ltd.	METALS
127	AMAL NATH P K	NTPC Ltd.	POWER
128	AMISHA R MAJALIKAR	National Aluminium Co. Ltd.	METALS

129	ASHISH.M	Navin Fluorine International Ltd.	CHEMICALS
130	BHARATH	Nestle India Ltd.	CONSUMER GOODS
131	BHARGAVA HEBBAR M L	Nippon Life India Asset Management Ltd.	FINANCIAL SERVICES
132	BIRADAR ANUPAMA BASAVARAJ	Oberoi Realty Ltd.	CONSTRUCTION
133	DEEPAK S IYER	Oil & Natural Gas Corporation Ltd.	OIL & GAS
134	DHANUSH S ANEPLA	Oil India Ltd.	OIL & GAS
135	DHRUVA ADITHYA.H	PI Industries Ltd.	FERTILISERS & PESTICIDES
136	G UDAYA KUMAR	Page Industries Ltd.	TEXTILES
137	HARI CHANDANA SRI MAREMALLA	Petronet LNG Ltd.	OIL & GAS
138	JAGPAL REDDY	Pidilite Industries Ltd.	CHEMICALS
139	JAGRUTHI.S	Piramal Enterprises Ltd.	FINANCIAL SERVICES
140	JAYRAJ S K	Polycab India Ltd.	INDUSTRIAL MANUFACTURING
141	KARTHIKEYA.N.S	Power Finance Corporation Ltd.	FINANCIAL SERVICES
142	KAVYA B KULKARNI	Power Grid Corporation of India Ltd.	POWER
143	KAVYA NANDKUMAR JOGLEKAR	Prestige Estates Projects Ltd.	CONSTRUCTION

144	KEERTI MANOHARA BAGEWADI	Procter & Gamble Hygiene & Health Care Ltd.	CONSUMER GOODS
145	KRUTHIKANANDA H S	Punjab National Bank	FINANCIAL SERVICES
146	MAHESH S HEGDE	RBL Bank Ltd.	FINANCIAL SERVICES
147	MANORANJAN C M	REC Ltd.	FINANCIAL SERVICES
148	MR.KIRAN.D.SHIRAHATTI	Reliance Industries Ltd.	OIL & GAS
149	NAMANA T.G	SBI Cards and Payment Services Ltd.	FINANCIAL SERVICES
150	NAVEEN KUMAR G	SBI Life Insurance Company Ltd.	FINANCIAL SERVICES
151	NAVNEETH.S	SRF Ltd.	CHEMICALS
152	NIKHITA VINOD KALMANE	Sanofi India Ltd.	PHARMA
153	PEARL JOVITA MARTIS	Shree Cement Ltd.	CEMENT & CEMENT PRODUCTS
154	PRADYUMNA K P	Shriram Transport Finance Co. Ltd.	FINANCIAL SERVICES
155	PRITHVI S	Siemens Ltd.	INDUSTRIAL MANUFACTURING
156	RAHIL M	Sona BLW Precision Forgings Ltd.	AUTOMOBILE
157	RAHUL RAJENDRA JAWALI	State Bank of India	FINANCIAL SERVICES
158	RAJATH K L	Steel Authority of India Ltd.	METALS
159	ROHAN R HUNNARAGI	Sun Pharmaceutical Industries Ltd.	PHARMA
160	RUDRESH H R	Sun TV Network Ltd.	MEDIA ENTERTAINMENT & PUBLICATION

161	S.R. SREEVARSHA	TVS Motor Company Ltd.	AUTOMOBILE
162	SAHANA PATIL	Tata Chemicals Ltd.	CHEMICALS
163	SANA UR RAHMAN	Tata Communications Ltd.	TELECOM
164	SANJAYA M	Tata Consultancy Services Ltd.	IT
165	SHAMANTH.U	Tata Consumer Products Ltd.	CONSUMER GOODS
166	SHARATH M N	Tata Motors Ltd.	AUTOMOBILE
167	Anushka Bhatra	Tata Steel Ltd.	METALS
168	SHREYA NAGESH	Tech Mahindra Ltd.	IT
169	SRUJANRAJ G B	The Ramco Cements Ltd.	CEMENT & CEMENT PRODUCTS
170	SURE SAI NITHYUSHA	Titan Company Ltd.	CONSUMER GOODS
171	SUSHMITHA JOIS	Trent Ltd.	CONSUMER SERVICES
172	SWATHI C D	UltraTech Cement Ltd.	CEMENT & CEMENT PRODUCTS
173	TEJASWI SURESH GAONKAR	Union Bank of India	FINANCIAL SERVICES
174	VAISHAVI.N.NAIDU	United Breweries Ltd.	CONSUMER GOODS
175	VIBHA SHANKARNARAYAN BHAT	United Spirits Ltd.	CONSUMER GOODS
176	YOGESHWARI D	Varun Beverages Ltd.	CONSUMER GOODS
177	Reshma	Voltas Ltd.	CONSUMER GOODS

178	Shashank	Whirlpool of India Ltd.	CONSUMER GOODS
179	Nilanjan	Wipro Ltd.	IT
180	Dushyanth	Zee Entertainment Enterprises Ltd.	MEDIA ENTERTAINMENT & PUBLICATION

Course Facilitators:

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Prof. Somashekar V



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Section: A / B / C

Rubrics for Evaluation

Capstone Project (individual base): Rubrics

Sl. No	Particulars	Marks
1	Introduction of the Company	5
2	Tools and Techniques Used for Measuring Financial Health of Selected Company	15
3	Overall Report	5

#Tools and Techniques Used for Measuring Financial Health of Selected Company;

Sl. No	Methods	Marks	Remarks
1	Ratio Analysis and interpretation	5	Any Three methods(or) best Three methods will be considered
2	Common Size Analysis and interpretation	5	
3	Comparative Analysis and interpretation	5	
4	Trend Analysis and interpretation	5	

Note:

1. More weightage will be considered on Interpretation
2. Use MS Excel (Spread sheet) for calculations
3. Consider or Collect the data from Capitaline or Screener Database or any other relevant data source.

**ASSIGNMENT ON FINANCIAL ANALYSIS OF
APOLLO HOSPITALS ENTERPRISE LTD. USING TOOLS
LIKE COMPARITIVE, COMMON SIZE AND TREND
ANALYSIS STATEMENTS**

Project Report submitted in partial fulfilment of the requirements for the
award of the Degree of

MASTER OF BUSINESS ADMINISTRATION

By

**CHAITANYA KAMATAGI B
RVIM21MBA123**

**UNDER THE GUIDANCE OF
Prof. Rajkumar Chavan
Assistant Professor**



**R V Institute of Management
Bangalore**

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2	FINANCIAL ANALYSIS AND INTERPRETATION COMPARITIVE ANALYSIS COMMONSIZE ANALYSIS TREND ANALYSIS	14 - 24
3	FINDINGS, SUGGESTION AND CONCLUSION	25 - 29
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CHAPTER 1:
INTRODUCTION

Apollo Hospitals Enterprise Ltd.



Apollo Hospitals was established in 1983 by Dr. Prathap C Reddy, renowned architect of modern healthcare in India. As the nation's first corporate hospital, Apollo Hospitals is acclaimed for pioneering the private healthcare revolution in the country.

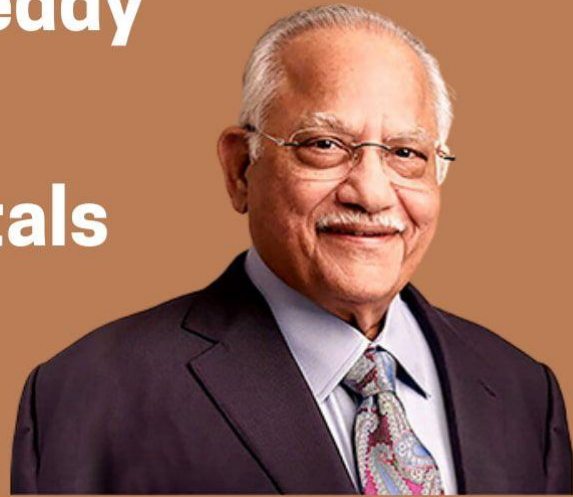
Apollo Hospitals has emerged as Asia's foremost integrated healthcare services provider and has a robust presence across the healthcare ecosystem, including Hospitals, Pharmacies, Primary Care & Diagnostic Clinics, routine wellness & preventive health care to innovative life-saving treatments, diagnostic services and several Retail Health models.

Dr Prathap C Reddy

Founder,

Apollo Hospitals.

Prathap C. Reddy Founder, Apollo Hospitals



Apollo Hospitals has touched more than 120 million lives from over 120 countries, offering the best clinical outcomes.

■ **7,000+ Healing Hands**

Largest network of the world's finest and brightest medical experts who provide compassionate care using outstanding expertise and advanced technology.

■ **4,000+ Pharmacies**

Apollo Pharmacy is India's first, largest and most trusted branded pharmacy network, with over 4000 plus outlets covering the entire nation

■ **Most Advanced Healthcare Technology**

Apollo Hospitals has been the pioneer in bringing ground-breaking healthcare technologies to India.

■ **Best Clinical Outcomes**

Leveraging its vast medical expertise & technological advantage, Apollo Hospitals has consistently delivered best in class clinical outcomes.

■ **Healthcare Business (53% of revenues)**

Company's healthcare business has a capacity of 10,261 beds in 71 facilities located in

India and overseas. Of the 71 facilities, 45 are self-owned hospitals, 10 are cradles, 11 are day care/short surgical stay centres and 5 are hospitals under management.

- Apollo Hospitals has facilities located in large urban centres such as Chennai, Hyderabad, Kolkata, Bengaluru, New Delhi, Ahmedabad, Mumbai, Pune, Bhubaneswar, Madurai and Mysore among others. Presently, the company's facilities function at comfortable utilization rates at around 69-70%.

- **Pharmacy Business(41% of revenues):**

Apollo Pharmacy is India's first and largest branded pharmacy network. It has around 3,800 outlets present in ~400 cities/towns spread across 21 states & 4 union territories. Apollo Pharmacies has widened its offerings extensively. This segment which was traditionally focused on pharmaceutical products, is now equipped with a wide variety of wellness and private label products.

- Recently, company divested its front-end portion of its pharmacy business into Apollo Pharmacy Ltd. in which company holds 25.5% stake. Although, it is still the exclusive supplier to pharmacy business with long-term supplier agreement in place.

- **Health & Lifestyle Business (6% of revenues):**

The company operates in the retail healthcare space through its 70% owned subsidiary Apollo Health & Lifestyle Ltd (AHLL). AHLL was introduced with an intention to take healthcare services from a purely 'hospital' setting closer to the home within the neighbourhood with a goal to serve the community through multiple touch points.

- AHLL owns ~950 retail touchpoints undertaking various activities like diagnostics, clinics, sugar clinics, cradle, spectra care, dental & dialysis. Diagnostics accounts for most of the retail touchpoints with 650 centres.

Evolution of Apollo Hospitals Enterprise Limited

Apollo Hospitals Enterprise Limited (AHEL) was incorporated as a Public Limited Company in the year 1979. Promoted by Dr Pratap C Reddy, it is the first group of hospitals that pioneered the concept of corporate healthcare delivery in India. AHEL is a listed Company on the Bombay Stock Exchange.

AHEL today, is the leading private sector healthcare provider in Asia and owns and manages a network of speciality hospitals and clinics, a chain of Pharmacy retail outlets across the country, and provides Consultancy Services for commissioning and managing the Speciality Hospitals

It is often said that nothing happens, unless there is a dream first. At the genesis of the Apollo story there was a dream. A dream so powerful, that it helped transform the medical landscape in India. The dream nurtured and grew within Dr Pratap C Reddy, the founder Chairman of Apollo Hospitals, until the point of inflection happened in 1983.

Apollo Hospitals started as a 150-bed hospital in Chennai. And it has to be said, amidst much scepticism. India in the early 80's was not the easiest place for private enterprise. Moreover, private healthcare institutions were unknown and they were not doing cutting edge work. 25 years later it is an amazing story of success, achievement and most importantly, dreams realized.

As Apollo Hospitals has made colossal strides to reach where it is, more and more facets of the founding vision have turned to reality. Today Apollo Hospitals is not just one of the country's premier healthcare providers but has also played a pioneering role in helping India become a centre-of-excellence in global healthcare.

The Apollo Hospitals group's futuristic vision has ensured that it has been in a position of strength at every touch point of the healthcare delivery chain. Its presence encompasses over 10,000 beds across 61 hospitals, more than 1500 pharmacies, over 100 primary care & diagnostic clinics, 115 telemedicine units across 9 countries, health insurance services, global projects consultancy, 15 academic institutions and a Research Foundation with a focus on global clinical trials, epidemiological studies, stem-cell and genetic research.

However, the largest achievement of the Apollo Group has been to take quality healthcare to across the length and breadth of India. Of touching 10 million lives and giving hope to an entire segment of the Indian population who did not have an option beyond limited medical infrastructure.

Apollo has succeeded in being more than just a quality healthcare provider. It has been a major player in scripting the medical landscape of the nation. This is primarily because the group has continuously been at the helm of several game-changing innovations in Indian healthcare.

By the start of the new millennium, Apollo Hospitals Group had become an integrated healthcare organization with owned and managed hospitals, diagnostic clinics, dispensing pharmacies and consultancy services. In addition, the group's service offerings include healthcare at the patient's doorstep, clinical & diagnostic services, medical business process outsourcing, third party administration services and health insurance. To enhance performance and service to customers, the company also makes available the services to support the business of healthcare; telemedicine services, education and training programmes & research services and a host of not-for-profit projects.

Company's Vision

Apollo's vision for the next phase of development is to 'Touch a Billion Lives'.

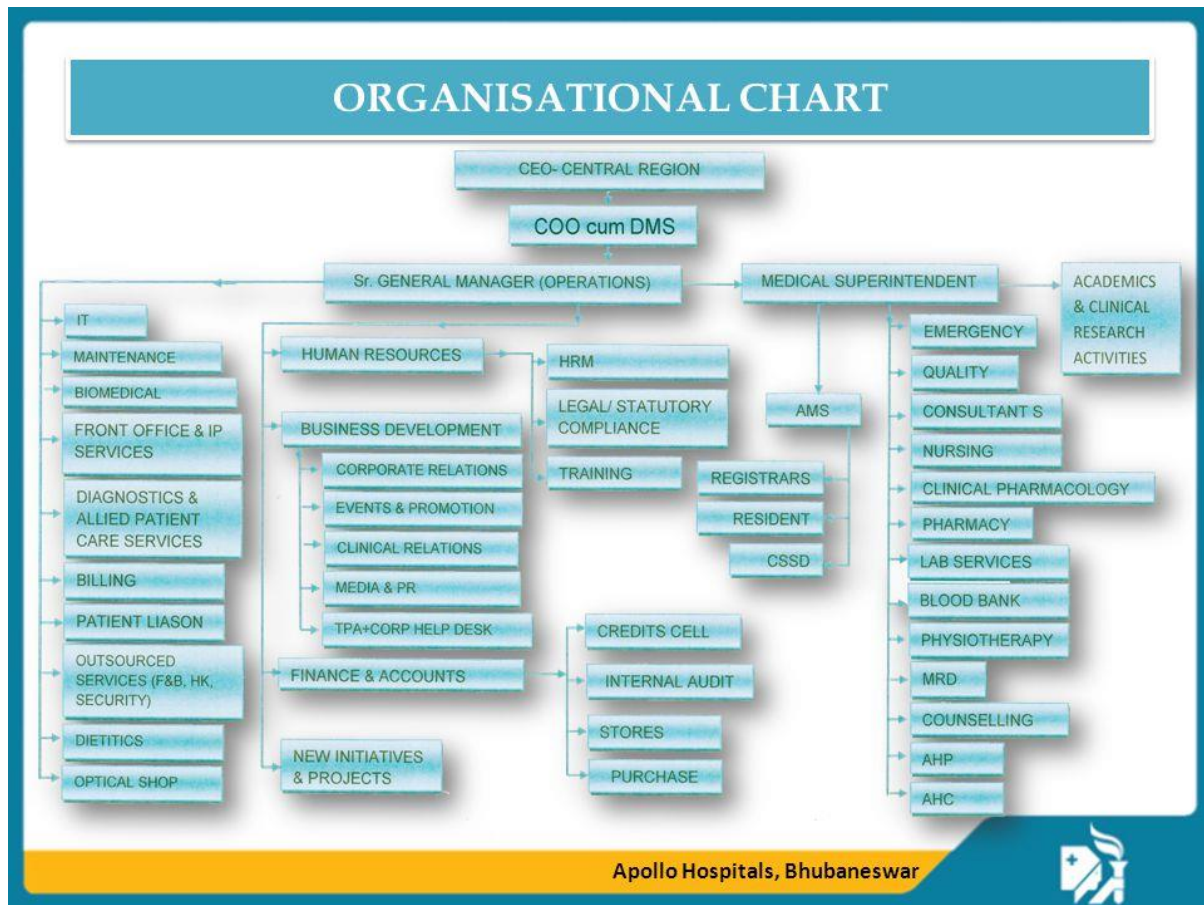
Mission Statement

"Our mission is to bring healthcare of international standards within the reach of every individual. We are committed to the achievement and maintenance of excellence in education, research and healthcare for the benefit of humanity"

Services offered by the company:

-  Cardiology & Cardiothoracic Surgery
-  Orthopaedics & Joint Replacement Surgery
-  Spine Surgery
-  Oncology
-  Medical & Surgical Gastroenterology
-  Neurology & Neurosurgery
-  Nephrology & Urology
-  Critical Care Medicine

ORGANISATIONAL STRUCTURE OF APOLLO HOSPITAL ENTERPRISE LIMITED.



Medical Milestones:

- ❑ Pioneered open heart surgeries and cardiac catheterization, in the early 80's.
- ❑ Pioneers of the Preventive health check programmes in India and performed 3 million checks to date.
- ❑ Introduced cutting edge procedures like off-pump and beating-heart surgery, either by thoracotomy (minimal invasive access) or classical sternotomy, trans-radial angioplasty and stenting, mitral valve replacement.

- By 1992, Apollo Hospitals introduced Artery Stenting for the first time in India. Conducted over 90,000 cardiac surgeries – one of only 10 hospitals in the world to achieve these volumes. Achieved a 99.6% success rate in cardiac bypass surgeries, over 91% of which were beating heart surgeries.
- Largest series of aortic valve replacement with stent less heart valve bio prosthesis performed. Performed over 7,50,000 major surgeries and over 10,00,000 minor surgical procedures with exceptional clinical outcomes.
- First private healthcare provider to perform a heart transplant in 1995.
- In 1995, Apollo Hospitals performed its first Bone Marrow Transplantation, as well as the first multi organ transplant in the country.
- Apollo performed an unprecedented revolution in orthopaedics by equalizing limbs and deformity correction by the Ilizarov procedure.
- Centre for liver disease and transplantation, Apollo Hospitals Chennai has completed 100 liver transplantations in less than 4 years with over 90% success rate, creating a milestone.
- Latest M guard stent technology, a specially designed Mesh covered stent, was used to save a 27-year-old man from an acute heart attack. Apollo Hospital is first to introduce the technology in Chennai.
- World's first iPod Navigation Hip Resurfacing Surgery was successfully performed at Apollo Speciality Hospitals, Chennai.
- Apollo Specialty Hospitals, Chennai added successfully conducted exultant Micro vascular free tissue transfer and Aesthetic surgeries on more than 1000 patients by the end of March 2011.
- Apollo Hospitals Chennai completed 10,000 Coronary Angioplasties in 2009, including many refined procedures like Multi–Vessel Angioplasty, Left Main Angioplasty and Bifurcation Lesions.

- Apollo Hospitals Group has performed more than 775 solid organ transplants for the year, 2010, making it one of the World's Busiest Liver Transplant Centres. Indraprastha Apollo Hospitals, Delhi has also completed over 500 liver transplants in February, 2011.
- Apollo Gleneagles Cancer Hospital Launches Eastern India's first dedicated comprehensive Bone Marrow Transplant Unit.
- The Apollo Hospitals, one of the six centres in India to be part of a global trial on using drug-eluting bio-resorbable stents, are the first in Chennai to use the product. The next generation in devices that relieve blood vessel blocks will dissolve within a couple of years. The device works like a regular stent by restoring blood flow to a clogged vessel. It also contains a drug that is slowly released to help the healing process.
- Apollo Bramwell Hospital, Mauritius in conjunction with Global Bio health Solutions, launched the Apollo Bramwell Stem Cell Therapy Program.
- First American underwent a successful Heart Transplant at Apollo Hospitals, Chennai! Ronald Lemmer, 65 years old, was transplanted with the heart of a 36-year-old accident victim in an eight-hour surgery by Dr Paul Ramesh at Apollo Hospitals Chennai. In the process, two records were also created. The patient was not only the first U.S. citizen to undergo a heart transplant in India, but he was also the oldest person to undergo a heart transplant in the country.

Achievements/ recognition:

Over the years, Apollo has received many awards and accolades in recognition of its pioneering achievements in Indian healthcare.

- In April 2014– Indraprastha Apollo Hospitals became the first hospital in India to have successfully performed 500 liver transplants in Pakistani patients – Chairman honoured with Lifetime Achievement Award by CNBC TV18
- In Jan 2010, Chairman Dr Pratap C Reddy was conferred with the Padma Vibhushan award by the Government of India, for excellence and exceptional service in the

Healthcare industry in the country. Dr Pratap C Reddy, was also awarded the Padma Bhushan in 1991.

- Dr Pratap C Reddy awarded with the prestigious Alexandria – Frost & Sullivan 2010 – Lifetime Achievement Award in Healthcare Sector and Apollo Pharmacy presented with the Healthcare Retail Company of the Year Award.
- Billion Hearts Beating (BHB) Campaign is a proud winner in the Corporate Social Responsibility practice category, at the 5th Indy's Awards 2011. Apollo Telemedicine Networking Foundation India has obtained the 'Best Poster' Award at the 7th Annual World Health Care Congress & World Health Innovations Summit, 2011 held at Washington DC.
- Apollo Hospitals Group Website won the “Best Healthcare Provider Website” Award in the Internet Advertising Competition – IAC 2011 by the Web Marketing Association, USA.
- Apollo Health City –Hyderabad has become the first hospital in the country to be recognized as the 'Best Medical Tourism Facility for 2009–2010' by Ministry of Tourism – Government of India. This prestigious National Honour was given on 28 March 2011 by Ms. Meira Kumar – Honourable Speaker, Lok Sabha in New Delhi in a glittering ceremony.
- Apollo Hospitals Group won many laurels in the Best Hospitals in India – Survey 2010 by 'The Week' Magazine.
- Apollo Hospitals, Chennai & Hyderabad won the healthcare awards 2008, instituted by the Express Healthcare Publications (The Indian Express Group). The awards received include: – Apollo Hospitals Chennai– Overall Best Hospital of the year – Apollo Hospital Chennai– Operational Excellence– Apollo Speciality Hospital, Chennai– Leveraging Global Opportunity– Apollo Health City Hyderabad– Sustained Growth– Apollo Health City Hyderabad– Patient Care.

- Apollo Hospitals, Chennai has been rated 'Best Private Sector Hospital' in India by The Week magazine for 2003, 2004, 2007 and 2008.
- Apollo Hospitals was recognized as a 'Super brand of India' in the healthcare sector for 2003 and 2004
- Apollo Clinics were awarded Franchisor of the Year for 2003 and 2004.
- The Asia–Pacific Bio Business Leadership Award 2005 was awarded to Dr Pratap C. Reddy, Founder Chairman Apollo hospitals group.
- Modern Medicare Excellence Award 2006–07 award to Dr Pratap C Reddy, Founder Chairman, Apollo Hospitals Group, by ICICI Group, to honour outstanding achievements in the healthcare industry.
- Save a Child's Heart (SACH) – was a runner–up in the 'Corporate Governance' category at Hospital Management Asia 2004, a major hospital expo in Bangkok, Thailand.
- Avaya Global Connect award went for the second successive year, in 2006, to Apollo Hospitals, Hyderabad for customer responsiveness in the healthcare sector based on a nationwide polling exercise.

Competitors:

- Dr Lalpath labs.
- Fortis healthcare ltd.
- Narayan hrudalaya ltd.
- Metropolis healthcare ltd.
- Aster DM healthcare ltd.
- Thyrocare technologies ltd.
- Shalby ltd.
- Indraprastha medical corporation ltd.
- Kaya ltd.

- Lotus eye hospital and institute ltd.

SWOT ANALYSIS Strengths in the SWOT analysis of Apollo Hospitals

Strengths of any organization encounter and accumulatively account for the positive aspects of any brand. This is exactly what the case with the Apollo Hospitals is as well. It accounts for a number of strengths that makes it one of the most favourable hospitals around the country. The following the strengths of Apollo Hospitals:

- **Present in all the major cities** – one of the best aspects of this hospital is its availability across all the major cities across India. This ensures to make it easier for people to avail the services from anywhere they are located in. This makes it a lot easier to avail any of the services, even during the times of emergency because of the easy availability of the hospitals across the various cities.
- **Highly qualified and experienced doctors** – the doctors and facilities are what make a hospital good. This is something that is readily available in Apollo Hospitals. Every single appointed doctor is highly qualified with impeccable experience which ensures that you are in good hands and not just callous ones. This is what segregates this hospital from the sea of other hospitals.
- **Big brand name** – the brand name of Apollo Hospitals is yet another thing that sets it apart from the other hospitals. The brand name has been the result of years of hard work and dedication put behind the same.
- **Amazing services** – prompt services in Apollo Hospitals is another positive aspect of it. It has a dedicated emergency section which tends to severe and most important cases. Not just that, it even has separate sections for all the different aspects including renal, cardio and even the gynaecology and cancer departments.

Weaknesses in the SWOT analysis of Apollo Hospitals

- Weaknesses in an organization account for the downside in a brand's works and services. There might not be many downsides when it comes to Apollo Hospitals, but there are some. Some of the weaknesses of Apollo Hospitals include:
- **High costs** – this is one of the downsides that have been around since the beginning. Even with the world-class services that they provide, they charge a hefty amount of

money which is not always affordable by the common people. This is why this hospital is not always the first option for the ordinary people, even with the kind of services that they provide.

- **Lack of it in suburban areas** – the hospital is mainly found around the main cities and not built around the suburban areas. This is why many patients fail to avail the services of the hospital if they are from a remote of the suburban area.

Opportunities in the SWOT analysis of Apollo Hospitals

Opportunities classify as the sectors in the market where they can expand and spread their name in. It accounts for the main sectors where the brand can grow and proliferate. The opportunities that can be cited for the Apollo Hospitals include:

- Increased costs of healthcare in western countries – even with the increased costs in Apollo Hospitals, it is a lot lesser than what you would normally pay for in the western countries. This is exactly one of the reasons for the rising opportunities that this hospital has over its contemporaries.
- Underdeveloped healthcare availability – India is that third world country that is evolving in terms of hospitals and healthcare. This is definitely one of the main reasons which account for positive opportunities for the Apollo Hospitals. The lesser amount of developed healthcare service providers around the country pose as one of the best opportunities for this hospital.

Threats in the SWOT analysis of Apollo Hospitals

The threats account for the obstacles along the path of success for the brand. The threats that are expected to be experienced by the Apollo Hospitals include:

- **Newer evolving hospitals** – with the advancing technology and newer medical interventions, several hospitals are evolving with their services as well. This is one of the primary threats that the Apollo Hospitals might encounter in the coming future. Newer technologies are being added and most of the high-end hospitals are incorporating the same into their services to be able to successfully serve people with their added and advanced services. This is one of those threats that this establishment might face along the way but with the amount of brand trust that it has built surrounding it, it is going to be hard to deter it from its place

CHAPTER 2: FINANCIAL ANALYSIS

COMPARATIVE PROFIT AND LOSS ACCOUNT

FROM THE PERIOD MARCH 2020-2021

Particulars	Mar-21	Mar-20	Absolute increase or decrease	Percentage increase or decrease
Revenue				
Revenue From Operations [Net]	9,084.40	9,720.70	636.30	7%
Other Operating Revenues	68.6	73.7	5.10	7%
Total Operating Revenues	9,153.00	9,794.40	641.40	7%
Other Income	18.1	10.9	-7.20	-40%
Total Revenue	9,171.10	9,805.30	634.20	7%
EXPENSES				
Purchase Of Stock-In Trade	4,155.20	3,754.20	-401.00	-10%
Operating And Direct Expenses	1,329.90	1,532.10	202.20	15%
Changes In Inventories Of FG, WIP And Stock-In Trade	-127.6	-104.3	23.30	-18%
Employee Benefit Expenses	1,275.10	1,519.20	244.10	19%
Finance Costs	343.8	425.9	82.10	24%
Depreciation And Amortisation Expenses	435.9	482.3	46.40	11%
Other Expenses	1,573.10	1,677.90	104.80	7%
Total Expenses	8,985.40	9,287.30	301.90	3%
Profit/Loss Before Exceptional, ExtraOrdinary Items And Tax	185.7	518	332.30	179%
Exceptional Items	-9.1	164.4	173.50	-1907%
Profit/Loss Before Tax	176.6	682.4	505.80	286%
Tax Expenses-Continued Operations				
Current Tax	62.1	118.2	56.10	90%
Deferred Tax	9.5	93.9	84.40	888%
Total Tax Expenses	71.6	212.1	140.50	196%
Profit/Loss After Tax And Before ExtraOrdinary Items	105	470.3	365.30	348%
Profit/Loss From Continuing Operations	105	470.3	365.30	348%
Profit/Loss For The Period	105	470.3	365.30	348%

Interpretations:**Comparative profit and loss account:**

- The company's sales are increased by 7% and the expenses has increased by 7%, that is net no major increase in its revenue compared to previous year.
- Seeing the cost of inflation percentage, the present growth of the company would be worthless

- The profit has increased by 348% in comparison to the previous year, showing that the company is having a good growth prospective.

COMPARATIVE BALANCE SHEET				
FOR THE PERIOD 2020-2021				
	Mar-21	Mar-20	Absolute increase or decrease	Percentage increase or decrease
EQUITIES AND LIABILITIES				
SHAREHOLDER'S FUNDS				
Equity Share Capital	71.9	69.6	-2.3	-3%
Total Share Capital	71.9	69.6	-2.3	-3%
Reserves and Surplus	5,129.60	3,918.80	-1210.8	-31%
Total Reserves and Surplus	5,129.60	3,918.80	-1210.8	-31%
Total Shareholders Funds	5,201.50	3,988.40	-1213.1	-30%
NON-CURRENT LIABILITIES				
Long Term Borrowings	1,965.40	2,499.70	534.3	21%
Deferred Tax Liabilities [Net]	297.8	291.3	-6.5	-2%
Other Long Term Liabilities	743.2	1,421.80	678.6	48%
Total Non-Current Liabilities	3,006.40	4,212.80	1206.4	29%
CURRENT LIABILITIES				
Short Term Borrowings	0	456.9	456.9	100%
Trade Payables	849.6	727.2	-122.4	-17%
Other Current Liabilities	574.2	650.5	76.3	12%
Short Term Provisions	97.5	108.4	10.9	10%
Total Current Liabilities	1,521.30	1,943.00	421.7	22%
Total Capital And Liabilities	9,729.20	10,144.20	415	4%
ASSETS				
NON-CURRENT ASSETS				
Tangible Assets	4,895.60	5,937.80	1042.2	18%
Intangible Assets	142.4	117.9	-24.5	-21%
Capital Work-In-Progress	196.9	200.1	3.2	2%
Intangible Assets Under Development	22.3	26.5	4.2	16%
Fixed Assets	5,257.20	6,282.30	1025.1	16%
Non-Current Investments	1,134.50	1,048.80	-85.7	-8%
Long Term Loans And Advances	31.2	38.2	7	18%
Other Non-Current Assets	268.6	459.9	191.3	42%
Total Non-Current Assets	6,691.50	7,829.20	1137.7	15%
CURRENT ASSETS				

Current Investments	956.2	27.5	-928.7	-3377%
Inventories	210.3	707.4	497.1	70%
Trade Receivables	1,204.00	966.1	-237.9	-25%
Cash And Cash Equivalents	408.2	346.5	-61.7	-18%
Short Term Loans And Advances	5.3	7	1.7	24%
OtherCurrentAssets	253.7	260.5	6.8	3%
Total Current Assets	3,037.70	2,315.00	-722.7	-31%
Total Assets	9,729.20	10,144.20	415	4%

Comparative balance sheet:

- Share holders fund has decreased by 3%, reserves and surplus has decreased by 31% which means the company has utilised the funds into tangible assets with the hope to increase production.
- The company's current asset is almost double the current liabilities which means it is having good current ratio to meet sudden working capital deficiency.
- Inventory has increased by 70%, which indicates that the company invested in tangible assets in hope of increasing the production, that is implied when the investment in inventory of the company is increased.

COMMON SIZE PROFIT AND LOSS ACCOUNT				
FOR THE PERIOD MARCH 2020-2021				
Particulars	Mar-21	Percentage	Mar-20	Percentage
INCOME				
Revenue From Operations [Net]	9,084.40	99.05%	9,720.70	99.14%
Other Operating Revenues	68.6	0.75%	73.7	0.75%
Total Operating Revenues	9,153.00	99.80%	9,794.40	99.89%
Other Income	18.1	0.20%	10.9	0.11%
Total Revenue	9,171.10	100%	9,805.30	100%
EXPENSES				
Purchase Of Stock-In Trade	4,155.20	46.24%	3,754.20	40.42%
Operating And Direct Expenses	1,329.90	14.80%	1,532.10	16.50%
Changes In Inventories Of FG,WIP And Stock-In Trade	-127.6	-1.42%	-104.3	-1.12%
Employee Benefit Expenses	1,275.10	14.19%	1,519.20	16.36%
Finance Costs	343.8	3.83%	425.9	4.59%
Depreciation And Amortisation Expenses	435.9	4.85%	482.3	5.19%
Other Expenses	1,573.10	17.51%	1,677.90	18.07%
Total Expenses	8,985.40	100%	9,287.30	100%
Profit/Loss Before Exceptional, Extraordinary Items And Tax	185.7	2.04%	518	5.3%
Exceptional Items	-9.1	-13.27%	164.4	1.7%
Profit/Loss Before Tax	176.6	1.93%	682.4	7.0%
Tax Expenses-Continued Operations		0.00%		0.0%
Current Tax	62.1	0.68%	118.2	1.2%
Deferred Tax	9.5		93.9	1.0%
Total Tax Expenses	71.6	1.72%	212.1	2.2%
Profit/Loss After Tax And Before Extraordinary Items	105	7.90%	470.3	4.8%
Profit/Loss from Continuing Operations	105	-82.29%	470.3	4.8%
Profit/Loss for The Period	105	8.23%	470.3	4.8%

Common size profit and loss account:

- Revenue from operations is 99.05% of total income and the operating expense associated is only 14.8% of the total expense.so, the profit is of exceptional amount when compared to the previous two years.

- Other income has increased by 0.09%, and other expenses has increased by only 0.5%, but the expenses are higher in comparison to income, which is unhealthy for the company.

COMMON SIZE BALANCE SHEET				
FOR THE PERIOD MARCH 2020-2021				
	Mar-21	Percentage	Mar-20	Percentage
	12 months	%	12 months	%
EQUITIES AND LIABILITIES				
SHAREHOLDER'S FUNDS				
Equity Share Capital	71.9	0.7%	69.6	1%
Total Share Capital	71.9	0.7%	69.6	1%
Reserves and Surplus	5,129.60	52.7%	3,918.80	39%
Total Reserves and Surplus	5,129.60	52.7%	3,918.80	39%
Total Shareholders' Funds	5,201.50	53.5%	3,988.40	39%
NON-CURRENT LIABILITIES				
Long Term Borrowings	1,965.40	20.2%	2,499.70	25%
Deferred Tax Liabilities [Net]	297.8	3.1%	291.3	3%
Other Long-Term Liabilities	743.2	7.6%	1,421.80	14%
Total Non-Current Liabilities	3,006.40	30.9%	4,212.80	42%
CURRENT LIABILITIES				
Short Term Borrowings	0	0.0%	456.9	5%
Trade Payables	849.6	8.7%	727.2	7%
Other Current Liabilities	574.2	5.9%	650.5	6%
Short Term Provisions	97.5	1.0%	108.4	1%
Total Current Liabilities	1,521.30	15.6%	1,943.00	19%
Total Capital and Liabilities	9,729.20	100.0%	10,144.20	100%
ASSETS				
NON-CURRENT ASSETS				
Tangible Assets	4,895.60	50.3%	5,937.80	58.53%
Intangible Assets	142.4	1.5%	117.9	1.16%
Capital Work-In-Progress	196.9	2.0%	200.1	1.97%
Intangible Assets Under Development	22.3	0.2%	26.5	0.26%
Fixed Assets	5,257.20	54.0%	6,282.30	61.93%
Non-Current Investments	1,134.50	11.7%	1,048.80	10.34%
Long Term Loans And Advances	31.2	0.3%	38.2	0.38%
Other Non-Current Assets	268.6	2.8%	459.9	4.53%
Total Non-Current Assets	6,691.50	68.8%	7,829.20	77.18%
CURRENT ASSETS				
Current Investments	956.2	9.8%	27.5	0.27%

Inventories	210.3	2.2%	707.4	6.97%
Trade Receivables	1,204.00	12.4%	966.1	9.52%
Cash And Cash Equivalents	408.2	4.2%	346.5	3.42%
Short Term Loans And Advances	5.3	0.1%	7	0.07%
Other Current Assets	253.7	2.6%	260.5	2.57%
Total Current Assets	3,037.70	31.2%	2,315.00	22.82%
Total Assets	9,729.20	100.0%	10,144.20	100.00%



Common size Balance sheet:

- The reserve and surplus has decreased by 13% and tangible assets has increased by 8.5%.
- Long term borrowings has increased by 5%. The fixed assets have also increased by 6%. It is a good sign of capital appraisalment.
- Long term loans and advances have increased due to which the payments with regards to finance costs may be high in future.
- Other current liabilities have increased by only 0.1% and Current Asset has decreased by 0.012%, which implies that the current ratio is very fluctuating and there are chances of deficiency in working capital which will hamper the day to day operations of the company.

TREND ANALYSIS FOR PROFIT AND LOSS ACCOUNT					
FOR THE PERIOD MARCH 2017-MARCH 2021					
PARTICULARS	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21
INCOME					
Revenue From Operations [Gross]	6,274.19	7,159.19	8,308.70	9,720.70	9,084.40
Revenue From Operations [Net]	6,274.19	7,159.19	8,308.70	9,720.70	9,084.40
Other Operating Revenues	27.07	23.83	27.95	73.7	68.6
Total Operating Revenues	6,301.26	7,183.01	8,336.66	9,794.40	9,153.00
Other Income	25.89	12.59	12.24	10.9	18.1
Total Revenue	6,327.15	7,195.60	8,348.90	9,805.30	9,171.10
EXPENSES					
Purchase Of Stock-In Trade	2,228.52	2,614.22	3,049.30	3,754.20	4,155.20
Operating And Direct Expenses	1,182.43	1,268.00	1,391.68	1,532.10	1,329.90
Changes In Inventories Of FG, WIP And Stock-In Trade	-46.99	-80.93	-72	-104.3	-127.6
Employee Benefit Expenses	941.78	1,118.81	1,295.09	1,519.20	1,275.10
Finance Costs	200.39	240.17	268.02	425.9	343.8
Depreciation And Amortisation Expenses	240.59	272	299.9	482.3	435.9
Other Expenses	1,221.50	1,433.18	1,654.45	1,677.90	1,573.10
Total Expenses	5,968.23	6,865.46	7,886.43	9,287.30	8,985.40
Profit/Loss Before Exceptional, Extra Ordinary Items And Tax	358.92	330.14	462.47	518	185.7
Exceptional Items	0	0	0	164.4	-9.1
Profit/Loss Before Tax	358.92	330.14	462.47	682.4	176.6
Tax Expenses-Continued Operations					
Current Tax	75.66	74.35	111.2	118.2	62.1
Deferred Tax	-1.89	22.59	48.51	93.9	9.5
Total Tax Expenses	73.77	96.94	159.71	212.1	71.6
Profit/Loss After Tax And Before ExtraOrdinary Items	285.15	233.2	302.76	470.3	105
Profit/Loss From Continuing Operations	285.15	233.2	302.76	470.3	105
Profit/Loss For The Period	285.15	233.2	302.76	470.3	105

Mar-17	Mar-18	Mar-19	Mar-20	Mar-21
100%	114%	132%	155%	145%
100%	114%	132%	155%	145%
100%	88%	103%	272%	253%
100%	114%	132%	155%	145%
100%	49%	47%	42%	70%
100%	114%	132%	155%	145%
100%	117%	137%	168%	186%
100%	107%	118%	130%	112%
100%	172%	153%	222%	272%
100%	119%	138%	161%	135%
100%	120%	134%	213%	172%
100%	113%	125%	200%	181%
100%	117%	135%	137%	129%
100%	115%	132%	156%	151%
100%	92%	129%	144%	52%
100%	92%	129%	190%	49%
100%	98%	147%	156%	82%
	-	-	-	-
100%	1195%	2567%	4968%	503%
100%	131%	216%	288%	97%
100%	82%	106%	165%	37%
100%	82%	106%	165%	37%
100%	82%	106%	165%	37%

Trend analysis profit and loss account:

-  The trend analysis shows that there is slow and steady growth in the total revenue from sales. Whereas the increase in the expenses is high in comparison to the increase in sales.
-  The other incomes for the company have decreased but the other expenses have increased, which is a bad sign for the company.

TREND ANALYSIS FOR BALANCE SHEET					
FOR THE PERIOD MARCH 2017-MARCH 2021					
PARTICULARS	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21
	12 mths	12 mths	12 mths	12 mths	12 mths
EQUITIES AND LIABILITIES					
SHAREHOLDER'S FUNDS					
Equity Share Capital	69.56	69.56	69.56	69.6	71.9
Total Share Capital	69.56	69.56	69.56	69.6	71.9
Reserves and Surplus	3,509.45	3,623.94	3,813.85	3,918.80	5,129.60
Total Reserves and Surplus	3,509.45	3,623.94	3,813.85	3,918.80	5,129.60
Total Shareholders Funds	3,579.01	3,693.50	3,883.42	3,988.40	5,201.50
NON-CURRENT LIABILITIES					
Long Term Borrowings	2,619.81	2,547.10	2,597.33	2,499.70	1,965.40
Deferred Tax Liabilities [Net]	233.67	246.61	310.37	291.3	297.8
Other Long Term Liabilities	10.28	9.79	4.15	1,421.80	743.2
Total Non-Current Liabilities	2,863.77	2,803.50	2,911.85	4,212.80	3,006.40
CURRENT LIABILITIES					
Short Term Borrowings	48.91	349.53	455.69	456.9	0
Trade Payables	392.02	473.39	536.43	727.2	849.6
Other Current Liabilities	247.61	424.64	544.93	650.5	574.2
Short Term Provisions	61.84	67.52	96.04	108.4	97.5
Total Current Liabilities	750.37	1,315.07	1,633.08	1,943.00	1,521.30
Total Capital And Liabilities	7,193.15	7,812.07	8,428.35	10,144.20	9,729.20
ASSETS					
NON-CURRENT ASSETS					
Tangible Assets	3,484.34	3,630.13	3,844.77	5,937.80	4,895.60
Intangible Assets	115.68	131.39	125.04	117.9	142.4
Capital Work-In-Progress	327.55	698.3	818.81	200.1	196.9
Intangible Assets Under Development	0	0	0	26.5	22.3
Fixed Assets	3,927.56	4,459.82	4,788.62	6,282.30	5,257.20
Non-Current Investments	977.71	898.27	1,072.71	1,048.80	1,134.50
Long Term Loans And Advances	0	0	19.59	38.2	31.2
Other Non-Current Assets	543.45	474.16	544.41	459.9	268.6
Total Non-Current Assets	5,448.72	5,832.24	6,425.33	7,829.20	6,691.50
CURRENT ASSETS					
Current Investments	86.05	2.01	12.57	27.5	956.2

Inventories	442.5	538.68	561.15	707.4	210.3
Trade Receivables	663.59	749.94	909.32	966.1	1,204.00
Cash And Cash Equivalents	272.75	294.56	277.66	346.5	408.2
Short Term Loans And Advances	0	0	8	7	5.3
OtherCurrentAssets	279.53	394.65	234.34	260.5	253.7
Total Current Assets	1,744.43	1,979.83	2,003.02	2,315.00	3,037.70
Total Assets	7,193.15	7,812.07	8,428.35	10,144.20	9,729.20

Trend analysis for balance sheet:

- The share capital of the company is almost unchanged in the past five years.
- The reserves and surplus is on an increasing trend and has increased substantially in the past year which indicates that the company is earning which are transferred to reserves on a later stage resulting in increase in reserves and surplus.
- The long-term borrowings of the company is on a decreasing trend which is a positive sign, because it indicates that the revenue of the company is high which is making the company to attain self-sufficiency in terms of liquid fund.
- The other long-term liabilities have increased exponentially, which is a very bad sign.
- The investment in non-current assets is increasing, which may be invested out of the borrowed funds for future expansion plans.
- The current assets and current liabilities are being used in an efficient way.

**CHAPTER 3:
FINDINGS, SUGGESTION AND CONCLUSION**

Findings:

In this project, I found the importance of comparative, common size, and, trend analysis while evaluating the value of the firm before investing in the stock. One of the benefits of using common-size analysis is that it allows investors to identify drastic changes in a company's financial statement. It mainly applies when the financials are compared over a period of two or three years. Any significant movements in the financials across several years can help investors decide whether to invest in the company. Common-size Statement helps the users of financial statements to make clear the ratio or percentage of each individual item to the total assets/liabilities of a firm. For example, if an analyst wants to know the working capital position, he may ascertain the percentage of each individual component of current assets against the total assets of a firm and also the percentage share of each individual component of current liabilities. The common-Size statement does not recognize the change in price level i.e., the inflationary effect. So, it supplies misleading information since it is based on historical costs.

The comparative statements show the figures of various firms or the number of years side by side i.e., both for inter-firm comparison and intra-firm comparison. Comparative financial statements help to measure important Distress financial ratios which are used for predicting financial distress and predicting corporate failure with the help of the Multivariate Model. The drawback of the comparative statement is, Interfirm comparison will only be effective if both the firms follow the same accounting principles, method of valuation of stocks, assets, etc. i.e., all the accounting concepts and conventions, in a real-world situation, are not identically followed by both the firms e.g., Firm A follows the FIFO method of valuing stock whereas Firm B follows the LIFO method for the same.

Trend analysis (in terms of percentage) is found to be more effective in comparison with the absolute figures/data on the basis of which the management can make the decisions. Trend analysis helps the analyst/and the management to understand the short-term liquidity position as well as the long-term solvency position of a firm over the years with the help of related financial Trend ratios. one of the disadvantages of trend analysis is, It is not so easy to select the base year. Usually, a normal year is taken as the base year. But it is very difficult to select such a base year for the purpose of ascertaining the trend. Otherwise, comparison or trend analyses will be of no value.

SUGESSTIONS:

SUGESSTIONS FOR THE COMPANY:

- There is an increase in borrowings which led to increase in non-controlling interest which shows that the major portion of the investor's money is spent on repaying this loan. This will in turn decreases the returns for an investor.
- The company has raised a lot of secured loans over the years, to maybe incest into fixed assets, investments. But, in future the repayment of principal and interest may affect the profit earning. So, the company has to reduce borrowings of loans.
- The promoter's holdings have decreased over the last 3 years by 5.06%, which can be a threat when the investor analysis the fundamentals of the company.
- The net profit is the lowest in comparison to the last 5 years, so the profit earnings has to be taken care of.
- The borrowings of the company have been increasing from past years, which may increase the finance costs in the coming future and act as a burden to the company. So the company should avoid borrowings as much as possible.

SUGESSTIONS FOR THE INVESTOR:

- The promoter holding has decreased in the company which can be because of the investment diversification or to curtain the unethical conduct, the investor should check on the company's fundamentals thoroughly before making a decision.
- The stock is at present trading at 12.08 times of its book value and is been increasing when checked for long term. The investor should note that the share price is fluctuating and should wait for a fair price and then invest.

CONCLUSION:

Apollo hospitals has spread its wings to every part of the country, which is considered to be a major strength of the company. Apollo hospitals have the services of most of the best surgeons, doctors, and health care workers. The impeccable service it provides cannot be matched by any of its peers. The most important aspect in the hospital sector is the brand name and success rates of cured patients, and apollo stands tall in comparison to its competitors.

In a nutshell, “APOLLO HOSPITALS” deserves its first place in the market and should be the first investment option for any investor, who is interested in healthcare industry.

Comparative financial statements give managers and analysts advantages, which allow more efficient and detailed analysis of the entity’s performance. While the normal financial statement is a static reflection of the current financial position of the company, comparative financial statements reflect the dynamics in its development and allow to determine trends and forecast changes.

My brief analysis of the Comparative Income Statement and Common Size Income Statement, from the examples we used in explaining the comparative and common-size financial statements, clearly defines the significance of each method as a tool for financial analysis. Where the comparative provides the value of the results of the business, the common size presents the performance trend and the aspects that need to show improvement. it can be said that the common size income statement facilitates easy comparison. It makes analysis much easier such that the analyst can see what is actually driving the profit of a company, and then compare that performance to its peers.

The trend is a friend, is a well-known quote in the trader’s fraternity. The trader makes a good profit by following the trend, and trend analysis is not an easy task. It required eyes on detail and an understanding of the market dynamics.

The trend analysis in accounting can be used by management or the analyst to forecast future financial statements. Following blindly can be dangerous if a proper analysis of the past event is not done.

The assignment even focused on the study of different aspects of the company Apollo hospital enterprise ltd. such as its history, McKinney’s 7S model, SWOT analysis, products, promotion and organisation structure. This has helped us understand the

company profile in a better manner. The assignment has helped us in better understanding of the financial data of any particular company and how the data can be analysed to know the financial standings of the company. I have used income statement and balance sheet and then with the help of financial tools such as comparative, common size, and trend analysis to understand the financial data of the Axis bank ltd. The interpretation of the data by using above mentioned tools was the main part of the assignment because it shows how good have you understood the data and analysed it. Overall, the assignment has helped us to improve our knowledge of the financial data. I was able to compare what we learn and how we can apply it know more about the industrial financial data.

CHAPTER 4:
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BIBLIOGRAPHY:

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CHAPTER 5:
ANNEXURE:

ANNEXURE

Apollo Hospitals Enterprises

PROFIT AND LOSS FOR THE PERIOD MARCH 2017-2021

Standalone Profit & Loss account	----- in Rs. Cr. -----				
	Mar 21	Mar 20	Mar 19	Mar 18	Mar 17
	12 months	12 months	12 months	12 months	12 months
INCOME					
Revenue From Operations [Gross]	9,084.40	9,720.70	8,308.70	7,159.19	6,274.19
Revenue From Operations [Net]	9,084.40	9,720.70	8,308.70	7,159.19	6,274.19
Other Operating Revenues	68.60	73.70	27.95	23.83	27.07
Total Operating Revenues	9,153.00	9,794.40	8,336.66	7,183.01	6,301.26
Other Income	18.10	10.90	12.24	12.59	25.89
Total Revenue	9,171.10	9,805.30	8,348.90	7,195.60	6,327.15
EXPENSES					
Purchase Of Stock-In Trade	4,155.20	3,754.20	3,049.30	2,614.22	2,228.52
Operating And Direct Expenses	1,329.90	1,532.10	1,391.68	1,268.00	1,182.43
Changes In Inventories Of FG, WIP And Stock-In Trade	-127.60	-104.30	-72.00	-80.93	-46.99
Employee Benefit Expenses	1,275.10	1,519.20	1,295.09	1,118.81	941.78
Finance Costs	343.80	425.90	268.02	240.17	200.39
Depreciation And Amortisation Expenses	435.90	482.30	299.90	272.00	240.59
Other Expenses	1,573.10	1,677.90	1,654.45	1,433.18	1,221.50
Total Expenses	8,985.40	9,287.30	7,886.43	6,865.46	5,968.23
	Mar 21	Mar 20	Mar 19	Mar 18	Mar 17
	12 months	12 months	12 months	12 months	12 months

Profit/Loss Before Exceptional, Extraordinary Items and Tax	185.70	518.00	462.47	330.14	358.92
Exceptional Items	-9.10	164.40	0.00	0.00	0.00
Profit/Loss Before Tax	176.60	682.40	462.47	330.14	358.92
Tax Expenses-Continued Operations					
Current Tax	62.10	118.20	111.20	74.35	75.66
Deferred Tax	9.50	93.90	48.51	22.59	-1.89
Total Tax Expenses	71.60	212.10	159.71	96.94	73.77
Profit/Loss After Tax and Before Extraordinary Items	105.00	470.30	302.76	233.20	285.15
Profit/Loss from Continuing Operations	105.00	470.30	302.76	233.20	285.15
Profit/Loss for The Period	105.00	470.30	302.76	233.20	285.15

Apollo Hospitals Enterprises

BALANCE SHEET FOR THE PERIOD MARCH 2017-2021

Standalone Balance Sheet	----- in Rs. Cr. -----				
	Mar 21	Mar 20	Mar 19	Mar 18	Mar 17
	12months	12 months	12 months	12 months	12 months
EQUITIES AND LIABILITIES					
SHAREHOLDER'S FUNDS					
Equity Share Capital	71.90	69.60	69.56	69.56	69.56
Total Share Capital	71.90	69.60	69.56	69.56	69.56
Reserves and Surplus	5,129.60	3,918.80	3,813.85	3,623.94	3,509.45
Total Reserves and Surplus	5,129.60	3,918.80	3,813.85	3,623.94	3,509.45
Total Shareholders' Funds	5,201.50	3,988.40	3,883.42	3,693.50	3,579.01
NON-CURRENT LIABILITIES					
Long Term Borrowings	1,965.40	2,499.70	2,597.33	2,547.10	2,619.81
Deferred Tax Liabilities [Net]	297.80	291.30	310.37	246.61	233.67
Other Long-Term Liabilities	743.20	1,421.80	4.15	9.79	10.28
Total Non-Current Liabilities	3,006.40	4,212.80	2,911.85	2,803.50	2,863.77
CURRENT LIABILITIES					
Short Term Borrowings	0.00	456.90	455.69	349.53	48.91
Trade Payables	849.60	727.20	536.43	473.39	392.02
Other Current Liabilities	574.20	650.50	544.93	424.64	247.61
Short Term Provisions	97.50	108.40	96.04	67.52	61.84
Total Current Liabilities	1,521.30	1,943.00	1,633.08	1,315.07	750.37
Total Capital and Liabilities	9,729.20	10,144.20	8,428.35	7,812.07	7,193.15

RV INSTITUTE OF MANAGEMENT

ASSETS					
NON-CURRENT ASSETS					
Tangible Assets	4,895.60	5,937.80	3,844.77	3,630.13	3,484.34
Intangible Assets	142.40	117.90	125.04	131.39	115.68
Capital Work-In-Progress	196.90	200.10	818.81	698.30	327.55
Intangible Assets Under Development	22.30	26.50	0.00	0.00	0.00
Fixed Assets	5,257.20	6,282.30	4,788.62	4,459.82	3,927.56
Non-Current Investments	1,134.50	1,048.80	1,072.71	898.27	977.71
Long Term Loans And Advances	31.20	38.20	19.59	0.00	0.00
Other Non-Current Assets	268.60	459.90	544.41	474.16	543.45
Total Non-Current Assets	6,691.50	7,829.20	6,425.33	5,832.24	5,448.72
CURRENT ASSETS					
Current Investments	956.20	27.50	12.57	2.01	86.05
Inventories	210.30	707.40	561.15	538.68	442.50
Trade Receivables	1,204.00	966.10	909.32	749.94	663.59
Cash And Cash Equivalentents	408.20	346.50	277.66	294.56	272.75
Short Term Loans And Advances	5.30	7.00	8.00	0.00	0.00
OtherCurrentAssets	253.70	260.50	234.34	394.65	279.53
Total Current Assets	3,037.70	2,315.00	2,003.02	1,979.83	1,744.43
Total Assets	9,729.20	10,144.20	8,428.35	7,812.07	7,193.15

Assignment on Capstone Project of Measuring Financial Health using Comparative, Common Size and Trend analysis of Coal India Ltd.

Project report submitted as an assignment of

Managerial accounting

Subject code: 21MBA311

Submitted by

PRAKASH

Register number – RVIM21MBA140

UNDER THE GUIDANCE OF

Prof. Rajkumar Chavan

Assistant Professor



R V Institute of Management

Bangalore

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I express my sincere thanks to our director Dr. Purushottam Bung, RVIM for extending his support by permitting me to do my project work.

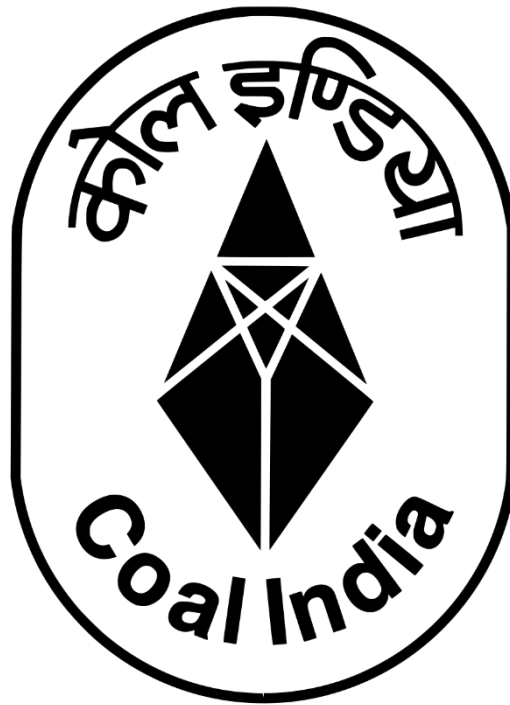
My deepest gratitude to mentor Prof. Rajkumar Chavan, Assistant Professor of RVIM for guiding me all the way from the commencement to the completion of this project work.

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CHAPTER – 1
INTRODUCTION

ABOUT THE COMPANY



ABOUT COMPANY

Coal India Limited (CIL) the state-owned coal mining corporate came into being in November 1975. With a modest production of 79 million Tonnes (MTs) at the year of its inception CIL, today is the single largest coal producer in the world and one of the largest corporate employers with manpower of 2,59,016 (as of 1st April 2021). CIL functions through its subsidiaries in 85 mining areas spread over eight (8) states of India. Coal India Limited has 345 mines (as on 1st April, 2021) of which 151 are underground, 172 open cast and 22 mixed mines. CIL is presently operating 13 coal washeries, with a total washing capacity of 35.38 MTY (Out of these, 11 are coking coal washeries and balance 2 are non-coking) and

also manages other establishments like workshops, hospitals, and so on. CIL has 20 training Institutes and 86 Vocational Training Centres. Indian Institute of Coal Management (IICM) as

a state-of-the-art Management Training ‘Centre of Excellence’ – the largest Corporate Training Institute in India - operates under CIL and conducts multi-disciplinary programmes.

CIL is a *Maharatna* company - a privileged status conferred by the Government of India to select state-owned enterprises in order to empower them to expand their operations and emerge as global giants. The select club has only ten members out of more than three hundred Central Public Sector Enterprises in the country.

CIL has seven producing subsidiaries namely Eastern Coalfields Limited (ECL), Bharat Coking Coal Limited (BCCL), Central Coalfields Limited (CCL), Western Coalfields Limited (WCL), South Eastern Coalfields Limited (SECL), Northern Coalfields Limited (NCL), and Mahanadi Coalfields Limited (MCL) and One mine planning and consultancy company that is Central Mine Planning & Design Institute (CMPDI). In addition, CIL has a foreign subsidiary in Mozambique namely Coal India Africana Limitada (CIAL). The mines in Assam i.e. North Eastern Coalfields are managed directly by CIL.

CIL has incorporated two new subsidiaries i.e. CIL Navi Karniya Urja Limited for the development of non-conventional/clean & renewable energy and CIL Solar PV Limited for development of the solar photovoltaic module.

- Mahanadi Coalfields Limited has four (4) subsidiaries which are i) MJSJ Coal Limited ii) MNH Shakti Ltd, iii) Mahanadi Basin Power Ltd iv) Neelanchal Power Transmission Company Private Ltd
- SECL has two subsidiaries i) M/s Chhattisgarh East Railway Ltd (CERL) ii)M/s Chhattisgarh East-West Railway Ltd (CEWRL)
- CCL has one subsidiary – Jharkhand Central Railway Ltd.

HISTORY

With dawn of the Indian independence a greater need for coal production was felt in the First Five Year Plan. In 1951 the Working Party for the coal Industry was set up which included representatives of coal industry, labour unions and government which suggested the amalgamation of small and fragmented producing units. Thus the idea for a nationalized unified coal sector was born. Integrated overall planning in coal mining is a post-independence phenomenon. National Coal Development Corporation was formed with 11 collieries with the task of exploring new coalfields and expediting development of new coal mines.

Factors which led up to Nationalization of Coal Industry in India

Nationalization of coal industry in India in the early seventies was a fall out of two related events. In the first instance it was the oil price shock, which led the country to take up a close scrutiny of its energy options. A Fuel Policy Committee set up for this purpose identified coal as the primary source of commercial energy. Secondly, the much needed investment needed for growth of this sector was not forthcoming with coal mining largely in the hands of private sector. The objectives of Nationalization as conceived by late Mohan Kumara Mangalam were; Conservation of the scarce coal resource, particularly coking coal, of the country by

- Halting wasteful, selective and slaughter mining.
- Planned development of available coal resources.
- Improvement in safety standards.
- Ensuring adequate investment for optimal utilization consistent with growth needs
- Improving the quality of life of the work force.

Moreover, the coal mining which hitherto was with private miners suffered with their lack of interest in scientific methods, unhealthy mining practices etc. The living conditions of miners.

Formation of COAL India,

With the Government's national energy policy, the near total national control of coal mines in India took place in two stages in 1970s. The Coking Coal Mines (Emergency Provisions) Act 1971 was promulgated by Government on 16 October 1971 under which except the captive mines of IISCO, TISCO, and DVC, the Government of India took over the management of all 226 coking coal mines and nationalised them on 1 May, 1972. Bharat Coking Coal Limited was thus born. Further by promulgation of Coal Mines (Taking over of Management) Ordinance 1973 on 31 January 1973 the Central Government took over the management of all 711 non-coking coal mines. In the next phase of nationalization these mines were nationalized with effect from 1 May 1973 and a public sector company named Coal Mines Authority Limited (CMAL) was formed to manage these non-coking mines.

A formal holding company in the form of **Coal India Limited was formed in November 1975 to manage both the companies.**

MILESTONE ACHIVED IN LAST 5YEARS

2019-2020

- Coal Production: Coal India Limited produced 602.13 million Tonnes (MTs) of coal, CIL breached the 600mt mark for the second year consecutively.
- In the month of March' 20, CIL produced 84.36 MT, the highest so far in a month since the inception of the company.
- Coal stock at power houses was its highest in a decade at 45 .01 Mt's (28 days) as on 31.3.2020.

2018-2019

- Coal India Limited for the first time, had breached the 600 million Tonne (MT) mark in coal production and off-take ending FY 2019 by producing 606.89 MTs of coal and supplying 608.14 MTs, clocking growths of 6.97% and 4.8% over previous year respectively.
- Coal India Limited aligned itself as corporate partner of International Solar Alliance (ISA), through a contribution of 1 million US \$, a little over Rs. 6.75 Crores, to ISA's corpus fund.

2017-2018

- Monitoring of 69 coal-mining project costing more than Rs.150 Crores with Project monitoring software MS Project have been started in Coal India Limited during the year 2016-17.
- CIL in association with CMPDI recently launched a portal MDMS (Mine Data Base Management System) to monitor the on-going projects costing Rs. 20 Crores and above in CIL.

2016-2017

- Coal India has been accredited with IS/ISO 9001:2015 (Quality Management System) and IS/ ISO 50001:2011 (Energy Management System) certification on 27th October 2016.

VISION

To emerge as a global player in the primary energy sector committed to provide energy security to the country by attaining environmentally & socially sustainable growth through best practices from mine to market.

MISSION

To produce & market planned quantity of coal & coal products efficiently & economically with due regards to safety, conservation & quality.

PRODUCTS

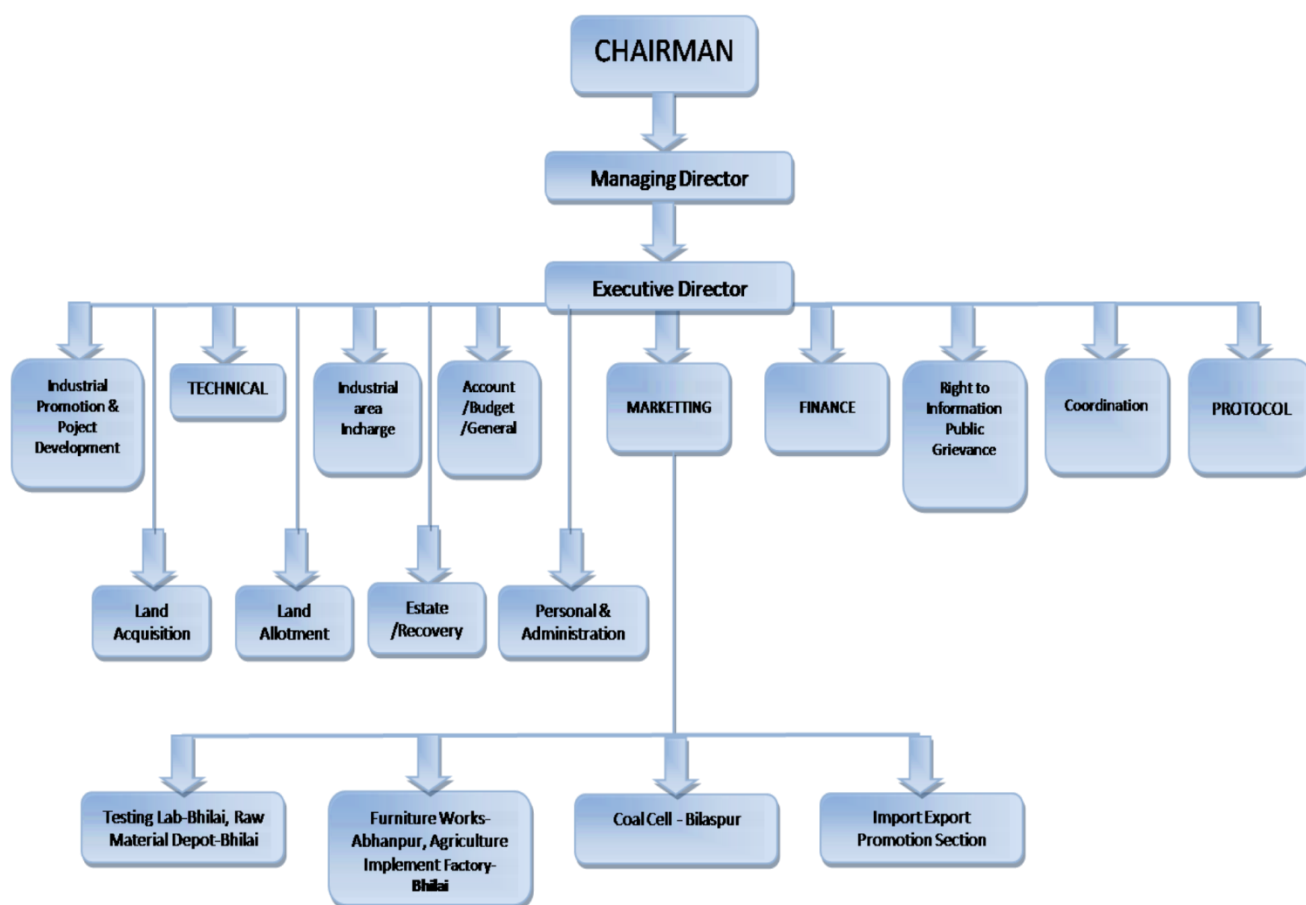
Its product offerings include Coking Coal, Semi Coking Coal, Non-Coking Coal, Washed and Beneficiated Coal, Middling's, Rejects, Coal Fines/Coke Fines, CIL Coke / LTC Coke and Tar/Heavy Oil/Light Oil/Soft Pitch. Its Coking Coal products are used in steel making and metallurgical industries. Its Semi Coking Coal products are used as blend-able coal in steel making, merchant coke manufacturing and other metallurgical industries. Its Non-Coking Coal products are used as thermal grade coal for power generation and also used for cement, fertilizer, glass, ceramic, paper, chemical and brick manufacturing, and for other heating purposes. It's washed and Beneficiated Coal is used in manufacturing of hard coke for steel making.



MANAGEMENT

Name	Designation
B Dayal	Director - Technical
M Viswanathan	Co. Secretary & Comp. Officer
Pramod Agrawal	Chief Executive Officer
Pramod Agrawal	Chairman & Managing Director
R P Srivastava	Director - Personnel
S N Tiwary	Director - Marketing
S Sarkar	Chief Financial Officer
S Soni	Director - Finance
Sunil Kumar Mehta	General Manager - Finance
V K Tiwari	Part Time Official Director
Yatinder Prasad	Part Time Official Director

STRUCTURE



KEY COMPETITORS

- 20 Microns Ltd.
- Ashapura Minechem Ltd.
- ASI Industries Ltd.
- Auroma Coke Ltd. AURCOK.
- Deccan Gold Mines Ltd. DECGOL.
- Foundry Fuel Products Ltd. FOUFUE.

COAL INDIA LTD BRAND ANALYSIS

Parent Company: Public Sector- Government of India

Category: Mining and minerals

Sector: Heavy Equipment & Engineering

Tagline/ Slogan: Nurturing nature, empowering India, Enabling life

USP: Largest company in the world in terms of coal production

SWOT ANALYSIS OF COAL INDIA LTD

Coal India Ltd Strengths:

1. CIL owns the world's largest recoverable coal reserves at more than 22bnt
2. Tie ups with shipping Corporation of India enables CIL to tap into the expertise of an experienced shipper while avoiding the vagaries of the spot market.
3. Strategic overseas venture secures its future position and energy requirements
4. Strong employee base with over 350,000 people in the organisation
5. Strong backing by the govt of India
6. The CIL is also recognized as a Maharatna Company in India
7. Excellent advertising and marketing in B2B as well as TVCs, print and online media

Coal India Ltd Weaknesses:

1. State control reduces CIL's flexibility in responding to changes in the market.
2. Inefficient production from the company's coal blocks is causing supply problems in India's power sector.
3. Bound to supply domestic customers even at subsidized rates

Coal India Ltd Opportunities:

1. Project delays due to environmental and land issues pose threat to companies sustained future supplies
2. Policy uncertainty continues to be an issue. There is still a lack of clarity in the 26% profit sharing clause included in the mining bill
3. Foreign investment in mining sector

Coal India Ltd Threats:

1. Project delays due to environmental and land issues pose threat to companies sustained future supplies
2. Policy uncertainty continues to be an issue. There is still a lack of clarity in the 26% profit sharing clause included in the mining bill
3. Foreign investment in mining sector

COAL INDIA LTD STP

Segment: Coal and mining company in India

Target Group: Firms across globe, cost conscious state- and privately-owned energy sector

Positioning: Low-cost coal producer

Coal India Marketing Strategy & Marketing Mix (4Ps)

Marketing Strategy of Coal India analyses the brand with the marketing mix framework which covers the 4Ps (Product, Price, Place, Promotion). There are several marketing strategies like product innovation, pricing approach, promotion planning etc. These business strategies, based on Coal India marketing mix, help the brand succeed.

Coal India marketing strategy helps the brand/company to position itself competitively in the market and achieve its business goals & objectives.

Let us start the Coal India Marketing Strategy & Mix to understand its product, pricing, advertising & distribution strategies:

Coal India Product Strategy:

The product strategy and mix in Coal India marketing strategy can be explained as follows:

Coal India is one the leading coal mining and extraction companies in India. Though the core product of Coal India is coal, the different kinds of coal it produces that are used in industries like power generation, steel, glass, ceramic, paper, chemical, cement and various other industries makes Coal India a powerful organization in the world. Its products in its marketing mix are varied like: Coking Coal, non – Coking, semi-coking coal, washed & beneficiated coal, Rejects, CIL/ LTC Coke, Middling, coal/coke fines, tar, heavy / light oil and soft pitch. These are used in pharma, oil and dye manufacturing companies also. In Coking coal category, it produces different variants that differ in ash content and graded as Steel and washery. Also in the non-coking coal category, Coal India produces several variants that are differed in gross calorific value, the range for this GCV is from 2200 – 7000+ Kcal/Kg. Similarly, semi coking coke is graded on the basis of ash and moist content in the coal.



Coal India Price/Pricing Strategy:

Below is the pricing strategy in Coal India marketing strategy:

Coal India used to charge based on useful heat value pricing mechanism, but in an attempt to rejjig its strategies it changed to a much profitable gross calorific value-based coal pricing.

And on an average the price of one tonne of coal is at 1,100+ rupees. Coal India also uses differential pricing strategy. Here it charges a different price to regulated and unregulated sectors in India. As part of this strategy Coal India charges nearly 20% more to the unregulated sector than what it charges to the regulated sectors. All the prices it charges include FOB. It also keeps in mind the price that is offered by the Chinese players who are offering at a lower price. Even though Coal India is a public sector company it takes very tough calls in regard to price and have no apprehensions in increasing the price. Hence, this gives an insight in the Coal India marketing mix pricing strategy.

Coal India Place & Distribution Strategy:

Following is the distribution strategy in the Coal India marketing mix:

Coal India being the largest producer in the world runs in nearly 81 mining areas. These are spread across the country in eight states. These 81 mining areas have nearly 430 coal mines. Coal India operates in different places through its seven subsidiaries. Coal India also has a joint venture with international coal venture Pvt Ltd. To procure coal outside the country. It sells all its products through e-auction for high degree of transparency. It also provides Coal India the ability to sell to customers at any place in India from any of its production sites.

It has different types of e-auction facilities to cater to the consumers of all kinds like, spot e-auction and forward e-auction.

Coal India Promotion & Advertising Strategy:

The promotional and advertising strategy in the Coal India marketing strategy is as follows:

Coal India mainly does B2B promotions and rightly so as its customer base is industries across various domains. It gives advertisements in print and online platforms to reach out to its customer base. As a part of its PR activities Coal India involves in many CSR activities also. Recently it is sponsoring the Hockey India League as a title sponsor. It is spending nearly 13 crores for this. Though they consider it a CSR activity to help sports it is an exercise to reach more customers. Also, its subsidiaries also involve in individual promotional activities like, South Eastern Coal Fields Ltd. Also, Coal India sponsored world hockey league. Coal India also received recognition and awards like Rastriya Khel Protsahan Puraskar (2015) for its contribution to developing sports at grass roots level in India. Hence, this completes the Coal India marketing mix.

CHAPTER – 2

Financial Analysis

Comparative analysis of income statement

Compared for the years 2020 and 2021.
Figures in Crores.

Particulars	Mar-20	Mar-21	Absolute Inc./Dec.	%Inc./Dec.
Sales	96,080	90,026	-6,054	-6.30
Expenses	74,500	71,455	-3,045	-4.09
Operating Profit	21,581	18,571	-3,010	-13.95
Other Income	6,444	3,791	-2,653	-41.17
Interest	503	645	142	28.23
Depreciation	3,451	3,709	258	7.48
Profit before tax	24,071	18,009	-6,062	-25.18
Tax	7,357	5,309	-2,048	-1.17
Net Profit	16,714	12,700	-4,014	-24.02

Common size analysis of income statement

Compared for the years 2020 and 2021.
Figures in Crores.

Particulars	Mar-20	%	Mar-21	%
Sales	96,080	100	90,026	100
Expenses	74,500	77.53	71,455	79.37
Operating Profit	21,581	22.416	18,571	20.62
Other Income	6,444	6.7	3,791	4.21
Interest	503	0.52	645	0.71
Depreciation	3,451	3.59	3,709	4.11
Profit before tax	24,071	25.05	18,009	20
Tax	7,357	8	5,309	5.89
Net Profit	16,714	17.39	12,700	14.01

Trend analysis of income statement

Compared for the years 2017,2018,2019,2020 and 2021.

Figures in Crores.

Particulars	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21
Sales	78,164	85,244	99,586	96,080	90,026
Expenses	65,716	75,956	74,579	74,500	71,455
Operating Profit	12,448	9,288	25,007	21,581	18,571
Other Income	5,316	4,975	5,834	6,444	3,791
Interest	410	430	264	503	645
Depreciation	2,907	3,063	3,450	3,451	3,709
Profit before tax	14,446	10,770	27,127	24,071	18,009
Tax	5,166	3,731	9,664	7,357	5,309
Net Profit	9,280	7,039	17,463	16,714	12,700

	2017%	2018%	2019%	2020%	2021%
	100	109.06	127.41	122.92	115.18
	100	115.58	113.49	113.37	108.73
	100	74.61	200.89	173.37	149.19
	100	93.59	109.74	121.22	71.31
	100	104.88	64.39	122.68	157.32
	100	105.37	118.68	118.71	127.59
	100	74.55	187.78	166.63	124.66
	100	72.22	187.07	142.41	102.77
	100	75.85	188.18	180.11	136.85

Comparative analysis of Balance sheet

Compared for the years 2020 and 2021.

Figures in Crores.

Particular	Mar-20	Mar-21	Absolute inc/dec	%inc/dec
Share Capital -	6,163	6,163	0	0.00
Equity Capital	6,163	6,163	0	0.00
Reserves	25,994	30,355	4,361	16.78
Borrowings	6,434	5,883	-551	-8.56
Other Liabilities -	1,11,430	1,18,657	7,227	6.49
Non-controlling int	394	441	47	11.93
Trade Payables	7,251	7,638	387	5.34
Advance from Customers	12,002	13,647	1,645	13.71
Other liability items	91,783	96,932	5,149	5.61
Total Liabilities	1,50,020	1,61,058	11,038	7.36
Fixed Assets -	36,784	42,405	5,621	15.28
Land	15,924	18,771	2,847	17.88
Building	4,036	4,509	473	11.72
Plant Machinery	17,941	21,794	3,853	21.48
Equipment's	315	343	28	8.89
Furniture n fittings	318	372	54	16.98
Railway sidings	3,652	5,500	1,848	50.60
Vehicles	190	208	18	9.47
Other fixed assets	8,808	8,296	-512	-5.81
Gross Block	51,184	59,792	8,608	16.82
Accumulated Depreciation	14,400	17,387	2,987	20.74
CWIP	8,328	10,490	2,162	25.96
Investments	1,973	5,950	3,977	201.57
Other Assets -	1,02,936	1,02,212	-724	-0.70
Inventories	6,618	8,947	2,329	35.19
Trade receivables	14,408	19,623	5,215	36.20
Cash Equivalent	28,449	17,310	-11,139	-39.15
Loans n Advances	37,731	39,271	1,540	4.08
Other asset items	15,730	17,061	1,331	8.46
Total Assets	1,50,020	1,61,058	11,038	7.36

Common size analysis of Balance sheet

Compared for the years 2020 and 2021.

Figures in Crores.

Particular	Mar-20	%	Mar-21	%
Share Capital -	6,163	4.11	6,163	3.827
Equity Capital	6,163	4.11	6,163	3.827
Reserves	25,994	17.33	30,355	18.847
Borrowings	6,434	4.29	5,883	3.653
Other Liabilities -	1,11,430	74.28	1,18,657	73.673
Non-controlling int	394	0.26	441	0.274
Trade Payables	7,251	4.83	7,638	4.742
Advance from Customers	12,002	8.00	13,647	8.473
Other liability items	91,783	61.18	96,932	60.185
Total Liabilities	1,50,020	100.00	1,61,058	100.000
Fixed Assets -	36,784	24.52	42,405	26.329
Land	15,924	10.61	18,771	11.655
Building	4,036	2.69	4,509	2.800
Plant Machinery	17,941	11.96	21,794	13.532
Equipment's	315	0.21	343	0.213
Furniture n fittings	318	0.21	372	0.231
Railway sidings	3,652	2.43	5,500	3.415
Vehicles	190	0.13	208	0.129
Other fixed assets	8,808	5.87	8,296	5.151
Gross Block	51,184	34.12	59,792	37.125
Accumulated Depreciation	14,400	9.60	17,387	10.795
CWIP	8,328	5.55	10,490	6.513
Investments	1,973	1.32	5,950	3.694
Other Assets -	1,02,936	68.61	1,02,212	63.463
Inventories	6,618	4.41	8,947	5.555
Trade receivables	14,408	9.60	19,623	12.184
Cash Equivalents	28,449	18.96	17,310	10.748
Loans n Advances	37,731	25.15	39,271	24.383
Other asset items	15,730	10.49	17,061	10.593
Total Assets	1,50,020	100.00	1,61,058	100.000

Trend analysis of Balance sheet

Compared for the years 2017,2018,2019,2020 and 2021.

Figures in Crores.

Particular	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21
Share Capital -	6,207	6,207	6,163	6,163	6,163
Equity Capital	6,207	6,207	6,163	6,163	6,163
Reserves	18,311	13,971	20,292	25,994	30,355
Borrowings	3,014	1,538	2,210	6,434	5,883
Other Liabilities -	91,054	1,03,754	1,04,356	1,11,430	1,18,657
Non-controlling int	346	362	408	394	441
Trade Payables	3,884	6,974	9,418	7,251	7,638
Advance from Customers	9,799	13,772	14,677	12,002	13,647
Other liability items	77,025	82,645	79,853	91,783	96,932
Total Liabilities	1,18,587	1,25,471	1,33,021	1,50,020	1,61,058
Fixed Assets -	23,811	27,574	32,618	36,784	42,405
Land	10,197	11,869	14,694	15,924	18,771
Building	2,937	3,265	3,765	4,036	4,509
Plant Machinery	11,914	14,233	16,664	17,941	21,794
Equipment's	180	224	251	315	343
Furniture n fittings	188	271	309	318	372
Railway sidings	245	333	647	3,652	5,500
Vehicles	104	122	147	190	208
Other fixed assets	3,664	5,753	7,749	8,808	8,296
Gross Block	29,428	36,068	44,226	51,184	59,792
Accumulated Depreciation	5,617	8,494	11,608	14,400	17,387
CWIP	8,585	10,273	9,658	8,328	10,490
Investments	1,483	1,704	3,170	1,973	5,950
Other Assets -	84,708	85,920	87,576	1,02,936	1,02,212
Inventories	9,717	6,444	5,584	6,618	8,947
Trade receivables	12,476	6,258	5,499	14,408	19,623
Cash Equivalents	31,149	31,280	31,124	28,449	17,310
Loans n Advances	20,304	28,004	29,984	37,731	39,271
Other asset items	11,061	13,935	15,385	15,730	17,061
Total Assets	1,18,587	1,25,471	1,33,021	1,50,020	1,61,058

Trend analysis continued

2017%	2018%	2019%	2020%	2021%
100	100.00	99.29	99.29	99.29
100	100.00	99.29	99.29	99.29
100	76.30	110.82	141.96	165.77
100	51.03	73.32	213.47	195.19
100	113.95	114.61	122.38	130.31
100	104.62	117.92	113.87	127.46
100	179.56	242.48	186.69	196.65
100	140.54	149.78	122.48	139.27
100	107.30	103.67	119.16	125.84
100	105.81	112.17	126.51	135.81
100	115.80	136.99	154.48	178.09
100	116.40	144.10	156.16	184.08
100	111.17	128.19	137.42	153.52
100	119.46	139.87	150.59	182.93
100	124.44	139.44	175.00	190.56
100	144.15	164.36	169.15	197.87
100	135.92	264.08	1490.61	2244.90
100	117.31	141.35	182.69	200.00
100	157.01	211.49	240.39	226.42
100	122.56	150.29	173.93	203.18
100	151.22	206.66	256.36	309.54
100	119.66	112.50	97.01	122.19
100	114.90	213.76	133.04	401.21
100	101.43	103.39	121.52	120.66
100	66.32	57.47	68.11	92.08
100	50.16	44.08	115.49	157.29
100	100.42	99.92	91.33	55.57
100	137.92	147.68	185.83	193.42
100	125.98	139.09	142.21	154.24
100	105.81	112.17	126.51	135.81

Chapter 3
Interpretation

1. Comparative analysis of income statement

- There has been a decrease in the revenue collected from sales from previous year 2020 to the present year 2021 which accounts to decrease of 6054Cr or a -6.3%. This in turn has led to decrease in the expenses by 4.09% compared to the previous year.
- The other income of the company has also decreased comparing to previous year by 13.95%. As compared to the decrease in sales revenue this is a major decrease which is a bad sign for the company.
- There has been an increase in interest paid by the company by 28.23% compared to previous year which indicates that the company has taken additional loans or borrowings.
- The net profit of the company has decreased drastically compared to last year by 24.02%. This compared with the decrease in sales revenue is very large and it is not a good sign for the company.

2. Common size analysis of income statement

- We can see that the decrease in sales has caused decrease in expenses compared to previous year. But the expenses in the previous year accounted to 77.53% of sales revenue but in the present year it accounts to 79.37% which is not a good sign for the company.
- There is also an increase in depreciation from 3.59% in previous year to 4.11% for the present year which indicates in purchase of any fixed assets.
- The operating profit of the company has also decreased from 22.41% in previous year to 20.62% for the present year which is not a good sign for the company as well as the investors and shareholders.
- The profit of the company has reduced from 17.39% to 14.01% of the sales revenue from previous year to present year which shows that the company has not seen any growth in its business.

3. Trend analysis of income statement

- The sales of the company have increased gradually up to 2019 and then started to decrease which in turn has led to the increase and decrease of the expenses of the company respectively.
- The depreciation of the company has increased gradually over the year except for a single year in 2020 which shows that the company has purchased fixed assets in all these years except the year 2020.
- The operating profit of the company is very unstable over the years indicating that there may be a unstable conditions in the operating sector of the company and is not solved over the years.
- The tax paid by the company compared to its sales revenue is very unstable indicating that there would have been a change in the policies of the tax payment which is also one of the major factors deciding the profit of the company.

4. Comparative analysis of Balance sheet

- The reserves have increased as compare to previous year that is 25994cr to 30355cr which indicates that there may be a increase in profit of the company
- The borrowings have decreased by 8.56% as compared to previous year which is 6434 to 5883, this decrease in borrowings is a good sign for the company
- Fixed asset has increased as compared to previous year by 15.28% indicating that there is a purchase in the fixed asset
- There is an increased in inventory by 35.19% compared to previous year which means an increasing in productivity

5. Common size analysis of Balance sheet

- There is an increased in advance from customers by 8% to 8.47% which is 12002 to 13647, which shows there is a demand in the market for products of company.
- There is an increase in capital work in progress 10490 from 8328 which shows there are some under constructions building or plant which indicates there is future in increase in assets.
- The investments have increased by 3.694 from 1.32 which is 1973 to 5950 which shows that the company is trying to meet future demand.
- There is an increased in trade receivable shows that there increased in credit sales.
- There is increased in fixed assets it means company purchased new fixed assets by this there is increased in the value of assets.

6. Trend analysis of Balance sheet

- There is marginally increase in share capital and same for over the years it means that the company not issued new shares and it indicates that effective usage of share capital.
- The reserves of company gradually increased over the year it means company is going to use for specific purpose like buying of fixed assets, payment of legal settlements, debts repayments or payment of dividends.
- The fixed assets increased over the years it means the company has effectively used investments in fixed assets to generate sales.
- There is gradually increased in loans and advances over the years it shows company earning more income by lending loans.
- There is an increase in trade payables and trade receivables it means company doing more credit transactions over the year.

Chapter 4
Suggestions and conclusions

Suggestions:

For the company

- The company has a major trade receivable increase in the last two years compared with the previous years which shows increase in the credit sales. The company has to reduce its credit sales so that it can generate more revenue at a present situation.
- The company has a very stable growth but not rapidly this is good sign for the company for the long run scenario.
- From the trend analysis seen above we can see that advances from customers have seen an increasing and sudden decrease and then an increase in amounts through the 5 years, this has made the company into a two-way entanglement where it is even taking advances and also giving credit sales. Due to which there is a lot of revenue outstanding for the company.
- The company had decrease in sales from 2020 which led to major decrease in profit so the company must increase in its sales to grow further.

For the investors

- The company has not increased its share capital but they have raised capital through the reserves which is good sign for the investors because earnings per share will increase.
- There is an increase in borrowings which led to increase in non-controlling interest which shows that the major portion of the investor's money is spent on repaying this loan. This will in turn decreases the returns for an investor.
- There is a huge amount invested in CWIP which indicates that the investor money may be also used for the same purpose which reduces the return for the investors.
- The company is stable in its growth rather than a rapid way this indicates there will be a good return for a longer run scenario.

Conclusion:

The assignment even focused on the study of different aspects of the company Axis bank ltd such as its history, McKinney's 7S model, SWOT analysis, products, promotion and organisation structure. This has helped us understand the company profile in a better manner.

The assignment has helped us in better understanding of the financial data of any particular company and how the data can be analysed to know the financial standings of the company.

I have used income statement and balance sheet and then with the help of financial tools such as comparative, common size, and trend analysis to understand the financial data of the Axis bank ltd.

The interpretation of the data by using above mentioned tools was the main part of the assignment because it shows how good have you understood the data and analysed it.

Overall, the assignment has helped us to improve our knowledge of the financial data. I was able to compare what we learn and how we can apply it know more about the industrial financial data.

CHAPTER 5

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Annexure 1

Income statement

For the years 2017,2018,2019,2020 and 2021.
Figures in Crores.

Particulars	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21
Sales	78,164	85,244	99,586	96,080	90,026
Expenses	65,716	75,956	74,579	74,500	71,455
Operating Profit	12,448	9,288	25,007	21,581	18,571
Other Income	5,316	4,975	5,834	6,444	3,791
Interest	410	430	264	503	645
Depreciation	2,907	3,063	3,450	3,451	3,709
Profit before tax	14,446	10,770	27,127	24,071	18,009
Tax	5,166	3,731	9,664	7,357	5,309
Net Profit	9,280	7,039	17,463	16,714	12,700

Annexure 1

Balance sheet

For the years 2017,2018,2019,2020 and 2021.

Figures in Crores.

Particular	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21
Share Capital -	6,207	6,207	6,163	6,163	6,163
Equity Capital	6,207	6,207	6,163	6,163	6,163
Reserves	18,311	13,971	20,292	25,994	30,355
Borrowings	3,014	1,538	2,210	6,434	5,883
Other Liabilities -	91,054	1,03,754	1,04,356	1,11,430	1,18,657
Non-controlling int	346	362	408	394	441
Trade Payables	3,884	6,974	9,418	7,251	7,638
Advance from Customers	9,799	13,772	14,677	12,002	13,647
Other liability items	77,025	82,645	79,853	91,783	96,932
Total Liabilities	1,18,587	1,25,471	1,33,021	1,50,020	1,61,058
Fixed Assets -	23,811	27,574	32,618	36,784	42,405
Land	10,197	11,869	14,694	15,924	18,771
Building	2,937	3,265	3,765	4,036	4,509
Plant Machinery	11,914	14,233	16,664	17,941	21,794
Equipment's	180	224	251	315	343
Furniture n fittings	188	271	309	318	372
Railway sidings	245	333	647	3,652	5,500
Vehicles	104	122	147	190	208
Other fixed assets	3,664	5,753	7,749	8,808	8,296
Gross Block	29,428	36,068	44,226	51,184	59,792
Accumulated Depreciation	5,617	8,494	11,608	14,400	17,387
CWIP	8,585	10,273	9,658	8,328	10,490
Investments	1,483	1,704	3,170	1,973	5,950
Other Assets -	84,708	85,920	87,576	1,02,936	1,02,212
Inventories	9,717	6,444	5,584	6,618	8,947
Trade receivables	12,476	6,258	5,499	14,408	19,623
Cash Equivalent	31,149	31,280	31,124	28,449	17,310
Loans n Advances	20,304	28,004	29,984	37,731	39,271
Other asset items	11,061	13,935	15,385	15,730	17,061
Total Assets	1,18,587	1,25,471	1,33,021	1,50,020	1,61,058



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Assignment on Measuring Financial Health of
AVENUE SUPERMART Ltd.

Project Report submitted in partial fulfillment of the requirements for the award of

The Degree of

MASTER OF BUSINESS ADMINISTRATION

OF

BENGALURU CENTRAL UNIVERSITY

BY

GIRISH N NASHI

RVIM21MBA139

UNDER THE GUIDANCE OF

Prof. Rajkumar Chavan

Assistant Professor



RV Institute of Management

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CHAPTER-1

INTRODUCTION

INTRODUCTION

DMart is a one-stop supermarket chain that aims to offer customers a wide range of basic home and personal products under one roof. Each DMart store stocks home utility products - including food, toiletries, beauty products, garments, kitchenware, bed and bath linen, home appliances and more - available at competitive prices that our customers appreciate. Their core objective is to offer customers good products at great value.

DMart was started by Mr. Radhakishan Damani and his family to address the growing needs of the Indian family. From the launch of its first store in Powai in 2002, DMart today has a well-established presence in 271 locations across Maharashtra, Gujarat, Andhra Pradesh, Madhya Pradesh, Karnataka, Telangana, Chhattisgarh, NCR, Tamil Nadu, Punjab and Rajasthan. With their mission to be the lowest priced retailer in the regions we operate, our business continues to grow with new locations planned in more cities.

The supermarket chain of DMart stores is owned and operated by Avenue Supermarts Ltd. (ASL). The company has its headquarters in Mumbai.

Avenue Super marts Ltd. (ASL) understand the soul of Indian consumers. As one of India's retail pioneers with multiple retail formats, Avenue Super marts Ltd. (ASL) connects a diverse and passionate community of Indian buyers, sellers and businesses. The collective impact on business is staggering. Around 300 million customers walk into the stores each year and choose products and services supplied by Avenue Super marts Ltd. (ASL)'s 30,000 small, medium and large entrepreneurs and manufacturers from across India. And this number is set to grow.

Avenue Super marts Ltd. (ASL) employs 30,000 people directly from every section of our society. They source their supplies from enterprises across the country, creating fresh employment, impacting livelihoods, empowering local communities, and fostering mutual growth.

It believes in the 'Indian dream' and has aligned our business practices to their larger objective of being a premier catalyst in India's consumption-led growth story. Working towards this end, Avenue Super marts Ltd. (ASL) are ushering positive socio-economic changes in communities to help the Indian dream fly high and the 'Sone Ki Chidiya' soar once again.

AVENUE SUPERMARTS LTD. (ASL) ALSO OWNS

- Central Hypermarket



- Brand Factory



- Pantaloons



- e-ZONE



- Hometown



- futurebazaar.com



- KB's Fair Price



COMPANY PROFILE

Avenue Super marts were incorporated as Avenue Super marts Private Limited on May 12 2000 at Mumbai Maharashtra as a private limited company under the Companies Act 1956. Subsequently the name of the Company was changed to Avenue Super marts Limited due to conversion from a private company to a public company pursuant to a special resolution passed by the Shareholders at an extraordinary general meeting held on February 1 2011. Pursuant to the aforesaid change of name a fresh certificate of incorporation was issued to the Company by the RoC on May 3 2011. The supermarket chain of D-Mart stores is owned and operated by Avenue

Founders

Super marts Ltd. (ASL). The company has its headquarters in Mumbai.

DMart is owned and operated by Avenue Super marts Ltd. (ASL) – a company founded by Mr. Radhakishan Damani. Mr. Radhakishan Damani is respected in the business world as an astute investor in the Indian equity market, he has built a company that constantly strives towards developing a deep understanding of customer needs and satisfying them with the right products. A firm believer in core business fundamentals and strong ethical values, Mr. Damani has built DMart into an efficient, large and profitable retail chain that is highly respected by customers, partners and employees alike.

The brands D Mart, D Mart Mini-max, D Mart Premier, D-Homes Dutch Harbor etc are brands owned by ASL. D-Mart is a one-stop supermarket chain that aims to offer customers a wide range of basic home and personal products under one roof. Each D-Mart store stocks home utility products - including food toiletries, beauty products, garments, kitchenware, bed and bath linen home appliances and more - available at competitive prices. The company's core objective is to offer customers good products at great value. D-Mart was started by Mr. Radhakishan Damani and his family to address the growing needs of the Indian family. From the launch of its first store in Powai in 2002 D-Mart today has a well-established presence in 154 locations across Maharashtra, Gujarat, Andhra Pradesh, Madhya Pradesh, Karnataka, Telangana, Chhattisgarh NCR Tamil Nadu, Punjab and Rajasthan.

INDUSTRY PROFILE

India retail industry is the largest industry in India, with an employment of around 8% and contributing to over 10% of the country's GDP. Retail industry in India is expected to rise 25% yearly being driven by strong income growth, changing lifestyles, and favourable demographic patterns.

It is expected that by 2025 modern retail industry in India will be worth US\$ 175- 250 billion. India retail industry is one of the fastest growing industries with revenue expected in 2007 to amount US\$ 320 billion and is increasing at a rate of 5% yearly. A further increase of 7-8% is expected in the industry of retail in India by growth in consumerism in urban areas, rising incomes, and a steep rise in rural consumption. It has further been predicted that the retailing industry in India will amount to US\$ 22.5 billion by 2015 from the current size of US\$ 18.5 billion. Shopping in India has witnessed a revolution with the change in the consumer buying behaviour and the whole format of shopping also altering. Industry of retail in India which has become modern can be seen from the fact that there are multi- stored malls, huge shopping centres, and sprawling complexes which offer food, shopping, and entertainment all under the same roof.

India retail industry is expanding itself most aggressively; as a result a great demand for real estate is being created. Indian retailers preferred means of expansion is to expand to other regions and to increase the number of their outlets in a city. It is expected that by 2025, India may have 2000 new shopping centres.

In the Indian retailing industry, food is the most dominating sector and is growing at a rate of 9% annually. The branded food industry is trying to enter the India retail industry and convert Indian consumers to branded food. Since at present 60% of the Indian grocery basket consists of non- branded items.

India retail industry is progressing well and for this to continue retailers as well as the Indian government will have to make a combined effort.

DMart stores are aimed at providing a local marketplace feel to the shoppers. They offer a wide variety of household items including retail apparels, food products, general merchandise, furniture, electronics, books, fast food, etc. Several stores also have leisure and entertainment sections. The hypermarket chain crossed the 100 store mark in 2008.

VISION

To offer customers a wide range of basic home and personal products under one roof.

MISSION

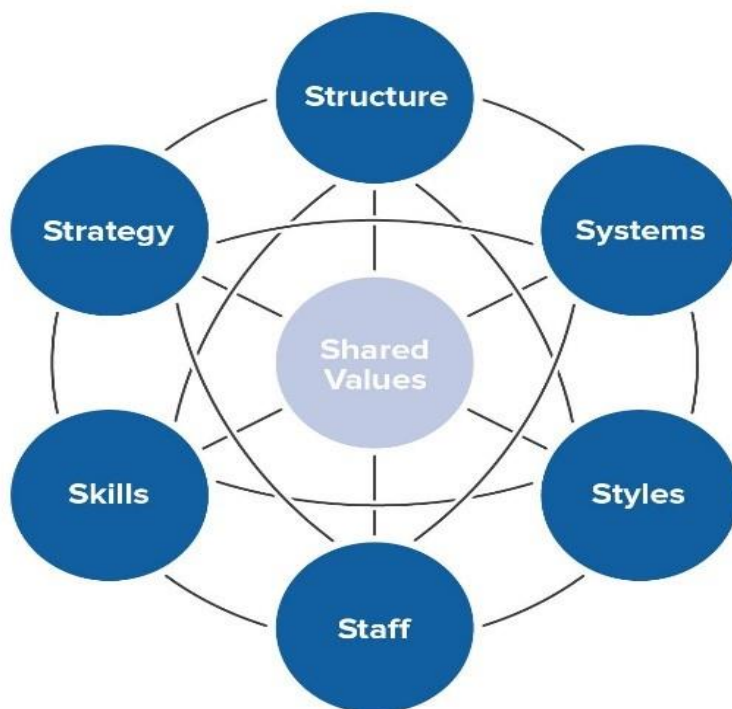
At DMart, they research, identify and make available new products and categories that suit the everyday needs of the Indian family. Their mission is to provide the best value possible for our customers, so that every rupee they spend on shopping with us gives them more value for money than they would get anywhere else.

D-MART VALUES

- Excellence
- Dedication
- Determination
- Enthusiastic: to love what I do
- Respect
- Integrity

THE MCKINSEY 7S MODEL

The McKinsey 7s model is a strategic tool and framework that helps managers and businesses assess their performance. The McKinsey 7s model identifies 7 key elements for an organization that need to be focused and aligned for successful change management processes as well as for regular performance enhancements.



Clearly defined

The strategic direction and the overall business strategy for DMart are clearly defined and communicated to all the employees and stakeholders. This helps the organization manage performance, guide actions, and devise different tactics that are aligned with the business strategy.

Guiding behavior for goal attainment

The strategic direction for DMart is also important in helping the business guide employee, staff, and stakeholder behavior towards the attainment and achievement of goals. SMART Goals are set with short- and long-term deadlines in accordance with the business strategy. The business strategy helps employees decide tactics and behaviors for attaining the set goals and targets to help the business grow.

Competitive pressures

DMart's strategy also takes into consideration the competitive pressures and activities of competitors. The strategy addresses these competitive pressures through suggestive measures and actions to address competition via strategic tactics and activities that ensure sustainability to DMart's Successful Retail Journey A Lesson for Indian Retailers via adapting to market changes, and evolving consumer trends and demands.

Changing consumer demands

An important aspect of the strategy at DMart is that it takes into constant consideration the changing consumer trends and demands, as well as the evolving consumer market patterns and consumption behavior. This is an important part of the strategic direction at DMart as it allows the company to remain competitive and relevant to its target consumer groups, as well as allows the company to identify demand gaps in the consumer market.

Flexibility and adaptability

With flexibility and adaptability, the DMart is not only able to benefit from quickly reacting and responding to changing consumer patterns globally, but is also able to locally and culturally adapt its products via localization for different countries and regions. Moreover, the company is often able to proactively predict consumer market changes, and devise strategic changes accordingly to meet the market trends.

STRUCTURE

Organizational hierarchy

DMart s has a flatter organizational hierarchy that is supported by learning and progressive organizations. With lesser managerial levels in between and more access to the senior management and leadership, the employees feel more secure and confident and also have higher access to information. Moreover, the flatter hierarchy also allows quicker decision-making processes for DMart and increases organizational commitment in the employees.

Inter-Departmental coordination

DMart has high coordination between different departments. The company's departments often form inter-department teams for projects and tasks that require multiple expertise. All coordination between different departments is effective and organized. DMart has a systematic process for initiating and monitoring coordination between departments to ensure smooth work operations and processes – and goal attainment.

Internal team dynamics [department specific]

DMart encourages teamwork and team-oriented tasks. Where jobs require individual attention and scope, the company also assigns individual responsibilities and job tasks. However, all employees at DMart are expected to be team players who can work well with and through other members, and who get along well with other people.

Centralization vs. decentralization

DMart has a hybrid structure between centralization and decentralization. Like many progressive organizations, largely supports decentralized decision making. Job roles at DMart are designed to be carried out with responsibility, and employees often set their goals with mutual coordination and understanding with the supervisors.

However, DMart is also centralized in making sure that supervisors oversee, and approve of the various efforts, and tactics that employees choose to ensure that they are aligned with the organizational strategy ad values.

Communication

DMart has a developed and intricate system for ensuring communication between employees, and different managerial levels. The communication systems at DMart enhance the overall organizational structure. The systematic, defined, and organized communication allows an easy flow of information and ensures that no organizational tasks and goals are compromised because of a lack of communication, or misunderstandings.

Systems

Organizational systems in place

DMart has defined and well-demarcated systems in place to ensure that the business operations are managed effectively and that there are no conflicts or disputes.

Defined controls for systems

Each of the defined and demarcated systems at DMart has especially designed tools and methods as controls for evaluating performance and goal attainment. These controls and measures are designed specifically in different departments based on the nature of their tasks and responsibilities. Moreover, each department also designs specific controls for members for performance evaluation, as well as for inter-departmental tasks and responsibilities.

Monitoring and evaluating controls

DMart continually evaluates its systems through the designed controls. This monitoring of the performance is continual and ongoing. This is largely done through observation and informal discussions. Feedback to employees and overall department heads is informally given regularly as and when is required. Formal evaluation of performance is also conducted semiannually – or quarterly, depending on the need and the urgency of the projects and assigned tasks. This is a formal process that is undertaken by supervisors and managers to ensure the identification of performance lags, and suggestive means of improvement.

Soft elements

The soft elements of the McKinsey 7s model, in turn, include shared values, staff, skills, and strategy. These elements are less tangible in nature and are more influenced by the organizational culture. As such, the management does not have direct influence or control over them. These elements are also harder to describe and directly identify – but are equally important for an organization’s success and improved performance.

Shared values

Core values

The core values at DMart are defined and communicated to foster a creative and supportive organizational structure that will allow employees to perform optimally, and enhance their motivation and organizational commitment. The core values at include, but are not limited to:

- Creativity
- Honesty
- Transparency
- Accountability
- Trust
- Quality
- Heritage

The DMart s business also ensures that all its activities and operations are conducted with high ethical and moral standards that redefined and benchmarked against international criteria.

Corporate culture

DMart s encourages an inclusive culture that celebrates diversity. The company has an international presence, and production units that are spread across different countries, as such, DMart ensure that its organizational culture is supportive of diversity, and has internal policies to reduce incidences of discrimination.

The corporate culture at also encourages innovation and creativity by allowing independence for growth to individuals and teams –thus helping them refine their careers as well as personalities. Lastly, the corporate culture at DMart also has a supportive leadership which works towards increasing employee motivation and job satisfaction by giving way to visibility and accessibility.

Task alignment with values

DMart ensures that all its job tasks and roles are aligned with the core values that the company propagates. This means that all activities, tactics, and strategic tactics employed by DMart will reflect its core values, and will not deviate away from these. This is to ensure a consistent, and reliable brand image, as well as an honest organizational culture. In the event of organizational change, the company will continue to ensure that all change management processes and methods incorporate the core values so that the organizational culture is consistently maintained, and systematically changed if need be.

Style

Management/leadership style

DMart has a participative leadership style. Through a participative leadership style, DMart is able to engage and involve its employees in decision-making processes and managerial decisions. This also allows the leadership to regularly interact with the employees and different managerial groups to identify any potential conflicts for resolution, as well as for feedback regarding strategic tactics and operations. Through its participative leadership, DMart is able to enhance employee motivation, and increase organizational commitment and ownership amongst employees as well as other stakeholders.

Effectiveness of leadership style

The participative leadership style is highly effective in achieving the business goals and vision of the organization. Employees feel to be active members of the organization who are valued for their suggestions, feedback, and input. Moreover, through participative leadership, leaders and managers are able to identify current and potential conflicts within the DMart organization, and actively work to resolve them as soon as possible.

Cooperation vs competition – internally

With its supportive and encouraging organizational culture, DMart gives way to internal collaboration and cooperation between employees, systems, teams, and departments. This cooperation and collaboration at DMart is important since its operations are spread globally, and also because tasks and responsibilities within the company often require inter-departmental feedback and input.

Team vs groups

DMart has effective and functional teams and works with them internally to achieve its various business goals and objectives, and complete tasks. The company's management is encouraging and supportive, and the leadership provides a motivating and pragmatic vision to achieve. The human resource management system, as well as the organizational training, supports all employees in their growth fairly and transparently.

Staff

Employee skill level vs. business goals

DMart has a sufficient number of employees employed across its global operations. Employees for different job roles and positions are hired internally as well as externally – depending on the urgency and the skill levels required. Based on this, it is seen that DMart has employees who are skilled as per the requirements of their job roles and positions. All employees are given in-house training to familiarize themselves with the company and its values. External training along with in-house training is provided for skill level enhancement.

Number of employees

DMart has employed a large number of employees. The number of employees varies from country to country as per the requirements and needs of the business and operations. The global team of DMart is an inclusive one that accepts, and encourages diversity, and works in synchronization with members to ensure attainment of business goals. The team members and employees are the most important part of business success for DMart.

Gaps in required capabilities and capacities

DMart has a well-defined system for identifying potential needs of capabilities and capacities for the organization. The human resource function of the business has a systematic process that aligns all other departments to identify potential vacancies or skill gaps. Based on the nature of the need, the human resource department arranges for recruitments which may be permanent or contractual in nature, as well as arranges training sessions if need be for the current workforce.

Skills

Employee skills

DMart has a commendable workforce, with high skills and capacities. All employees are recruited based on their merit and qualifications. DMart s Successful Retail Journey A Lesson for Indian Retailers prides itself on hiring the best professionals and grooming them further to facilitate growth and development.

Employee skills vs task requirements

DMart has defined tasks and job roles and hires and trains employees for skill levels accordingly with respect to those. The company ensures that all its job requirements are met and that employees have the sufficient skills to perform their respective jobs in accordance with the values and culture as well as the business goals and strategy of DMart.

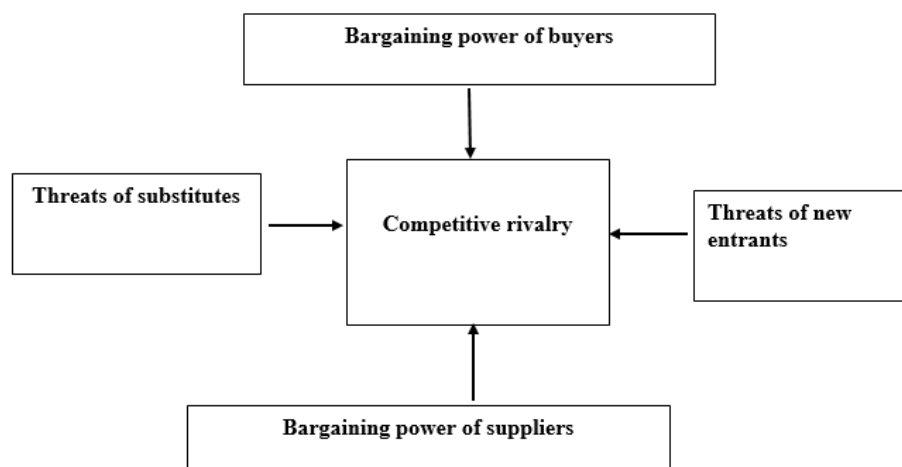
Skill management

DMart pays particular attention to enhancing the skills and capacities of its employees. It arranges regular training and workshops – internally as well as externally managed- to provide growth and development opportunities for its employees. DMart focuses on personal as well as professional growth for its employees and works accordingly with them.

Porter's Five Forces

Introduction to Porter Five Forces

First published in 1979, "How Competitive Forces Shape Strategy" by Michael E. Porter, revolutionized the field of strategy. Popularly known as "Porter's Five Forces" - not only influenced a generation of academic research but also provided a map to rigorously analyze the competitive forces.



1. Bargaining power of buyers of Dmart Geographies

Bargaining power of buyers indicates the pressure that customers exert on the business organizations to get high quality products at affordable prices with excellent customer service. This force directly influences the DMart Disrupting Food Retailing's ability to accomplish the business objectives. Strong bargaining power lowers profitability and makes the industry more competitive. Whereas, when buyer power is weak, it makes the industry less competitive and increases the profitability and growth opportunities for DMart Disrupting Food Retailing

2. Threat of new entrants

- DMart Disrupting Food Retailing will face the low threat of new entrants if existing regulatory framework imposes certain challenges to the new firms interested to enter in the market. In this case, new players will be required to fulfil strict, time consuming regulatory requirements, which may discourage some players from entering the market.
- The threat will be low if psychological switching cost for consumers is high and existing brands have established a loyal customer base.
- New entrants will be discouraged if access to the distribution channels is restricted.

3. Threat of substitute products and services

The availability of substitute products or services makes the competitive environment challenging for DMart Disrupting Food Retailing and other existing players. High substitute threat shows that customers can use alternative products/services from other industries to meet their needs. Various factors determine the intensity of this threat for DMart.

4. Rivalry among existing players

The Rivalry among existing firms shows the number of competitors that give tough competition to the DMart Disrupting Food Retailing High rivalry shows DMart can face strong pressure from the rival firms, which can limit each other's growth potential. Profitability in such industries is low as firms adopt aggressive targeting and pricing strategies against each other.

5. Bargaining power of suppliers of Dmart Geographies –

Bargaining power of suppliers in the Porter 5 force model reflects the pressure exerted by suppliers on business organizations by adopting different tactics like reducing the product availability, reducing the quality or increasing the prices. When suppliers have strong bargaining power, it costs the buyers- (business organizations). Moreover, high supplier bargaining power can increase the competition in the industry and lower the profit and growth potential for DMart Disrupting Food Retailing Similarly, weak supplier power can make the industry more attractive due to high profitability and growth potential.

SWOT Analysis

SWOT Analysis of DMart is a basic method that can help a company examine what it does best right now and develop a successful future strategy. It exposes the areas where people are holding back or how competitors may profit.

With the growing neck-and-neck rivalry in membership warehouses, it is critical for organizations like DMart to examine the business environment.



Strengths of DMart

Strengths are defined as what each business does best in its gamut of operations which can give it an upper hand over its competitors. The following are the strengths of DMart:

- **People-Centric Management:** It maintains good relations with all of its stakeholders including its vendors and suppliers. It has a strong employee policy and is transparent in employee relations.
- **Discount Policy:** It is known for its low price and various offers and discounts. This gives DMart an edge over the competition. Through its pricing strategies, it is sufficiently generating value.
- **Family Experience:** DMart stores offer a full family shopping experience. It is a one-stop destination for all of the family's needs which makes the customer shopping experience way much easier and people are liking this.
- **Digital Platform:** DMart also allows customers to order online through its website and its app, DMart ready. Customers can now order listing products from the DMart app and easily receive their products at the doorstep.
- **National Presence:** DMart has its presence almost everywhere in India, which makes it the most preferred retailer by the customers: It has its presence in about 72 Indian cities.
- **Distribution Channels:** DMart has a healthy and stable distribution system that ensures that the products of partners are easily accessible on time and allows it to operate in many locations of India.

Weaknesses of Dmart

Weaknesses are used to refer to areas where the business or the brand needs improvement.

Some of the key weaknesses of DMart are

- **Focus on Certain Places:** The majority of DMart stores are in the Western States and less in the southern market which makes DMart leave a lot of untapped markets.
- **Dependent on One Nation:** DMart is dependent heavily on India and is susceptible to foreign players.
- **Rented Assets:** Retail stores like DMart operate mostly through rented stores in malls, resulting in higher costs and the majority of sales going to pay rents.
- **Slow Growth:** DMart was established 20 years ago, but it still hasn't been able to capture the market as much as it should have. It's mainly because of its long term focus on only one mission.

- **Extended Focus on Low Prices:** In its attempt to provide low prices to its customers they have to continuously haggle with vendors which may aggravate vendor relations.
- **No Frills Approach:** This basically means that in an attempt to cut costs it may have to reduce the quality of service they provide to their customers like unprofessional customer interaction in stores by employees.

Opportunities for DMart

DMart is one of the largest supermarkets. Therefore they might have many opportunities approaching them that could give them a chance to capitalize to increase their returns.

- **Improving Technology:** Improved technology will enhance the in-store experience of customers and it, therefore, can charge a premium for that.
- **Quality of Service:** Retailers like DMart should capitalize on the propensity to pay more and therefore improve the quality of service.
- **Growth Potential:** DMart stores aspire to be India's most valuable retail stores for its customers. They can take this as a motivation to grow more in the market such as global expansion and tie-ups with international brands.
- **Developing Economies:** The entire economy is open, and DMart has a rising opportunity to access burgeoning developing economies.
- **Personalized Service:** Customers are always looking for more personalized service and are even willing to pay more for it.
- **Scope for Increasing Market Share:** DMart has a great scope of expanding its market share by opening more stores in the southern states

Threats to DMart

DMart also has some threats on their business from the outside. It is very important to anticipate them before one becomes a victim to them.

- **Online Competition:** People today are more and more inclined to shop online rather than visit a store and do all the hard work. Online competitors like Amazon Pantry and Local Platforms are becoming tough competitors of supermarkets like DMart.
- **Online Start-ups:** There is a massive increase in the number of startups and they generally provide even lower prices and personalized experiences.
- **Low Barriers to Entry:** In retail, there are low barriers to entry which means there is not much restriction to start a business and so there is high competition.
- **Unorganized Retail:** A large population of the target market still prefers to buy goods directly from local convenience stores and shops.
- **Government Policies:** There is a continuous change in government policies across different countries. Moreover, political unrest in the country can impede business, resulting in lower performance and higher costs.

CSR ACTIVITIES

As a part of Avenue Super marts Ltd. (ASL), DMart is involved in various social activities that include green initiatives for the community, blood donation camps, Diwali celebrations with orphanages, visits to orphanages and other NGOs helping underprivileged children. These activities usually involve all members of the management as well as staff of DMart.

- In September 2011, Avenue Super marts Ltd. (ASL) signed a strategic partnership with the Himachal Pradesh Government to directly source, market and promote the state's products and services through its DMart stores under the brand 'Himachal'. The aim of this partnership is to aid the development of various 'source-to-market' initiatives to enhance livelihoods for more than 25,000 families in the state.
- DMart created a platform called Yatra to provide women of self-help groups across various towns and regions of Maharashtra and Gujarat the opportunity to market their wide assortment of indigenous food and non-food products. As part of the programme, women from over 30 regional self-help groups were invited, encouraged and helped to set up stalls to exhibit their products at DMart stores.
- DMart Mysore started offering a free wholesome meal to all its customers, who in return contribute 'Shraddha Anussar' for a community cause. In other words, the customers donate any amount for the meal which would be used for a local, regional or topical cause.

ADVERTISING CAMPAIGNS & MARKETING INITIATIVES

In view of the increasing competition in the retail market, DMart has introduced certain steps to keep itself updated and continue promoting the brand.

Advertising initiatives

DMart has recently launched a 360-degree promotion drive covering the three prime media, television, print and social media, to mark the launch of the new logo. The entire media campaign was developed by Mudra Communications as DMart celebrating April Utsav on 2013. They Offering Rs. 50 off on Rs. 500 or Rs. 100 off on Rs. 500 or Rs. 200 off on Rs. 500 coupon through missed call.

DMart has come up with 3 catchy lines written on hoardings taking on biggies like Westside, Shoppers Stop and Lifestyle. They are :

- “Keep west-aSide. Make a smart choice!”
- “Shoppers!Stop. Make a smart choice!”
- “Change your Lifestyle. Make a smart choice!”

FOUR P'S OF DMART

PRODUCT MIX



Fig.: Product Mix

PRICE MIX

- Value Pricing (EDLP)
- Promotional Pricing
- Low Interest Financing
- Psychological Discounting
- Special Event Pricing
- Differentiated Pricing
- Time Pricing
- Bundling

PLACE MIX

- Initially Identifies Future/Potential development areas.
- Acquire such areas at an early phase before the real estate value booms.
- Located at high traffic areas.
- Design to look crowded.

PROMOTION MIX

- “SaalKeSabseSasta 3 Din”
- Future Card(3%Discount)
- Advertising(Print ads, TV Ads, Radio)
- Brand Endorsement by M.S Dhoni
- Exchange Offer
- Weekend Discount
- Point of Purchase Promotion

PRODUCTS PROFILE

The product profile of DMart is as follows. They are dealing with various types of products and so they had divided them into various departments for the customer's convenience.

The departments are:

- FOOD BAZAAR
- HOME CARE PRODUCTS
- HEAD TO TOE
- FIT & HEALTHY
- BOOKS & STATIONARIES
- APPARELS & GARMENTS
- MEN & WOMEN ACCESSORIES
- KIDS ACCESSORIES
- CROCKERY & PLASTIC ITEMS
- UTENSILS
- HOME DECORS
- HOME LINEN
- GIFTS
- BAGS & TRALLIES
- FURNITURES
- ELECTRONIC GOODS
- FOOT WEARS

COMPETITORS PROFILE

DMart faces competition from other retailers of similar products & services. These include stand alone stores in the organised & unauthorised sector, as well as other chain of stores including Department stores.

It is because of this and the service and ambience that DMart believes have been able to create a differentiation in the mind of the customer vis-a-vis our competitors where similar products and Brands are available.

COMPETITORS OF DMART

- More
- Easy Day
- Lifestyle International
- Reliance Trend
- Wal-Mart
- Reliance
- Shoppers stop
- Vishal Mega Mart
- Local retailers
- Spencer's
- Reliance Fresh

CHAPTER 02
FINANCIAL ANALYSIS

COMPARATIVE INCOME STATEMENT

AVENUE SUPER MART LIMITED				
Comparative Income Statement				
for the financial year 2020 & 2021				
Particulars	Mar-20	Mar-21	Absolute Increase or Decrease	Percentage Change
Sales	24,870.20	24,143.06	-727.14	-2.92%
(-) Expenses	22,741.89	22,398.23	-343.66	-1.51%
Operating Profit	2,128.31	1,744.83	-383.48	-18.02%
(+) Other Income	59.99	194.43	134.44	224.10%
(-) Depreciation	374.41	414.16	39.75	10.62%
(-) Interest	69.12	41.65	-27.47	-39.74%
Profit before tax	1,744.77	1,483.45	-261.32	-14.98%
(-) Tax	443.79	384.02	-59.77	-13.47%
Net profit	1,301.08	1,099.49	-201.59	-15.49%
Calculation of Other Income				
Other income normal	47	1		
Exceptional items	12.99	193.43		
Other Income	59.99	194.43		

AVENUE SUPER MART LIMITED				
COMPARITIVE BALANCE SHEET				
for the financial year 2020-2021				
PARTICULARS	Mar 2020	Mar2021	ABSOLUTE INCREASE OR DECREASE	PERCENTAGE CHANGE
LIABILITIES				
EQUITY CAPITAL	647.7	647.77	0.07	0.01
RESERVES	10431.97	11535.94	1103.97	10.58
BORROWING	333.26	392.71	59.45	17.84
OTHER LIABILITIES	663.23	1078.63	415.4	62.63
TOTAL LIABILITIES	12076.16	13655.05	1578.89	13.07
ASSETS				
LAND	2740	3483	743	27.12
BUILDING	3139	3648	509	16.22
PLANT AND MACHINERY	272	352	80	29.41
EQUIPMENT	39	50	11	28.21
FURNITURE & FITTING	477	581	104	21.80
VEHICLE	4.03	3.8	-0.23	-5.71
COMPUTERS	96	119	23	23.96
INTANGIBLE ASSETS	78	78	0	0.00
OTHER FIXED ASSETS	82	81	-1	-1.22
(-) ACCUMULATED DEPRICIATION	979	1387	408	41.68
CAPITAL WORK IN PROGRESS	364.4	1019.59	655.19	179.80
INVESTMENT	14.68	2.95	-11.73	-79.90
OTHER ASSETS	5749.05	5623.71	-125.34	-2.18
TOTAL ASSTES	12076.16	13655.05	1578.89	13.07

INTERPRETATION

COMPARATIVE INCOME STATEMENT

- Sales percentage has decreased by 2.92% as compared to expenses which decreased by 1.51%. This shows decrease in sales and expenses of Avenue super mart Ltd. This indicates a bad sign for the company as sales decreased.
- The operating expenses is decreased which is not a good sign for the company as sales decreased by 2.92%
- There is a tremendous increase in non operating income of super mart by 224% which is a healthy sign for the company.
- The Net Profit of the company has decreased by 15.49% this is a very bad sign for the company.

COMPARATIVE BALANCE SHEET

- The fixed assets of the company in the year 2021 are increased by 17.83% as compared to the previous year 2020 which the good sign for the Company.
- There is an increase of 10.58% of reserves and surplus in the current year (2021) which is an good sign for the Shareholders of the Company as this indicates increase in profits.
- There is a purchase of Plant and machinery by Avenue Super mart in the current Year which the Good sign for the company.
- There is no change in intangible assets of the company.
- The Stock of the company has increased in 2021 by ₹301 crores which is Good sign for the company.

COMMON SIZE INCOME STATEMENT

AVENUE SUPER MART LIMITED				
Common Size Income Statement				
for the financial year 2020 & 2021				
Particulars	Mar-20	Percentage	Mar-21	Percentage
Sales	24,870.20	100.00	24,143.06	100.00
(-) Expenses	22,741.89	91.44	22,398.23	92.77
Operating Profit	2,128.31	8.56	1,744.83	7.23
(+) Other Income	59.99	0.24	194.43	0.81
(-) Depreciation	374.41	1.51	414.16	1.72
(-) Interest	69.12	0.28	41.65	0.17
Profit before tax	1,744.77	7.02	1,483.45	6.14
(-) Tax	443.79	1.78	384.02	1.59
Net profit	1,301.08	5.23	1,099.49	4.55
Calculation of Other Income				
Year	March 2020	March 2021		
Other income normal	47	1		
Exceptional items	12.99	193.43		
Other Income	59.99	194.43		

COMMON SIZE INCOME STATEMENTS

- The company's sales has decreased by ₹727.14 crores as compared to previous year, expenses has decreased by 343.66 crores as compared to previous year. This is the reason for the decrease in gross profit and net profit of the company.
- The company's operating profit has decreased from 2020 to 2021 i.e. ₹383.48 crores which is a negative sign for the company as well as shareholders, investors and other external financial institutions.
- The company has an decrease of 15.49% of EAT/PAT which is a bad sign for the company as well as for the investments from the outsiders and a negative sign for the company and board of directors.

COMMON SIZE BALANCE SHEET

Common Size Balance Sheet				
for the financial year 2020 & 2021				
Liabilities	Mar-20	Percentage	Mar-21	Percentage
Equity Share Capital	647.70	5.36	647.77	4.74
Reserves	10,431.97	86.38	11,535.94	84.48
Borrowings	333.26	2.76	392.71	2.88
Other Liabilities	663.23	5.49	1,078.63	7.90
Total	12,076.16	100.00	13,655.05	100.00
Assets	Mar-20	Percentage	Mar-21	Percentage
Fixed Assets	5,948.03	49.25	7,008.80	51.33
Capital Work in Progress	364.40	3.02	1,019.59	7.47
Investments	14.68	0.12	2.95	0.02
Other Assets	5,749.05	47.61	5,623.71	41.18
Total	12,076.16	100.00	13,655.05	100.00

Calculation of Equity Share Capital		
Particulars	March 2020	Mar 2021
Preference Capital	0	0
Equity Capital	647.70	647.77
Share Capital	647.70	647.77
Calculation of Other Liabilities		
Particulars	March 2020	Mar 2021
Non controlling int	1.23	0
Trade Payables	433	578.63
Other liability items	229	500
Other Liabilities	663.23	1,078.63

Calculation of Fixed Assets		
Particulars	March 2020	March 2021
Land	2,740	3,483
Building	3,139	3,648
Plant Machinery	272	352
Equipments	39	50
Computers	96	119
Furniture n fittings	477	581
Vehicles	4.03	3.8
Intangible Assets	78	78
Other fixed assets	82	81
Accumulated Depreciation	979	1,387
Fixed Assets	5,948.03	7,008.80
Calculation of Other		
Particulars	March 2020	March 2021
Inventories	1947	2,248
Trade receivables	20	44
Cash Equivalents	108	1,446
Loans n Advances	266	335.71
Other asset items	3,408	1,550
Other Assets	5,749.05	5,623.71

COMMON SIZE BALANCE SHEET

- The company has raised the capital marginally in the year 2021 which is a good sign for the company.
- There is a marginal increase by 10.58% of reserves and surplus in the current year (2021) which is an good sign.
- There is a good amount of purchase in land and building by Avenue super Mart in the current year which is a good sign for the company.
- There is no change in intangible assets of the company
- Stock of the company has increased in 2021 by ₹301 crores which is an excellent sign

TREND ANALYSIS

INCOME STATEMENT

AVENUE SUPER MART Ltd.										
TREND ANALYSIS INCOME STATEMENT										
for the financial year 2017-18-19-20-21										
PARTICULARS	Mar 2017	Mar 2018	Mar 2019	Mar 2020	Mar 2021	MAR 2017(%)	MAR 2018(%)	MAR 2019(%)	MAR 2020(%)	MAR 2021(%)
SALES	11898	15033	20004.52	24870.2	24143.06	100	126.35	168.13	209.03	202.92
(-) EXPENSE	10929	13680	18371.21	22741.89	22398.23	100	125.17	168.10	208.09	204.94
OPERATING PROFIT	969	1353	1633.31	2128.31	1744.83	100	139.63	168.56	219.64	180.07
OTHER NON OPERATING INCOME	28	88	48.33	59.99	194.43	100	314.29	172.61	214.25	694.39
(-) INTERST	122	60	47.21	69.12	41.65	100	49.18	38.70	56.66	34.14
(-) DEPRECIATION	128	159	212.49	374.41	414.16	100	124.22	166.01	292.51	323.56
EBT/PBT	747	1222	1421.94	1744.77	1483.45	100	163.59	190.35	233.57	198.59
(-) TAX%	268.92	415.48	519.48	443.79	384.02	100	154.50	193.17	165.03	142.80
EAT/PAT	478.08	806.52	902.46	1300.98	1099.33	100	168.70	188.77	272.13	229.95

TREND ANALYSIS INCOME STATEMENT

- There is a continuous increase in the revenue generated over the last 5 years which indicates that the company is growing gradually its business over the year and this is a good sign for both investors and the company but in 2021 the sales has decreased by 6.11%.
- The company along with increase in its revenue is also following a gradual increase in its expenses which is a bad sign for the company because an increase in expenses will lead to decrease in profits of the company but in 2021 the expenses decreased because of decrease in sales.
- There has been a fluctuation in other incomes generated by the company over the years which is a not good sign for the company but it is in increasing trend from the past 3 years.
- The net profit of the company has been in increasing trend from 2017 to 2020 but it decreased in 2021.

BALANCE SHEET

AVENUE SUPERMART LTD

Trend

Particulars	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21
Equity Share Capital	624.08	624.08	624.08	647.77	647.77
Reserves	3,217.70	4,044.97	4,963.37	10,431.97	11,535.94
Borrowings	1,497.32	439.25	700.15	333.19	392.71
Other Liabilities	480.18	539.92	717.90	663.23	1,078.63
Total	5,819.28	5,648.22	7,005.50	12,076.16	13,655.05
Fixed Assets	2,577.75	3,399.97	4,400.37	5,948.03	7,008.80
Capital Work in Progress	152.89	147.07	376.84	364.40	1,019.59
Investments	25.69	68.18	16.53	14.68	2.95
Other Assets	3,062.95	2,033.00	2,211.76	5,749.05	5,623.71
Total	5,819.28	5,648.22	7,005.50	12,076.16	13,655.05

Analysis

% Change in 2017	% Change in 2018	% Change in 2019	% Change in 2020	% Change in 2021
100%	100.00%	100.00%	103.80%	103.80%
100%	125.71%	154.25%	324.21%	358.52%
100%	29.34%	46.76%	22.25%	26.23%
100%	112.44%	149.51%	138.12%	224.63%
100%	97.06%	120.38%	207.52%	234.65%
100%	131.90%	170.71%	230.75%	271.90%
100%	96.19%	246.48%	238.34%	666.88%
100%	265.40%	64.34%	57.14%	11.48%
100%	66.37%	72.21%	187.70%	183.60%
100%	97.06%	120.38%	207.52%	234.65%

Calculation of Equity Share Capital

Particulars	Mar 2017	Mar 2018	Mar 2019	Mar 2020	Mar 2021
Preference Capital	0	0	0	0	0
Equity Capital	624.08	624.08	624.08	647.77	647.77
Share Capital	624.08	624.08	624.08	647.77	647.77

Calculation of Other

Particulars	Mar 2017	Mar 2018	Mar 2019	Mar 2020	Mar 2021
Non controlling int	0	1	1	0	0
Trade Payables	261	317	463	433	578
Other liability items	219	222	254	230	500
Other Liabilities	480	540	718	663	1,078

Calculation of Fixed Assets					
Particulars	Mar 2017	Mar 2018	Mar 2019	Mar 2020	Mar 2021
Land	1,044	1,438	2,028	2,740	3,483
Building	1,379	1,757	2,173	3,139	3,649
Plant Machinery	88	124	191	272	352
Equipments	16	21	29	39	50
Computers	30	53	76	95	119
Furniture n fittings	202	265	357	476	581
Vehicles	6	2	3	4	4
Intangible Assets	0	78	78	78	78
Other fixed assets	39	61	74	82	81
Fixed Assets	2,804	3,799	5,009	6,925	8,397
Calculation of Other					
Particulars	Mar 2017	Mar 2018	Mar 2019	Mar 2020	Mar 2021
Inventories	948	1,163	1609	1947	2248
Trade receivables	21	34	64	20	44
Cash Equivalentents	1,884	560	219	108	1,446
Loans n Advances	124	159	178	267	336
Other asset items	85	117	141	3,408	1,550
Other Assets	3,062	2,033	2,211	5,750	5,624

TREND ANALYSIS BALANCE SHEET

- The equity share capital has remained same from 2017 to 2019 which is 624.08 crores and increases to 647.7 from 2020 to 2021.
- There is significant increase in the reserves. It has increased from 100% in 2017 to 358% in 2022. This is the good sign for the company because it indicates profit has increased
- We can observe a significant decrease in barrowings from 1497.32 crores to 392.71crores. This is the very good sign for the company because their obligations has increased
- The fixed asset has increased from 100% in 2017 to 271.90 % in 2021. This indicates that the company is increasing their fixed assets and they are planning for expansion of company or starting a new product.
- There is an increase in capital work in progress so there is indication that the company is trying to expand business through new plants or machinery.

CHAPTER -03
FINDINGS, SUGGESTIONS AND CONCLUSION

FINDINGS

In this project we found the importance of few of the financial statements. The following financial statements used for Avenue Super Mart are:

1. **Comparative income statement** : It presents the results of multiple accounting periods in separate columns. The intent of this format is to allow the reader to compare the results of multiple historical periods, thereby giving a view of how a business is performing over time.
2. **Comparative Balance sheet**: It is a statement that shows the financial position of an organization over different periods for which comparison is made or required. The financial position is compared with 2 or more periods to depict the trend, direction of change, analyze and take suitable actions.
3. **Common size income statement**: A common size income statement is an income statement in which each line item is expressed as a percentage of the value of revenue or sales. It is used for vertical analysis, in which each line item in a financial statement is represented as a percentage of a base figure within the statement.
4. **Common size balance sheet**: A common size balance sheet is a balance sheet that displays both the numeric value and relative percentage for total assets, total liabilities, and equity accounts.
5. **Trend analysis**: Income statement & balance sheet: Trend analysis provides a means to analyze company data over a period of time by focusing on the change in specific line items within the income statement and balance sheet. Changes are typically measured in dollars and percentages. Trends over several years can be evaluated by calculating the trend percentage as the current year divided by the base year.

All the 6 financial statement models are equally important for analyzing a particular company and the shareholders. The balance sheet shows the financial position of the company and provides detailed investments of the company's asset investments. The balance sheet also contains the company's debt and equity levels. This capital mix helps investors and creditors understand the position and the company's performance.

The balance sheet is a snapshot of the company's assets, liabilities, equity, and debt. It does not show what actually happened in the period that caused the company to get to the position where it is now. Therefore, profit figures on the income statement are important to the investors. Income statement format contains sales, expenses, losses, and profit. Using these statements can help investors evaluate the companies past performance and determine the future cash flows.

SUGGESTIONS:

- In the recent days share price of Avenue Super Mart is going up and down so they need to focus on this.
- During covid pandemic the company faced marginal loss which did not affect the company much but there should be focus of attention.
- From 2017 to 2019 there is a significant increase in the earning per share but in the 2020 and till now due to pandemic there is decrease in the share value so company need to work on it.
- Though the profit has increased to year to year, the company has an increasing expense over the years. This is bad sign for a company in the future. So company has to address this issue to reduce the expenses as much as possible.

CONCLUSION

DMart is a major shopping complex for today's customers. It is a place where customers find variety of products at a reasonable price. DMart has a good reputation of itself in the market. It has positioned itself in the market as a discounted store. It holds a huge customer base. The majority of customers belong to middle class family. The youth generation also likes shopping and moving around DMart. Volume sales always take place in DMart. Impulse buying behaviour of customers comes in to play most of the times in DMart.

DMart is a hypermarket store where varieties of products are being sold on different product category. It has emerged as a hub of shopping specially for middle class people. Different types of products starting from a baby food to pizzas all are available under one roof. In Delhi it is the middle class people who mostly do marketing from DMart. Even most of the people do their monthly shopping from DMart. People not only visit DMart to do shopping but also visit for outing purpose as it provides a very nice ambience to its customers.

As people go to malls they just tend to move around DMart whether it is for shopping purpose or for outing purpose. Grocery, apparels and food items are the products which are demanded most by the customers of Northern part of India in DMart. The major drawback of DMart is that it lacks in providing enough parking space for its customers. This may discourage the customers to come to DMart and shop as they face difficulty in parking their vehicles. Even though some customers say that they don't feel problem in parking their vehicle, it is because of the parking space available to them by the mall.

CHAPTER-04
BIBLIOGRAPHY AND ANNEXURE

BIBLIOGRAPHY AND ANNEXURE

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ANNEXURE

TREND ANALYSIS

AVENUE SUPER MART Ltd.										
TREND ANALYSIS INCOME STATEMENT										
for the financial year 2017-18-19-20-21										
PARTICULARS	Mar 2017	Mar 2018	Mar2019	Mar 2020	Mar 2021	MAR 2017(%)	MAR 2018(%)	MAR 2019(%)	MAR 2020(%)	MAR 2021(%)
SALES	11898	15033	20004.52	24870.2	24143.06	100	126.35	168.13	209.03	202.92
(-) EXPENSE	10929	13680	18371.21	22741.89	22398.23	100	125.17	168.10	208.09	204.94
OPERATING PROFIT	969	1353	1633.31	2128.31	1744.83	100	139.63	168.56	219.64	180.07
OTHER NON OPERATING INCOME	28	88	48.33	59.99	194.43	100	314.29	172.61	214.25	694.39
(-) INTERST	122	60	47.21	69.12	41.65	100	49.18	38.70	56.66	34.14
(-) DEPRECIATION	128	159	212.49	374.41	414.16	100	124.22	166.01	292.51	323.56
EBT/PBT	747	1222	1421.94	1744.77	1483.45	100	163.59	190.35	233.57	198.59
(-) TAX%	268.92	415.48	519.48	443.79	384.02	100	154.50	193.17	165.03	142.80
EAT/PAT	478.08	806.52	902.46	1300.98	1099.33	100	168.70	188.77	272.13	229.95

BALANCE SHEET

AVENUE SUPERMART LTD					
					Trend
Particulars	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21
Equity Share Capital	624.08	624.08	624.08	647.77	647.77
Reserves	3,217.70	4,044.97	4,963.37	10,431.97	11,535.94
Borrowings	1,497.32	439.25	700.15	333.19	392.71
Other Liabilities	480.18	539.92	717.90	663.23	1,078.63
Total	5,819.28	5,648.22	7,005.50	12,076.16	13,655.05
Fixed Assets	2,577.75	3,399.97	4,400.37	5,948.03	7,008.80
Capital Work in Progress	152.89	147.07	376.84	364.40	1,019.59
Investments	25.69	68.18	16.53	14.68	2.95
Other Assets	3,062.95	2,033.00	2,211.76	5,749.05	5,623.71
Total	5,819.28	5,648.22	7,005.50	12,076.16	13,655.05

Analysis

% Change in 2017	% Change in2018	% Change in 2019	% Change in 2020	% Change in 2021
100%	100.00%	100.00%	103.80%	103.80%
100%	125.71%	154.25%	324.21%	358.52%
100%	29.34%	46.76%	22.25%	26.23%
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100%	265.40%	64.34%	57.14%	11.48%
100%	66.37%	72.21%	187.70%	183.60%
100%	97.06%	120.38%	207.52%	234.65%

**Assignment on Capstone Project of Measuring Financial
Health using Comparative, Common Size and Trend
analysis of Asian Paints Ltd.**

Project report submitted on partial fulfilment of the requirements for the award
of the degree of

MASTERS OF BUSINESS ADMINISTRATION

OF

R V Institute of Management

By

Deepak Girish Kalyani

UNDER THE GUIDANCE OF

Prof. Rajkumar Chavan

Assistant Professor



R V Institute of Management

Bangalore

Declaration

We, hereby declare that the project work entitled “Assignment on Capstone Project of Measuring Financial Health using Comparative, Common Size and Trend analysis of Asian Paints Ltd.” is a record of indivisual and Bonafede project work carried out by me under the supervision and guidance of, Prof. Rajkumar Chavan, Assistant Professor, RV INSTITUTE OF MANAGEMENT BANGALORE. The information and data are given in the report is authentic to the best of my knowledge.

Place: Bangalore.

Deepak Girish Kalyani

Date: 25/04/2022.

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CHAPTER – 1

Introduction

ABOUT THE COMPANY



Set up in 1942, the Asian Paints group is the largest paint manufacturer in India also engaged in the business of manufacturing of varnishes, enamels or lacquers, surfacing preparation, organic composite solvents and thinners. It operates in 15 countries and has 26 paint manufacturing facilities in the world serving consumers in over 60 countries. Besides Asian Paints, the group operates around the world through its various brands viz. Asian Paints Berger, Apco Coatings, SCIB Paints, Tubman's, Causeway Paints and Kadisco Asian Paints. It also manufactures metal sanitary ware such as bath, sinks, washbasins and similar articles. Recently introduced Lightings, Furnishings and Furniture thus adding more products in the home décor and Interior Design category.

3rd Largest Paint Co. in Asia. 9th Largest Coatings Co. in the World. 50+ Years of Market Leadership in India. Leading wallpaper manufacturer under the brand NILAYA. 3x of nearest Competitor in India. Top 3 player in decorative paints in 12 of the 14 countries outside India. Revenue Breakup Decorative Coatings - 83.70% Industrial Coatings - 2.40% International Operations - 11.60% Home Improvement Business - 2.30%.

HISTORY

Asian Paints Ltd is India's largest Asia's third largest and World's 9th largest paint company. The company along with their subsidiaries has operations in 22 countries globally with 27 paint manufacturing facilities servicing consumers in 65 countries through Berger International SCIB Paints Apco Coatings and Taubmans. Asian Paints manufactures a wide range of paints for decorative and industrial use. The products of the company include ancillaries automotive decorative paints and industrial paints.

The company has manufacturing plants in Maharashtra Gujarat Andhra Pradesh Uttar Pradesh Tamil Nadu and Haryana. In Decorative paints the company is present in all the four segments namely Interior Wall Finishes Exterior Wall Finishes Enamels and Wood Finishes. They have also introduced many innovative concepts in the Indian paint industry like Colour Worlds (Dealer Tinting Systems) Home Solutions (painting solutions Service) Kids World (painting solutions for kid's room) Colour Next (Prediction of Colour Trends through in-depth research) and Royale Play Special Effect Paints just to name a few.

Asian Paints Ltd was incorporated in the year 1945. In the year 1965 the name of the company was changed to Asian Paints (India) Pvt Ltd. In the year 1973 the company was converted into a public limited company. In the year 1972 they undertook a major modernization programme to streamline the paint production facilities by improving the layout of machines addition to balancing equipment and replacement of old machinery to meet the demand.

In the year 1985 the Company had set up a third paint unit at Patancheru a notified backward area near Hyderabad for the manufacture of 15000 MT of paints and enamels. Also they entered into a collaboration agreement with Nippon Paints Company Ltd Japan to obtain technical know-how to manufacture powder coating and coil coatings. In the year 1987 the company commissioned a plant for the manufacture of synthetic rubbers lattices with a capacity of 1200 tonnes per annum. Also the company in association with Tamil Nadu Industrial Development Corporation (TIDCO) promoted a joint sector company under the name of Pentasia Chemicals Ltd (PCL) for the purpose of manufacture 3000 TPA of pentaerythritol and 1800 TPA of sodium formate.

In the year 1990 the company promoted two joint venture companies namely Asian Paints (South Pacific) Ltd in Fiji and Asian Paints (Tonga) Ltd. Apart from this the company formulated two more joint ventures under the names and styles of Asian Paints (Nepal) Pvt Ltd and Asian Paints (S.I.) Ltd. In May 1991 the company acquired 1910000 equity shares of Pentasia Chemicals Ltd from TIDCO and thus PCL became a subsidiary of the company.

During the year 1992-93 the company installed and commissioned the manufacturing facilities for the powder coatings with a capacity of 300 MT at Kasna plant. In the year 1993 they set up a joint venture unit along with their overseas subsidiaries in Queens land Australia for manufacture of paints enamels and varnishes. In the year 1994 Pentasia Chemicals Ltd was amalgamated with the company with effect from October 1 1994. In the year 1995 the company set up a joint venture unit for the manufacture of paints enamels and varnishes in the Republic of Mauritius.

In the year 1996 the company and PPG Industries Inc. of USA set up a joint venture company namely Asian PPG Industries Pvt Ltd to market and/or manufacture automotive paints and

certain Industrial products. In the year 1998 they introduced three new products NC range of wood finishes ACE Exterior Emulsion and Asian wall putty. Also they launched a new marketing thrust with the introduction of a one-stop Colour shop for paints complete with software for consumers to choose and select their different shade combinations. They launched their first exclusive showroom in Mumbai.

In the year 1999 the company acquired 76% of equity stake in Sri Lanka-based Delmege Forsyth & Co (Paints) Ltd. In the year 2000 they launched two variants in polyurethane (PU) wood finish under the brand name Opal. They opened a manufacturing plant in Oman in partnership with a local company. Also they acquired the entire paints business of Pacific Paints Company based in Australia for over of Rs. 1 crore. In the year 2001 the company introduced Utsav Enamel for the festival season.

In 2002 the company revamped their international operations and transferred shares in their subsidiaries in Fiji Tonga Solomon Island Vanuata Australia and the Sultanate of Oman to the Mauritius based subsidiary Asian Paints International. Also they acquired controlling stake of 50.1% in Berger International Singapore for the consideration of Rs. 58 crore. In the year 2003 the company through their Singapore-based subsidiary Berger International signed a technology and brand licensing agreement with PT Abadi Coatings Solusi an Indonesian paint company. Also they acquired Taubmans Paints (Fiji) Ltd through their subsidiary Asian Paints (South Pacific) Ltd in Fiji.

During the year 2003-04 Pentasia Investments Ltd a wholly owned subsidiary of the company was amalgamated with the company. In the year 2004 the company launched paint solutions for kids. In January 2005 they set up a new paint plant at Sriperumbudur in Tamil Nadu and commenced commercial production. In the year 2006 the company commissioned a manufacturing facility for powder coatings at Baddi Himachal Pradesh. In September 2007 the company tailored their first exclusive industrial coatings manufacturing facility at Taloja in Maharashtra with an installed capacity of 14000 KL per annum. During the year 2007-08 the company commissioned the polymer plant in Sriperumbudur. Also they commenced expansion of the Sriperumbudur plant. Also Asian Paints (International) Ltd the company's direct subsidiary divested their entire stake in Asian Paints (Queensland) Pty Ltd Australia.

During the year 2008-09 the company made a tie up with Dupont USA to co-brand the Royale range of Emulsions with Teflon the product synonymous with toughness and durability. The company commenced introducing a new chain of 'Colour ideas' where retail outlets have been modified to offer slice of the 'Signature Store' thereby providing the same inspiration to consumers in process of designing their homes. The first two stores have been inaugurated at Hyderabad and Chennai.

During the year the company increased the capacity of the Sriperumbudur Plant to 100000 KL per annum. Also they commissioned the Distribution Centres at Kasna Plant and Ankleshwar Plant. Asian Paints (International) Ltd the company's direct subsidiary purchased the balance 49% stake in Asian Paints (Tonga) Ltd for a consideration of TOP 646800 (approx. USD 314000) making it a wholly owned subsidiary.

During the year 2009-10 the company increased the capacity of Sriperumbudur Plant in Tamil Nadu to 140000 KL per annum. They procured land for setting up a manufacturing facility for Decorative Paint in Kesurdi Maharashtra. As per the scheme of amalgamation Technical

Instruments Manufacturers (India) Ltd (TIM) a 100% subsidiary of the company was amalgamated with the company with effect from April 1 2009. In April 12 2010 the company commissioned the first phase of sixth Decorative paint plant at Rohtak Haryana as a cost of approx. Rs 500 crore with an initial capacity of 150000 KL per annum.

During the year 2010-11 the company augmented the synthetic resins and polymer capacity by 50000 MT. The company launched a number of new products. Water based wood finishes launched in North India would be launched across the country in a phased manner. New textured finishes for the exteriors - Duracast Pebbletex and Crosstex were launched and met with good response from builders/ contractors for large projects.

During the year the company approved the plans to enhance its 14 year relationship with PP Industries Inc. (PPG) to accelerate growth of their non-decorative coatings businesses in India. As part of this arrangement the company and PPG will expand their existing non-decorative coatings presence in India by expanding their current 50-50 joint venture relationship Asian PPG Industries Ltd (APPG) and also establish a second 50-50 joint venture.

The company decides to increase the installed capacity at the Rohtak Plant from 150000 KL per annum to 200000 KL per annum. The company commenced the construction at Khandala near Pune (in Maharashtra) for the seventh Decorative Paints plant with an initial capacity of 300000 KL per annum of paints with an investment of around Rs. 1000 crore. The plant will be commissioned sometime around the last quarter of FY 2012-13. The Khandala plant can be expanded to 400000 KL per annum later.

Asian Paints with its intent to enter the Home Improvement and Decor space in India acquired 51% stake in Sleek International Private Limited (Sleek) a kitchen solutions provider in August 2013. Mumbai-based Sleek Group is a major organised player in the modern kitchen space and is engaged in the business of manufacturing selling and distributing kitchens kitchen components including wire baskets cabinets appliances accessories etc with pan India presence. In June 2014 Asian Paints acquired the entire front and sales business including Brands Network and Sales Infrastructure of Ess Ess Bathroom products Pvt Ltd. Ess Ess is a prominent player in the bath fittings business.

On 3 April 2017 Berger International Private Limited (BIPL) Singapore an indirect subsidiary of Asian Paints completed the acquisition of 100% controlling stake in Causeway Paints Lanka (Private) Limited Sri Lanka (CPLPL) a key player in the Sri Lanka coatings market.

On 5 September 2017 PT Asian Paints Indonesia Indonesia (PT API) a wholly owned subsidiary of Berger International Private Limited Singapore (an indirect subsidiary of the Asian Paints) commenced manufacturing operations with a capacity of 5000 tons per annum on a single shift basis in Jawa Barat region in Indonesia.

On 11 December 2017 Asian Paints acquired the entire remaining 49% stake in kitchen solution provider company Sleek International Private Limited from the Ahuja family thereby making it a wholly-owned subsidiary of the company.

During the year 2018 under review in order to consolidate the Company's investments in overseas subsidiary companies Asian Paints (International) Limited Mauritius wholly owned subsidiary was amalgamated with the Company pursuant to an Order dated 29th November 2017 passed by the Mumbai Bench of the Hon'ble National Company Law Tribunal pursuant to Sections 230 to 232 and 234 other applicable provisions of the Companies Act 2013 and any

other applicable Regulations. The appointed date for the Scheme of amalgamation was 1st January 2017.

The merger was effective 15th January 2018 after obtaining necessary approvals including approval from the Registrar of Companies Mauritius.

The company acquired the balance 49% of the paid up share capital of Sleek International Private Limited (Sleek) from the Ahuja family for a consideration of Rs 50 Crore. Sleek became a wholly owned subsidiary of the Company.

The Company also acquired 100% stake in Reno Chemicals Pharmaceuticals & Cosmetics Private Limited (Reno) for an amount of Rs 159.52 crore with an objective of using the land and building of Reno to meet the Company's growing infrastructure requirements.

The Company also fully exited from its operations in the Caribbean region carried on through Lewis Berger (Overseas Holdings) Limited (LBOH) United Kingdom indirect subsidiary of the Company for a consideration of Rs 189.16 crore (approx). The divestment was with an objective to focus on its international presence in growing geographies across the continents of Asia and Africa.

During the year 2018 the Company resolved to expand the existing paint manufacturing capacity at its unit situated at Ankleshwar Gujarat from 130000 KL to 300000 KL per annum and to augment the manufacturing capacity of synthetic resins and emulsions from existing 32000 MT to 85000 MT (approx.) over a span of the next 3 - 4 years. The said expansion and augmentation would involve phasing out the current Phthalic Anhydride and its allied products manufactured at this facility. The Company is awaiting necessary approvals from statutory authorities and will thereafter work on this project in a phased manner.

During the Year 2019 under review the Board of Directors at their meeting held on 9th May 2019 have inter alia approved the following investments approximately in accordance with the applicable provisions of law: (i) Rs 300 crore by way of subscription of equity shares of Asian Paints International Private Limited (APIPL) Singapore wholly owned subsidiary of the Company for the purpose of meeting funding requirements of its step down operating subsidiaries; and (ii) Rs 80 crore by way of subscription of equity shares of Sleek International Private Limited (Sleek) wholly owned subsidiary of the Company to meet its requirements towards capital expenditure and working capital.

During 2019 the Company commenced commercial production of water based paints and intermediaries at Mysuru Plant situated in the state of Karnataka with an initial capacity of 3 (three) lakh KL p.a. having ultimate capacity of 6(six) lakh KL p.a. and at Vishakhapatnam Plant situated in the state of Andhra Pradesh with an initial capacity of 3 (three) lakh KL p.a. having ultimate capacity of 5(five) lakh KL p.a.

During the year 2020 under review The Board of Directors of the Company at their meeting held on 22nd January 2020 approved the Scheme of Amalgamation of Reno Chemicals Pharmaceuticals & Cosmetics Private Limited (Reno) wholly owned subsidiary of the Company with the Company subject to necessary statutory and regulatory approvals including approval of the National Company Law Tribunal Mumbai. The proposed Amalgamation is inter alia to maintain a simple corporate structure eliminate duplicate corporate procedures and reduce multiplicity of legal and regulatory compliances between both the companies. There is no consideration involved as the entire share capital of Reno is held by the Company along

with its nominees. The appointed date for the Scheme of Amalgamation is 1st April 2019 or such other date as may be approved by the National Company Law Tribunal (NCLT) and the Scheme shall be effective from the last date of receipt of all approvals permissions as may be required or filing of necessary certified copies of Orders under the applicable section(s) of the Act with the Registrar of Companies Maharashtra at Mumbai. The NCLT vide its Orders dated 22nd April 2020 and 27th April 2020 inter alia admitted the Scheme of Amalgamation.

Asian Paints International Private Limited Singapore (APIPL) wholly owned subsidiary of the Company divested its entire stake in Berger Paints Singapore Pte Limited Singapore (BPS) wholly owned subsidiary of APIPL to Omega Property Investments Pty Ltd Australia for a consideration of approx Rs 20.81 crore on 17th September 2019. BPS had a limited presence in the Singapore coatings market and was not material in overall Company's international operations.

The company also continued to focus on building capacity across units to support our growth ambitions. The expansion project of the existing plant in Indonesia progressed on schedule. Work also commenced on the company's second plant in Bangladesh. Capacity expansion was completed in Sri Lanka Nepal and the UAE. The Company has also completed a blueprint for future expansion in Nepal.

The Company has 23 subsidiaries and 2 joint-venture companies as on 31 March 2021.

The Company Petition filed for amalgamation of Reno Chemicals Pharmaceuticals & Cosmetics Private Limited Company's wholly owned subsidiary with the Company was admitted on 26 April 2021 by Hon'ble National Company Law Tribunal Mumbai (NCLT).

With effect from 01 April 2021 indirect subsidiary of the Company Asian Paints (Lanka) Limited amalgamated with Causeway Paints Lanka (Private) Limited.

Asian Paints (Tonga) Limited has ceased its business operations w.e.f. 10 December 2020 and liquidated all its assets & liabilities. The name of the Company was struck off from the Business Registries Office Kingdom of Tonga on 29 January 2021.

On 02 September 2021 the National Company Law Tribunal Mumbai approved the scheme of amalgamation of Reno Chemicals Pharmaceuticals and Cosmetics Private Limited wholly owned subsidiary of the Company with the Company. Pursuant to the necessary filings with the Registrars of Companies Mumbai the scheme has become effective from 17 September 2021 with the appointed date of 01 April 2019.

During the quarter ended 30 September 2021 the Company made additional equity investment of Rs 79.99 crore in Sleek International Private Limited a wholly owned subsidiary of the Company.

VISION

We want to be an innovative, agile, and responsive world class research and technology organisation that's aligned to future customer needs and catalyses the growth of the company across existing and future businesses.

MISSION

Obviously a clear goal for the future, Asian paints is one of the best five extravagant covering organizations on the planet by expanding its skill in rising markets. All the while, the association means to assemble long haul an incentive in modern covering business through collusions with set up global partners

QUALITY POLICY

- We shall comply with all statutory and other applicable requirements.
- We shall provide products and services that meet stated standards on time, every time.
- We shall continually improve our processes to understand changing stakeholder needs and preferences including statutory changes and use the same as input for periodically reviewing and revising performance standards of our products and services.
- We accept Zero Defect as a quality absolute and shall design and operate our quality system accordingly.
- We shall organize our work practices to do a job right the first time, every time.
- We are committed to continual improvement in quality in all business processes and shall track such improvement through measurable indicators.

PRODUCTS

Asian Paints offers a wide spectrum of services in the following areas -

Decorative – under this segment it offers Painting Guide, Painting Solution, Paint Calculator and paint selector as value added service.

Industrial – Asian Paints offers 4 types of industrial coatings such as -

Protective Coatings – protects steel and concrete structures from the corrosive action of harsh climates, pollution, sea spray, acids, oils and solvents.

Road Markings – are used as road markers for lane as indicator of lane separation and also as safety markers. They include ordinary road marking paint, hot applied retro-reflective thermoplastic material and retro-reflective water borne paints.

Powder Coatings – is used to enhance the performance of Industrial paints.

Floor Coatings – such paints protects the floor surface and prevents crack formation, insect nest formation, water seepage etc.

Automotive – It includes wide range of motor bikes and car paints.



PAINTS & TEXTURES

WALL COVERINGS

HEALTH & HYGIENE

Full Collection

By Design

By Colour

Ideas Gallery

Designer Collection

Abstract

Whites

Disney

Botanical

Purples & Pinks

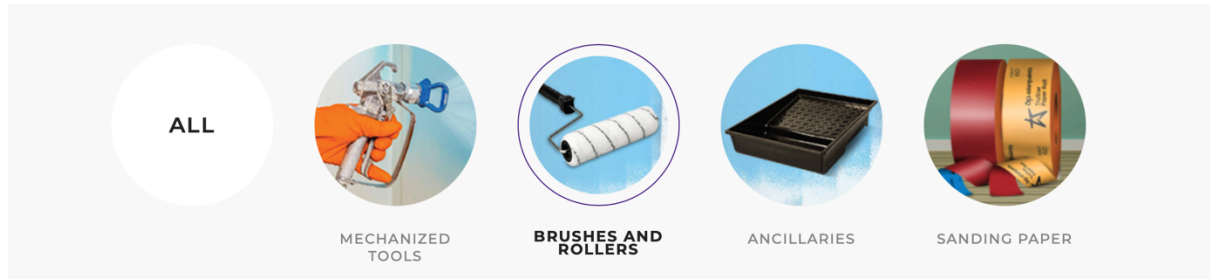
View All

Damask

Reds & Oranges

View All

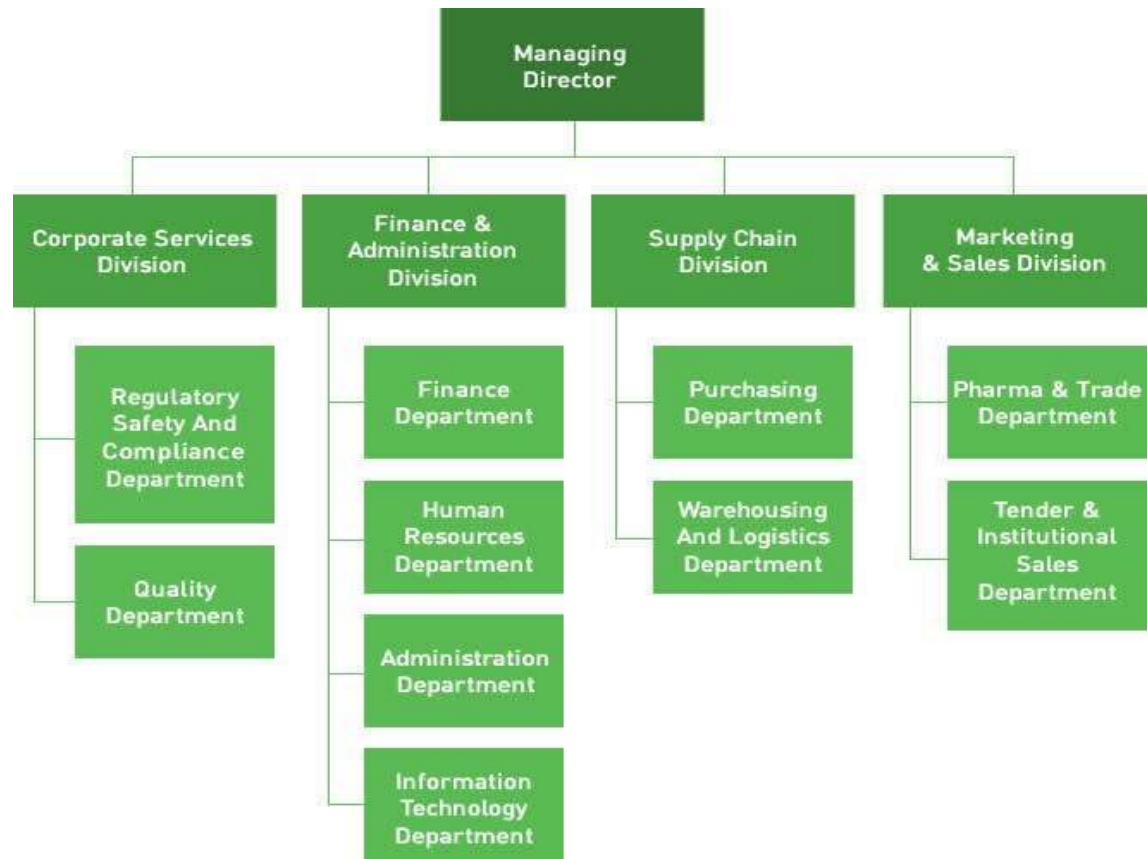
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MANAGEMENT INFORMATION

CHAIRMAN (NON-EXECUTIVE)	ASHWIN DANI
INDEPENDENT DIRECTOR	DEEPAK SATWALEKAR
DIRECTOR	MALAV DANI
INDEPENDENT DIRECTOR	VIBHA PAUL RISHI
DIRECTOR	AMRITA VAKIL
INDEPENDENT DIRECTOR	R SESHASAYEE
VICE CHAIRMAN	MANISH CHOKSI
INDEPENDENT DIRECTOR	SURESH NARAYANAN
INDEPENDENT DIRECTOR	PALLAVI SHROFF
DIRECTOR	JIGISH CHOKSI
CFO & COMPANY SECRETARY	R J JEYAMURUGAN
MANAGING DIRECTOR & CEO	AMIT SYNGLE
ADDITIONAL DIRECTOR	MILIND SARWATE
NON EXECUTIVE DIRECTOR	NEHAL A VAKIL
AUDITOR	DELOITTE HASKINS & SELLS LLP
IND NAME	PAINTS / VARNISHES
HOUSE NAME	INDIAN PRIVATE

Organisational STRUCTURE



KEY COMPETITORS

- Berger
- APCO
- Scib Paints
- PPG Asian Paints
- Taubmans
- Sleek Kitchens
- Kadisco and many others.

CHAPTER 2

Introduction to Models

1. Comparative

A) Income Statement

The comparative Income Statement is prepared for the financial year 2020 and 2021.

The figures are in crores.

Particulars	Mar-20	Mar-21	Absolute Inc. / Dec.	(inc. / dec.) %
Net sales [in crores]	17761	18974	1213	6.82
(-) Total expenditure	13580	14114	564	4.15
Operating profit	4181	4860	679	16.24
(-)Interest	78	71	-7	-8.97
Gross profit	4103	4789	686	16.71
(-) Non-operating expense	690	697	7	1.01
Profit before tax	3413	4092	679	19.89
(-) Tax	877	1059	182	20.75
Profit after tax	2536	3033	497	19.59

B) Balance sheet

The Comparative Balance sheet is prepared for the financial year 2020 and 2021. The figures are in crores.

particulars	Mar-20	Mar-21	absolute Inc. / Dec.	% Inc. / Dec.
Share Capital -	1940	2421	481	24.79
Equity Capital	96	96	0	0
Reserves	1,614	2,092	478	30
Borrowings	230	233	3	1.3
Other Liabilities -	1,845	2,190	345	18.69
Non-controlling int	94	110	16	17.02
Trade Payables	718	1,087	369	51.39
Advance from Customers	0	0	0	0
Other liability items	1,033	992	-41	-3.96
Total Liabilities	3,785	4,611	826	21.82
Fixed Assets -	1,538	1,815	277	18.01
Land	220	220	0	0
Building	356	343	-13	-3.65
Plant Machinery	730	1,011	281	38.49
Equipment	36	66	30	83.33
Furniture n fittings	66	45	-21	-31.81
Vehicles	10	9	-1	-10
Intangible Assets	59	59	0	0
Other fixed assets	61	62	1	1.63
Investments	403	0	-403	-100
Other Assets -	1,844	2,796	952	51.6
Inventories	956	1,305	349	36.5
Trade receivables	543	573	30	5.52
Cash Equivalents	106	626	520	490.56
Loans n Advances	270	229	-41	-15.18
Other asset items	31	63	32	103.22
Total Assets	3,785	4,611	826	21.82

2. Common Size

A) Income Statement

The Common Size Income Statement is prepared for the financial year 2020 and 2021.

The figures are in crores.

Particulars	Mar-20	%	Mar-21	%
Net sales [in crores]	17761	100	18974	100
(-) Total expenditure	13580	76.45	14114	74.54
Operating profit	4181	23.55	4860	25.61
(-) Interest	78	0.43	71	0.37
Gross profit	4103	23.1	4789	25.23
(-) Non-operating expense	690	3.88	697	3.67
Profit before tax	3413	19.21	4092	21.56
(-) Tax	877	4.93	1059	5.58
Profit after tax	2536	14.27	3033	15.98

B) Balance sheet

The Common Size Balance sheet is prepared for the financial year 2020 and 2021. The figures are in crores.

particulars	Mar-20	%	Mar-21	%
Share Capital -	1940	51.2549538	2421	52.5
Equity Capital	96	2.53632761	96	2.08
Reserves	1,614	43	2,092	45
Borrowings	230	6.07661823	233	5.05
Other Liabilities -	1,845	49	2,190	47.49
Non-controlling int	94	2.48348745	110	2.38
Trade Payables	718	19	1,087	23.57
Advance from Customers	0	0	0	0
Other liability items	1,033	27.2919419	992	21.51
Total Liabilities	3,785	100	4,611	100
Fixed Assets -	1,538	41	1,815	39.36
Land	220	5.81241744	220	4.77
Building	356	9.40554822	343	7.43
Plant Machinery	730	19	1,011	21.92
Equipment's	36	0.95112285	66	1.43
Furniture n fittings	66	1.74372523	45	0.97
Vehicles	10	0.26420079	9	0.19518543
Intangible Assets	59	1.55878468	59	1.2795489
Other fixed assets	61	1.61162483	62	1.34461071
Investments	403	11	0	0
Other Assets -	1,844	49	2,796	60.63
Inventories	956	25	1,305	28.3018868
Trade receivables	543	14.346103	573	12.4268055
Cash Equivalent	106	2.8005284	626	13.5762308
Loans n Advances	270	7.1334214	229	4.96638473
Other asset items	31	0.81902246	63	1.36629798
Total Assets	3,785	100	4,611	100

3. Trend Analysis

A) Income Statement

The Trend Analysis Income Statement is prepared for the financial year 2017, 2018, 2019, 2020 and 2021.

The figures are in crores.

Particulars	2017 (Rs.)	2018(Rs.)	2019(Rs.)	2020(Rs.)	2021(Rs.)
Net sales [in crores]	15,062	16825	19240	17761	18974
(-) Total expenditure	12,068	13621	15475	13580	14114
Operating profit	2,994	3204	3765	4181	4860
(-)Interest	37	41	110	78	71
Gross profit	2957	3163	3655	4103	4789
(-) Non-operating expense	335	360	622	690	697
Profit before tax	2622	2803	3033	3413	4092
(-) Tax	839	925	1000	877	1059
Profit after tax	1783	1878	2033	2536	3033

The Trend Analysis Income Statement is prepared for the financial year 2017, 2018, 2019, 2020 and 2021.

The figures are in crores.

2017%	2018%	2019%	2020%	2021%
100	111.704953	127.73868	117.919267	125.972646
100	112.868744	128.231687	112.529002	116.953928
100	107.014028	125.751503	139.645959	162.324649
100	110.810811	297.297297	210.810811	191.891892
100	106.96652	123.605005	138.755495	161.954684
100	107.462687	185.671642	205.970149	208.059701
100	106.903127	115.675057	130.167811	156.064073
100	110.250298	119.189511	104.529201	126.221692
100	105.328099	114.021312	142.232193	170.106562

B) Balance Sheet

The Trend Analysis Balance Sheet is prepared for the financial year 2017, 2018, 2019, 2020 and 2021.

The figures are in crores.

Particulars	2017 (Rs.)	2018(Rs.)	2019(Rs.)	2020(Rs.)	2021(Rs.)
Share capital	96	96	96	96	96
Reserves and Surplus	7508	8314	9375	10034	12710
secured loans	560	533	1320	1118	1094
Other liability	4241	4820	5459	4889	6456
Total Liability	12405	13763	16250	16137	20356
fixed assets	3304	3732	6497	6272	5859
Investments	2910	3546	2779	2160	4920
Stock	2627	2658	3150	3390	3799
Debtors	2254	2871	2965	2972	4425
Cash	1310	956	859	1344	1353
Total Assets	12405	13763	16250	16138	20356

The Trend Analysis Balance Sheet is prepared for the financial year 2017, 2018, 2019, 2020 and 2021.

The figures are in crores.

2017%	2018%	2019%	2020%	2021%
100	100	100	100	100
100	110.735216	124.866809	133.644113	169.286095
100	95.1785714	235.714286	199.642857	195.357143
100	113.65244	128.719642	115.279415	152.228248
100	110.947199	130.995566	130.084643	164.095123
100	112.953995	196.640436	189.830508	177.330508
100	121.85567	95.4982818	74.2268041	169.072165
100	101.180053	119.908641	129.044537	144.613628
100	127.373558	131.543922	131.854481	196.317657
100	72.9770992	65.5725191	102.59542	103.282443
100	110.947199	130.995566	130.092705	164.095123

CHAPTER 3

Interpretation

Comparative Financial Analysis

A. Income Statement

Interpretation:

1. Based on the data table, there is a significant % increase in the SALES i.e., 6.82 when compared to the % increase in the COGS i.e., 4.15. That shows a positive sign of growth in the company.
2. Company's gross profit has shown an increase of 16.71% when compared to the previous year.
3. Non-operating expense has increased by 1.01%, where in the Profit before tax has increased by 19.89%.
4. Profit after tax has increased by 19.59% when compared to the previous year, which is a tremendous growth of almost 1/5, showing the company's positive growth.

B. Balance Sheet

Interpretation:

1. The company has not raised any owners fund but has increased its reserves, which means it has a stable profit so has transferred it to reserves. That is the sign of a constant production and constant sales and revenue.
2. The company has sold investments and has utilized it towards the increase of fixed assets by 18.01% and other assets by 51.6%.
3. Plant and machinery has increased by 38.49% which subsequently has increased the stock by 36.5% which shows that the company has made long-term decisions of growth.
4. Here, the company is trying to re-arrange its production, to gradually increase the sales and profit.

Common Size Financial Analysis

A. Income Statement

Interpretation:

1. The company's sales has increased by Rs. 1213 (1000's), as compared to previous year. The COGS has also increased to 14114 from 13580 in comparison to sales the COGS has helped in significant increase of the sales too compared to previous year company's operating profit has increased in a significant 2.26% when compared to previous year, which is a positive sign for the shareholder's, investors and banks.
2. Company was able to increase the Profit After Tax upto 1.71% when compared to the previous year where in the PAT was 2536 and PAT for March 2021 was 3033. This shows that the company is aiming at a steady growth.

B. Balance Sheet

Interpretation

1. Company has raised Share capital in year 2021 by increase of Rs.481 (1000's) which is of 1.25% increase in share capital by issue of various instruments or by increase in reserves and surplus. Thus is a positive sign of steady development.
2. The company has sold complete of its investment's which is from 403 in 2020 to 0 in 2021.
3. It has bought plant and machinery showing an increase by 2.92%, equipment by 30%, that is the working platform has seen a sturdy growth thus showing its impact on the production to which the sign is increase in the inventories by 3.3%. The working capital also has a tremendous increase of 520%. To all of which the funding has been from the investments sold.

Trend Analysis Financial Analysis

A .Income Statement

Interpretation

1. Net sales has increased for 2018, 2019 but then decreased in 2020 but again has increased in 2021. COGS holds the same trend of increase – decrease – increase over the time period of 5 years. Here the operating profit over the years has seen a steady rise from 100 to 162 thus is a good sign of growth even under the presence of a volatile trend in sales and COGS.

2. PAT has seen a demanding increase over 5 years of time period.

B. Balance Sheet

Interpretation

1. Share capital has seen no changes in the trend over the years, reserves and surplus has increased gradually from 100 to 169 that shows the company's internal monetary policies are efficient.

2. Stocks over the years has increased from 100 to 144, which is a good sign for the company.

3. Fixed assets has seen a rise and dip in the trend values over the 5 years. and the total assets has seen a steady rise from 100 to 164 over the trend of 5 years.

CHAPTER 4

Suggestion and Conclusion

Findings

In this project, I found the importance of comparative, common size, and, trend analysis while evaluating the value of the firm before investing in the stock. One of the benefits of using common-size analysis is that it allows investors to identify drastic changes in a company's financial statement. It mainly applies when the financials are compared over a period of two or three years. Any significant movements in the financials across several years can help investors decide whether to invest in the company. Common-size Statement helps the users of financial statements to make clear the ratio or percentage of each individual item to the total assets/liabilities of a firm. For example, if an analyst wants to know the working capital position, he may ascertain the percentage of each individual component of current assets against the total assets of a firm and also the percentage share of each individual component of current liabilities. The common-Size statement does not recognize the change in price level i.e., the inflationary effect. So, it supplies misleading information since it is based on historical costs.

The comparative statements show the figures of various firms or the number of years side by side i.e., both for inter-firm comparison and intra-firm comparison. Comparative financial statements help to measure important financial ratios which are used for predicting financial distress and predicting corporate failure with the help of the Multivariate Model. The drawback of the comparative statement is, Interfirm comparison will only be effective if both the firms follow the same accounting principles, method of valuation of stocks, assets, etc. i.e., all the accounting concepts and conventions, in a real-world situation, are not identically followed by both the firms e.g., Firm A follows the FIFO method of valuing stock whereas Firm B follows the LIFO method for the same.

Trend analysis (in terms of percentage) is found to be more effective in comparison with the absolute figures/data on the basis of which the management can make the decisions. Trend analysis helps the analyst/and the management to understand the short-term liquidity position as well as the long-term solvency position of a firm over the years with the help of related financial Trend ratios. one of the disadvantages of trend analysis is, It is not so easy to select the base year. Usually, a normal year is taken as the base year. But it is very difficult to select such a base year for the purpose of ascertaining the trend. Otherwise, comparison or trend analyses will be of no value.

Suggestions

For the Company

- The sales of the company has increased-decreased-increased and the operating expense has increased-decreased-increased over the years, but in a different amount when compared between the two that shows a Erotic pattern of the company's financial proceedings.
- Debtors have been increasing over the years, which means credit sales have been too high, due to which the revenue may decrease in the future due to bad debts. So, it should bring reforms to its sales policies.
- The company has raised a lot of secured loans over the years, to maybe invest into fixed assets, investments. But, in future the repayment of principal and interest may affect the profit earning. So, the company has to reduce borrowings of loans.

For the Investors

- Sales has increased and decreased in an erotic manner. But still has increased over the years. So, for investors a risk free investment to get. Huge return on investment.
- Share Capital is constant. So, EPS increase is caused as profits would be more due to increase over the future years as seen in the trend analysis. So, when invested in this company it will yield high EPS can be earned.
- The company has higher ratio of amount into the non-current assets and not into current assets. So, the returns would be high from the company. The investment of new investors would be taken into non-current assets. So, a good company for overall constant returns, even under an erotic financial environment.

Conclusion

According to the Trend Analysis we did for the Asian Paints we conclude that Asian Paints managed their business better. Having said that, it would be injustice if we do not appreciate Asian paints for its spectacular performance despite poor macro-economic conditions.

We understood that subprime crisis, economic downturn, high inflation, real estate bubbles, and slow construction sector are some of the reasons for the reduced performance. Despite all the hurdles it faced, Asian Paints performed fairly well and that is the reason for increase in its share price by 3 times, in a short span of 5 years.

In a nutshell, Asian Paints deserves its first place in the market and should be the first investment option for any investor, who is interested in Paint industry.

Comparative financial statements give managers and analysts advantages, which allow more efficient and detailed analysis of the entity's performance. While the normal financial statement is a static reflection of the current financial position of the company, comparative financial statements reflect the dynamics in its development and allow to determine trends and forecast changes.

My brief analysis of the Comparative Income Statement and Common Size Income Statement, from the examples we used in explaining the comparative and common-size financial statements, clearly defines the significance of each method as a tool for financial analysis. Where the comparative provides the value of the results of the business, the common size presents the performance trend and the aspects that need to show improvement. It can be said that the common size income statement facilitates easy comparison. It makes analysis much easier such that the analyst can see what is actually driving the profit of a company, and then compare that performance to its peers.

The trend is a friend, is a well-known quote in the trader's fraternity. The trader makes a good profit by following the trend, and trend analysis is not an easy task. It required eyes on detail and an understanding of the market dynamics.

The trend analysis in accounting can be used by management or the analyst to forecast future financial statements. Following blindly can be dangerous if a proper analysis of the past event is not done.

CHAPTER 5

BIBLIOGRAPHY

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- Financial Accounting – Jerry J. Weygandt
- www.asianpaints.com

CHAPTER 6

Annexure

Annexure – 1

LAST FIVE YEARS INCOME STATEMENT

Particulars	2017 (Rs.)	2018 (Rs.)	2019 (Rs.)	2020 (Rs.)	2021(Rs.)
Net sales [in crores]	15,062	16825	19240	17761	18974
(-) Total expenditure	12,068	13621	15475	13580	14114
Operating profit	2,994	3204	3765	4181	4860
(-) Interest	37	41	110	78	71
Gross profit	2957	3163	3655	4103	4789
(-) Non-operating expense	335	360	622	690	697
Profit before tax	2622	2803	3033	3413	4092
(-) Tax	839	925	1000	877	1059
Profit after tax	1783	1878	2033	2536	3033

Annexure – 2

LAST FIVE YEARS BALANCE SHEET

Particulars	2017 (Rs.)	2018 (Rs.)	2019 (Rs.)	2020 (Rs.)	2021 (Rs.)
Share capital	96	96	96	96	96
Reserves and Surplus	7508	8314	9375	10034	12710
secured loans	560	533	1320	1118	1094
Other liability	4241	4820	5459	4889	6456
Total Liability	12405	13763	16250	16137	20356
fixed assets	3304	3732	6497	6272	5859
Investments	2910	3546	2779	2160	4920
Stock	2627	2658	3150	3390	3799
Debtors	2254	2871	2965	2972	4425
Cash	1310	956	859	1344	1353
Total Assets	12405	13763	16250	16138	20356

FINANCIAL MANAGEMENT

CAPSTONE PROJECT DETAILS

Objects

At the end of these projects students will be able to:

- Evaluate and calculate WACC
- Evaluate financial health of the company
- To use Capital Budgeting techniques in real-time exercise

Introduction

A capstone project is a small-scale project on real-time business problems to understand the concept. This project addresses to make detailed understanding the financial health of the company taught in the classroom capital budgeting as part of the Financial Management curriculum. You need to use all techniques except ARR techniques and study all the cases, then compare the same and write your comment to complete this project. Marks rubrics and instructions are listed as follows.

MARKS RUBRICS (Maximum Marks 15)

S.No	Topics	Marks
1	Calculation of k_e by using CAPM	2
	Calculation of K_d by using company information	1
	Calculation of WACC	1
	Calculation Of Cost Of Capital	4
2	Identifying CIF by using TTM of FCFE (morningstar.com)	1
	Identifying the growth of CI and estimation of CI for remaining 4 years	2
	Identifying CO^*	1
	Calculation of expected cash flows inflow and outflows	4
3	Calculation of PBP	2
	Calculation of DPBP	2

	Calculation of NPV	2
	Calculation of IRR	2
	Calculation of PI	2
	Calculation of Investment Decision	10
4	Overall Report	2

PROJECT FLOW CHART

Part A

- 1) Calculation of CIF - Visit <https://www.morningstar.in> and collect TTM value of FCFF
- 2) Calculate the growth rate on the basis of 10 years FCFF value and use the same to forecast remaining 4 years CIF (Note - assume TTM value of FCFF as positive in case you get negative TTM of FCFF)

Part B

Consider COF as, A - 75% of \square PV, B - 125% of \square PV, and C - 100% \square PV with 15% Salvage Value of 100% \square PV.

Part C

Calculate beta, RF and RM using past 5 years equity price and NIFTY 50 Index Price.

Derive K_e (Cost of Equity) using CAPM method

Derive K_d using company details and assume a 30% tax rate.

INSTRUCTIONS

Prepare a detailed report with proper interpretation, tables and visualizations

Prepare Your report in either MS word or Google Doc with 'Times New Roman' font and 12 font size

Convert Report file into PDF format and upload the same

Start Date - 5th September 2022

End Date - 7th October 2022

No time extension will be allowed

2nd Semester 2021-23 Batch

Section: A

Capstone Project on Measuring Financial Health of Selected Company

Sl. No	Student Name	Company Name	Industry
1	CHAITANYA KAMATAGI B	ACC Ltd.	CEMENT & CEMENT PRODUCTS
2	AKASH RACHAPPA KHANAGAVI	AU Small Finance Bank Ltd.	FINANCIAL SERVICES
3	SHETTY TRUPTHI CHANDRAHAS	Aarti Industries Ltd.	CHEMICALS
4	HARSHITHA SRINIVAS	Adani Enterprises Ltd.	METALS
5	SAGI SAMPI	Adani Green Energy Ltd.	POWER
6	PAULOMEE BARUAH	Adani Ports and Special Economic Zone Ltd.	SERVICES
7	NEETHA KAMATH	Adani Total Gas Ltd.	OIL & GAS
8	ADITYA UDAY HEGDE	Adani Transmission Ltd.	POWER
9	SHREYAS G A	Aditya Birla Capital Ltd.	FINANCIAL SERVICES
10	SRUJANA S	Aditya Birla Fashion and Retail Ltd.	CONSUMER SERVICES
11	PRAJWAL S N	Ajanta Pharmaceuticals Ltd.	PHARMA
12	SUCHITRA G	Alembic Pharmaceuticals Ltd.	PHARMA
13	SANKET SURESH SHIRSAT	Alkem Laboratories Ltd.	PHARMA
14	ANIKET SANJAY REVANKAR	Amara Raja Batteries Ltd.	AUTOMOBILE
15	M LUQMAN NAWAZ	Ambuja Cements Ltd.	CEMENT & CEMENT PRODUCTS

16	MADHURA A	<i>Apollo Hospitals Enterprise Ltd.</i>	<i>HEALTHCARE SERVICES</i>
17	H V SHREEVATSA	<i>Apollo Tyres Ltd.</i>	<i>AUTOMOBILE</i>
18	LILIMA DASH	<i>Ashok Leyland Ltd.</i>	<i>AUTOMOBILE</i>
19	KUMAR ASHUTOSH	<i>Asian Paints Ltd.</i>	<i>CONSUMER GOODS</i>
20	RAHUL S SANGOLLI	<i>Astral Ltd.</i>	<i>INDUSTRIAL MANUFACTURING</i>
21	GIRISH N NASHI	<i>Aurobindo Pharma Ltd.</i>	<i>PHARMA</i>
22	ANKITA GAJANAN NAIK	<i>Avenue Supermarts Ltd.</i>	<i>CONSUMER SERVICES</i>
23	GURUBASAVARAJ K M	<i>Axis Bank Ltd.</i>	<i>FINANCIAL SERVICES</i>
24	LIKHITHA L	<i>Bajaj Auto Ltd.</i>	<i>AUTOMOBILE</i>
25	RAHUL RAM BHAT	<i>Bajaj Finance Ltd.</i>	<i>FINANCIAL SERVICES</i>
26	AMIT KAMADOLLISHET TARU	<i>Bajaj Finserv Ltd.</i>	<i>FINANCIAL SERVICES</i>
27	POOJARANI TALAWAR	<i>Bajaj Holdings & Investment Ltd.</i>	<i>FINANCIAL SERVICES</i>
28	ABHITHA K	<i>Balkrishna Industries Ltd.</i>	<i>AUTOMOBILE</i>
29	ABHISHEK SHENOY	<i>Bandhan Bank Ltd.</i>	<i>FINANCIAL SERVICES</i>
30	DEEPAK GIRISH KALYANI	<i>Bank of Baroda</i>	<i>FINANCIAL SERVICES</i>
31	ISAAC JESSE K	<i>Bank of India</i>	<i>FINANCIAL SERVICES</i>
32	VINAYAK RAO GAIKWAD K	<i>Bata India Ltd.</i>	<i>CONSUMER GOODS</i>
33	SUTOPA DEB	<i>Berger Paints India Ltd.</i>	<i>CONSUMER GOODS</i>
34	BHASKARA PRABHU	<i>Bharat Petroleum Corporation Ltd.</i>	<i>OIL & GAS</i>

35	PRAKASH SHIVAKUMAR	Biocon Ltd.	PHARMA
36	AKANKSH K G	Bosch Ltd.	AUTOMOBILE
37	BERNARD FERNANDES	Britannia Industries Ltd.	CONSUMER GOODS
38	VIOLA PINTO	Cadila Healthcare Ltd.	PHARMA
39	VARSHA	Canara Bank	FINANCIAL SERVICES
40	GAGANDEEP V N	Castrol India Ltd.	OIL & GAS
41	ANUSHA	Cholamandalam Investment and Finance Company Ltd.	FINANCIAL SERVICES
42	KAVYAPRIYA J	Cipla Ltd.	PHARMA
43	BASAVARAJ	City Union Bank Ltd.	FINANCIAL SERVICES
44	ANVITH KUMAR	Coal India Ltd.	METALS
45	DESAI JATIN ARUN	Coforge Ltd.	IT
46	NAYAN KUMAR	Colgate Palmolive (India) Ltd.	CONSUMER GOODS
47	DINAH NEETHA NORONHA	Container Corporation of India Ltd.	SERVICES
48	CHETAN SINGH M	Coromandel International Ltd.	FERTILISERS & PESTICIDES
49	KAUSTUBH LACHAPPANAVAR	Crompton Greaves Consumer Electricals Ltd.	CONSUMER GOODS
50	KSHITIJ P L	Cummins India Ltd.	INDUSTRIAL MANUFACTURING
51	BHUVANES P	DLF Ltd.	CONSTRUCTION
52	KOKILA K	Dabur India Ltd.	CONSUMER GOODS

53	M M JABEZ	Dalmia Bharat Ltd.	CEMENT & CEMENT PRODUCTS
54	KALAVALA ABHISHTA	Deepak Nitrite Ltd.	CHEMICALS
55	KAPARTHI BHAVANA	Dhani Services Ltd.	FINANCIAL SERVICES
56	HEMA S	Divi's Laboratories Ltd.	PHARMA
57	RAMANABOINA ANAND KUMAR	Dixon Technologies (India) Ltd.	CONSUMER GOODS
58	SNEHA U	Dr. Lal Path Labs Ltd.	HEALTHCARE SERVICES
59	D SURIYA PRIYASREE	Dr. Reddy's Laboratories Ltd.	PHARMA
60	TEJAS N	Eicher Motors Ltd.	AUTOMOBILE

2nd Semester 2021-23 Batch

Section: B

Capstone Project on Measuring Financial Health of Selected Company

Sl. No	Student Name	Company Name	Industry
61	AISHWARYA G	Emami Ltd.	CONSUMER GOODS
62	SUPRIYA GOVIND BELSARE	Endurance Technologies Ltd.	AUTOMOBILE
63	AISHWARYA P	Escorts Ltd.	AUTOMOBILE
64	CHIDRI BALAJI	Exide Industries Ltd.	AUTOMOBILE
65	PRAJWALA	Federal Bank Ltd.	FINANCIAL SERVICES
66	POORNIMA L	Fortis Healthcare Ltd.	HEALTHCARE SERVICES
67	SAMEEKSHA M P	GAIL (India) Ltd.	OIL & GAS
68	RAKSHITH R T	Gland Pharma Ltd.	PHARMA
69	SHUBHA R	Glenmark Pharmaceuticals Ltd.	PHARMA
70	ADITI RANI	Godrej Consumer Products Ltd.	CONSUMER GOODS

71	NEELAMMA M K	Godrej Industries Ltd.	CONSUMER GOODS
72	NAMRATHA N	Godrej Properties Ltd.	CONSTRUCTION
73	OLETI SAI SREENITHYA	Grasim Industries Ltd.	CEMENT & CEMENT PRODUCTS
74	RAMANUJAM H J	Gujarat Gas Ltd.	OIL & GAS
75	CHAVI JAGADEESH	Gujarat State Petronet Ltd.	OIL & GAS
76	MALLESH S	HCL Technologies Ltd.	IT
77	SRINIDHI K	HDFC Asset Management Company Ltd.	FINANCIAL SERVICES
78	B SHASHANK	HDFC Bank Ltd.	FINANCIAL SERVICES
79	NAGARAJ GAJANAN HEGDE	Havells India Ltd.	CONSUMER GOODS
80	YASHASWINI P	Hero MotoCorp Ltd.	AUTOMOBILE
81	TANUSHREE R	Hindalco Industries Ltd.	METALS
82	CHETHAN KUMAR V A	Hindustan Aeronautics Ltd.	INDUSTRIAL MANUFACTURING
83	DEEPAK GOPALAKRISHNA N	Hindustan Copper Ltd.	METALS
84	POORNAPRAJNYA K MANGALVEDI	Hindustan Petroleum Corporation Ltd.	OIL & GAS
85	JENISHA MENEZES	Hindustan Unilever Ltd.	CONSUMER GOODS
86	SRAVANI SUNIL MHALSEKAR	Hindustan Zinc Ltd.	METALS
87	M RITISH	Housing Development Finance Corporation Ltd.	FINANCIAL SERVICES
88	PREETHAM D VARMA	ICICI Bank Ltd.	FINANCIAL SERVICES

89	DHIRAJKUMAR BELAVADI	<i>IDFC First Bank Ltd.</i>	<i>FINANCIAL SERVICES</i>
90	FERNANDES RICHA FLORINDA	<i>ITC Ltd.</i>	<i>CONSUMER GOODS</i>
91	MEGHA U JOSHI	<i>Indiamart InterMesh Ltd.</i>	<i>CONSUMER SERVICES</i>
92	HEGDE PAVANA GANAPATHI	<i>Indian Bank</i>	<i>FINANCIAL SERVICES</i>
93	LOYSTON CRASTA	<i>Indian Hotels Co. Ltd.</i>	<i>CONSUMER SERVICES</i>
94	ANJANA KSHIRASAGAR	<i>Indian Oil Corporation Ltd.</i>	<i>OIL & GAS</i>
95	TEJAS H P	<i>Indian Railway Catering And Tourism Corporation Ltd.</i>	<i>SERVICES</i>
96	AMITH BHAT	<i>Indian Railway Finance Corporation Ltd.</i>	<i>FINANCIAL SERVICES</i>
97	NUTHANA U	<i>Indraprastha Gas Ltd.</i>	<i>OIL & GAS</i>
98	MUCHELI SUBBARAJU	<i>Indus Towers Ltd.</i>	<i>TELECOM</i>
99	NANDAGOPAL B R	<i>IndusInd Bank Ltd.</i>	<i>FINANCIAL SERVICES</i>
100	VISHAL SHIVARAJ	<i>Info Edge (India) Ltd.</i>	<i>CONSUMER SERVICES</i>
101	SHASHI KUMAR R	<i>Infosys Ltd.</i>	<i>IT</i>
102	YASHWANTH R	<i>InterGlobe Aviation Ltd.</i>	<i>SERVICES</i>
103	NAVEEN C	<i>Ipca Laboratories Ltd.</i>	<i>PHARMA</i>
104	PAVAN KUMAR M	<i>JSW Energy Ltd.</i>	<i>POWER</i>
105	MADHUSUDAN G	<i>JSW Steel Ltd.</i>	<i>METALS</i>
106	ANNASAGARAM RAGHAVENDRA	<i>Jindal Steel & Power Ltd.</i>	<i>METALS</i>
107	SYED MUSSAVEERULLA	<i>Jubilant Foodworks Ltd.</i>	<i>CONSUMER SERVICES</i>
108	SYED SAMEER	<i>Kotak Mahindra Bank Ltd.</i>	<i>FINANCIAL SERVICES</i>
109	GURU VARUN G	<i>L&T Finance Holdings Ltd.</i>	<i>FINANCIAL SERVICES</i>

110	NAVEEN SETTY N A	L&T Technology Services Ltd.	IT
111	REHAN FAISAL QADRI	LIC Housing Finance Ltd.	FINANCIAL SERVICES
112	SMITHA M	Larsen & Toubro Infotech Ltd.	IT
113	ANIRUDH K	Larsen & Toubro Ltd.	CONSTRUCTION
114	SALMAN FAISAL QADRI	Laurus Labs Ltd.	PHARMA
115	RAVISH RAMACHANDRA HEGDE	Lupin Ltd.	PHARMA
116	POOJA VALLUR	MRF Ltd.	AUTOMOBILE
117	MAHANTH GOWDA K C	Mahindra & Mahindra Financial Services Ltd.	FINANCIAL SERVICES
118	SHAH VINIT SIDDHARTH	Mahindra & Mahindra Ltd.	AUTOMOBILE
119	NAYANA G C	Manappuram Finance Ltd.	FINANCIAL SERVICES
120	NIRANJAN JANARDHAN HEGDE	Marico Ltd.	CONSUMER GOODS

2nd Semester 2021-23 Batch

Section: C

Capstone Project on Measuring Financial Health of Selected Company

Sl. No	Student Name	Company Name	Industry
121	VIPUL VILAS NAIK	Maruti Suzuki India Ltd.	AUTOMOBILE
122	M PRANEETH KUMAR REDDY	MindTree Ltd.	IT
123	NIKHIL S ANJANALLI	Mphasis Ltd.	IT
124	KARTHIK P SHETTY	Muthoot Finance Ltd.	FINANCIAL SERVICES
125	AMITH C	NATCO Pharma Ltd.	PHARMA

126	AKANKSH P	NMDC Ltd.	METALS
127	SACHITH B K	NTPC Ltd.	POWER
128	SOURAV SADANAND SWAR	National Aluminium Co. Ltd.	METALS
129	NISHANTH KRISHNA	Navin Fluorine International Ltd.	CHEMICALS
130	MEHUL V BHASKAR	Nestle India Ltd.	CONSUMER GOODS
131	SHUBHAM RAJENDRA REVANKAR	Nippon Life India Asset Management Ltd.	FINANCIAL SERVICES
132	SHEEBAL M S	Oberoi Realty Ltd.	CONSTRUCTION
133	VISHNU KUMAR	Oil & Natural Gas Corporation Ltd.	OIL & GAS
134	AKHILA H	Oil India Ltd.	OIL & GAS
135	ANANYA P HEGDE	PI Industries Ltd.	FERTILISERS & PESTICIDES
136	NIVEDITHA K SWAMY	Page Industries Ltd.	TEXTILES
137	S SHREYAS	Petronet LNG Ltd.	OIL & GAS
138	B S SUSHEN	Pidilite Industries Ltd.	CHEMICALS
139	PRAJWALA H	Piramal Enterprises Ltd.	FINANCIAL SERVICES
140	VAISHNAVI N	Polycab India Ltd.	INDUSTRIAL MANUFACTURING
141	M S SUKRUT	Power Finance Corporation Ltd.	FINANCIAL SERVICES
142	AMOGHA Y G	Power Grid Corporation of India Ltd.	POWER

143	BHARATH K S	<i>Prestige Estates Projects Ltd.</i>	CONSTRUCTION
144	SHUBIKSHA S	<i>Procter & Gamble Hygiene & Health Care Ltd.</i>	CONSUMER GOODS
145	P T KIRTI	<i>Punjab National Bank</i>	FINANCIAL SERVICES
146	MANOJ RAKSHATH B S	<i>RBL Bank Ltd.</i>	FINANCIAL SERVICES
147	DIVYA SHREE M	<i>REC Ltd.</i>	FINANCIAL SERVICES
148	VARUN S BHARADWAJ	<i>Reliance Industries Ltd.</i>	OIL & GAS
149	S KARTHIK	<i>SBI Cards and Payment Services Ltd.</i>	FINANCIAL SERVICES
150	PRAMOD K L	<i>SBI Life Insurance Company Ltd.</i>	FINANCIAL SERVICES
151	BHOOMIKA BHAT	<i>SRF Ltd.</i>	CHEMICALS
152	SOUMYA GANAPATI HEGDE	<i>Sanofi India Ltd.</i>	PHARMA
153	SHREEKRISHNA	<i>Shree Cement Ltd.</i>	CEMENT & CEMENT PRODUCTS
154	YOGASHREE C N	<i>Shriram Transport Finance Co. Ltd.</i>	FINANCIAL SERVICES
155	CHARANA T U	<i>Siemens Ltd.</i>	INDUSTRIAL MANUFACTURING
156	NIKITHA J SHANBHOJ	<i>Sona BLW Precision Forgings Ltd.</i>	AUTOMOBILE
157	DHANYA S SHARMA	<i>State Bank of India</i>	FINANCIAL SERVICES
158	GANESH HEGDE	<i>Steel Authority of India Ltd.</i>	METALS

159	ANUSHA PRAKASH	<i>Sun Pharmaceutical Industries Ltd.</i>	<i>PHARMA</i>
160	JAGADISH SHENOY R	<i>Sun TV Network Ltd.</i>	<i>MEDIA ENTERTAINMENT & PUBLICATION</i>
161	MADHAN KUMAR C S	<i>TVS Motor Company Ltd.</i>	<i>AUTOMOBILE</i>
162	DHANUSH K V	<i>Tata Chemicals Ltd.</i>	<i>CHEMICALS</i>
163	SWAMI SAMIKSHA PUSHPARAJ	<i>Tata Communications Ltd.</i>	<i>TELECOM</i>
164	NALASANI VARSHITHA	<i>Tata Consultancy Services Ltd.</i>	<i>IT</i>
165	KOTHA KEERTHANA	<i>Tata Consumer Products Ltd.</i>	<i>CONSUMER GOODS</i>
166	SANKALP V	<i>Tata Motors Ltd.</i>	<i>AUTOMOBILE</i>
167	MANOJ N S	<i>Tata Steel Ltd.</i>	<i>METALS</i>
168	SHIVAM GANAPATI ANVEKAR	<i>Tech Mahindra Ltd.</i>	<i>IT</i>
169	SHUBHAM SINGH	<i>The Ramco Cements Ltd.</i>	<i>CEMENT & CEMENT PRODUCTS</i>
170	ABHIJEETH MASHETTY	<i>Titan Company Ltd.</i>	<i>CONSUMER GOODS</i>
171	PRANITH KUMAR S	<i>Trent Ltd.</i>	<i>CONSUMER SERVICES</i>
172	LIKITHA A	<i>UltraTech Cement Ltd.</i>	<i>CEMENT & CEMENT PRODUCTS</i>
173	BHUPALI SAURABH PRAKASH	<i>Union Bank of India</i>	<i>FINANCIAL SERVICES</i>
174	SYED RAIHAN	<i>United Breweries Ltd.</i>	<i>CONSUMER GOODS</i>
175	SHRI HARI L	<i>United Spirits Ltd.</i>	<i>CONSUMER GOODS</i>
176	SATHYA B NAYAKA	<i>Varun Beverages Ltd.</i>	<i>CONSUMER GOODS</i>

177	NEHA H V	<i>Voltas Ltd.</i>	<i>CONSUMER GOODS</i>
178	SAAHIL SRIKANT KULLOLI	<i>Whirlpool of India Ltd.</i>	<i>CONSUMER GOODS</i>
179	SIMRANJIT KAUR	<i>Wipro Ltd.</i>	<i>IT</i>
180	AGAMYA A KINHAL	<i>Zee Entertainment Enterprises Ltd.</i>	<i>MEDIA ENTERTAINMENT & PUBLICATION</i>



CAPSTONE PROJECT
PREDICTIVE ANALYTICS USING R

**DEMONSTRATION OF CHARTS, UNIVARIATE ANALYSIS, LINEAR REGRESSION & MULTIPLE
REGRESSION**

Marks Rubrics: (10 marks for report + 5 marks for viva)

1. About the Company – 0.5 marks
2. About the Variables – 0.5 marks
3. Construction of Line Chart, Scatter Plot & Histogram – for any one continuous variables: 1.5 marks
4. Computation of Univariate Analysis – Mean; Median; Mode; Standard deviation; Testing of Normality (for any one continuous variables): 1.5 marks
5. Construction of Linear Regression (Close Price against Open Price): 3 marks
6. Construction of Multiple Regression (Close Price against all other variables): 3 marks
7. Viva–voce : 5 marks

INSTRUCTIONS

Prepare a detailed report with proper interpretation, tables and visualizations

Prepare your report in MS word with ‘Times New Roman’ font and 12 font size

Convert Report file into PDF format and upload in quiklrn

Start Date – 12th April 2023

End Date – 25th April 2023

No time extension will be allowed

Sl. No	Student Name	Company Name	Industry
1	Team 1	ACC Ltd.	CEMENT & CEMENT PRODUCTS
2	Team 2	Adani Enterprises Ltd.	METALS
3	Team 3	Bajaj Auto Ltd.	AUTOMOBILE
4	Team 4	Bajaj Finance Ltd.	FINANCIAL SERVICES
5	Team 5	Bosch Ltd.	AUTOMOBILE
6	Team 6	Britannia Industries Ltd.	CONSUMER GOODS
7	Team 7	Castrol India Ltd.	OIL & GAS
8	Team 8	Colgate Palmolive (India) Ltd.	CONSUMER GOODS
9	Team 9	DLF Ltd.	CONSTRUCTION
10	Team 10	Dabur India Ltd.	CONSUMER GOODS
11	Team 11	Dr. Reddy's Laboratories Ltd.	PHARMA
12	Team 12	Eicher Motors Ltd.	AUTOMOBILE
13	Team 13	Emami Ltd.	CONSUMER GOODS
14	Team 14	Federal Bank Ltd.	FINANCIAL SERVICES
15	Team 15	Glenmark Pharmaceuticals Ltd.	PHARMA
16	Team 16	Godrej Consumer Products Ltd.	CONSUMER GOODS
17	Team 17	HCL Technologies Ltd.	IT
18	Team 18	HDFC Bank Ltd.	FINANCIAL SERVICES
19	Team 19	Hindustan Aeronautics Ltd.	INDUSTRIAL MANUFACTURING
20	Team 20	Hindustan Unilever Ltd.	CONSUMER GOODS
21	Team 21	ICICI Bank Ltd.	FINANCIAL SERVICES
22	Team 22	IDFC First Bank Ltd.	FINANCIAL SERVICES
23	Team 23	ITC Ltd.	CONSUMER GOODS
24	Team 24	Indian Bank	FINANCIAL SERVICES
25	Team 25	Indian Oil Corporation Ltd.	OIL & GAS



RASHTREEYA SIKSHANA SAMITHI TRUST
R V INSTITUTE OF MANAGEMENT
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2nd Semester
Batch 2021-2023

SUBJECT CODE: 21MBA321

SUBJECT: FINANCIAL MANAGEMENT

TOPIC

Capstone Project on measuring financial health of

ACC ACC Limited

NAME OF THE STUDENT	Chaitanya Kamatagi B
SEMESTER	2 nd SEM 'A' section
REGISTERED NUMBER	P18FW21M0009
NAME OF THE FACULTY(Guided by)	Prof. Dileep S



ACC Limited (ACC) is a leading player in the Indian building materials space, with a pan-India manufacturing and marketing presence. With 17 cement manufacturing units, 85 ready mix concrete plants, over 6,600 talented employees, a vast distribution network of 56,000 dealers & retailers and a countrywide spread of sales offices, it contributes tremendously to the landscape of the country.

For over 80 years, ACC has been synonymous with cement, establishing its reputation as a pioneer organisation that consistently sets new benchmarks in research and innovative product development.

History was created more than eight decades ago when the doyens of the Indian cement industry unified their operations to build the foundation of a company that has only grown stronger with every passing year. From the Bhakra Nangal Dam in 1960 to the Mumbai-Pune Expressway, ACC cement is at the heart of iconic landmarks across the country.

Our success over the years can be attributed to our unrelenting focus on customer centricity, ethical business practices and sustainable development. We pay tribute to our motto of ‘Cementing Relationships’ with every single interaction with our range of stakeholders.

ACC's brand architecture comprises the Gold range and Silver range of products assuring superior quality for general construction as well as for specialised applications and environments. The ready-mix concrete product range provides one-stop solutions from basic requirements to high grades of concrete to build the country's tallest structures.

Sustainability is an integral part of our business strategy, with our Sustainable Development 2030 Plan focused on four broad themes: Climate, Circular Economy, Water & Nature and People & Communities. Our corporate social responsibility efforts benefit local communities across the country by furthering economic and social progress. ACC's earliest initiatives in community development date back to the 1940's – long before the term 'corporate social responsibility' was coined.

ACC was among the first Indian companies to include commitment to environmental protection as one of its corporate objectives. Since inception, we have integrated this commitment into all activities of our value chain, from mining to sales to promoting the use of alternative fuels and resources, resulting in one of the lowest carbon footprints in the cement industry.

ACC Limited (ACC) is one of the leading players in the Indian building materials space with 17 modern cement factories, 90 ready mixed concrete plants, a vast distribution network of over 10,000 channel partners and a countrywide spread of sales offices. Headquartered in Mumbai, ACC's operations span the whole country with cement factories, ready mix concrete plants, regional offices, sales units and area offices

In 2022, ACC became a part of Adani Group - the largest and fastest-growing portfolio of diversified sustainable businesses.

VISION

To be one of the most respected companies in India; recognized for challenging conventions and delivering on our promises.

PRODUCTS

ACC LTD. Has a wide range of gold range ,silver range cements. The brand ACC is a hallmark of quality and durability in Cement and Ready Mixed Concrete - to build homes for

the masses of India in its cities, towns and villages as well as enduring structures for infrastructure and industry.

BUILDING A NEW AND STRONG INDIA

ACC CONCRETE XTRA STRONG
ACC F2R SUPERFAST FOUNDATION & ROOF
ACC GOLD WATER SHIELD
ACC SURAKSHA POWER
ACC HPC LONG LIFE BEST PERFORMANCE CEMENT

ACC LeakBlock Cement Block WATERPROOFING "ADVANCED"
ACC LeakBlock Cement Coat WATERPROOFING "ADVANCED"

ACC CEMENT

ACC Cementing Relationships

CEMENT ■ READY MIX CONCRETE ■ CONSTRUCTION CHEMICALS

The advertisement features a city skyline at dusk with a body of water in the foreground. In the center, a red ACC cement truck is parked on a wooden pier. To the left of the truck are two large plastic jugs of ACC LeakBlock waterproofing product, one yellow and one black. Behind the truck and jugs are five large bags of ACC cement, each with a different color and label: ACC CONCRETE XTRA STRONG (red and yellow), ACC F2R SUPERFAST FOUNDATION & ROOF (red and yellow), ACC GOLD WATER SHIELD (red and blue), ACC SURAKSHA POWER (red and blue), and ACC HPC LONG LIFE BEST PERFORMANCE CEMENT (red and green). The ACC logo is prominently displayed in the bottom right corner, along with the tagline 'Cementing Relationships'. At the bottom left, the text 'CEMENT ■ READY MIX CONCRETE ■ CONSTRUCTION CHEMICALS' is written.

PART A

1. COST OF EQUITY

Cost of equity is the percentage of returns payable by the company to its equity shareholders on their holdings. Investors use it as a benchmark for an equity investment, while companies use it for projects or related investments.

The Capital Asset Pricing Model (CAPM) is a commonly accepted formula for calculating the Cost of Equity. CAPM quantifies the relationship between risk and required return in a well-functioning market.

$$K_e = R_f + \beta(R_m - R_f)$$

Cost of equity (Ke)	
Rf	6.10
Rm	11.64
Beta	1.02
Ke	11.74

Here,

Rf = Risk free rate of return

β = Beta is a measure of risk or degree of risk

Rm = Expected market return

Rm-Rf = Risk premium

Interpretation: When a company's Beta value is more than 1, there is a little higher risk involved. For shareholders and investors, 11.7472 % is a satisfactory rate of return to take the risk of volatility. Investors will be drawn to the business effortlessly. Additionally, a business can easily realize this rate of return in exchange for a particular investment or project to make it worthwhile to raise funds through equity.

The company has to spend Rs 11.74 to raise a capital of Rs 100, i.e the company should make all the provisions to earn a return of Rs 11.74 or more on every Rs 100 invested.

2. COST OF DEBT

The cost of debt is the return that a company provides to its debtholders and creditors. Debt is also cheaper than equity from a company's perspective, because of the different corporate tax

treatment of interest and dividends. In the profit and loss account, interest is subtracted before the tax is calculated; thus, the company gets tax relief on interest.

$$\text{Cost of debt} = \text{Total interest} / \text{total debt} (1-t)$$

Cost of debt (Kd)	
Interest Amt	15Cr
Debt Amt	126Cr
Interest Rate	11.9%
Tax rate	26%
Kd	8.81%

Here,

T= tax rate

Kd= Cost of debt

Interpretation:

The cost of debt means the amount that the company should be ready to expend in order to raise the desired fund. For ACC Ltd. The cost to be incurred is Rs 8.81 to raise a capital of Rs 100. The company should be able to accrue income of 8.81% or more to make it beneficial for raising the fund.

3. COST OF CAPITAL(WACC)

Cost of capital is the minimum rate of return or profit a company must earn before generating value. WACC is a simple average between the cost of equity and the cost of debt. It is essential for a company to have an ideal blend of debt & equity that maximizes firm's market value and minimize cost of capital. The decision on the composition of proportion of equity and debt capital should a company have is called the financing decision.

COST OF CAPITAL				
Sources of finance	D/E ratio	Weightage	SC (%)	WC
EQUITY	1.00	0.9901	11.7472	11.6309
DEBT	0.01	0.0099	8.81	0.0872
	1.01	1.0000		11.7181

Here,

SC = Specific cost

WC = Weighted cost

Interpretation: The WACC of the company is 11.7181%, which means that the total cost to be incurred by the company to raise funds from all the sources(Equity + Debt).

The company has to spend a total of Rs 11.7181 in paying its equity share-holders ad debt holders to raise fund of Rs 100. This will provide company an edge over its rivals in raising fund in a cost-effective way and providing decent returns to its stake holders.

PART B

1. CALCULATION OF Cash In Flow

Free cash flow (FCF) measures a company's financial performance. It shows the cash that a company can produce after deducting the purchase of assets such as property, equipment, and other major investments from its operating cash flow.

YEAR	FCF/Net income(Billions)
2012	0.95
2013	0.10
2014	0.00
2015	0.57
2016	1.44
2017	1.10
2018	0.39
2019	1.24
2020	1.03
2021	0.89
2022(TTM)	0.89
CAGR	-0.01

Here,

TTM = Trailing twelve months

CAGR = Compound Annual Growth Rate

The compound annual growth rate (CAGR) is the annualized average rate of revenue growth between two given years, assuming growth takes place at an exponentially compounded rate. TTM is considered as cash inflow for first year of forecasting i.e., 2022. For subsequent years, CIF is calculated by multiplying growth rate of 99.45% (100-0.55) to previous year's CIF.

$$CAGR = \left(\frac{\text{Ending balance}}{\text{Beginning balance}} \right)^{1/n} - 1$$

Note: CAGR of the company is calculated in MS Excel using function of =RRI (nper, pv, fv)

Interpretation:

For large-cap companies, a CAGR in sales of 5-12% is good. Similarly, for small companies, it has been observed a CAGR between 15% to 30% is good. ACC Ltd has marked -0.01%

CAGR, which means if first year there is Rs.100 of cashflow, next year company would have inflow of Rs.99.99. And in third year 99.99% of second year's inflow and so on. Negative CAGR implies decline in net income.

Calculation of present values of future cash flows:

Year	FCF/CIF(Rs in Billion)	DF(11.72 %)	PV(Rs in Billion)
2023	0.8900	0.8950	0.7966
2024	0.8836	0.8011	0.7079
2025	0.8772	0.7171	0.6290
2026	0.8709	0.6419	0.5590
2027	0.8646	0.5745	0.4967

Here,

CIF = Cash Inflow

DF = Discounting Factor

PV = Present Value

Interpretation:

WACC which is already calculated becomes discount rate for calculation of discounting factor and present value. A lower discount rate leads to a higher present value. Discounting factor is a weighing factor that is most commonly used to find the present value of future cash flows and is calculated by adding the discount rate to one which is then raised to the negative power of a number of periods.

$$\text{Discounting factor} = \frac{1}{(1 + \text{discounting rate})^{\text{Period number}}}$$

In forecasting of future cash inflow, for first year i.e., 2022 the CIF is taken as Rs.0.89 billion which is TTM (trailing twelve months). This will be the basis for calculation further future cash inflows. CIF for following years is calculated using formula.

$$\text{CIF of previous year} \times (1 + \text{CAGR})$$

2. CALCULATION OF COF

Total PVCIF = 3.18939

Calculation of COF		
Scenario A	75% of PVCIF	2.39204
Scenario B	125% of PVCIF	3.98673
Scenario C	100% of PVCIF	3.18939

Interpretation :

Cash outflow is when cash is moving out of your business. When cash outflow is higher than cash inflow, it leads to negative cash flow which isn't an ideal situation to be in. Generally, Start-ups can experience negative cash flows in the beginning before the customers start to buy from them.

PART C

1. PAY BACK PERIOD (PBP)

The payback period is the time required to recover the initial cost of an investment. It is the number of years it would take to get back the initial investment made for a project. It is used to compare projects and derive the number of years it takes to get back the initial investment. The project with the least number of years usually is selected.

Payback period is calculated for all the given 3 scenarios where cash outflows are different.

Year	CIF (Rs In Billion)	CCIF
2023	0.8900	0.8900
2024	0.8836	1.7736
2025	0.8772	2.65.8
2026	0.8709	3.5216
2027	0.8646	4.3862

Here,

CCIF = Cumulative CIF

	A	B	C
COF	2.3920	3.9867	3.1894
PBP (Years)	2.71	4.54	3.62

Interpretation : The shorter the payback period is better for the organization. Since the cash outflow or investment amount is lower in scenario A, the payback period is likewise shorter. In contrast, the B scenario, which has the largest outflow of the three, will have 3.54 years of PBP. Since investment option A has shorter payback periods than B and C, it is advised to choose scenario A.

Note: In scenario C, while calculating PBP, salvage value of 15% of PVCIF is added to CIF of 2027.

2. DISCOUNTED PAYBACK PERIOD (DPBP):

The discounted payback period is a modified version of the payback period that accounts for the time value of money. The basic method of the discounted payback period is taking the future estimated cash flows of a project and discounting them to the present value.

Year	CIF (Rs In Billion)	DF @ 11.72%	PVCIF	PVCCIF
2023	0.8900	0.8950	0.7966	0.7966
2024	0.8836	0.8011	0.7079	1.5045
2025	0.8772	0.7171	0.6290	2.1336
2026	0.8709	0.6419	0.5590	2.6926
2027	0.8646	0.5745	0.4967	3.1893
A	COF	2.3920	DPBP	3.42 years
B	COF	3.9867	DPBP	6.60 years
C	COF	3.1894	DPBP	4.64 years

Interpretation:

It is not advisable for the company to have the B outlay in scenario B because it will take the company more than 5 years, to be accurate 6.60 years, to recoup the original outlay. A and C investment would be feasible. A is the ideal choice when it comes to investments that are mutually exclusive.

Note: For year 2026, discounted salvage value is added to CIF.

3. NET PRESENT VALUE (NPV)

Net present value (NPV) is the difference between the present value of cash inflows and the present value of cash outflows over a period of time. NPV is used in capital budgeting and investment planning to analyse the profitability of a projected investment or project. Net Present Value (NPV) is a better indicator than Payback Period (PBP) because it tells precisely which value would be earned by the investors if they decide to undertake it.

	PVCIF	COF	NPV
A	3.189389	2.392041467	0.797347
B	3.189389	3.986735778	-0.79735
C	3.464269	3.189388622	0.274881

Interpretation:

Since B has a greater PBP, it was inferred that it is an unsuitable investment. After seeing the NPV, which is negative, it is precise evident that B should not be pursued by the company because it will result in a net loss for the business. The profitability of scenario A outlay is higher than that of B and C. Selection of option A is the most feasible decision.

Note: In C scenario, salvage value is added to PVCIF.

4. INTERNAL RATE OF RETURN (IRR)

The internal rate of return (IRR) is the annual rate of growth that an investment is expected to generate. IRR is calculated using the same concept as net present value (NPV), except it sets the NPV equal to zero.

	A	B	C
Outflow	-2.3920	-3.9867	-3.1893
2023	0.7966	0.7966	0.7966
2024	0.7079	0.7079	0.7079
2025	0.6291	0.6291	0.6291
2026	0.5590	0.5590	0.5590
2027	0.4968	0.4968	0.4968
IRR	11%	-8%	3%

The first row in above table which is showing negative value is cash outflow of the company. Calculation of IRR is done using =IRR (values) function in MS Excel.

Interpretation:

As we can see in the above table, scenario A outlay has highest IRR of all which is 11%. Higher IRR means better return of an investment. B has the negative IRR because it has less cashflows caused by investment than initial investment. So, the company experiences negative return on investment. Whereas C outlay gives positive return but when compared to scenario A it is less. Therefore, it is suggested to decide on project A if the projects are mutually exclusive.

5. PROFITABILITY INDEX (PI)

The profitability index rule is a decision-making exercise that helps evaluate whether to proceed with a project or not. The index itself is a calculation of the potential profit of the proposed project. The profitability index is calculated by dividing the present value of future cash flows that will be generated by the project by the initial cost of the project.

Profitability Index	
A	1.33
B	0.8
C	1.11

Interpretation: As per the rule, profitability index of 1 indicates that the project will break even. If it is less than 1, the costs outweigh the benefits. If it is above 1, the venture will be profitable.

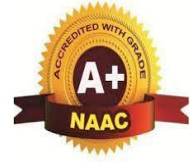
So, here scenario A outlays the most benefits i.e., 1.33% next to scenario C i.e., 1.11%, and project B gives outcome which is less than 1, which implies that it is loss making. Thus, scenario B must be abandoned.

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Bengaluru, Karnataka 560 041
(Autonomous Institution Affiliated to BCU)



A CAPITAL BUDGETING DECISION ON ADITYA BIRLA CAPITAL LTD.

CAPSTONE PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT OF
FINANCIAL MANAGEMENT SUBJECT

MASTER OF BUSINESS ADMINISTRATION

Autonomous Institution Affiliated to BCU

By

SHREYAS G A

REG NO: P18FW21M0023

Under the guidance of

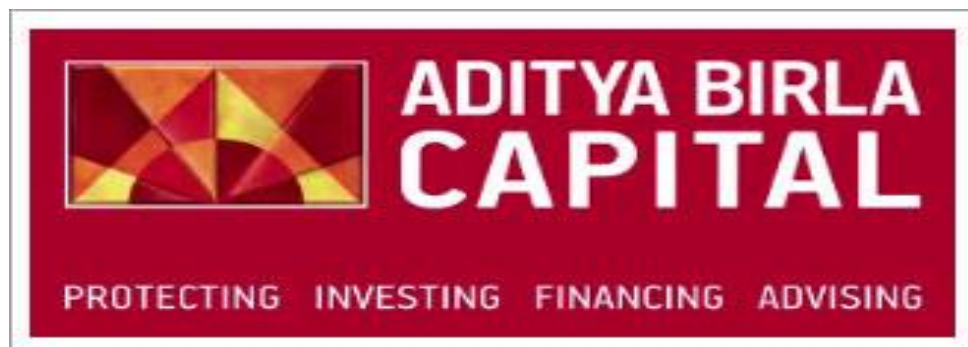
Prof. DILEEP S

Assistant Professor



RV INSTITUTE OF MANAGEMENT

2022-23



Aditya Birla Capital Ltd., incorporated in the year 2007, is a Large Cap company (having a market cap of Rs 27,838.25 Crore) operating in NBFC sector. The Company offers life and health insurance, private equity, corporate lending, structured finance, asset and wealth management, currency and commodity brokerage, online personal finance management, housing finance, pension funds, and other financial services.

Aditya Birla Capital Ltd. Key Products/Revenue Segments include Dividend, Income from Sale of Share & Securities and Interest for the year ending 31-Mar-2022. For the quarter ended 30-06-2022, the company has reported a Consolidated Total Income of Rs 5,599.04 Crore, down 15.42 % from last quarter Total Income of Rs 6,620.15 Crore and up 30.15 % from last year same quarter Total Income of Rs 4,301.94 Crore. Company has reported net profit after tax of Rs 372.05 Crore in latest quarter.

The company's top management includes Mr.Kumar Mangalam Birla, Mr.Ajay Srinivasan, Mr.Romesh Sobti, Dr.Santrupt Misra, Mr.Sushil Agarwal, Mr.Arun Adhikari, Mr.P H Ravikumar, Mr.S C Bhargava, Mrs.Vijayalakshmi R Iyer, Mrs.Pinky Mehta, Mr.Mukesh Malik, Mr.Amber Gupta, Mr.A Dhananjaya.

Company has Deloitte Haskins & Sells LLP as its auditors. As on 30-06-2022, the company has a total of 241.65 Crore shares outstanding.

SECTOR	Financials
INDUSTRY	Insurance
INCORPORATED	10/15/2007
ADDRESS	1 Indiabulls Ctr, Twr 1 Jupite Compound, 18th Fl, Elphinstone Mumbai, 400 013 India
WEBSITE	www.adityabirlacapital.com
NO. OF EMPLOYEES	30878
BSE:	540691
NSE:	ABCAPITAL
Market Cap	27838.25 (₹ Cr.)

CHAPTER: 1

CALCULATION OF COST OF CAPITAL

Calculation of cost of equity by CAPM (k_e):

In capital budgeting, corporate accountants and financial analysts often use the capital asset pricing model (CAPM) to estimate the cost of shareholder equity.

The capital asset pricing model (CAPM) is used to calculate expected returns given the cost of capital and risk of assets. The CAPM formula requires the rate of return for the general market, the beta value of the stock, and the risk-free rate.

CAPM FORMULA: $K_e = R_f + [\beta \cdot (R_m - R_f)]$

- R_f (Risk free rate of return): The return of a security with no risk is known as the risk-free rate of return. Zero beta, zero volatility, and default risk. Most people consider a ten-year government bond to be a risk-free rate.
- β (Beta): A statistical measure of a company's stock price volatility in relation to the entire stock market is called beta. As a result, a high beta indicates greater risk for the company, which increases the cost of luring investors. That simply means more K_e .
- R_m (Market rate of return): It gauges the excess return equities investors want above a risk-free rate as compensation for the investment's risk, which is equal to the market's overall volatility. Estimates of the risk premium range from 4.0% to 7.0%.

R_m	
Average per month	1.223226
Average per annum	14.67872

K_e (CAPM):	
Rf	6.100000
Beta(β)	1.663869
Rm	14.678720
k_e (CAPM)	20.373866

- Here, $R_f=6.1$ (Constant, as per the RBI less than 1-lakh R_f)
- R_m = Average per annum (i.e., average per month*12): Average of sensitivity index.
- Beta = Slope between price return and market return.

INTERPRETATION:

- Company needs to give 20.3738% to the shareholders which is more compared to the cost of debt. Company will incur 20.3738% cost if the company issue the equity funds.

Calculation of cost of debt (k_d):

The cost of debt is the effective interest rate that a company pays on its debts, such as bonds and loans. Calculating the cost of debt involves finding the average interest paid on all of a company's debts.

The cost of debt measure is helpful in understanding the overall rate being paid by a company to use these types of debt financing. The measure can also give investors an idea of the company's risk level compared to others because riskier companies generally have a higher cost of debt.

Formula: $k_d = I * (1 - t)$

- K_d before Tax = (interest/Debt) * 100
- K_d after Tax = (K_d before tax) * (1 - Tax rate)
- Tax = 27% (According to ABCAPITAL's Profit and Loss Statement)

K_d	
Interest	3480 (cr. Rs)
Borrowings	58425 (cr. Rs)
(i/b)	0.059563543
I	5.9563543
K_d	4.348138639

INTERPRETATION:

As per calculation the cost of debt is 4.3481%. It indicates that the company incurs Rs.4.3481 for every Rs.100 of borrowings or loan made by the company. It means company would have to return Rs.104.3481 for every Rs.100 loan or borrowings made.

Calculation of WACC (Weighted Average Cost of Capital):

WACC tells us the return that lenders and shareholders expect to receive in return for providing capital to a company. It represents a firm's average after-tax cost of capital from all sources, including common stock, preferred stock, bonds, and other forms of debt. WACC is the average rate that a company expects to pay to finance its assets.

Formula:

$$\text{WACC} = (\text{Ke} * \text{We}) + (\text{Kd} * \text{Wd})$$

Ke	20.37387%
Kd	4.348139%

WACC				
SF	Amount	Weights	SC(%)	WC (%)
Equity	1	0.229358	20.37387	4.672906
Debt	3.36	0.770642	4.348139	3.350859
	4.36	1		8.023765
			WACC	8.023765

THE COST OF CAPITAL = 8.023765%

INTERPRETATION:

WACC represents the expense of raising money—so the higher it is, the lower a company's net profit. A WACC of 8.023765% means that the business will have to pay its investors an average of Rs.0.08023765 in return for every Rs.1 in extra funding.

CHAPTER 2

CALCULATION OF EXPECTED CASH INFLOWS AND OUTFLOWS

TTM=3.53
Growth Rate=5% (Assumed)

Calculation of FCFF			
YEAR	FCF/CIF (Rs in Billion)	DF (8.023765121%)	PV (Rs in Billion)
2023	3.530000	0.92572	3.26780
2024	3.706500	0.85696	3.17633
2025	3.891825	0.79331	3.08742
2026	4.086416	0.73438	3.00100
2027	4.290737	0.67983	2.91699
Total			15.44953

IDENTIFYING CASH OUTFLOW:

1) IN CASE OF 75% AND 125%:

Calculation of FCFF			
YEAR	FCF/CIF (Rs in Billion)	DF (8.023765121%)	PV (Rs in Billion)
2023	3.530000	0.92572	3.26780
2024	3.706500	0.85696	3.17633
2025	3.891825	0.79331	3.08742
2026	4.086416	0.73438	3.00100
2027	4.290737	0.67983	2.91699
Total			15.44953

RESULTS:

IDENTIFYING CASH OUTFLOW		
FOR 75%	15.44953 * 75%	11.587150
FOR 125%	15.44953 * 125%	19.311917

2) IN CASE OF 100% (INCLUDING SALVAGE VALUE OF 15%):

YEAR	FCF/CIF (Rs in Billion)	DF (8.023765121%)	PV
2023	3.530000	0.925722	3.267799
2024	3.706500	0.856962	3.176328
2025	3.891825	0.793308	3.087418
2026	4.086416	0.734383	3.000996
2027	4.290737	0.679835	2.916993
		CIF	15.449534
Add			
SV	2.317430	0.679835	1.575470
		Total	17.025004

PVCIF	17.025004
PVCOF	15.449534

CHAPTER 3

CALCULATIONS OF INVESTMENT DECISIONS

1. CALCULATION OF PBP:

Payback period refers to the amount of time it takes to recover the cost of an investment. Simply put, it is the length of time an investment reaches a breakeven point. People and corporations mainly invest their money to get paid back, which is why the payback period is so important. In essence, the shorter payback an investment has, the more attractive it becomes. Determining the payback period is useful for anyone and can be done by dividing the initial investment by the average cash flows.

The payback period is calculated by dividing the amount of the investment by the annual cash flow.

A) PBP (75%):

COF	11.587150 (Rs in Billion)
YEAR	FCF/CIF (Rs in Billion)
2023	3.530000
2024	3.706500
2025	3.891825
2026	4.086416
2027	4.290737

PBP	3.112281	years
------------	-----------------	--------------

B) PBP (125%):

COF	19.311917 (Rs in Billion)
YEAR	FCF/CIF (Rs in Billion)
2023	3.530000
2024	3.706500
2025	3.891825
2026	4.086416
2027	4.290737

PBP	4.954889	years
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C) PBP (100%)

COF	15.449534 (Rs in Billion)
YEAR	FCF/CIF (Rs in Billion)
2023	3.530000
2024	3.706500
2025	3.891825
2026	4.086416
2027	4.290737

PBP	4.054721	years
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INTERPRETATION:

At the 75% of the outflow, it takes 3.11 years to recover the amount invested. At 125% it takes 4.95 years to recover the amount invested. At 100% of the outflow of PV, it takes 4.05 years to recover the amount invested. This means at 75% amount of PV outflow project is more viable than other cashflows.

2. CALCULATION OF DPBP:

A) DPBP (75%):

COF	11.587150		
YEAR	FCF/CIF (Rs in Billion)	DF (8.023765121%)	PV
2023	3.530000	0.925722	3.267799
2024	3.706500	0.856962	3.176328
2025	3.891825	0.793308	3.087418
2026	4.086416	0.734383	3.000996
2027	4.290737	0.679835	2.916993

DPBP	3.684974
	years

B) DPBP (125%):

COF	19.311917		
YEAR	FCF/CIF (Rs in Billion)	DF (8.023765121%)	PV
2023	3.530000	0.925722	3.267799
2024	3.706500	0.856962	3.176328
2025	3.891825	0.793308	3.087418
2026	4.086416	0.734383	3.000996
2027	4.290737	0.679835	2.916993
2028	4.505274	0.629338	2.835341
2029	4.730538	0.582592	2.755975

DPBP	6.372660
	years

C) DPBP (100%):

C	15.449534		
YEAR	FCF/CIF (Rs in Billion)	DF (8.023765121%)	PV
2023	3.530000	0.925722	3.267799
2024	3.706500	0.856962	3.176328
2025	3.891825	0.793308	3.087418
2026	4.086416	0.734383	3.000996
2027	4.290737	0.679835	2.916993

DPBP	5.000000
	years

INTERPRETATION:

At the 75% of the outflow, it takes 3.68 years to recover the amount invested. At 125% it takes 6.37 years to recover the amount invested. At 100% of the outflow of PV it takes 5 years to recover the amount invested. This means at 75% amount of PV outflow project is more viable than other cashflows.

3) CALCULATION OF NET PRESENT VALUE (NPV):

Net present value (NPV) is the difference between the present value of cash inflows and the present value of cash outflows over a period of time. NPV is used in capital budgeting and investment planning to analyse the profitability of a projected investment or project. NPV is the result of calculations used to find the current value of a future stream of payments.

Net present value (NPV) is used to calculate the current value of a future stream of payments from a company, project, or investment. To calculate NPV, you need to estimate the timing

MEASURING FINANCIAL HEALTH OF ADITYA BIRLA CAPITAL LTD.

and amount of future cash flows and pick a discount rate equal to the minimum acceptable rate of return.

A) NPV (75%):

YEAR	FCF/CIF (Rs in Billion)	DF (8.023765121%)	PV
2023	3.530000	0.925722	3.267799
2024	3.706500	0.856962	3.176328
2025	3.891825	0.793308	3.087418
2026	4.086416	0.734383	3.000996
2027	4.290737	0.679835	2.916993

PVCIF	15.449534
-PVCOF	11.587150
NPV	3.862383

B) NPV (125%):

YEAR	FCF/CIF (Rs in Billion)	DF (8.023765121%)	PV
2023	3.530000	0.925722	3.267799
2024	3.706500	0.856962	3.176328
2025	3.891825	0.793308	3.087418
2026	4.086416	0.734383	3.000996
2027	4.290737	0.679835	2.916993

PVCIF	15.449534
-PVCOF	19.311917
NPV	-3.862383

C) NPV (100% with SV 15%):

YEAR	FCF/CIF (Rs in Billion)	DF (8.023765121%)	PV
2023	3.530000	0.925722	3.267799
2024	3.706500	0.856962	3.176328
2025	3.891825	0.793308	3.087418
2026	4.086416	0.734383	3.000996
2027	4.290737	0.679835	2.916993
		CIF	15.449534
SV	2.317430	0.679835	1.575470

PVCIF	17.025004
-PVCOF	15.449534
NPV	1.575470

INTERPRETATION:

At 75% of NPV is 3.862383, at 125% of NPV is -3.862383 and at 100% of NPV is 1.575470. the positive value of NPV indicates the net profit for the company and negative value of NPV is indicates net loss for the company. Company requires to choose case A for high profit. Just avoid the case B.

4) CALCULATION OF INTERNAL RATE OF RETURN (IRR):

The internal rate of return (IRR) is a metric used in financial analysis to estimate the profitability of potential investments. IRR is a discount rate that makes the net present value (NPV) of all cash flows equal to zero in a discounted cash flow analysis.

IRR			
	A.75%	B.125%	C.100% with SV 15%
PVCOF	-11.587150	-19.311917	-15.449534
2023	3.267799448	3.267799448	3.2677994
2024	3.176328299	3.176328299	3.1763283
2025	3.08741758	3.08741758	3.0874176
2026	3.00099562	3.00099562	3.0009956
2027	2.916992754	2.916992754	4.4924626
IRR=	11%	-7%	3%

INTERPRETATION:

At 75% of PV the IRR is 11%. At 100% the NPV is 3% and at 125% of the PV the IRR Is 78%. Which means Case A is more viable because it has highest IRR value. So, company require to select the case A.

5) CALCULATION OF PROFITABILITY INDEX (PI):

The profitability index (PI), alternatively referred to as value investment ratio (VIR) or profit investment ratio (PIR), describes an index that represents the relationship between the costs and benefits of a proposed project. It is calculated as the ratio between the present value of future expected cash flows and the initial amount invested in the project. A higher PI means that a project will be considered more attractive.

$$PI = \frac{PVCIF}{PVCOF}$$

A) PI (75%):

YEAR	FCF/CIF (Rs in Billion)	DF (8.023765121%)	PV
2023	3.530000	0.925722	3.267799
2024	3.706500	0.856962	3.176328
2025	3.891825	0.793308	3.087418
2026	4.086416	0.734383	3.000996
2027	4.290737	0.679835	2.916993

PVCIF	15.449534
PVCOF	11.587150

PI	1.333333
-----------	-----------------

B) PI (125%):

YEAR	FCF/CIF (Rs in Billion)	DF (8.023765121%)	PV
2023	3.530000	0.925722	3.267799
2024	3.706500	0.856962	3.176328
2025	3.891825	0.793308	3.087418
2026	4.086416	0.734383	3.000996
2027	4.290737	0.679835	2.916993

PVCIF	15.449534
PVCOF	19.311917

PI	0.800000
-----------	-----------------

C) PI (100% with SV 15%):

YEAR	FCF/CIF (Rs in Billion)	DF (8.023765121%)	PV
2023	3.530000	0.925722	3.267799
2024	3.706500	0.856962	3.176328
2025	3.891825	0.793308	3.087418
2026	4.086416	0.734383	3.000996
2027	4.290737	0.679835	2.916993
		CIF	15.449534
SV	2.317430	0.679835	1.575470

PVCIF	17.025004
PVCOF	15.449534

PI	1.101975
-----------	-----------------

INTERPRETATION:

At 75% of PV the PI is 1.33. At 125% the PI is 0.8 and at 100% of the PV the PI is 1.102. Which means Case A is more viable because it has highest PI value.

CONCLUSION:

The investment selections of a corporation should always create a return that surpasses the firm's cost of capital utilised to fund the project. Otherwise, investors will not see a profit from the investment.

According to the measurement of financial health of Aditya Birla Capital Ltd. Case A is more feasible compared to others as it has highest NPV, PI and IRR values. Also, the payback period is less than that of other cases which means company can recover the amount invested faster.

ANNEXURE:

1. Tax rate and Interest amount paid

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Aditya Birla Cap Chart Analysis Peers Quarters **Profit & Loss** Balance Sheet Cash Flow Ratios Investors Documents Notebook

Profit & Loss PRODUCT SEGMENTS

Consolidated Figures in Rs. Crores / [View Standalone](#)

	Mar 2015	Mar 2016	Mar 2017	Mar 2018	Mar 2019	Mar 2020	Mar 2021	Mar 2022	TTM
Sales +	2,710	3,645	5,882	11,526	15,168	16,696	19,260	22,232	23,515
Expenses +	1,002	1,156	2,478	7,539	9,850	10,934	13,966	16,694	17,690
Operating Profit	1,708	2,489	3,404	3,987	5,317	5,762	5,293	5,538	5,825
OPM %	63%	68%	58%	35%	35%	35%	27%	25%	25%
Other Income +	-39	24	4	177	230	254	282	351	336
Interest	1,112	1,612	2,299	3,024	4,109	4,634	3,916	3,480	3,532
Depreciation	37	33	43	44	58	103	114	122	126
Profit before tax	519	869	1,066	1,096	1,381	1,280	1,546	2,287	2,503
Tax %	40%	40%	35%	37%	41%	32%	28%	27%	
Net Profit	309	524	691	693	811	866	1,106	1,660	1,814
EPS in Rs	4.08	6.58	4.30	3.15	3.96	3.81	4.66	7.06	7.59
Dividend Payout %	0%	0%	0%	0%	0%	0%	0%	0%	

$$\text{Tax rate} = 27\% (2022)$$

2. Beta calculation:

Month	Sensex	Aditya Birla Capital	R_Sensex	R_Aditya Birla Capital
Sep-17	31283.72	183.65		
Oct-17	33213.13	178.15	6.167457067	-2.994827117
Nov-17	33149.35	194.65	-0.19203249	9.261857985
Dec-17	34056.83	184.1	2.737549907	-5.419984588
Jan-18	35965.02	171.1	5.602958349	-7.061379685
Feb-18	34184.04	166.6	-4.95197834	-2.630040912
Mar-18	32968.68	145.85	-3.55534337	-12.45498199
Apr-18	35160.36	159.7	6.647763878	9.496057593
May-18	35322.38	146.5	0.460803018	-8.265497808
Jun-18	35423.48	133	0.286220804	-9.215017065
Jul-18	37606.58	146.8	6.162861469	10.37593985
Aug-18	38645.07	141.1	2.761458234	-3.882833787
Sep-18	36227.14	115	-6.25676186	-18.49751949
Oct-18	34442.05	104.35	-4.92749359	-9.260869565
Nov-18	36194.3	105	5.087531085	0.62290369
Dec-18	36068.33	100	-0.34803823	-4.761904762
Jan-19	36256.69	81	0.522230999	-19
Feb-19	35867.44	91.95	-1.07359497	13.51851852
Mar-19	38672.91	97.65	7.821773731	6.199021207
Apr-19	39031.55	97.8	0.927367504	0.153609831
May-19	39714.2	98.9	1.748969744	1.124744376
Jun-19	39394.64	91.9	-0.80464922	-7.077856421

MEASURING FINANCIAL HEALTH OF ADITYA BIRLA CAPITAL LTD.

Jul-19	37481.12	82	-4.85731054	-10.77257889
Aug-19	37332.79	89.15	-0.39574591	8.719512195
Sep-19	38667.33	84.8	3.574712739	-4.879416713
Oct-19	40129.05	81.85	3.780245494	-3.478773585
Nov-19	40793.81	109.4	1.656555538	33.65913256
Dec-19	41253.74	102.7	1.127450464	-6.124314442
Jan-20	40723.49	99.15	-1.28533801	-3.456669912
Feb-20	38297.29	77.5	-5.95774085	-21.83560262
Mar-20	29468.49	42.2	-23.0533283	-45.5483871
Apr-20	33717.62	49.95	14.4192322	18.36492891
May-20	32424.1	45.85	-3.83633246	-8.208208208
Jun-20	34915.8	63.3	7.684715998	38.05888768
Jul-20	37606.89	54.1	7.707370302	-14.53396524
Aug-20	38628.29	61.25	2.715991671	13.21626617
Sep-20	38067.93	62.25	-1.45064666	1.632653061
Oct-20	39614.07	64.75	4.061528956	4.016064257
Nov-20	44149.72	88.2	11.44959354	36.21621622
Dec-20	47751.33	85	8.157718781	-3.628117914
Jan-21	46285.77	80.85	-3.06915012	-4.882352941
Feb-21	49099.99	123.65	6.08009762	52.93753865
Mar-21	49509.15	119.4	0.833319925	-3.437120906
Apr-21	48782.36	114.6	-1.46799127	-4.020100503
May-21	51937.44	121.15	6.467665771	5.715532286
Jun-21	52482.71	117.15	1.049859215	-3.301692117
Jul-21	52586.84	115.8	0.1984082	-1.152368758
Aug-21	57552.39	108	9.442571564	-6.735751295
Sep-21	59126.36	112.75	2.734847328	4.398148148
Oct-21	59306.93	96.75	0.305396781	-14.19068736
Nov-21	57064.87	109	-3.7804351	12.66149871
Dec-21	58253.82	123.9	2.083506017	13.66972477
Jan-22	58014.17	117.6	-0.41138933	-5.084745763
Feb-22	56247.28	105.65	-3.04561799	-10.16156463
Mar-22	58568.51	107.65	4.126830666	1.893043067
Apr-22	57060.87	120.75	-2.57414778	12.16906642
May-22	55566.41	101.1	-2.61906277	-16.27329193
Jun-22	53018.94	89.35	-4.58455027	-11.62215628
Jul-22	57570.25	106.3	8.584309683	18.97034135
Aug-22	59537.07	114.25	3.416382593	7.47883349
Sep-22	59119.72	115.9	-0.70099184	1.444201313

Beta calculation data

=SLOPE (R_Aditya Birla Capital, R_SENSEX)

=1.663869



RASHTREEYA SIKSHANA SAMITHI TRUST®

RV INSTITUTE OF MANAGEMENT

BANGALURU-5600041

(Autonomous Institution Affiliated to BCU)



**A CAPITAL BUDGETING DECISION ON
AUROBINDO PHARMA LIMITED**

**CAPSTONE PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT OF
FINANCIAL MANAGEMENT SUBJECT**

MASTER OF BUSINESS ADMINISTRATION

Autonomous Institution Affiliated to BCU

By

GIRISH N NASHI

REG NO: P18FW21M0036

Under the guidance of

Prof. DILEEP S

Assistant Professor



RV INSTITUTE OF MANAGEMENT

2022-23

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COMPANTY PROFILE



AUROBINDO

Incorporation Year	1986
Registered Office	Hyderabad, Telangana, India
Telephone	040-23736370
Fax	23001153
Chairman	Mr. K. Nithyanada Reddy
Managing Director	Mr. N. Govindarajan
Company secretary	B. Adi Reddy
Auditor	Sriram Mahalingam
Listing	BSE, NSE
Registrar	Plot No. 2, Maithrivihar Ameerpet, Hyerabad-500038

HISTORY (1986-2022)

Aurobindo Pharma Limited (APL), one of the world's top 5 manufacturers of semi synthetic penicillins was incorporated in 26th December 1986 as a private limited company. Mr. P.V.Ramaprasad Reddy, Mr. K.Nityananda Reddy and a small, highly committed group of professionals founded it. APL is developing, manufacturing and marketing active pharmaceutical ingredients (APIs also referred as bulk actives), intermediates and generic formulations. The company's robust product portfolio is spread over 6 major product areas encompassing (Antibiotics, Anti-Retro Virals, CVS, CNS, Gastroenterologicals, and Anti-Allergics) with around 65 APIs in the non-antibiotics and over 55 APIs in the antibiotic segment and the World Health Organization (WHO), Geneva, has also approved Aurobindo's products. APL is running with 29 manufacturing plants across the world conforming to GMP/ISO regulations and an extremely well equipped 9 R&D facilities. Aurobindo Pharma has identified international operations also catering to over 150 countries.

The Company has accelerated the DMF/ANDA filings programme in its efforts to build a broad product portfolio for the regulated markets. Cumulatively, the Company has filed a total of 337 DMFs (Drug Master Files), of which 110 are with US FDA, and 133 in Europe including with the EDQM and 102 in other countries. This is one of the highest filings. The Company commenced its operations during the year 1988-89 with a single unit manufacturing semi synthetic penicillins (SSPs) at Pondicherry and it became a public venture in 1992. In the same year 1992, another unit was also set up for the manufacture of CMIC Chloride, a bulk drug intermediate at Pashamylaram, near Hyderabad through another company, namely Chaitanya Organics Pvt. Ltd. Later in 1994-95, it was merged with the company. The commercial production of the pharmaceutical formulation unit was started in April of the year 1994. Aurobindo Pharma had gone public in 1995 by listing its shares in various stock exchanges in the country. Glaxo (India), the Indian subsidiary of the UK-based multinational came to an alliance with the company to meet its global bulk drug requirements during the year 1997. In the year 1998, the company had launched new formulations like auronim Suspension in the paediatric segment.

During 1999-2000, the company diversified its product portfolio further with the introduction of wide range of Cephalosporins (Oral & Sterile) and anti - virals in addition to macrolides, anti-ulcerants, quinolones, semi-synthetic penicillins and formulations for domestic and export market. APL made Joint Ventures for formulations business in US, with an investment of a million in the year 2000. Sri Chakra Remedies Ltd was amalgamated with the company in the identical year of 2000. The Company has launched an exclusive anti-viral division Immune during the year 2001 to educate and to provide preventive drug care for HIV/AIDS patients in the country. APL had launched two more drugs in the same year of 2001, namely Efavirenz (Viranz) and Nelfinavir (NELVEX) for the treatment of AIDS. During the year 2001-02 the company acquired 79% stake in Ranit Pharma Company under the same management. Ranit Pharma and Calc Private Ltd were amalgamated with APL as at 1st April of the year 2002.

Citadel Aurobindo Biotech Ltd, a 50:50 Joint Venture (JV) Company introduced Aztreonam a Monabactam Betalactam antibiotic for the first time in the Indian Pharma Market with a brand name 'TREONAM' in the year 2003. During the same year the JV was happened between APL and Shanxi Tonging Pharmaceuticals Company, as an upshot formulated the JV Company under the name of Aurobindo Tonging (Datong) pharmaceuticals Ltd, China, for manufacture of pharmaceutical products to the local market. APL's 100% subsidiary company in China had commenced its commercial production during the year 2003-2004, which was formulated to procure raw material 6 APA at an economical cost. APL also launched the second JV Company in US for the purpose of Research and Development. During the year 2004, the company received its first Certificate of Suitability (CoS) approval from the European Directorate for Quality Medicines (EDQM) for its product in the therapeutic segment of gastroenterology.

During the year 2004-05 the company acquired a sterile plant of Dee Pharma for the consideration of Rs.38 million which located at Bhiwadi in Rajasthan. US FDA part of Department of health and human science approved the Unit VIII facility of the company in the year of 2005 as a site to manufacture of APIs for the US Market. Also in the same year APL had received US FDA clearance for AIDS drug. The State Labour Department of the Government of Andra Pradesh has awarded the 'Best Management Award' for the year 2005 for the Company's contributions towards community development, harmonious employee relations and their

welfare. During the year 2005-06, the company made a strategic entry with its generic formulations in the premium markets of USA & Europe, participated in the PEPFAR program initiated by the Government of USA and consolidated its strengths in the less regulated and emerging markets. Also in same year APL had acquired the UK based Milpharm Limited, the generic formulation pharmaceutical company engaged in marketing generic formulations mainly in the UK market. During March of the year 2007, the US FDA has granted final approval for the Company's Didanosine Oral Suspension (Pediatric Powder) 10 mg / ml. As at June 13th of the year 2007 the Company unveiled their new Logo and Corporate Identity at a ceremony in Hyderabad. The new corporate logo reflects this pace and leadership. Artistic lines intersect to make up the company's initials 'A' and 'P'. The way the initials 'A' and 'P' have joined conveys the spirit of 'partnership' with the company's business. The Hon'ble High Court of Andhra Pradesh has approved the scheme of arrangement for merger of APL Life Sciences and Senor Organics into the company and the utilisation of share premium account of the company during June of the year 2007.

APL concluded a strategic deal, for acquisition of intellectual property & marketing authorizations, with TAD Italy, a generic company registered in Italy during March of the year 2008. This acquisition will give Aurobindo an access to more than 70 ready to market products, which will fast track Aurobindo's entry into the Italian generic market. As a part of this deal, APL also acquired high profile OTC brands - Mapooro and Carmiooro from TAD in same period of the year 2008. On 6 September 2010, Aurobindo Pharma announced that it has entered into licensing and supply agreements with AstraZeneca, one of the world's leading biopharmaceutical companies, to supply several solid dosage and sterile products for emerging markets.

On 11 January 2011, Aurobindo Pharma announced that it had entered into a definitive agreement with China National Pharmaceutical Group Corporation (Sinopharm) to divest in its subsidiary company Aurobindo (Datong) Bio Pharma Co Ltd, China (ADBPL), subject to regulatory approvals. ADBPL is engaged in manufacturing of 6APA, a derivative of Penicillin-G. Aurobindo Pharma decided to retain 19.50% stake in ADBPL so as to ensure uninterrupted supply of raw materials at competitive price.

On 7 September 2011, Aurobindo Pharma announced the establishment of an equal joint venture in Russia with OJSC DIOD to manufacture and sell pharmaceuticals in Russia, Belarus and Kazakhstan.

On 1 April 2014, Aurobindo Pharma announced the completion of the acquisition of certain commercial operations in Western Europe from Actavis pl, a global, integrated specialty pharmaceutical company focused on developing, manufacturing and distributing generic, brand and biosimilar products. The agreement to acquire the Actavis operations was announced in January 2014.

On 5 December 2014, Aurobindo Pharma announced the completion of acquisition of assets of nutritional supplement maker, Natrol Inc. and other affiliate entities (Natrol) through its wholly owned subsidiary Aurobindo Pharma USA Inc. (APUSA). On 12 November 2014, APUSA emerged as the highest and best bidder to acquire assets of Natrol under the auction process by the United States Bankruptcy Court for the District of Delaware. APUSA acquired the manufacturing assets, personnel, commercial infrastructure including the well established nutraceuticals brands in USA of Natrol along with an agreement to take on certain liabilities, with a bid of \$132.5 million.

On 25 November 2016, Arrow Generiques SAS, a French subsidiary of Aurobindo Pharma Ltd, announced the signing of an agreement to acquire the right, title and interest in its products Calcium and Calcium Vitamin D3 in France, including the use of the OROCAL trademark, from Teva Pharmaceutical Industries.

On 7 January 2017, Aurobindo Pharma announced the signing of a binding agreement by and through its wholly owned step-down subsidiary, Agile Pharma B.V, Netherlands, to acquire Generis Farmaceutica SA, a Portuguese pharmaceutical company, for a total consideration 135 million Euro, including net working capital of 21.7 million Euro.

On 9 February, 2017, Aurobindo Pharma announced the acquisition of four cell culture derived biosimilar products from TL Biopharmaceutical AG. As part of this agreement, TL will supply all the developmental data for four molecules and Aurobindo and/or its affiliates will develop, commercialize and market these products globally. As on 31 March 2018, the company has 56 subsidiary companies under its roof.

During the FY2018, the company launched 38 products including 6 injectables in the US. The company also filed 47 ANDA with USFDA.

During the year, Agile Pharma BV, a step down subsidiary of the Company acquired Generis Farmaceutica SA and its 4 subsidiaries viz. Mer Medicamentos, Portugal, Generis Phar, Portugal, Pharma APS, Portugal and Generis Mozambique, Portugal. Post acquisition of Generis Farmaceutica SA, Portugal, as part of restructuring of operations in Portugal, Aurobindo Pharma (Portugal) Unipessoal Limitada and Aurovitas, Unipessoal LDA, Mer Medicamentos, Lda, Farma APS and Generis Mozambique have been either merged with Generis Farmaceutica SA or liquidated.

On May 28, 2019 the Board of Directors had accorded its approval for the draft scheme for merger of Company's 5 (Five) Wholly Owned Subsidiaries (i.e. APL Research Centre Limited, Aurozymes Limited, Curepro Parenterals Limited, Hyacinths Pharma Private Limited and APL Healthcare Limited) and 1 (one) step-down wholly owned subsidiary (i.e. Silicon Life Sciences Private Limited) with the Company. No shares of the Company will be issued as consideration for the said amalgamation and the shares held by the Company in its wholly owned subsidiaries and step-down wholly owned subsidiary shall stand cancelled. The Scheme would be subject to the requisite statutory/ regulatory approvals including the approval of the National Company Law Tribunal (Hyderabad Bench). Pursuant to the orders dated 30 September 2019, the required approvals of the Shareholders and unsecured creditors were obtained at the meetings held on 30 November 2019.

The Company has made an investment of Rs 150 million in Synergy Remedies Private Limited (Synergy), a Tirupathi based pharma company and acquired 19.9% holding in the said company. The objective of this acquisition was to ensure assured supplies of some of the APIs and intermediates.

As on 31 March 2019, the company has 67 subsidiary companies under its roof.

During the year 2018-19, Aurobindo has been awarded IP Excellence in INDIA 2018 by Questel Orbit INC, as a part of their Indian IP Awards, 2018. Aurobindo Pharma has bagged award for the category of Best CSR Practices in Responsible Business Awards hosted by World CSR Day. The company also bagged the 'Outstanding Export Award for FY2017-18'

conducted by Pharmaceutical Export Promotion Council of India (Pharmexcil).

As on 31 March 2020, the company has 68 subsidiary companies under its roof.

During the FY2020, the Company through Auro Vaccines LLC, 100% subsidiary of Aurobindo Pharma USA Inc., USA, which in turn is 100% subsidiary of the Company, acquired certain R&D assets from Profectus BioSciences Inc', USA, a clinical stage vaccine development company in the design and development of preventive and therapeutic vaccines for an upfront cash consideration US\$11.29 million with potential earn outs on achieving certain milestones. This acquisition provided access to Proprietary & Innovative technology platforms for Prophylactic use & Therapeutic use along with Global R&D center to develop newer vaccines from basic discovery research into FDA-approved product. FEEDBACK

The Board of Aurobindo Pharma Limited on 3rd June 2020 had approved the transfer of Company's Biosimilar business and related R&D manufacturing facilities (Unit-17 and R&D-3) situated at survey No. 77 & 78, Indrakaran Village, Kandi Mandai, Sanga Reddy District, Telangana to its newly incorporated wholly owned subsidiary CuraTeQ Biologics Private Limited (CuraTeQ), through a slump sale.

On 25 October 2020, pursuant to the Board's approval, the Group entered into a definitive agreement to dispose of business assets of a wholly-owned step-down subsidiary, Natrol LLC, United States of America as a going concern with related assets, liabilities, products, brands and employees for a cash price of USD 550 million.

The Board in its meeting held on 16 October 2020 decided to enter into a share purchase agreement to acquire 100% equity share capital of MViyes Pharma Ventures Private Limited. MViyes is holding 32.18% shareholding in Eugia Pharma Specialties Limited, a joint venture company in which the Parent Company, through its wholly-owned subsidiary company, is holding 67.82%. By this acquisition, both Eugia Pharma Specialties Limited and MViyes Pharma Ventures Private Limited have become wholly owned subsidiaries.

During the year 2018-19 Aurobindo has been awarded IP Excellence in INDIA 2018 by Questel Orbit INC as a part of their Indian IP Awards 2018. Aurobindo Pharma has bagged award for the category of Best CSR Practices in Responsible Business Awards hosted by World CSR Day. The company also bagged the 'Outstanding Export Award for FY2017-18' conducted by

Pharmaceutical Export Promotion Council of India (Pharmexcil). As on 31 March 2020 the company has 68 subsidiary companies under its roof. During the FY2020 the Company through Auro Vaccines LLC 100% subsidiary of Aurobindo Pharma USA Inc. USA which in turn is 100% subsidiary of the Company acquired certain R&D assets from 'Profectus BioSciences Inc'. USA a clinical stage vaccine development company in the design and development of preventive and therapeutic vaccines for an upfront cash consideration US\$11.29 million with potential earn outs on achieving certain milestones. This acquisition provided access to Proprietary & Innovative technology platforms for Prophylactic use & Therapeutic use along with Global R&D center to develop newer vaccines from basic discovery research into FDA-approved product. The Board of Aurobindo Pharma Limited on 3rd June 2020 had approved the transfer of Company's Biosimilar business and related R&D manufacturing facilities (Unit-17 and R&D-3) situated at survey No. 77 & 78 Indrakaran Village Kandi Mandai Sanga Reddy District Telangana to its newly incorporated wholly owned subsidiary CuraTeQ Biologics Private Limited (CuraTeQ) through a slump sale. On 25 October 2020 pursuant to the Board's approval the Group entered into a definitive agreement to dispose of business assets of a wholly-owned step-down subsidiary Natrol LLC United States of America as a going concern with related assets liabilities products brands and employees for a cash price of USD 550 million. The Board in its meeting held on 16 October 2020 decided to enter into a share purchase agreement to acquire 100% equity share capital of MViyes Pharma Ventures Private Limited. MViyes is holding 32.18% shareholding in Eugia Pharma Specialties Limited a joint venture company in which the Parent Company through its wholly-owned subsidiary company is holding 67.82%. By this acquisition both Eugia Pharma Specialties Limited and MViyes Pharma Ventures Private Limited have become wholly owned subsidiaries. During the FY2021 the company has incorporated WYTELLS PHARMA PRIVATE LIMITED w.e.f 20 February 2021 as a subsidiary to Eugia Pharma Specialties Limited India.

VISION

To deliver sustained business performance through progressive talent management and development of Aurobindo Pharma as learning organization .

MISSION

To become the most valued Pharma partner to the World Pharma fraternity by continuously researching, developing and manufacturing a wide range of pharmaceutical products that comply with the highest regulatory standards.

QUALITY POLICY

-As a long term ethically binding policy, we target, and commit ourselves to only those products that meet international cGMP standards. We continuously strive to achieve customer satisfaction by supplying products meeting various quality parameters and within stipulated delivery time.

We anticipate customer's perspective and support them adequately with all required technical data and information in a time bound manner.

-We continuously review our various operations to make them more efficient, relevant with changing international scenario and environment friendly. We comply with all relevant statutory and regulatory requirements.

-Providing training to our employees is a regular feature in our calendar that fosters team spirit in addition to inculcate them with recent innovations and advancements in the industry around the world.

-We stringently adhere to implementing Quality Management Systems and are committed towards making continual improvements to the same.

PRODUCTS LIST

- Acetaminophen or Paracetamol
- Ambroxol
- Amoxicillin
- Cefoperazone Sodium Injection
- Cefpodoxime Proxetil
- Cefuroxime
- Celecoxib
- Ciprofloxacin and Tinidazole
- Diclofenac
- Diltiazem
- Dimethicone
- Doxazosin
- Efavirenz

PRODUCTS

- Medication



➤ Generic drug



➤ Over-the-counter drug



➤ Medical diagnosis



➤ Contact lens



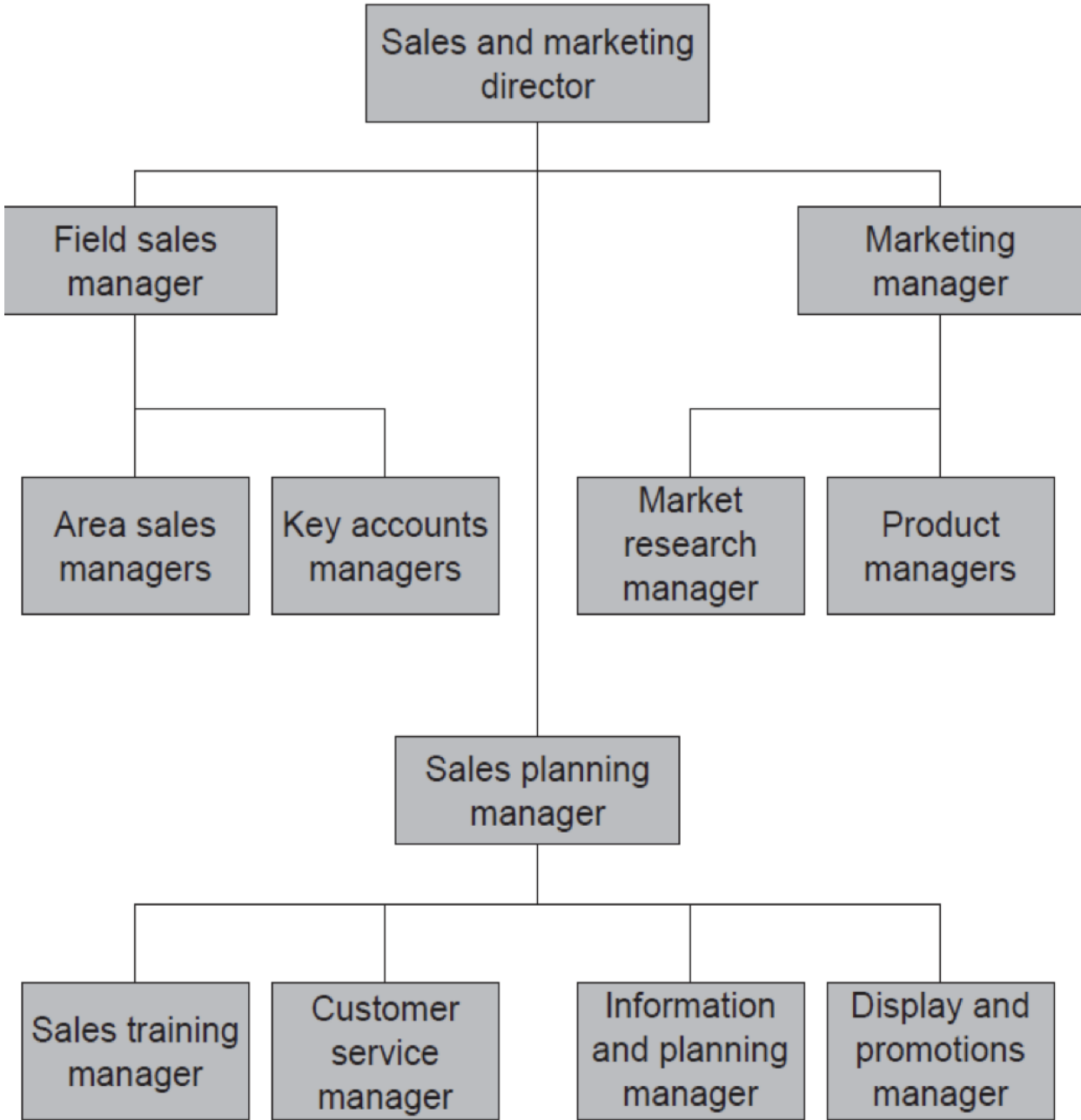
MANAGEMENT

CHAIRMAN (NON-EXECUTIVE).	MR. K. RAGUNATHAN
VICE CHAIRMAN.	MR. K. NITHYANANDA REDDY
MANAGEGING DIRECTOR	MR. N. GOVINDARAJAN
INDEPENDENT DIRECTOR	DR. M. SIVAKUMARAN
INDEPENDENT DIRECTOR	MR. M. MADAN MOHAN REDDY
INDEPENDENT DIRECTOR	MR. P. SARATH CHANDRA REDDY
PROMOTOR	MR. P.V. RAMPRASAD REDDY
NON-EXECUTIVE DIRECTOR	MR. M. SITARAMA MURTHY
INDEPENDENT DIRECTOR	DR. AVNIT BIMAL SINGH
INDEPENDENT DIRECTOR	MR. RANGASWAMY
AUDITOR	SRIRAM MAHALINGAM
HOUSE NAME	INDIAN PRIVATE

KEY COMPETITORS

- DR. REDDY'S PHARMA
- GLENMARK PHARMA
- CIPLA PHARMA
- LUPIN PHARMA
- ZYDUS PHARMA
- MANKIND PHARMA
- BIOCON PHARMA
- ABBOTT PHARMA

ORGANISATIONAL STRUCTURE



CALCULATION OF COST OF CAPITAL

I. Calculation of Ke (Cost of Equity) using CAPM

CAPM (Capital Asset Pricing Model): the capital asset pricing model (CAPM) evaluates if investment is fairly valued, given its risk and time value of money in relation to its anticipated return.

Step 1: Market Prices and Aurobindo Pharma ltd. Prices from the year 2010 to 2022 are considered to calculate the value of Beta.

Step 2: The Risk Free Return is taken from the RBI Deposit Rates

Step 3: Calculation of Ke

$$K_e = R_f + (\beta \times (R_m - R_f))$$

CAPM	
RF	6.1
Beta	1.108186
Rm	11.64073
Ke	12.24017

Interpretation:

- Beta indicates how volatile a stock's price is in comparison to the overall stock market. A beta of more than 1 indicates that a stock's price is more volatile than the overall market.
- Therefore Aurobindo pharma ltd. has a beta value of 1.108 which indicates the stock price is more volatile than the market.
- The cost of equity under CAPM is 12.24017% which means for every 100-rupee invested by the shareholders the company is paying 12.24017 rupees as the return which is actually cost to the company.
- Beta is 1.108187 which explains that the share price of the company is positively correlated with the SENSEX that is market. If the market increases by 12 percent the company share price also increases.

Calculation of Kd:

The cost of debt is the effective interest rate that a company pays on its debts, such as bonds and loans, credit interest etc. The cost of debt can refer to the before-tax cost of debt, which is the company's cost of debt before taking taxes into account, or the after-tax cost of debt.

$$Kd = \text{Interest amount} * (1 - \text{Tax rate})$$

$$\text{Tax rate} = 22\%$$

Interest amount	49 Crore
Loan amount	249 Crore
Tax	22%
Kd	15.349

Interpretation:

- Here the cost of debt is at 15.349% which means the company has to bear the cost of 15.349 rupees to get the debt of 100 rupees. In other words, it has to pay Rs. 15.349 as interest expense for every Rs. 100 debt raised.

Calculation of WACC

The Weighted Average Cost of Capital (WACC) of a company is a measure of its total cost of capital, which includes debt, common shares, and preferred shares. Each sort of capital's cost is multiplied by how much of the total capital it makes up.

SF	Cost of capital(WACC)			WC
	Amount	Weightage	SC(%)	
Equity	1	0.98039216	12.24018	12.00018
Debt	0.02	0.01960784	15.34939	0.300968
	1.02	1		12.30114

INTERPRETATION

- The WACC of the company is at 12.30% which explains that the total cost arising for the company to raise capital from all sources (equity and Debt).
- Company needs to spend ₹12.30 out of ₹100 as a expenses towards for paying shareholders and debt holders. It will provide the bank an advantage over its rivals in maintaining a competitive advantage by raising capital at low cost.

CALCULATION OF CASH INFLOWS AND OUTFLOWS

Year	FCF/CIF (RS in Billion)	DF (12.30%)	PV
2023	0.87	0.8905	0.7747
2024	1.36	0.7929	1.0782
2025	2.13	0.7061	1.5007
2026	3.32	0.6288	2.0887
2027	5.19	0.5599	2.9071
	CIF		8.3495

Identifying Cash Outflow

Cash outflow of the company is calculated under 3 assumed conditions

75% of the Cash in Flow = $8.3495 * 75\% = 6.2621$

125% of the Cash in Flow = $8.3495 * 125\% = 10.4368$

100% of the Cash in Flow = $8.3495 * 100\% = 8.3495$

CALCULATION OF PAY BACK PERIOD (PBP)

Payback period (PBP) is widely used when long-term cash flows, that is, over a period of several years, are difficult to forecast, since no information is required beyond the breakeven point.

Case 1 – 75% of summation PV

Case 2 – 125% of summation PV

Case 3 – 100% of summation PV with 15% of salvage value

Year	FCF/CIF (RS in Billion)	ccif
2023	0.87	0.87
2024	1.36	2.23
2025	2.13	4.36
2026	3.32	7.68
2027	5.19	12.87
PBP		3.574025

Year	FCF/CIF (RS in Billion)	ccif
2023	0.87	0.87
2024	1.36	2.23
2025	2.13	4.36
2026	3.32	7.68
2027	5.19	12.87
PBP		4.532105

Year	FCF/CIF (RS in Billion)	ccif
2023	0.8700	0.87
2024	1.3598	2.23
2025	2.1254	4.36
2026	3.3220	7.68
2027	6.4447	14.12
PBP		4.104623

INTERPRETATION:

The shortest payback period is generally considered to be the most acceptable. This is a particularly good rule to follow when a company is deciding between one or more projects or investments. The reason being, the longer the money is tied up, the less opportunity there is to invest it elsewhere.

- In project A it requires 3.574 years to recover the initial investment made at first.
- In project B it requires 4.532 years to recover the initial investment made at first.
- In project C it requires 4.104 years to recover the initial investment made at first.

From the projects A, B and C the payback period is 3.574, 4.532 and 4.104 respectively. From the above projects it is most feasible for the company to select **Project A** as it has the least pay back period. The project which has the least payback period is selected among others as it will be more profitable for the company.

CALCULATION OF DISCOUNTED PAYBACK PERIOD:

Year	FCF/CIF (RS in Billion)	DF (12.30%)	PV	CPV
2023	0.87	0.8905	0.7747	0.7747
2024	1.36	0.7929	1.0782	1.8530
2025	2.13	0.7061	1.5007	3.3537
2026	3.32	0.6288	2.0887	5.4424
2027	5.19	0.5599	2.9071	8.3495
DPBP				4.2820

Year	FCF/CIF (RS in Billion)	DF (12.30%)	PV	CPV
2023	0.87	0.8905	0.7747	0.7747
2024	1.36	0.7929	1.0782	1.8530
2025	2.13	0.7061	1.5007	3.3537
2026	3.32	0.6288	2.0887	5.4424
2027	5.19	0.5599	2.9071	8.3495
2028	8.12	0.4986	4.0461	12.3955
DPBP				5.5159

Year	FCF/CIF (RS in Billion)	DF (12.30%)	PV	CPV
2023	0.87	0.8905	0.7747	0.7747
2024	1.36	0.7929	1.0782	1.8530
2025	2.13	0.7061	1.5007	3.3537
2026	3.32	0.6288	2.0887	5.4424
2027	5.19	0.5599	3.6083	9.0507
DPBP				4.8057

INTERPRETATION:

The discounted payback period, also known as the time needed to break even on an investment, is the period of time needed for the initial cost of a project to equal the discounted value of expected cash flows. It is the time frame in which a project's total net present value equals zero.

The only difference between PBP and DPBP is that, in PBP the cash inflows are considered and in DPBP present value of cash inflows are considered.

- In project A it requires 4.2820 years to recover the initial investment made at first.
- In project B it requires 5.51 years to recover the initial investment made at first.
- In project C it requires 4.80 years to recover the initial investment made at first.

From the projects A, B and C the payback period is 4.2820, 5.51 and 4.80 respectively. From the above projects it is most feasible for the company to select **Project A** as it has the least payback period. The project which has the least payback period is selected among others as it will be more profitable for the company.

INTERPRETATION

A higher Net Present Value is always considered when making investment decisions because it shows that an investment would be profitable.

With a higher NPV, an investment would have a future cash stream that is higher than the amount of money that was invested in the project.

Case 1: The project would be financially successful because the NPV Value is 2.0874, which is a positive number.

Case 2: Here, the NPV value is -2.0874, a negative number that indicates that the project will not be profitable.

Case 3: Even though the NPV value obtained is 0.7012, which is less than Case 1, it is still positive.

Conclusion: Case 1 should be selected as it gives the highest positive NPV value and would give the highest returns among the three cases.

So Case 1 is recommended.

CALCULATION OF PROFITABILITY INDEX

The profitability index (PI) is a measure of a project's or investment's attractiveness. The PI is calculated by dividing the present value of future expected cash flows by the initial investment amount in the project.

$$\text{Profitability index} = \text{PVCIF}/\text{PVCOF}$$

Case 1 When cash outflow is 75% of PV			
Year	CIF	DF @12.30%	PV
2023	0.87	0.8905	0.7747
2024	1.36	0.7929	1.0782
2025	2.13	0.7061	1.5007
2026	3.32	0.6288	2.0877
2027	5.19	0.5599	2.9071
	PVCIF	8.3495	
	LESS PVCOF	6.2621	
	NPV	2.0874	
	PI	1.3333	

Case 2 When cash outflow is 125% of PV			
Year	CIF	DF @12.20%	PV
2023	0.87	0.8905	0.7747
2024	1.36	0.7929	1.0784
2025	2.13	0.7061	1.5007
2026	3.32	0.6288	2.0877
2027	5.19	0.5599	2.9071
	PVCIF	8.3495	
	LESS PVCOF	10.4368	
	NPV	-2.0874	
	PI	0.8000	

Case 3 @15% Salvage value			
Year	CIF	DF @12.20%	PV
2023	0.87	0.8905	0.7747
2024	1.36	0.7929	1.0784
2025	2.13	0.7061	1.5007
2026	3.32	0.6288	2.0887
2027	5.19	0.5599	2.9071
Add SV	1.2525	0.5599	0.7012
PVCIF		9.0507	
LESS PVCOF		8.3495	
NPV		0.7012	
PI		1.08409	

Interpretation:

Profitability index helps in ranking investments and deciding the best investment that should be made.

PI greater than 1 indicates that present value of future cash inflows from the investment is more than the initial investment, thereby indicating that it will earn profits.

Case 1: In this case the PI is 1.33 which indicates profitability.

Case 2: In this case the PI is 0.8 which indicates the costs outweigh the benefits. It is not profitable.

Case 3: In this case the PI is 1.0840 which is profitable.

Conclusion: The Company should select Case 1, which has a PI of 1.33 and provides the largest profit, as the best alternative.

CALCULATION OF IRR

IRR		
A	B	C
-6.2621	-10.4368	-8.3495
0.7747	0.7747	0.7747
1.0782	1.0782	1.0782
1.5007	1.5007	1.5007
2.0887	2.0887	2.0887
2.9071	2.9071	3.6083
8%	-6%	2%

Case 1: In this case we see that the IRR is 8%. This indicates that for 100 rupees of cash flow the company would obtain 8 rupees as cash inflow..

Case 2: We observe here that the IRR is -6% that indicates it is negative. In this case, the investing entity will experience a negative return on its investment.

Case 3: In this case we see that the IRR is 2%. This indicates that for 100 rupees of cash flow the company would obtain 2 rupees as cash inflow.

Therefore, the investment with the highest IRR is recommended. Comparing Case 1 to the other outflow cases, Case 1 has the highest IRR i.e. 8%.

So Case 1 recommended over the other two cases.

**ASSIGNMENT ON MEASURING FINANCIAL HEALTH OF
TCS (TATA CONSULTANCY SERVICES)**

Project Report submitted in partial fulfilment of the requirements for the award of

The Degree of

MASTER OF BUSINESS ADMINISTRATION

OF

BENGALURU CENTRAL UNIVERSITY

By

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P18FW21M0019

UNDER THE GUIDANCE OF

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Assistant Professor



RV Institute of Management

Bangalore

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INTRODUCTION TO TCS (TATA CONSULTANCY SERVICES)



About The Company

Tata Consultancy Services is an Indian multinational information technology services and consulting company with its headquarters in Mumbai. It is a part of the Tata Group and operates in 149 locations across 46 countries. In July 2022, it was reported that TCS had crossed 6 lakh or 600,000 Employees

BUSINESS HIGHLIGHTS

- Announced plans to grow operations in New Jersey by hiring nearly 1,000 more employees by the end-2023 to meet the strong demand for digital transformation. This follows a similar announcement earlier, to expand in Arizona by investing more than \$300 million by 2026 and hiring over 220 employees by 2023. In both states, TCS will also grow the reach of its STEM and computer science education programs, expanding teacher training and student programs.
- Became the #2 most valuable brand in the IT services sector globally, according to Brand Finance, the world's leading brand valuation firm. According to the Brand Finance 2022 Global 500 IT Services Ranking report, TCS grew its brand value by \$1.8 billion (+12.5%) year on year, to \$16.8 billion in 2021.
- Ranked #1 in Customer Satisfaction in the largest survey of European businesses by Whitelane Research, for the ninth consecutive year, covering 1,800 CxOs from top IT spending companies in Europe. TCS' Overall Satisfaction Score was 84% with the lead over the nearest competitor expanding to 4 percentage points vs 1 percentage point in the prior year.

CALCULATION OF COST OF CAPITAL

I. Calculation of Ke (Cost of Equity) using CAPM

ABOUT CAPM METHOD –CAPITAL ASSETING PRICING MODEL

Systemic Risk. Also called market risk, this is general risk from developments impacting the entire economy and all investment assets. It is influenced by factors such as interest rates, inflation, recessions and geopolitical events like war. Systemic risk applies to the market as a whole, which means that all assets are impacted in similar ways.

The capital asset pricing model concentrates on measuring systemic risk and its impact on the value of an asset. CAPM helps factor in systemic risks to estimate the fair value of an asset and understand the relationship between risk and expected returns.

CAPM		As per the RBI risk less than
Rf	6.1	
Beta	0.49	
Rm	11.64	
Ke	8.8146	

$$ER = RFR + [Beta \times (MR - RFR)]$$

ER: Expected return on a given asset

RFR: Risk-free rate, or the return on a Treasury security

MR: Market return, or return on a comparable market index

Month	Sensex	TCS	R_Sensex	R_TCS			
Jan-10	16357.96	735.45					
Feb-10	16429.55	761	0.4376	3.4741			
Mar-10	17527.77	780.8	6.6844	2.6018		Beta	0.4925
Apr-10	17558.71	766	0.1765	-1.8955		Average p.m	0.9701
May-10	16944.63	742	-3.4973	-3.1332		Average p.a	11.64074
Jun-10	17700.9	751.15	4.4632	1.2332			
Jul-10	17868.29	841.1	0.9457	11.9750			
Aug-10	17971.12	843.85	0.5755	0.3270			
Sep-10	20069.12	922.55	11.6743	9.3263			
Oct-10	20032.34	1051.8	-0.1833	14.0101			
Nov-10	19521.25	1076.7	-2.5513	2.3674			
Dec-10	20509.09	1165.05	5.0603	8.2056			
Jan-11	18327.76	1157.15	-10.6359	-0.6781			
Feb-11	17823.4	1112.95	-2.7519	-3.8197			
Mar-11	19445.22	1182.5	9.0994	6.2492			
Apr-11	19135.96	1163.6	-1.5904	-1.5983			
May-11	18503.28	1158.8	-3.3062	-0.4125			
Jun-11	18845.87	1180.35	1.8515	1.8597			
Jul-11	18197.2	1134.45	-3.4420	-3.8887			
Aug-11	16676.75	1040.6	-8.3554	-8.2727			
Sep-11	16453.76	1037.5	-1.3371	-0.2979			
Oct-11	17705.01	1114.2	7.6046	7.3928			
Nov-11	16123.46	1113.1	-8.9328	-0.0987			
Dec-11	15454.92	1161.25	-4.1464	4.3258			
Jan-12	17193.55	1130.5	11.2497	-2.6480			
Feb-12	17752.68	1221.05	3.2520	8.0097			
Mar-12	17404.2	1167.85	-1.9630	-4.3569			
Apr-12	17318.81	1244.9	-0.4906	6.5976			
May-12	16318.53	1245.8	0.0004	0.0700			

INTERPRETATION

From the above calculations that have already been done we can interpret the following

- According to the beta value calculated which is 0.49 it implies that if the stock market moves down by 5%, then TCS stock will only move down by $0.49 \times 5 = 2.45\%$.
- Even if the economy is in recession, these stocks tend to show stable revenues and stock prices.
- TCS has its expected return lower than the current market value which means their stock is being overvalued.

II. Calculation of Kd (Cost Of Debt)

Kd Calculation	
Interest Amount	784
Loan Amount	7,818
Percentage	10.02814019
Kd	7.019698133

INTERPRETATION

- The cost of debt is the effective rate that a company pays on its debt, such loans.
- The above values indicate that 7.01% interest rate is paid n the company's debt.
- The 7.01% indicates the average interest paid n all the company's debts.
- The above cost of debt is calculated after tax @30%.
- It also gives a chance for the company to save its tax.
- Company needs to give 8.81% to the shareholders which is greater than the cost of debt, which means company can rise capital at low cost through debtors instead of equity.

Calculation of WACC (weighted average cost of capital)

Calculation of WACC					
	SF	Amount(D/E RATIO)	W	SC(%)	WC
	Equity	1	0.71	8.8146	6.296142857
	Debt	0.4	0.29	7.019	2.005428571
		1.4		WACC	8.301571429

INTERPRETATION

- TCS has a WACC of 8.30%. This is the minimum amount TCS needs to return in order for investors to be satisfied
- WACC is calculated by using both cost of equity and cost of capital.
- TCS can also use this figure to determine if they should invest in a project or not.
- For instance, if TCS found the same 8.30% WACC figure, they would only consider investing in projects that would return anything higher than 12.9%. Anything lower would be destroying the wealth of the company.
- An increase in the WACC denotes a lower firm valuation as well, as investors require additional return for taking on more risk.
- TCS is having a WACC of 8.30% which is a moderate risk, further increase in WACC would not be favourable to the company.

CALCULATION OF EXPECTED CASH INFLOWS AND OUTFLOWS

I. Identifying CIF by using TTM of FCFF

Free cash flow to the firm (FCMM) Free cash flow to the firm (FCFF) represents the amount of cash flow from operations available for distribution after accounting for depreciation expenses, taxes, working capital, and investments. FCFF of the firm is operational performance data of the company from Morning Star.Com.

FCFF				
2013	0.65			
2014	0.61		GROWTH RATE	RRI
2015	0.83			0.0397664204
2016	0.7		Percentage	3.9766
2017	0.88			
2018	0.9			
2019	0.84			
2020	0.9			
2021	1.1			
2022	0.96			
TTM	0.96			

- The free cash flow and the TTM value of TCS are noted above.
- Trailing 12 months (TTM) is a term used to describe the past 12 consecutive months of a company's performance data, that's used for reporting financial figures

II. Identifying the growth of CI and estimation of CI for the remaining 4 years

Year	FCF/CIF(Rs. in Billion)	DF(8.30%)	PV
2023	0.96	0.923	0.8864265928
2024	0.998112	0.8526	0.8509858989
2025	1.037737046	0.7873	0.8169621783
2026	1.078935207	0.7269	0.7842987782
2027	1.121768935	0.6712	0.7529413109
		PVCIF	4.091614759

III. Identifying CO

A			
Year	FCF/CIF(Rs. in Billion)	DF(8.30%)	PV
2023	0.96	0.923	0.8864265928
2024	0.998112	0.8526	0.8509858989
2025	1.037737046	0.7873	0.8169621783
2026	1.078935207	0.7269	0.7842987782
2027	1.121768935	0.6712	0.7529413109
		PVCIF	4.091614759
		PVCOF	3.068711069

B			
Year	FCF/CIF(Rs. in Billion)	DF(8.30%)	PV
2023	0.96	0.923	0.8864265928
2024	0.998112	0.8526	0.8509858989
2025	1.037737046	0.7873	0.8169621783
2026	1.078935207	0.7269	0.7842987782
2027	1.121768935	0.6712	0.7529413109
		PVCIF	4.091614759
		PVCOF	5.114518449

C			
Year	FCF/CIF(Rs. in Billion)	DF(8.30%)	PV
2023	0.96	0.923	0.8864265928
2024	0.998112	0.8526	0.8509858989
2025	1.037737046	0.7873	0.8169621783
2026	1.078935207	0.7269	0.7842987782
2027	1.121768935	0.6712	0.7529413109
ADD SV	0.6137422139	0.6712	0.4119492461
		PVCIF	4.503564005
		PVCOF	4.091614759

CASE A- 75% Of PVCIF

CASE B- 125% Of PVCIF

CASE C- 100% Of PVCIF with 15% Salvage Value

- When the Cash Outflow is 75% of the PVCIF, we obtain a value of 3.06 a ratio greater than 1 indicates good financial health, as it indicates cash flow more than sufficient to meet short-term financial obligations.
- When the cash outflow is 125% of the PVCIF, the cash outflow is higher than cash inflow, it leads to negative cash flow which isn't an ideal situation to be in.
- With a Salvage Value being included, we observe cash outflow being marginally lesser than the inflow of cash to the company.
- A positive growth rate indicates a variable is increasing over time
- According to the calculation done, there is a 3.9% growth in free cash flow every year.

CALCULATION OF INVESTMENT DECISION

I. Calculation of PBP

	A	
Year	FCF/CIF(Rs. in Billion)	CCIF
2023	0.96	0.96
2024	0.998112	1.958112
2025	1.037737046	2.995849046
2026	1.078935207	4.074784253
2027	1.121768935	5.196553188
	COF	3.069
	PBP	3.068

	B	
Year	FCF/CIF(Rs. in Billion)	CCIF
2023	0.96	0.96
2024	0.998112	1.958112
2025	1.037737046	2.995849046
2026	1.078935207	4.074784253
2027	1.121768935	5.196553188
	COF	5.11
	PBP	4.923

	C	
Year	FCF/CIF(Rs. in Billion)	CCIF
2023	0.96	0.96
2024	0.998112	1.958112
2025	1.037737046	2.995849046
2026	1.078935207	4.074784253
2027	1.121768935	5.196553188
2028	1.166303162	6.36285635
	COF	4.092
	PBP	4.015

INTERPRETATION

- Payback period is defined as the number of years required to recover the original cash investment.
- When the outflow is 75%(Case A) of inflow the payback period is 3.06 years which means it'll take 3.06 years to payback the initial investment.
- When the outflow is 125%(Case B) of inflow the payback period is 4.92 years which means it'll take 4.92 years to payback the initial investment.
- When the outflow is 100%(Case C) of inflow with the Salvage value of 15% the payback period is 4.01 years which means it'll take 4.01 years to payback the initial investment.
- It is determined that the Case A takes less time to pay back and company's earning potential will be greater.
- Shorter pay back period means attractive investments, while longer pay back periods are less desirable.
- It says the CASE A is more viable because it has the shorter pay back period.

II. Calculation of DPBP

	A			
Year	FCF/CIF(Rs. in Billion)	DF @8.30%	PV	PVCCIF
2023	0.96	0.923	0.886	0.886
2024	0.998	0.8526	0.851	1.737
2025	1.038	0.7873	0.817	2.554
2026	1.079	0.7269	0.784	3.339
2027	1.122	0.6712	0.753	4.092
COF				3.069
DPBP				3.656159801

B				
Year	FCF/CIF(Rs. in Billion)	DF @8.30%	PV	PVCCIF
2023	0.96	0.923	0.886	0.886
2024	0.998	0.8526	0.851	1.737
2025	1.038	0.7873	0.817	2.554
2026	1.079	0.7269	0.784	3.339
2027	1.122	0.6712	0.753	4.092
2028	1.166303162	0.6198	0.723	4.814
2029	1.212605397	0.5723	0.694	5.508
COF				5.11
DPBP				6.425899619

C				
Year	FCF/CIF(Rs. in Billion)	DF @8.30%	PV	PVCCIF
2023	0.96	0.923	0.886	0.886
2024	0.998	0.8526	0.851	1.737
2025	1.038	0.7873	0.817	2.554
2026	1.079	0.7269	0.784	3.339
2027	1.122	0.6712	0.753	4.092
COF				4.092
DPBP				4.000511648

INTERPRETATION

- Discounted payback period is the length of time required to recover the cost of an investment after considering the time value of money.
- When the outflow is 75%(Case A) of inflow the payback period is 3.656 years which means it'll take 3.656 years to payback the initial investment.
- When the outflow is 125%(Case B) of inflow the payback period is 6.42 years which means it'll take 6.42 years to payback the initial investment.
- When the outflow is 100%(Case C) of inflow with the Salvage value of 15% the payback period is 4.00 years which means it'll take 4.00 years to payback the initial investment.
- The shorter the discounted payback period, the quicker the project generates cash inflows and breaks even.
- It says the CASE A is more viable because it has the shorter discounted pay back period.

III. Calculation of NPV and PI

A			
Year	FCF/CIF(Rs. in Billion)	DF(8.30%)	PV
2023	0.96	0.923	0.886
2024	0.998	0.8526	0.851
2025	1.038	0.7873	0.817
2026	1.079	0.7269	0.784
2027	1.122	0.6712	0.753
		PVCIF	4.092
		LESS PVCOF	3.069
		NPV	1.023
		PI	1.333333333

B			
Year	FCF/CIF(Rs. in Billion)	DF @8.30%	PV
2023	0.96	0.923	0.886
2024	0.998112	0.8526	0.851
2025	1.037737046	0.7873	0.817
2026	1.078935207	0.7269	0.784
2027	1.121768935	0.6712	0.753
		PVCIF	4.092
		LESS PVCOF	5.114518448
		NPV	-1.023
		PI	0.8

C			
Year	FCF/CIF(Rs. in Billion)	DF @8.30%	PV
2023	0.96	0.923	0.886
2024	0.998112	0.8526	0.851
2025	1.037737046	0.7873	0.817
2026	1.078935207	0.7269	0.784
2027	1.121768935	0.6712	0.753
ADD SV	0.6138	0.6712	0.4119880327
		PVCIF	4.504
		LESS PVCOF	4.092
		NPV	0.412
		PI	1.100587192

INTERPRETATION

- It is calculated as the difference between Present Value of cash inflow and present Value of cash outflow over a period of time.
- In case A the NPV of TCS when the Present Value of cash outflow is 75% of the Present Value of cash inflow is 1.023 (in billion).
- In case B the NPV of TCS when the Present Value of cash outflow is 125% of the Present Value of cash inflow is -1.023.
- In case C the NPV of TCS when the Present Value of cash outflow is 100% of the Present Value of cash inflow with 15% of Salvage Value is 1.0412(in billion).
- We can see that in this case A the NPV is positive i.e greater than 0 which indicates that A positive NPV means that the investment in TCS should increase the value of the firm and lead to maximizing shareholder wealth.
- In case B the NPV is negative which indicates a loss for the company TCS and the company should not pursue the Project.
- It also indicates that the company TCS is profitable to invest in case A and not profitable in case B .
- If the estimated cash flows and discount rate are accurate, this project (TCS) should increase shareholder wealth by 1.023 Billion in case A, -1.023 in case B, 0.412 in case C.
- The NPV method is theoretically the most appropriate method for making capital budgeting decisions because it measure wealth creation, which is the assumed goal of financial management.
- It helps evaluate whether to proceed with the project. It is the potential profit of a proposed project.
- In the case A the PI is 1.3333 which is again greater than 1, it says that the project should be proceeded.
- In the case B the PI is 0.8 which is less than 1, indicate the deficit of the outflows is greater than the discounted inflows, and the project should not be accepted.
- In the case C the PI is 1.10 which is again greater than 1, it says that the project should be proceeded.
- NPV and PI are inter-related. A positive NPV corresponds to a PI greater than 1.
- In the above case A we have a positive NPV which is 1.023 also PI as 1.3333 which explains the above statement.
- In the above case B we have a negative NPV which is -1.023 also PI as 0.8 which explains the above statement. It says the CASE A is more viable because it has the highest PI value.

IV. Calculation of IRR

A			
Year	CIF	DF @8.30%	PV
		0.9233610342	
2022	-3.069	1	-3.069
2023	0.96	0.923	0.886
2024	0.923	0.853	0.787
2025	0.888	0.787	0.699
2026	0.854	0.727	0.621
2027	0.822	0.671	0.551
		IRR	5%

B			
Year	CIF	DF @8.30%	PV
		0.9233610342	
2022	-5.114	1	-5.114
2023	0.96	0.923	0.886
2024	0.923	0.853	0.787
2025	0.888	0.787	0.699
2026	0.854	0.727	0.621
2027	0.822	0.671	0.551
		IRR	-12%

C			
Year	CIF	DF @8.30%	PV
		0.9233610342	
2022	-4.092	1	-4.092
2023	0.96	0.923	0.886
2024	0.923	0.853	0.787
2025	0.888	0.787	0.699
2026	0.854	0.727	0.621
2027	0.822	0.671	0.551
		IRR	-5%

INTERPRETATION

- The internal rate of return (IRR) is a metric used in financial analysis to estimate the profitability of potential investments.
- At the 75% of the PV the IRR is 5%. Which means for every 100Rs of cash flow we get the Rs.5 as a cash inflow over the period of 5 years. So that project viable.
- At the 100% of the PV the IRR is -5%. Which means for every 100Rs of cash flow we lose Rs.5 as a cash inflow over the period of 5 years. So that project is unviable because it is less than the cost of capital.
- At the 125% of the PV the IRR is -12%. Which means for every 100Rs of cash flow we lose Rs.12 as a cash inflow over the period of 5 years. So that project is unviable because it is less than the cost of capital.

ANNEXURES

Operating Performance

Fiscal	2013	2014	2015	2016	2017	2018	2019	2020
	43.66							
■ Return on Assets %	29.67	32.04	28.20	29.80	27.29	24.65	28.45	27.43
■ Return on Equity %	40.73	43.56	39.77	41.88	34.69	30.15	36.06	37.26
— Return on Invested Capital %	38.28	40.90	36.98	39.14	32.13	27.78	33.58	33.26
Financial Leverage	1.35	1.36	1.45	1.37	1.20	1.25	1.29	1.44
	59.73							
■ Gross Margin %	57.62	59.73	55.06	57.31	45.38	43.87	45.03	44.02
■ Operating Margin %	27.00	29.09	23.98	26.37	25.81	24.94	25.57	24.58
— Net Margin %	22.06	23.38	20.97	22.36	22.29	20.98	21.49	20.61
Days Sales Outstanding	37.51	6.44	5.60	5.10	37.56	70.61	65.15	67.30
Days Inventory	0.27	0.20	0.13	0.13	0.11	0.12	0.08	0.03
Days Payables	52.62	55.30	61.64	64.41	39.14	30.04	25.81	27.07
Receivables Turnover	9.73	56.66	65.15	71.55	9.72	5.17	5.60	5.42
Inventory Turnover	1,371.66	1,812.36	2,719.76	2,868.45	3,457.42	2,940.26	4,473.11	11,714.27
Fixed Asset Turnover	8.90	9.04	8.47	8.90	9.88	10.66	12.81	10.06
Total Asset Turnover	1.35	1.37	1.34	1.33	1.22	1.17	1.32	1.33
EBITDA Margin %	30.51	32.75	29.80	30.97	30.97	29.37	29.92	29.76
EBITDA (Bil)	192.18	267.90	282.01	336.44	365.32	361.58	438.17	467.01
Free Cash Flow/Net Income	0.65	0.61	0.83	0.70	0.88	0.90	0.84	0.90

Profit & Loss

Consolidated Figures in Rs. Crores / [View Standalone](#)

PRODUCT SEGMENTS

	Mar 2011	Mar 2012	Mar 2013	Mar 2014	Mar 2015	Mar 2016	Mar 2017	Mar 2018	Mar 2019	Mar 2020	Mar 2021	Mar 2022	TTM
Sales +	37,325	48,894	62,989	81,809	94,648	108,646	117,966	123,104	146,463	156,949	164,177	191,754	199,101
Expenses +	26,146	34,459	44,950	56,657	70,167	77,969	85,655	90,588	106,957	114,840	117,631	138,697	145,291
Operating Profit	11,178	14,435	18,040	25,153	24,482	30,677	32,311	32,516	39,506	42,109	46,546	53,057	53,810
OPM %	30%	30%	29%	31%	26%	28%	27%	26%	27%	27%	28%	28%	27%
Other Income +	604	428	1,178	1,637	3,720	3,084	4,221	3,642	4,311	4,592	1,916	4,018	4,086
Interest	26	22	48	39	104	33	32	52	198	924	637	784	837
Depreciation	735	918	1,080	1,349	1,799	1,888	1,987	2,014	2,056	3,529	4,065	4,604	4,759
Profit before tax	11,021	13,923	18,090	25,402	26,298	31,840	34,513	34,092	41,563	42,248	43,760	51,687	52,300
Tax %	17%	24%	22%	24%	24%	24%	24%	24%	24%	23%	26%	26%	
Net Profit	9,189	10,523	14,076	19,332	20,060	24,338	26,357	25,880	31,562	32,447	32,562	38,449	38,937
EPS in Rs	23.17	26.60	35.55	48.92	50.68	61.58	66.71	67.46	83.87	86.19	87.67	104.75	105.46
Dividend Payout %	30%	47%	31%	33%	78%	35%	35%	37%	36%	85%	43%	41%	

Balance Sheet

Consolidated Figures in Rs. Crores / [View Standalone](#)

CORPORATE ACTIONS

	Mar 2011	Mar 2012	Mar 2013	Mar 2014	Mar 2015	Mar 2016	Mar 2017	Mar 2018	Mar 2019	Mar 2020	Mar 2021	Mar 2022
Share Capital +	296	296	296	196	196	197	197	191	375	375	370	366
Reserves	24,209	29,284	38,350	48,999	50,439	70,875	86,017	84,937	89,071	83,751	86,063	88,773
Borrowings +	75	127	232	297	358	245	289	247	62	8,174	7,795	7,818
Other Liabilities +	8,092	11,551	13,154	17,337	22,325	16,974	15,830	19,751	24,393	27,820	35,764	43,967
Total Liabilities	32,572	41,157	51,932	66,829	73,318	88,291	102,333	105,126	113,901	120,120	129,992	140,924
Fixed Assets +	7,479	8,662	9,828	9,544	11,638	11,774	11,701	11,973	12,290	20,928	21,021	21,298
CWIP	1,194	1,446	1,895	3,168	2,766	1,670	1,541	1,278	963	906	926	1,205
Investments	1,763	1,350	1,897	3,434	1,662	22,822	41,980	36,008	29,330	26,356	29,373	30,485
Other Assets +	22,136	29,698	38,312	50,682	57,252	52,025	47,111	55,867	71,318	71,930	78,672	87,936
Total Assets	32,572	41,157	51,932	66,829	73,318	88,291	102,333	105,126	113,901	120,120	129,992	140,924

MINI PROJECT

INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT

Instructions

1. Group/ Individual: **Individual**
2. Four companies are allotted as mentioned in the list
3. Collect data for 3 years 2020, 2021 and 2022
4. Calculate individual securities risk and return which includes average return, standard deviation, correlation with the market index, and Beta
5. Calculate portfolio return assuming equal investment in all the five companies

Assessment parameters

S.No	Parameters	Marks
1	Company description and fundamentals of the company	3
2	Presentation of analysis of data	8
3	Interpretation on the results	5
4	Conclusion and submission on time	4

Last date for submission: 24/04/2023

Mode of submission : Quiklrn



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III SEMESTER
Batch 2021-2023

SUBJECT CODE: 21MBA332

SUBJECT: Investment Analysis and Portfolio Management

Topic:

**“Capstone mini project on Investment analysis
of select companies”**

NAME OF THE STUDENT	RAHUL RAM BHAT
SEMESTER	III
REGISTERED NUMBER	P18FW21M0042
NAME OF THE FACULTY	Dr Tamizharasi D
MARKS	

Student Declaration

DECLARATION BY THE STUDENT

I hereby declare that “Capstone mini project on Investment analysis of select companies” is the result of the project work carried out by me as a partial fulfillment for the award of Master’s Degree in Business Administration by Bengaluru City University. I also declare that this project is the outcome of my own efforts and that it has not been submitted to any other University or Institute for the award of any other degree or Diploma or Certificate.

Rahul Ram Bhat

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CHAPTER 1

About the companies

1) Charles Schwab Corporation



Charles Schwab Corporation, commonly referred to as Charles Schwab, is a financial services company headquartered in San Francisco, California, United States. It was founded in 1971 by Charles R. Schwab and is one of the largest brokerage firms in the United States.

Charles Schwab offers a wide range of financial services, including brokerage services, investment management, retirement planning, banking, and other related financial products and services. The company is known for its online brokerage platform, which allows investors to trade stocks, bonds, options, mutual funds, and other securities.

Charles Schwab is also a prominent player in the robo-advisory space, offering automated investment management services through its Schwab Intelligent Portfolios and Schwab Intelligent Advisory platforms. These platforms provide algorithm-based investment recommendations and portfolio management services for investors with varying levels of experience and investment goals.

In addition to its retail investor services, Charles Schwab also serves institutional clients, including registered investment advisors (RIAs), independent retirement plan advisors, and other institutional investors. The company provides custody, trading, and other support services to help these clients manage their assets and serve their own customers.

Charles Schwab has a significant presence in the financial industry and has grown through acquisitions, including the acquisition of TD Ameritrade in 2020, which further solidified its position as a major brokerage and investment management firm in the United States.

Charles Schwab is a publicly traded company listed on the New York Stock Exchange (NYSE) under the ticker symbol "SCHW". It is a well-known and established player in the financial services industry, serving millions of individual and institutional investors across the United States.

Particulars	2022	2021	2019	2018
Revenue	\$ 2,07,62,000.00	\$ 1,85,20,000.00	\$ 1,16,91,000.00	\$ 1,07,21,000.00
Net Profit	\$ 66,35,000.00	\$ 53,60,000.00	\$ 30,43,000.00	\$ 35,26,000.00
Basic EPS	\$3.52	\$2.84	\$2.13	\$2.69

Revenue: The company's revenue has been consistently increasing over the years, from \$1,07,21,000.00 in 2018 to \$2,07,62,000.00 in 2022. This indicates a positive trend in the company's top-line growth, and it may be experiencing sales growth and/or expansion in its business operations.

Net Profit: The company's net profit has also been increasing over the years, from \$35,26,000.00 in 2018 to \$66,35,000.00 in 2022. This indicates that the company's profitability has improved, and it is generating higher profits from its operations.

Basic EPS: The company's Basic Earnings Per Share (EPS), a key financial ratio that measures the company's profitability on a per-share basis, has also been increasing over the years, from \$2.69 in 2018 to \$3.52 in 2022. This indicates that the company's earnings attributable to each common share outstanding have increased, which may be positive for the company's shareholders.

2) CF Industries Holdings Inc



CF Industries Holdings Inc., commonly known as CF Industries, is a global producer and distributor of nitrogen fertilizers and other nitrogen-based chemical products. The company is headquartered in Deerfield, Illinois, United States, and was originally founded in 1946 as the Central Farmers Fertilizer Company. CF Industries is one of the largest producers of nitrogen fertilizers in the world, with production facilities in North America and the United Kingdom. The company's products are used in agriculture to enhance crop yields and improve food production, as nitrogen is an essential nutrient for plant growth.

The company's product portfolio includes anhydrous ammonia, urea, urea ammonium nitrate (UAN), ammonium nitrate, and other nitrogen-based products. These products are used by farmers and agricultural customers globally to improve soil fertility and increase crop yields in various crops, including corn, wheat, soybeans, and other grains.

CF Industries also operates a distribution network to market and sell its products to agricultural customers, including farmers, cooperatives, retailers, and industrial customers. The company has a significant presence in the United States, Canada, and other international markets, and its products are used in both conventional and specialty agricultural markets.

As a global leader in nitrogen fertilizers, CF Industries is committed to sustainable and responsible agriculture practices. The company invests in research and development to develop innovative and environmentally friendly fertilizer products and technologies, and it also participates in industry initiatives aimed at promoting sustainable agricultural practices and reducing environmental impacts.

CF Industries is a publicly traded company listed on the New York Stock Exchange (NYSE) under the ticker symbol "CF". It is a significant player in the global fertilizer industry, providing essential products that contribute to global food production and agriculture.

Particulars	2022	2021	2019	2018
Revenue	\$ 1,11,86,000.00	\$ 65,38,000.00	\$ 41,24,000.00	\$ 45,90,000.00
Net Profit	\$ 33,46,000.00	\$ 9,17,000.00	\$ 3,17,000.00	\$ 4,93,000.00
Basic EPS	\$16.45	\$4.27	\$1.48	\$2.24

Revenue: The company's revenue has been increasing over the years, from \$45,90,000.00 in 2018 to \$1,11,86,000.00 in 2022. This indicates a significant growth in the company's top-line, suggesting potential expansion in its business operations.

Net Profit: The company's net profit has also been increasing over the years, from \$4,93,000.00 in 2018 to \$33,46,000.00 in 2022. This indicates that the company's profitability has improved, and it is generating higher profits from its operations.

Basic EPS: The company's Basic Earnings Per Share (EPS), a key financial ratio that measures the company's profitability on a per-share basis, has also been increasing significantly over the years, from \$2.24 in 2018 to \$16.45 in 2022. This indicates that the company's earnings attributable to each common share outstanding have increased substantially, which may be positive for the company's shareholders.

3) GlaxoSmithKline



GSK plc, also known as GlaxoSmithKline, is a global pharmaceutical and healthcare company headquartered in London, United Kingdom. It is one of the largest pharmaceutical companies in the world and has a long history dating back to its founding in 1715.

GSK's mission is to help people do more, feel better, and live longer by discovering, developing, and manufacturing innovative medicines, vaccines, and consumer healthcare products. The company's areas of focus include pharmaceuticals, vaccines, and consumer healthcare products, with a diverse portfolio of prescription medicines, over-the-counter (OTC) healthcare products, and vaccines that are used to treat a wide range of diseases and conditions.

GSK's pharmaceutical division focuses on researching, developing, and manufacturing prescription medicines for various therapeutic areas, including respiratory, oncology, immunology, cardiovascular, and infectious diseases, among others. The company has a robust pipeline of innovative drugs in development, with a focus on breakthrough therapies and technologies.

GSK is also a global leader in vaccine development and production, with a broad portfolio of vaccines that protect against diseases such as influenza, meningitis, human papillomavirus (HPV), and others. The company is committed to addressing global health challenges, including infectious diseases, through its vaccine research and development efforts.

In addition to its pharmaceutical and vaccine businesses, GSK also has a consumer healthcare division that develops and manufactures a wide range of over-the-counter (OTC) healthcare products, including oral health, nutrition, and wellness products. Some of its well-known consumer healthcare brands include Sensodyne, Panadol, Voltaren, and Nicorette, among others. As a global healthcare company, GSK is committed to improving health outcomes, driving innovation, and addressing unmet medical needs. The company invests in research and development, clinical trials, and collaborations with academia, governments, and other stakeholders to advance medical science and bring new treatments and healthcare solutions to patients around the world.

GSK is a publicly traded company listed on the London Stock Exchange (LSE) and also has American Depository Receipts (ADRs) traded on the New York Stock Exchange (NYSE) under the ticker symbol "GSK". It operates in numerous countries and has a global presence with manufacturing facilities, research and development centers, and commercial operations in various regions worldwide.

Particulars	2022	2021	2019	2018
Revenue	\$ 2,93,24,000.00	\$ 3,41,14,000.00	\$ 3,40,99,000.00	\$ 3,37,54,000.00
Net Profit	\$ -8,03,000.00	\$ -7,56,000.00	\$ -8,48,000.00	\$ -8,14,000.00
Basic EPS	\$ -	\$2.19	\$2.89	\$2.35

Revenue: The company's revenue has fluctuated over the years, with a decrease from \$3,37,54,000.00 in 2018 to \$2,93,24,000.00 in 2022. This indicates a decline in the company's top-line, suggesting potential challenges in its business operations.

Net Profit: The company has reported negative net profits in recent years, with losses of -\$8,14,000.00 in 2018, -\$8,48,000.00 in 2019, -\$7,56,000.00 in 2021, and -\$8,03,000.00 in 2022. This indicates that the company has not been profitable in these years and has incurred losses from its operations.

4) Lumen Technologies



Lumen Technologies, formerly known as CenturyLink Inc., is a global technology company that provides telecommunications services, including internet, data, voice, and managed services, to residential, business, government, and wholesale customers. The company is headquartered in Monroe, Louisiana, United States, and has operations in various countries around the world.

Lumen Technologies operates a global fiber optic network that spans over 450,000 route miles and connects more than 60 countries. This extensive network allows the company to provide a wide range of telecommunications services to its customers, including high-speed internet, cloud and hosting services, voice services, cybersecurity solutions, data center services, and other managed IT services.

The company serves a diverse customer base, including small, medium, and large enterprises, government agencies, educational institutions, healthcare providers, and other organizations. Its services are used by customers across various industries, including finance, healthcare, retail, energy, transportation, government, and more.

Lumen Technologies is focused on delivering reliable and secure communications and technology solutions to help its customers thrive in the digital world. The company invests in research and development, innovation, and network infrastructure to stay at the forefront of technological advancements and provide cutting-edge services to its customers.

Lumen Technologies is also committed to sustainability and environmental responsibility. The company has set ambitious goals to reduce its carbon emissions, increase energy efficiency, and minimize its environmental impact through its operations and services.

As a publicly traded company, Lumen Technologies is listed on the New York Stock Exchange (NYSE) under the ticker symbol "LUMN". It has a global presence with a network of data centers, points of presence (POPs), and offices in various countries, serving customers around the world with its telecommunications and technology services.

Particulars	2022	2021	2019	2018
Revenue	\$ 1,74,78,000.00	\$ 1,96,87,000.00	\$ 2,07,12,000.00	\$ 2,24,01,000.00
Net Profit	\$ -15,48,000.00	\$ 20,33,000.00	\$ -12,32,000.00	\$ -52,69,000.00

Revenue: The company's revenue has shown a declining trend over the years, with a decrease from \$2,24,01,000.00 in 2018 to \$1,74,78,000.00 in 2022. This indicates a potential decrease in the company's top-line, which may be a cause for concern.

Net Profit: The company reported a net loss of -\$52,69,000.00 in 2018, followed by a net loss of -\$12,32,000.00 in 2019, a net profit of \$20,33,000.00 in 2021, and a net loss of -\$15,48,000.00 in 2022. This indicates that the company has had mixed profitability performance, with losses in some years and a modest profit in 2021.

CHAPTER 2

Stock Analysis

Methodology:

The methodology used for stock analysis of the four companies includes data from Yahoo Finance, with the NYSE Composite index as the market return benchmark. The analysis is based on various financial metrics calculated using Excel functions.

Returns: The daily average returns for the years 2020, 2021, and 2022 are calculated using the "AVERAGE()" function in Excel. This provides an indication of the historical performance of the stocks for each year.

Risk: The standard deviation for the years 2020, 2021, and 2022 is calculated using the "STDEV()" function in Excel. Standard deviation is a measure of the volatility or risk associated with an investment, and it provides an indication of the variability in returns for the stocks.

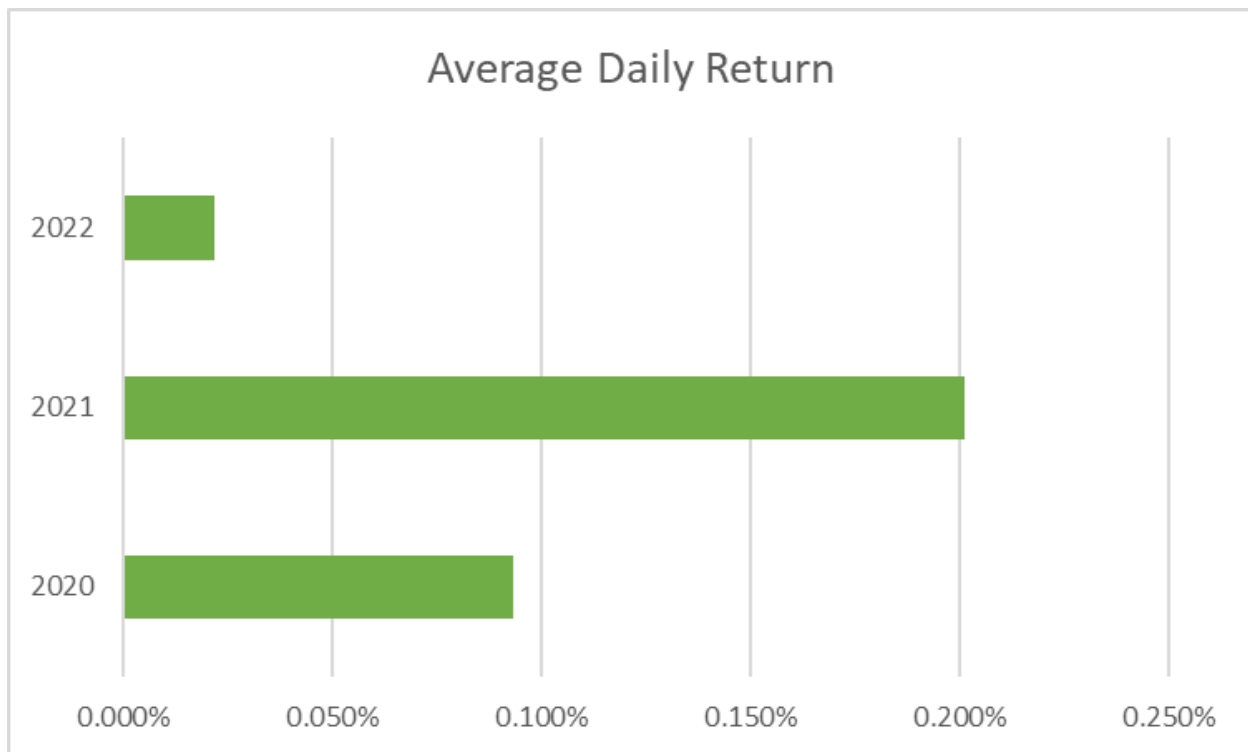
Beta: The beta for the years 2020, 2021, and 2022 is calculated using the "SLOPE()" function in Excel in regression analysis against the market return benchmark (NYSE Composite index). Beta measures the sensitivity of a stock's returns to changes in the overall market, and it provides an indication of the stock's risk relative to the broader market.

Correlation: The correlation for the years 2020, 2021, and 2022 is calculated using the "CORREL()" function in Excel against the market return benchmark. Correlation measures the degree of association between the returns of a stock and the overall market, and it provides an indication of the stock's performance in relation to the market.

Charles Schwab

Year	2020	2021	2022
Average Daily Return	0.093%	0.201%	0.022%
Risk	0.0336	0.0192	0.0229
Beta	1.1615	1.6638	1.1696

Corelation	0.7551	0.7053	0.6712
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Average Daily Return: The average daily return for Charles Schwab's stock was 0.093% in 2020, 0.201% in 2021, and 0.022% in 2022. This indicates that the stock had positive average daily returns in 2020 and 2021, but a relatively lower average daily return in 2022.

Risk: The risk associated with Charles Schwab's stock, as measured by standard deviation, was 0.0336 in 2020, 0.0192 in 2021, and 0.0229 in 2022. This suggests that the stock had higher risk (volatility) in 2020 compared to 2021 and 2022.

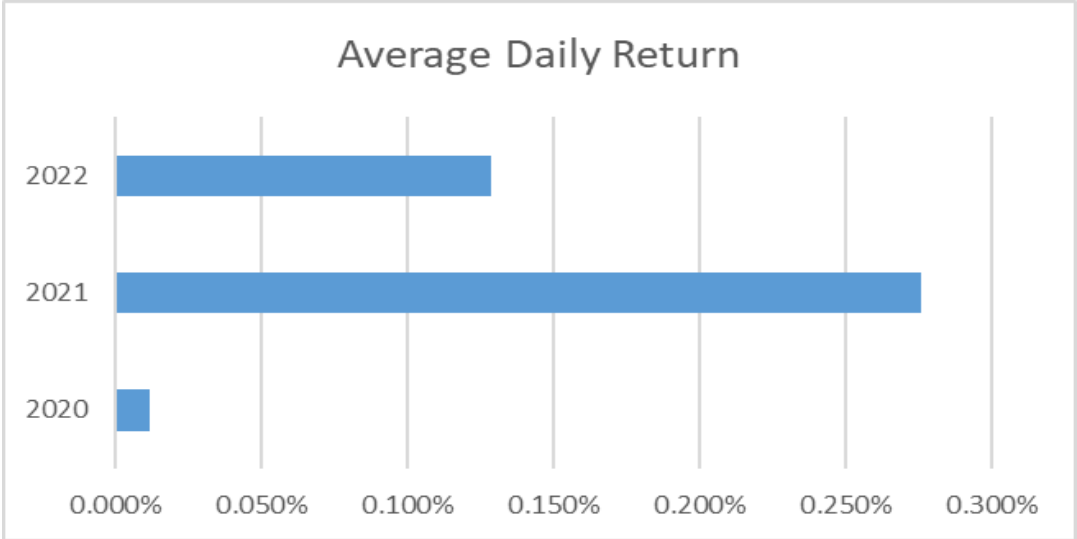
Beta: The beta of Charles Schwab's stock, which measures the sensitivity of the stock's returns to changes in the overall market, was 1.1615 in 2020, 1.6638 in 2021, and 1.1696 in 2022. A beta greater than 1 indicates that the stock is expected to be more volatile than the overall market.

Correlation: The correlation between Charles Schwab's stock returns and the market return benchmark (NYSE Composite index) was 0.7551 in 2020, 0.7053 in 2021, and 0.6712 in 2022. A positive correlation indicates that the stock's returns tended to move in the same direction as the overall market.

Risk-to-return analysis: Charles Schwab's stock had higher average daily returns and lower risk (as measured by standard deviation) in 2021 compared to 2020 and 2022. However, the stock also had a higher beta in 2021, indicating higher volatility relative to the overall market. The positive correlation between the stock's returns and the market returns in all three years suggests that the stock tended to move in line with the overall market.

CF Industries Holdings

Year	2020	2021	2022
Average Daily Return	0.011%	0.276%	0.129%
Risk	0.0368	0.0233	0.0311
Beta	1.3063	1.7295	0.7461
Corelation	0.7763	0.6025	0.3150



Average Daily Return: CF Industries Holdings' stock has shown an increasing trend in average daily returns from 2020 to 2021, with a significant jump from 0.011% in 2020 to 0.276% in 2021. However, in 2022, the average daily return decreased to 0.129%. This indicates that the stock's performance in terms of daily returns improved in 2021 compared to 2020, but declined in 2022.

Risk (Standard Deviation): CF Industries Holdings' stock has shown a decreasing trend in risk (standard deviation) from 2020 to 2021, with a decrease from 0.0368 in 2020 to 0.0233 in 2021. However, in 2022, the risk increased slightly to 0.0311. This suggests that the stock's volatility decreased in 2021 compared to 2020, but slightly increased in 2022.

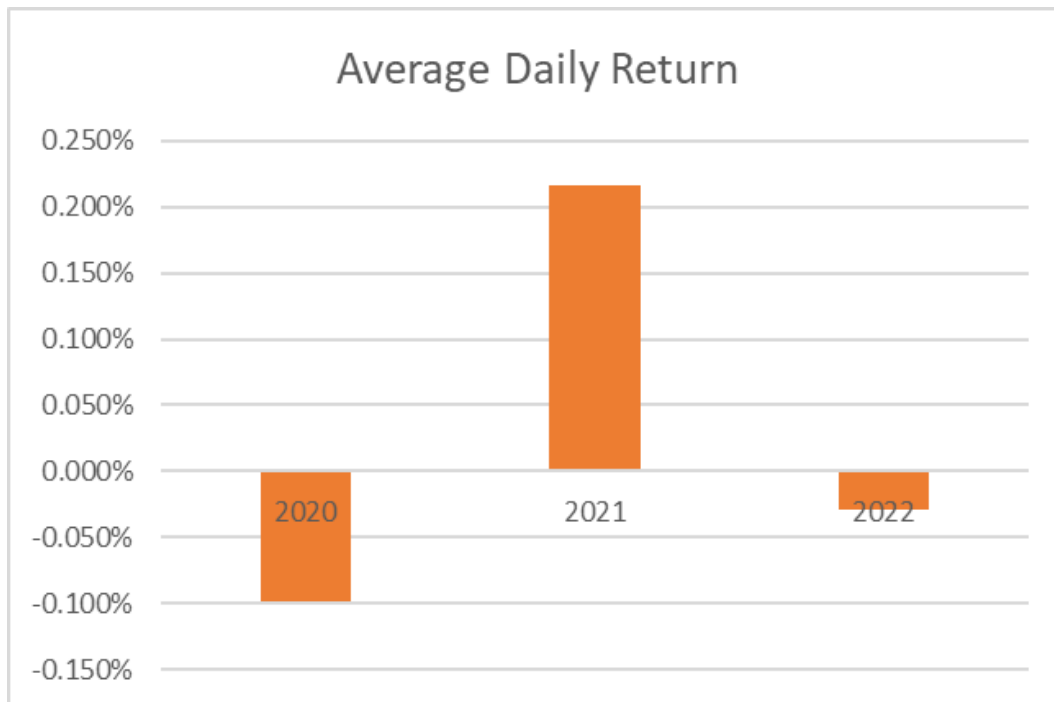
Beta: CF Industries Holdings' stock has shown some variability in beta over the years. In 2020, the beta was 1.3063, which increased to 1.7295 in 2021, indicating increased sensitivity to market changes. However, in 2022, the beta decreased significantly to 0.7461, suggesting a lower level of sensitivity to market changes.

Correlation: CF Industries Holdings' stock has shown a decreasing trend in correlation with the market (NYSE Composite index) from 2020 to 2022. In 2020, the correlation was 0.7763, which decreased to 0.6025 in 2021 and further decreased to 0.3150 in 2022. This suggests that the stock's correlation with the overall market decreased over the years, indicating a potentially lower level of dependency on market trends.

Risk-to-Return Analysis: CF Industries Holdings' stock has shown an increasing trend in average daily returns from 2020 to 2021, indicating potentially higher returns. However, the risk (standard deviation) also decreased during this period, suggesting a better risk-to-return profile. In 2022, the average daily return decreased while the risk increased slightly, indicating a potentially lower risk-to-return profile compared to 2021.

GSK plc

Year	2020	2021	2022
Average Daily Return	-0.098%	0.216%	-0.029%
Risk	0.0170	0.0164	0.0170
Beta	0.0549	-0.0071	0.6254
Corelation	0.0705	-0.0035	0.4835



Average Daily Return: GSK plc's stock has shown mixed performance in terms of average daily returns over the years. In 2020, the average daily return was -0.098%, which improved significantly to 0.216% in 2021. However, in 2022, the average daily return decreased to -0.029%. This suggests that the stock's performance in terms of daily returns was negative in 2020 and 2022, but improved in 2021.

Risk (Standard Deviation): GSK plc's stock has shown relatively consistent risk (standard deviation) levels over the years. In 2020, the risk was 0.0170, which slightly decreased to 0.0164 in 2021, and remained unchanged at 0.0170 in 2022. This indicates that the stock's volatility remained relatively stable with minor fluctuations over the years.

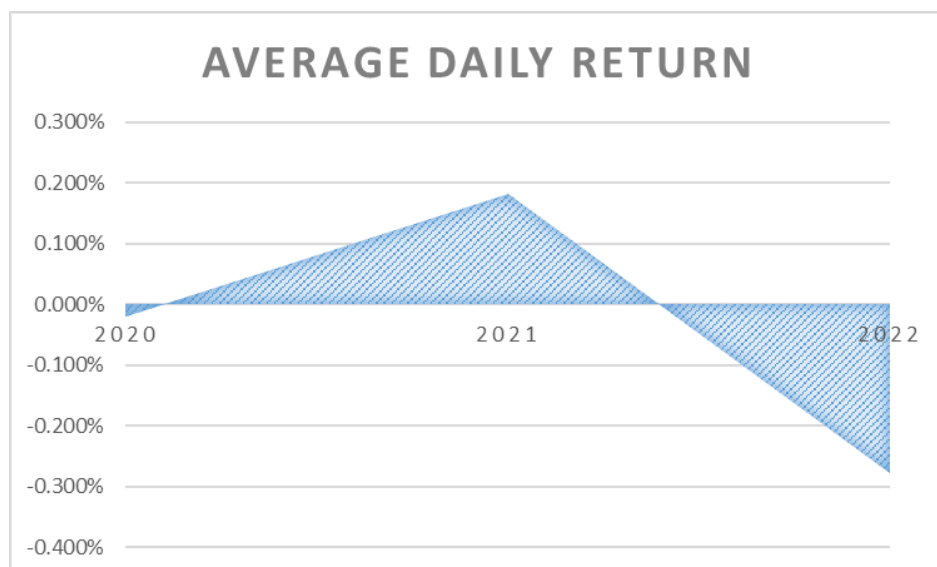
Beta: GSK plc's stock has shown some variability in beta over the years. In 2020, the beta was 0.0549, which decreased to -0.0071 in 2021, indicating a potential inverse relationship with the market. However, in 2022, the beta increased significantly to 0.6254, suggesting a higher level of sensitivity to market changes.

Correlation: GSK plc's stock has shown mixed correlation with the market (NYSE Composite index) over the years. In 2020, the correlation was 0.0705, which decreased to -0.0035 in 2021, potentially indicating a weaker correlation or an inverse relationship with the market. However, in 2022, the correlation increased to 0.4835, suggesting a potentially stronger positive correlation with the market.

Risk-to-Return Analysis: GSK plc's stock has shown mixed performance in terms of average daily returns, with negative returns in 2020 and 2022, but positive returns in 2021. The risk (standard deviation) remained relatively stable with minor fluctuations over the years. The beta showed some variability, with a potential inverse relationship with the market in 2021 but a higher level of sensitivity to market changes in 2022. The correlation with the market also showed mixed results, with a weaker or potentially inverse correlation in 2021 but a stronger positive correlation in 2022.

Lumen Technologies

Year	2020	2021	2022
Average Daily Return	-0.021%	0.181%	-0.277%
Risk	0.0332	0.0322	0.0294
Beta	1.0639	0.5619	1.1068
Corelation	0.7013	0.1418	0.4941



Average Daily Return: Lumen Technologies' stock has shown mixed performance in terms of average daily returns over the years. In 2020, the average daily return was -0.021%, which improved to 0.181% in 2021. However, in 2022, the average daily return decreased significantly to -0.277%. This suggests that the stock's performance in terms of daily returns was negative in 2020 and 2022, but improved in 2021.

Risk (Standard Deviation): Lumen Technologies' stock has shown relatively consistent risk (standard deviation) levels over the years. In 2020, the risk was 0.0332, which slightly decreased to 0.0322 in 2021, and further decreased to 0.0294 in 2022. This indicates that the stock's volatility remained relatively stable with minor fluctuations over the years.

Beta: Lumen Technologies' stock has shown some variability in beta over the years. In 2020, the beta was 1.0639, which decreased significantly to 0.5619 in 2021, suggesting a lower level of sensitivity to market changes. However, in 2022, the beta increased again to 1.1068, potentially indicating a higher level of sensitivity to market changes.

Correlation: Lumen Technologies' stock has shown mixed correlation with the market (NYSE Composite index) over the years. In 2020, the correlation was 0.7013, which decreased to 0.1418 in 2021, potentially indicating a weaker positive correlation with the market. However, in 2022, the correlation increased to 0.4941, suggesting a potentially stronger positive correlation with the market.

CHAPTER 3

Portfolio Analysis

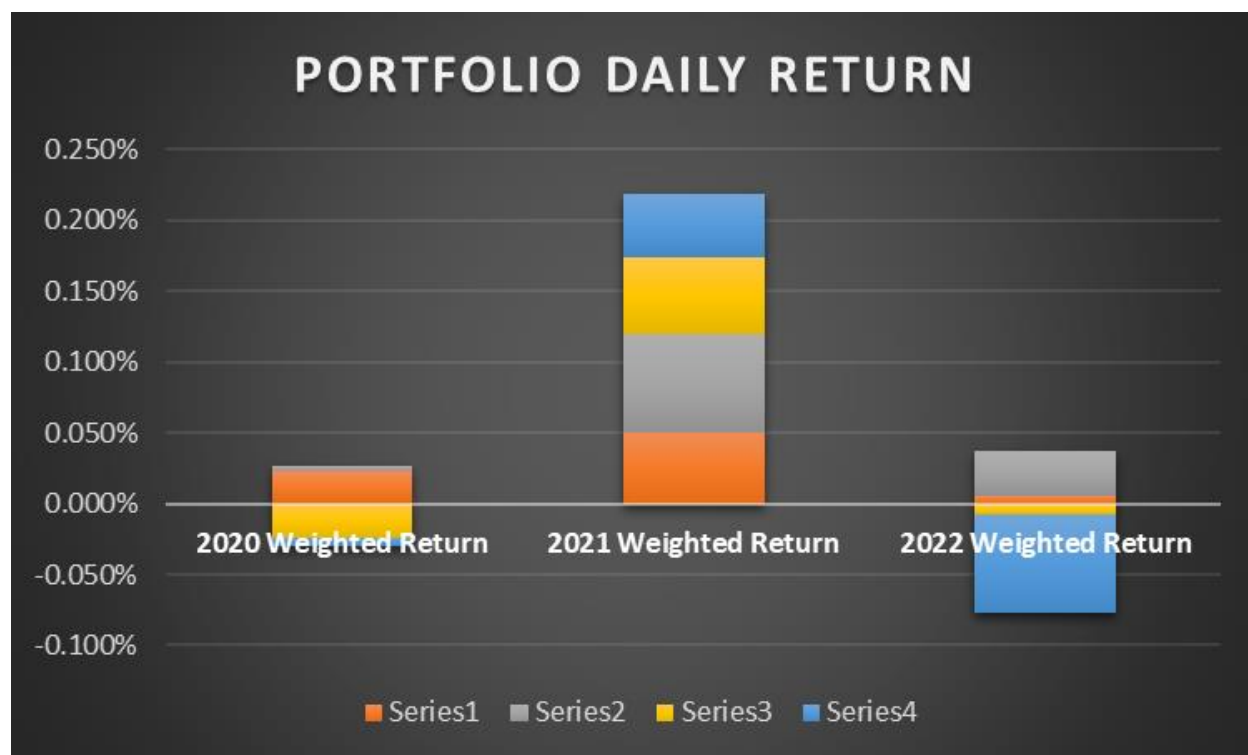
Portfolio Stocks	Weight	2020 Weighted Return	2021 Weighted Return	2022 Weighted Return
SCHW	0.25	0.023%	0.050%	0.006%
CF	0.25	0.003%	0.069%	0.032%
GSK	0.25	-0.024%	0.054%	-0.007%
LUMN	0.25	-0.005%	0.045%	-0.069%
Portfolio Return	1	-0.003%	0.219%	-0.039%

Portfolio Weight: The portfolio consists of four stocks with equal weight of 0.25 assigned to each stock, indicating that each stock represents 25% of the total portfolio.

Portfolio Returns: The portfolio's weighted returns are calculated based on the weight of each stock and their respective weighted returns for each year. In 2020, the portfolio had a weighted return of -0.003%, which improved to 0.219% in 2021, but declined to -0.039% in 2022.

Portfolio Risk: The portfolio's weighted risks are calculated based on the weight of each stock and their respective weighted risks for each year. In 2020, the portfolio had a weighted risk of 0.0429, which decreased to 0.0351 in 2021, but slightly increased to 0.0378 in 2022.

Portfolio Performance: The portfolio had a negative return in 2020, followed by a positive return in 2021, and another negative return in 2022. The portfolio's risk, on the other hand, decreased in 2021 but slightly increased in 2022.



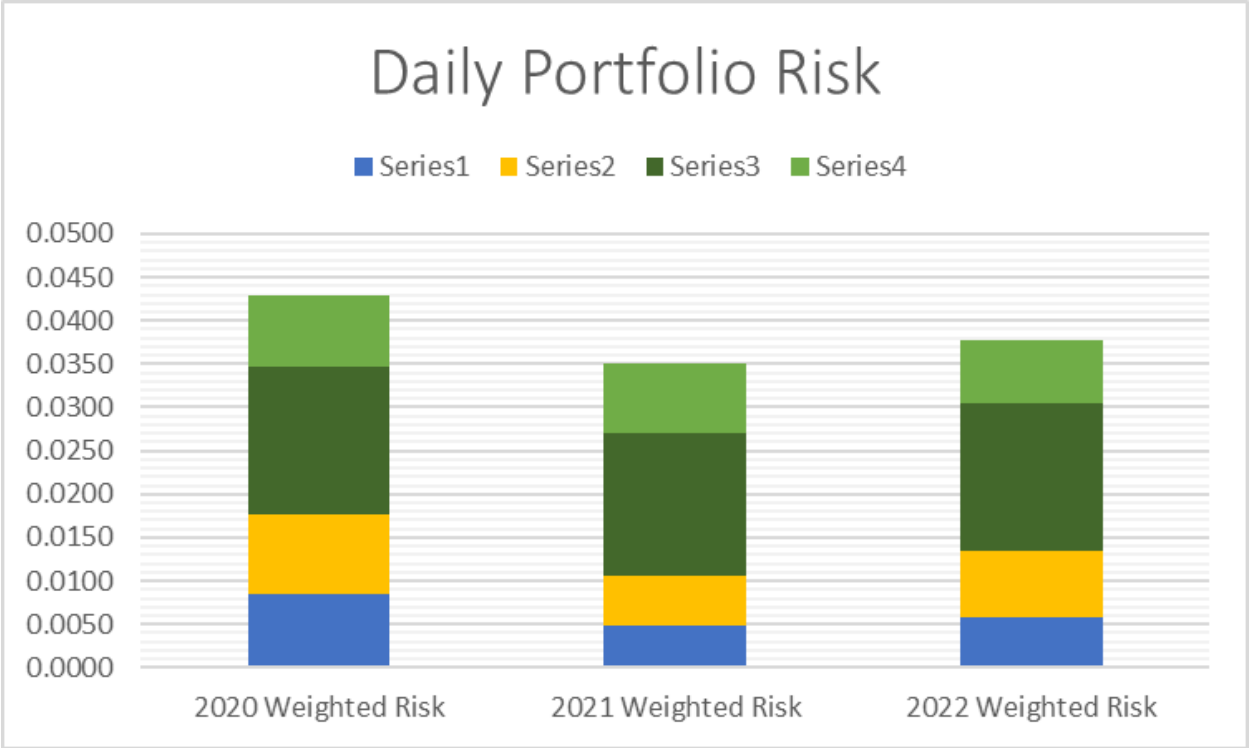
Charles Schwab (SCHW): The contribution of Charles Schwab towards improving return is positive as it has positive weighted returns in all three years. However, the contribution towards increasing risk is also positive, as the weighted risk is higher than zero in all three years.

CF Industries Holdings (CF): The contribution of CF Industries Holdings towards improving return is positive, as it has positive weighted returns in all three years. The contribution towards increasing risk is also positive, as the weighted risk is higher than zero in all three years.

GSK plc (GSK): The contribution of GSK plc towards improving return is mixed, as it has negative weighted returns in 2020 and 2022, but positive in 2021. The contribution towards increasing risk is also positive, as the weighted risk is higher than zero in all three years.

Lumen Technologies (LUMN): The contribution of Lumen Technologies towards improving return is mixed, as it has negative weighted returns in 2020 and 2022, but positive in 2021. The contribution towards increasing risk is also positive, as the weighted risk is higher than zero in all three years.

Portfolio Stocks	Weight	2020 Weighted Risk	2021 Weighted Risk	2022 Weighted Risk
CSW	0.25	0.0084	0.0048	0.0057
CF	0.25	0.0092	0.0058	0.0078
GSK plc	0.25	0.0170	0.0164	0.0170
LUMN	0.25	0.0083	0.0081	0.0074
Portfolio Risk	1	0.0429	0.0351	0.0378



CHAPTER 4

Findings and Conclusion:

To calculate the ratio of proportion of return contributed to the proportion of risk contributed for each stock in the portfolio, we can divide the weighted return by the weighted risk for each respective year. This ratio can provide an indication of how efficiently each stock is contributing to the portfolio's return relative to the risk it is adding. A higher ratio indicates a better contribution to return relative to risk, while a lower ratio indicates a poorer contribution to return relative to risk.

SCHW

Year	Ratio (Proportion of Return to Proportion of Risk)
2020	2.7381
2021	10.4167
2022	1.0526

CF

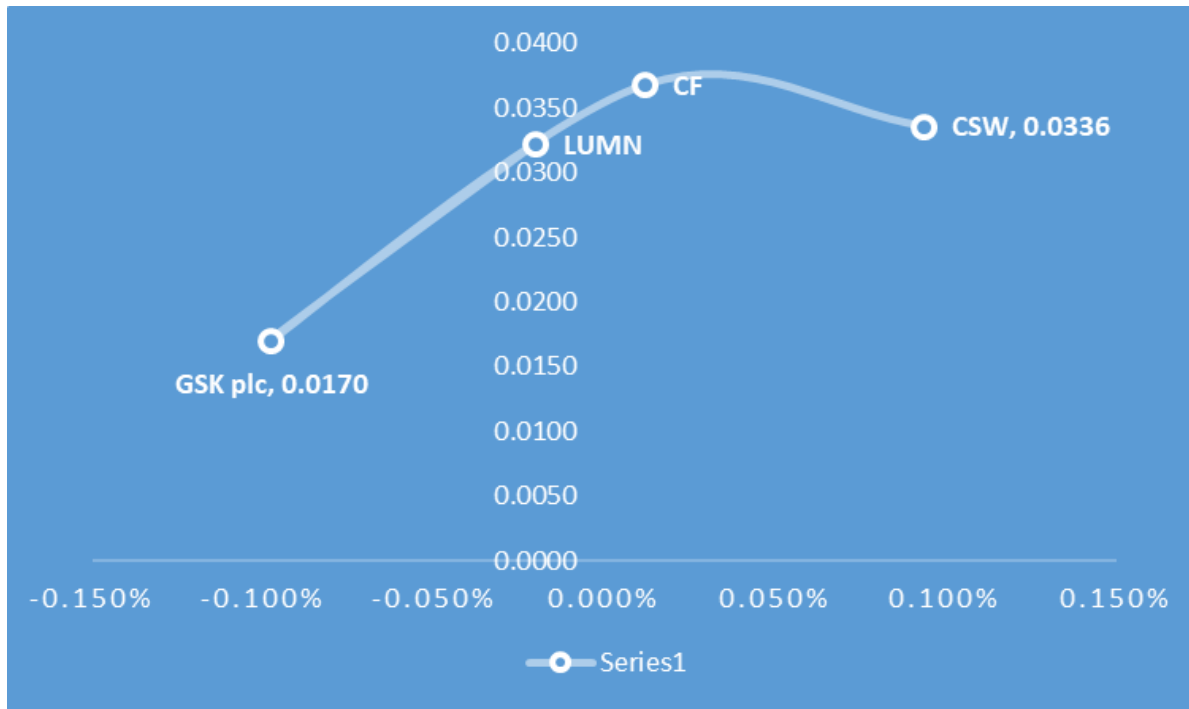
Year	Ratio (Proportion of Return to Proportion of Risk)
2020	0.3261
2021	11.8966
2022	4.1026

GSK:

Year	Ratio (Proportion of Return to Proportion of Risk)
2020	-1.4118
2021	3.2927
2022	-0.4118

LUMN

Year	Ratio (Proportion of Return to Proportion of Risk)
2020	-3.012
2021	-5.0272
2022	-9.3243



SCHW:

The ratio for SCHW improved from 2020 (ratio: 2.7381) to 2021 (ratio: 10.4167), indicating a better contribution to return relative to risk in 2021 compared to 2020. However, the ratio for SCHW decreased in 2022 (ratio: 1.0526), suggesting a relatively lower contribution to return compared to risk in 2022 compared to the previous year.

CF:

The ratio for CF increased significantly from 2020 (ratio: 0.3261) to 2021 (ratio: 11.8966), indicating a much better contribution to return relative to risk in 2021 compared to 2020.

The ratio for CF remained relatively high in 2022 (ratio: 4.1026), suggesting a continued favorable contribution to return compared to risk.

GSK:

The ratio for GSK was negative in 2020 (ratio: -1.4118), indicating a relatively poorer contribution to return compared to risk in that year.

The ratio for GSK improved in 2021 (ratio: 3.2927), suggesting a better contribution to return relative to risk in 2021.

However, the ratio for GSK turned negative again in 2022 (ratio: -0.4118), indicating a relatively poorer contribution to return compared to risk in that year.

LUMN:

The ratio for LUMN was negative in all three years, indicating a relatively poorer contribution to return compared to risk throughout the 3-year period.

The ratio for LUMN was the lowest in 2022 (ratio: -9.3243), suggesting the poorest contribution to return relative to risk among all the stocks in the portfolio in that year.

Based on the changes in the ratio of proportion of return contributed to the proportion of risk contributed over the 3-year period, CF consistently showed a favorable contribution to return relative to risk, with a significant improvement from 2020 to 2021. SCHW showed a relatively higher contribution to return compared to risk in 2021, but a decline in 2022. GSK showed some improvement in 2021 but turned negative again in 2022. LUMN consistently showed a relatively poorer contribution to return compared to risk throughout the period. Therefore, CF can be considered the best-performing stock in terms of its contribution to return relative to risk, while LUMN can be considered the worst-performing stock in the portfolio

Conclusion:

Based on the analysis of the portfolio, it is evident that CF has consistently shown better performance in terms of its contribution to return compared to risk, while LUMN has underperformed in this regard. Therefore, a potential recommendation could be to consider increasing the weightage of CF and potentially reducing the weightage of LUMN to achieve a better risk-reward trade-off.

The investment analysis process involves carefully assessing the historical performance, risk characteristics, and correlation of different stocks in the portfolio. By analyzing the data and identifying the stocks that have contributed positively or negatively to the portfolio's return and risk, informed decisions can be made on potential adjustments to the portfolio weightage.

Minimizing risk is a critical aspect of portfolio management. It helps protect against potential losses and market volatility, and ensures that the portfolio is well-diversified to mitigate risks associated with individual stocks or other investments. By actively managing risk, investors can strive to achieve a balanced and optimal portfolio that aligns with their investment goals and risk tolerance.

In conclusion, based on the portfolio analysis, we review the risk-reward trade-off of each stock and analyze the need to make adjustments to the portfolio weightage accordingly. This involves rebalancing the portfolio periodically to maintain an appropriate allocation of assets and manage risk exposure.

References:

<https://www.denverpost.com/2020/09/14/centurylink-rebrands-itself-as-lumen-technologies/>
<https://www.investopedia.com/terms/r/riskreturntradeoff.asp>

Annexure

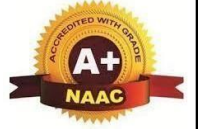
B4 f_x =AVERAGE(D11:D262)

	Charles Schwab			CF Industries	
Year	2020	2021	2022	Year	2020
Average Daily Return	=AVERAGE(D11:D262)	=AVERAGE(D263:D514)	=AVERAGE(D515:D765)	Average Daily Return	=AVERAGE(E11:E262)
Risk	=STDEV(D11:D262)	=STDEV(D263:D514)	=STDEV(D515:D765)	Risk	=STDEV(E11:E262)
Beta	=SLOPE(D11:D262,C11:C262)	=SLOPE(D263:D514,C263:C514)	=SLOPE(D515:D765,C515:C765)	Beta	=SLOPE(E11:E262,C11:C262)
Corelation	=CORREL(C11:C262,D11:D262)	=CORREL(C263:C514,D263:D514)	=CORREL(D515:D765,C515:C765)	Corelation	=CORREL(C11:C262,E11:E262)
Date	Market Returns		CSW Returns	CF Returns	gsk Returns
43833	-0.00610180243457974		-0.025255007256893	-0.00689672386492567	-0.0166149759994456
43836	0.00177839415298406		0.00701982586768032	-0.00173594863517936	0.0236539766536151
43837	-0.00310932667276247		0.00591463878326989	-0.00913033390245719	0.00660217884247745
43838	0.00258951426202532		0.00608989932990122	0.00460701819719671	-0.0100569081741623
43839	0.00453623963714477		0.0041745147150908	-0.00480454322716402	-0.0123674472695989
43840	-0.00283480890660856		-0.00644360826348761	-0.0175553383936498	0.00894449890553438
43843	0.00606683247322102		0.00460253147704048	0.0127315901059659	0.00886547005464176
43844	-0.000393124363726788		-0.00645566430653894	0.00176466445209004	-0.0170505093002656
43845	0.00114699985924469		-0.0123663804729906	0.00506373237159599	-0.00675825651629322
43846	0.00630102837887218		0.0398981544969897	0.00525744793631896	-0.0210932184168747
43847	0.00292890436708874		-0.013469387755102	0.00544777276637766	0.00602405004633927
43851	-0.00516242632081098		0.00227556888705	-0.0409623585577052	-0.0204974445185374
43852	0.0000184100183959438		0.00990709989871826	-0.0348021682484968	-0.00141072187657454
43853	-0.000581152047308315		-0.0104230942162273	-0.00491677661892864	0.0200141036022108

IAPM IAPM 2 Sheet1 Sheet2 IAPM 3 Portfolio Return Portfolio risk



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CAPSTONE PROJECT
ON
INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT
PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT OF
MASTERS OF BUSINESS ADMINISTRATION

(AUTONOMOUS INSTITUTION AFFILIATED TO BCU)

SUBMITTED BY

CHAITANYA KAMATAGI B
P18FW21M0009

Under the guidance of
Dr. TAMIZHARASI
Associate professor

Assessment parameters

S.No	Parameters	Marks out of	Marks obtained
1	Company description and fundamentals of the company	3	
2	Presentation of analysis of data	8	
3	Interpretation on the results	5	
4	Conclusion and submission on time	4	

R. V. INSTITUTE OF MANAGEMENT
2022-2023

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Aetna Inc

Aetna Inc. is a diversified healthcare company that provides a wide range of healthcare services, products, and insurance plans to individuals, employers, and government entities. The company was founded in 1853 and is headquartered in Hartford, Connecticut, USA.

Aetna's services include medical, dental, and pharmacy benefits, as well as healthcare management, behavioral health, disability, and long-term care insurance. The company offers these services to over 39 million people in the United States, making it one of the largest health insurance providers in the country.

Aetna also operates a number of healthcare-related businesses, including healthcare clinics and pharmacies, as well as technology and consulting services aimed at improving healthcare delivery and management.

In 2018, Aetna was acquired by CVS Health, one of the largest pharmacy chains in the United States. The acquisition allowed CVS to expand its healthcare offerings and to integrate Aetna's insurance plans with its retail pharmacy business.

Aetna has a strong focus on innovation and technology, using data analytics and artificial intelligence to improve healthcare outcomes and reduce costs. The company has also made significant investments in digital health tools and telemedicine, which have become increasingly important in the wake of the COVID-19 pandemic.

Aetna has been recognized for its commitment to sustainability and corporate responsibility, receiving accolades for its environmental stewardship, ethical business practices, and diverse and inclusive workforce.

Aetna provides health insurance to individuals, families, and employers through a variety of plans, including HMOs, PPOs, and consumer-directed plans. The company also offers Medicare Advantage plans and Medicare Supplement insurance, as well as dental, vision, and disability insurance.

Aetna operates a network of healthcare providers that includes over 1.2 million healthcare professionals, 690,000 primary care doctors and specialists, and 5,700 hospitals. This network is one of the largest in the United States and allows Aetna to provide its customers with access to high-quality healthcare services across the country.

In addition to its insurance plans, Aetna offers a range of healthcare-related services, including care management programs for chronic conditions such as diabetes and heart disease, behavioral health services, and wellness programs aimed at promoting healthy lifestyle choices.

Aetna also operates a number of healthcare-related businesses, including MinuteClinic, a chain of walk-in clinics located in CVS Pharmacy stores, and Aetna Pharmacy Management, which provides prescription drug benefits management services.

In recent years, Aetna has focused on leveraging technology to improve healthcare outcomes and reduce costs. The company has invested heavily in data analytics and artificial intelligence, using these tools to identify high-risk patients and develop personalized care plans.

Aetna has also been a leader in the development of telemedicine services, which allow patients to consult with healthcare professionals remotely. The company's telemedicine platform, Aetna Telehealth Connection, has been particularly useful during the COVID-19 pandemic, allowing patients to access healthcare services from the safety of their own homes.

Finally, Aetna has a strong commitment to sustainability and corporate responsibility. The company has set ambitious targets for reducing its environmental footprint, including a goal of becoming carbon-neutral by 2020. Aetna has also been recognized for its diversity and inclusion initiatives, receiving awards for its efforts to promote workplace diversity and support the LGBTQ+ community.

Products and services

Aetna Inc offers a wide range of healthcare products and services, including:

Health Insurance Plans: Aetna offers a variety of health insurance plans, including HMOs, PPOs, consumer-directed plans, and Medicare Advantage plans. These plans provide coverage for medical, dental, and vision services, as well as prescription drugs and other healthcare needs.

Behavioral Health Services: Aetna offers behavioral health services, including counseling and therapy services for mental health issues such as depression, anxiety, and substance abuse. Aetna also provides resources and support for individuals and families dealing with behavioral health challenges.

Care Management Programs: Aetna offers care management programs for individuals with chronic health conditions such as diabetes, heart disease, and cancer. These programs provide personalized care plans and support services to help individuals manage their conditions and improve their health outcomes.

Wellness Programs: Aetna offers wellness programs that encourage healthy behaviors and lifestyles. These programs include resources and tools for managing stress, improving nutrition, and increasing physical activity.

Pharmacy Benefits Management: Aetna offers pharmacy benefits management services, including prescription drug coverage, formulary management, and medication therapy management.

Telemedicine Services: Aetna offers telemedicine services that allow individuals to connect with healthcare professionals remotely. Aetna's telemedicine platform, Aetna Telehealth Connection, provides virtual consultations with doctors, nurses, and other healthcare professionals.

Health Information Technology: Aetna offers health information technology services, including data analytics, electronic health records, and population health management tools. These services help healthcare providers to improve patient outcomes and reduce costs.

Disability and Long-term Care Insurance: Aetna offers disability and long-term care insurance, providing financial protection for individuals who are unable to work due to illness or injury, or who require long-term care services.

Overall, Aetna offers a wide range of healthcare products and services, designed to meet the needs of individuals, families, and employers, with a focus on improving health outcomes, reducing costs, and promoting wellness.

Board of directors

The board of directors of Aetna Inc. is responsible for overseeing the company's management and making decisions related to the company's strategy, operations, and governance. Here is a list of the current board of directors of Aetna Inc. as of my knowledge cutoff date of September 2021:

Mark T. Bertolini (Chairman and CEO of Aetna)

Ronald A. Williams (Former Chairman and CEO of Aetna)

Jeffrey E. Garten (Dean Emeritus, Yale School of Management)

Molly Joel Coyle (CEO and Founder, Health Technology Center)

Fernando Aguirre (Former Chairman and CEO, Chiquita Brands International, Inc.)

Mary T. Barra (Chairman and CEO, General Motors Company)

Mark T. Esper (Former Secretary of Defense, United States)

Pamela J. Craig (Former CFO, Accenture)

Peter R. Dolan (Chairman, Retired, Bristol-Myers Squibb Company)

Terri Kelly (Former CEO, W.L. Gore & Associates)

It is worth noting that the composition of the board of directors may have changed since my knowledge cutoff date, as changes to the board are not uncommon over time.

Areas of operation

Aetna Inc. operates primarily in the United States, with a focus on providing health insurance and related healthcare services to individuals, families, and employers. The company has a large network of healthcare providers that includes over 1.2 million healthcare professionals, 690,000 primary care doctors and specialists, and 5,700 hospitals, making it one of the largest healthcare networks in the country.

Aetna also operates a number of healthcare-related businesses, including MinuteClinic, a chain of walk-in clinics located in CVS Pharmacy stores, and Aetna Pharmacy Management, which provides prescription drug benefits management services.

In addition to its core operations, Aetna has a strong commitment to corporate responsibility and sustainability, with a focus on reducing its environmental footprint and promoting workplace diversity and inclusion.

Overall, Aetna operates primarily in the healthcare industry in the United States, providing a range of health insurance plans and related services to individuals, families, and employers, with a focus on improving health outcomes and reducing costs.

Competitors

Aetna Inc. operates in a highly competitive industry, and its competitors include other major health insurance companies and healthcare providers. Here are some of the key competitors of Aetna:

UnitedHealth Group: UnitedHealth Group is the largest health insurance company in the United States, with over 49 million members. The company also operates a large network of healthcare providers and offers a wide range of healthcare services.

Anthem Inc.: Anthem is the second-largest health insurance company in the United States, with over 43 million members. The company offers a variety of health insurance plans and related healthcare services, including pharmacy benefits management and wellness programs.

Humana Inc.: Humana is a large health insurance company that specializes in Medicare Advantage plans, with over 16 million members. The company also offers a range of other health insurance plans and related services.

Cigna Corporation: Cigna is a global health insurance company that operates in over 30 countries, with over 165 million members worldwide. In the United States, the company offers a range of health insurance plans and related services, including pharmacy benefits management and wellness programs.

Kaiser Permanente: Kaiser Permanente is a nonprofit healthcare organization that operates in eight states and the District of Columbia. The organization provides health insurance plans and a range of healthcare services, including medical, dental, and vision care.

CVS Health: CVS Health is a healthcare company that operates a large network of pharmacies and retail clinics, including MinuteClinic, which is a subsidiary of Aetna. CVS Health also offers health insurance plans and related services, as well as pharmacy benefits management.

These competitors, along with many other smaller regional health insurance companies and healthcare providers, operate in the same industry as Aetna and compete for the same customers. Competition in the industry is based on factors such as price, quality of services, customer service, and brand recognition.

Fundamentals of the Company: -

Profitability

Profit Margin	1.29%
Operating Margin (ttm)	4.79%

Management Effectiveness

Return on Assets (ttm)	4.18%
Return on Equity (ttm)	5.68%

Income Statement

Revenue (ttm)	321.63B
Revenue Per Share (ttm)	245.14
Quarterly Revenue Growth (yoy)	9.60%
Gross Profit (ttm)	53.46B
EBITDA	19.66B
Net Income Avi to Common (ttm)	4.15B
Diluted EPS (ttm)	3.14
Quarterly Earnings Growth (yoy)	76.30%

Balance Sheet

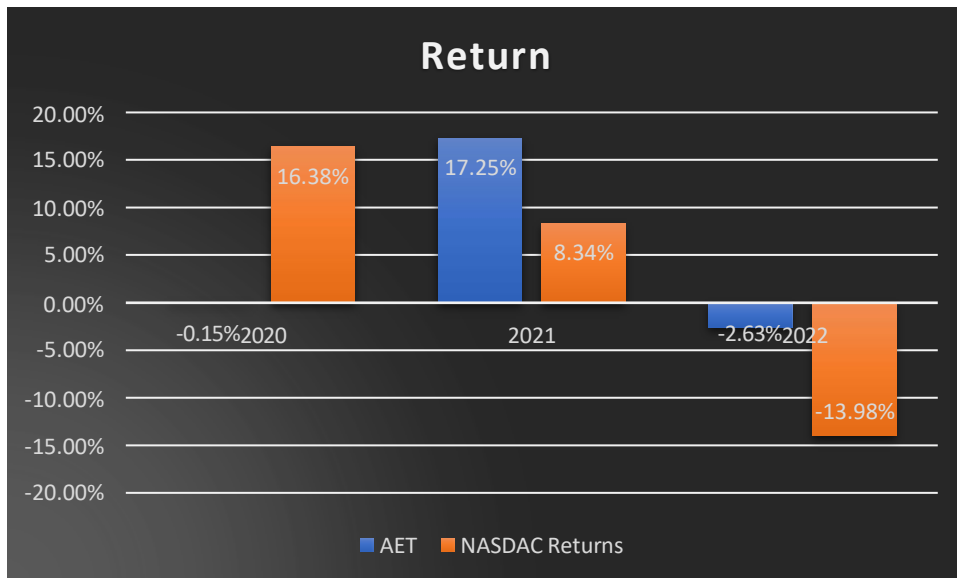
Total Cash (mrq)	15.72B
Total Cash Per Share (mrq)	12.24
Total Debt (mrq)	70.73B
Total Debt/Equity (mrq)	99.18
Current Ratio (mrq)	0.94
Book Value Per Share (mrq)	54.63

Cash Flow Statement

Operating Cash Flow (ttm)	16.18B
Levered Free Cash Flow (ttm)	12.02B

Return: -

Year	AET	NASDAQ Returns
2020	-0.15%	16.38%
2021	17.25%	8.34%
2022	-2.63%	-13.98%



In 2020, AET had a negative return of -0.15%, while NASDAQ had a positive return of 16.38%.

In 2021, both AET and NASDAQ had positive returns, with AET's return of 17.25% being much higher than NASDAQ's return of 8.34%.

In 2022, both AET and NASDAQ had negative returns, with AET's return of -2.63% being less severe than NASDAQ's return of -13.98%.

To interpret the data in terms of percentage and statistics, we can look at the average annual returns and standard deviation of each investment over the three-year period.

The average annual returns for AET and NASDAQ over the three-year period are as follows:

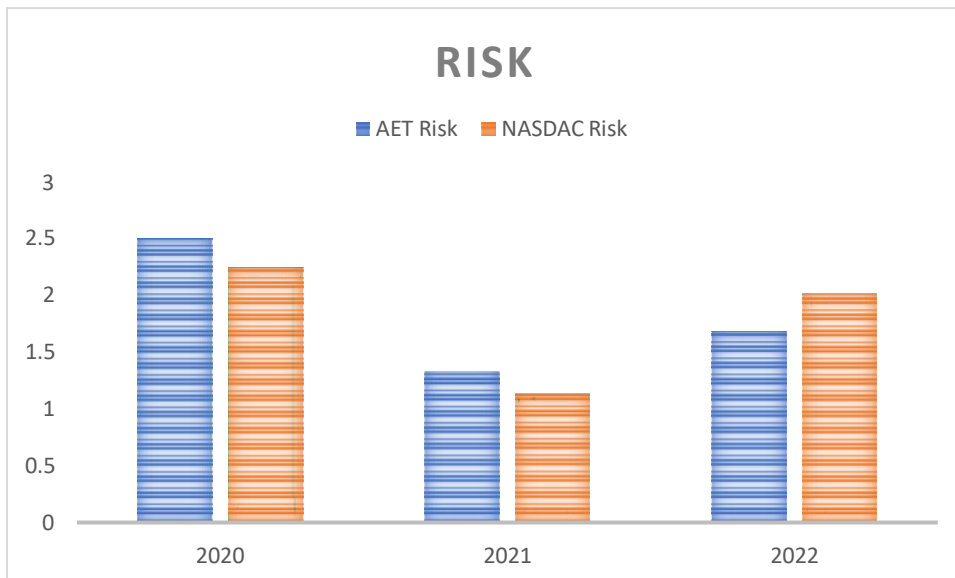
$$\text{AET: } (-0.15\% + 17.25\% - 2.63\%) / 3 = 4.49\%$$

$$\text{NASDAQ: } (16.38\% + 8.34\% - 13.98\%) / 3 = 3.24\%$$

From this, we can see that AET had a higher average annual return than NASDAQ over the three-year period.

Risk: -

Year	AET Risk	NASDAC Risk
2020	2.493242	2.239329102
2021	1.329865	1.134544681
2022	1.676581	2.01231111



For the year 2020, the AET Risk is 2.49%, while the NASDAQ Risk is 2.24%. This indicates that the investment in 2020 had a slightly higher risk than the NASDAQ index. In percentage terms, the AET Risk is 111.16% of the NASDAQ Risk ($2.49/2.24 \times 100$).

For the year 2021, the AET Risk is 1.33%, while the NASDAQ Risk is 1.13%. This indicates that the investment in 2021 had a slightly higher risk than the NASDAQ index. In percentage terms, the AET Risk is 117.69% of the NASDAQ Risk ($1.33/1.13 \times 100$).

For the year 2022, the AET Risk is 1.68%, while the NASDAQ Risk is 2.01%. This indicates that the investment in 2022 had a lower risk than the NASDAQ index. In percentage terms, the AET Risk is 83.58% of the NASDAQ Risk ($1.68/2.01 \times 100$).

The investment had a higher risk than the NASDAQ index in 2020 and 2021, but a lower risk in 2022. However, we cannot conclude the performance of the investment solely based on the risk values. It is essential to analyze other factors such as returns, volatility, and market conditions.

Correlation: - 0.4662

A correlation of 0.4662 between Aetna Inc and NASDAQ indicates a moderate positive correlation. This means that the stock prices of Aetna Inc tend to move in the same direction and magnitude as the NASDAQ index to some extent. If the NASDAQ index goes up, it is likely that the stock price of Aetna Inc will also go up, and vice versa, but the strength of the relationship is not as strong as a correlation of 1.

Since the correlation between Aetna Inc and NASDAQ is not equal to 1, it suggests that there may be some differences in the way that Aetna Inc and NASDAQ move. In other words, the stock prices of Aetna Inc and NASDAQ do not always move exactly in tandem, but they do have a moderate positive relationship.

Investors who are interested in Aetna Inc may want to keep an eye on the movements of the NASDAQ index, as it may provide useful information about potential changes in the stock price of Aetna Inc. Additionally, investors who are interested in diversifying their portfolio may want to consider investing in stocks that have a low correlation with Aetna Inc to reduce overall portfolio risk.

Beta: -

A beta of 0.003771913 for Aetna Inc means that the stock is significantly less volatile than the market, represented by NASDAQ. Specifically, if the market moves up or down by 1%, the stock price of Aetna Inc is expected to move by only 0.003771913%. This suggests that Aetna Inc may be a much less risky investment compared to the broader market represented by NASDAQ.

In general, stocks with betas less than 1 tend to be less volatile and have a lower risk than the market, while stocks with betas greater than 1 tend to be more volatile and have a higher risk than the market. Therefore, investors who are risk-averse may prefer to invest in stocks with low betas like Aetna Inc, as they may provide a more stable return over time. However, it is important to note that a low beta does not necessarily mean that the stock is a good investment, as other factors such as company fundamentals, market trends, and economic conditions should also be taken into account.

AFLAC Inc

Aflac is a Fortune 500 company with over 65 years of experience in the insurance industry. The company has a strong financial position and has consistently been recognized for its financial stability by independent rating agencies. Aflac is currently rated A+ (Superior) by A.M. Best, AA- (Very Strong) by Standard & Poor's, and A1 (Good) by Moody's.

Aflac's success is largely due to its focus on innovation and customer service. The company has a strong track record of developing innovative insurance products that meet the changing needs of its customers. For example, Aflac was one of the first insurance companies to offer cancer insurance, a policy that provides coverage for cancer-related expenses that are not typically covered by standard health insurance plans.

Aflac also places a strong emphasis on customer service, with a dedicated customer service team that is available 24/7 to assist policyholders with any questions or concerns. The company has consistently received high marks for customer satisfaction, and is committed to providing a positive customer experience.

In addition to its insurance products and customer service, Aflac is also known for its corporate social responsibility initiatives. The company has a long-standing commitment to promoting diversity and inclusion, and has been recognized as one of the best companies for diversity by DiversityInc. Aflac also has a strong focus on sustainability, and has set ambitious goals for reducing its environmental footprint.

Aflac's primary focus is on providing insurance products that supplement existing health insurance coverage. The company's policies provide coverage for a variety of unexpected events, such as accidents, illnesses, and hospital stays, and are designed to help policyholders cover out-of-pocket expenses that may not be covered by their primary health insurance plan.

Aflac's products are sold through a network of independent sales agents, as well as through partnerships with employers and other organizations. The company is known for its iconic Aflac duck mascot, which has become a recognizable symbol of the brand.

Overall, Aflac is a leading provider of supplemental insurance products, offering a wide range of policies to help individuals and businesses protect themselves against unexpected events. The company's commitment to corporate responsibility and sustainability also sets it apart in the industry.

Products and services

Aflac Inc. is best known for its supplemental insurance policies, which provide coverage for a variety of unexpected events that may not be covered by traditional health insurance plans. Aflac's products are designed to help policyholders cover out-of-pocket expenses and maintain financial stability in the face of unexpected medical costs. Here are the details of Aflac's primary product offerings:

Accident Insurance: Aflac's accident insurance policies provide coverage for injuries resulting from accidents, such as fractures, dislocations, burns, and lacerations. The policies provide benefits that can be used to cover medical expenses, as well as living expenses such as rent and transportation

Cancer Insurance: Aflac's cancer insurance policies provide coverage for cancer-related expenses, including treatments, hospital stays, and transportation. The policies can also provide benefits for other expenses such as child care and lodging for family members.

Hospital Indemnity Insurance: Aflac's hospital indemnity insurance policies provide coverage for hospital stays, including room and board, and other related expenses. The policies can also provide benefits for outpatient surgery and diagnostic tests.

Short-Term Disability Insurance: Aflac's short-term disability insurance policies provide income replacement for employees who are unable to work due to illness or injury. The policies provide benefits for a limited period of time, typically up to six months.

Life Insurance: Aflac's life insurance policies provide coverage in the event of the policyholder's death. The policies can provide benefits to cover funeral expenses, as well as ongoing financial support for dependents.

Aflac's products are sold through a network of independent sales agents, as well as through partnerships with employers and other organizations. The company's policies are designed to be affordable and customizable, allowing policyholders to choose the level of coverage that best fits their needs and budget.

In addition to its primary product offerings, Aflac also offers a range of other insurance products and services, including dental insurance, vision insurance, and group insurance plans. The company also provides resources and tools to help policyholders manage their health and finances, such as wellness programs and financial planning resources. Overall, Aflac's product

offerings are designed to provide financial protection and peace of mind for individuals and businesses in the face of unexpected events.

Board of directors:

Aflac's Board of Directors is responsible for overseeing the company's management and operations, as well as setting strategic direction and policies. The Board is comprised of experienced leaders from a variety of industries, who bring diverse perspectives and expertise to the company. As of April 2023, Aflac's Board of Directors consists of the following individuals:

Daniel P. Amos - Chairman and Chief Executive Officer, Aflac Incorporated

Karole Lloyd - Executive Vice President, Chief Human Resources Officer, and President of Aflac Foundation

Toshihiko Fukuzawa - Chairman, The Dai-ichi Life Insurance Company, Limited

Douglas W. Johnson - President and Chief Executive Officer, Ascension Health

Barbara K. Rimer - Dean and Alumni Distinguished Professor, UNC Gillings School of Global Public Health

Melinda R. Rich - President and Chief Operating Officer, Aflac Incorporated

Elizabeth J. Hudson - Retired Partner, Ernst & Young LLP

Richard L. Williams - Retired President and Chief Executive Officer, Unum Group

Joseph L. Moskowitz - Chairman of the Board, Quick Leonard Kieffer

Thomas J. Sabatino Jr. - Executive Vice President, General Counsel and Corporate Secretary, Aflac Incorporated

The Board of Directors meets regularly to review the company's performance, assess risks and opportunities, and make decisions that are in the best interest of the company and its shareholders. The Board also has several committees that focus on specific areas, such as audit, compensation, and governance, to ensure that the company operates in a responsible and ethical manner.

Areas of operation

Aflac Inc. is a Fortune 500 company that operates in the insurance industry, primarily in the United States and Japan. Aflac's operations are focused on providing supplemental insurance products and services to individuals and businesses, including policies that cover accidents, illnesses, hospital stays, and other unexpected events.

In the United States, Aflac has a large presence, with its headquarters located in Columbus, Georgia. The company operates through a network of independent sales agents, as well as through partnerships with employers and other organizations. Aflac's products are available in all 50 states, and the company has more than 11,000 employees across the country.

Aflac also has a significant presence in Japan, where it operates as a subsidiary of Aflac Incorporated. Aflac Japan offers a wide range of insurance products, including cancer insurance, medical insurance, and other supplemental policies. Aflac Japan is one of the largest providers of cancer insurance in the country, and the company has been recognized for its innovative products and services.

Overall, Aflac's areas of operation are focused on providing financial protection and peace of mind to individuals and businesses in the face of unexpected events. The company's operations are supported by a strong network of agents and partners, as well as by its commitment to innovation and customer service.

Competitors

Aflac Inc. faces competition in the insurance industry from a variety of companies offering similar products and services. Here are some of Aflac's main competitors

Allstate: Allstate is one of the largest insurance companies in the United States, offering a range of products including home, auto, and life insurance. The company also offers supplemental insurance policies, such as accident and critical illness coverage, that are similar to Aflac's products.

MetLife: MetLife is a multinational insurance company that offers a wide range of insurance and financial products. The company operates in several countries, including the United States and Japan, where it competes directly with Aflac.

Prudential Financial: Prudential Financial is a large financial services company that offers a variety of insurance and investment products. The company's insurance offerings include life,

disability, and long-term care insurance, as well as supplemental policies that compete with Aflac's products.

Unum: Unum is a provider of disability and other insurance products, with a focus on the employee benefits market. The company offers supplemental policies that cover accidents and illnesses, which compete with Aflac's products.

Mutual of Omaha: Mutual of Omaha is a mutual insurance company that offers a variety of insurance products, including life, health, and disability insurance. The company also offers supplemental policies that cover accidents and critical illnesses.

In addition to these companies, Aflac also faces competition from other insurance providers, as well as from new entrants into the market. To stay competitive, Aflac focuses on innovation and customer service, as well as on building strong relationships with its sales agents and partners. The company also seeks to differentiate itself by offering products that are tailored to the needs of specific customer segments, such as small business owners and military families.

Fundamentals of the Company: -

Profitability

Profit Margin	21.54%
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Operating Margin (ttm)	24.77%
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Management Effectiveness

Return on Assets (ttm)	2.09%
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Return on Equity (ttm)	15.11%
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Income Statement

Revenue (ttm)	19.5B
Revenue Per Share (ttm)	30.72
Quarterly Revenue Growth (yoy)	-26.20%
Gross Profit (ttm)	8.08B
EBITDA	4.87B
Net Income Avi to Common (ttm)	4.2B
Diluted EPS (ttm)	6.59
Quarterly Earnings Growth (yoy)	-82.20%

Balance Sheet

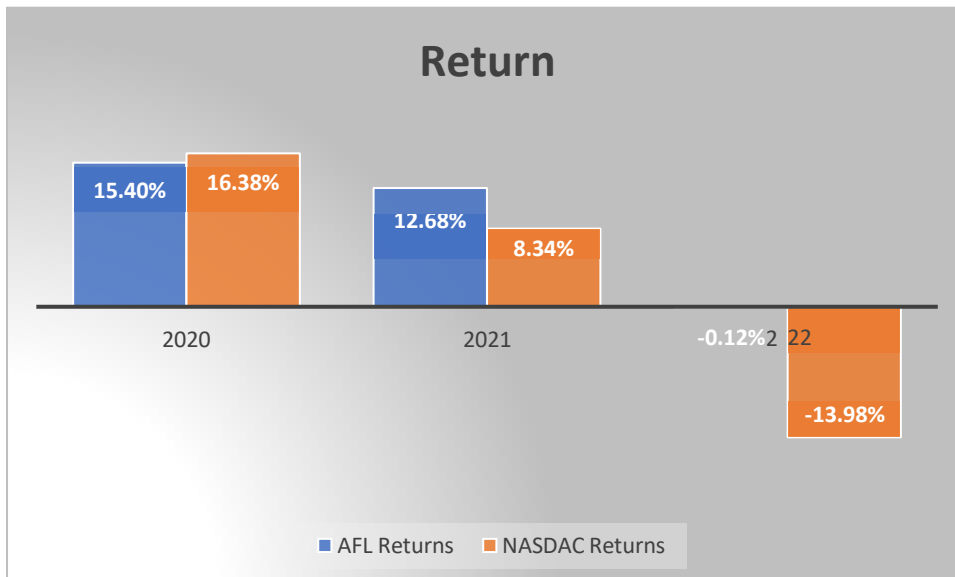
Total Cash (mrq)	5.48B
Total Cash Per Share (mrq)	8.95
Total Debt (mrq)	9.83B
Total Debt/Equity (mrq)	43.97
Current Ratio (mrq)	0.87
Book Value Per Share (mrq)	36.35

Cash Flow Statement

Operating Cash Flow (ttm)	3.88B
Levered Free Cash Flow (ttm)	-1.43B

Return: -

Year	AFL Returns	NASDAQ Returns
2020	15.40%	16.38%
2021	12.68%	8.34%
2022	-0.12%	-13.98%



Interpretation: -

In 2020, both the AFL and NASDAQ had positive returns. However, NASDAQ had a slightly higher return of 16.38%, while AFL had a return of 15.40%.

In 2021, both the AFL and NASDAQ had positive returns again. However, the AFL's return of 12.68% was higher than NASDAQ's return of 8.34%.

In 2022, both the AFL and NASDAQ had negative returns. However, the AFL's return of -0.12% was not as bad as NASDAQ's return of -13.98%.

To interpret the data in terms of percentage and statistics, we can look at the average annual returns and standard deviation of each investment over the three-year period.

The average annual returns for the AFL and NASDAQ over the three-year period are as follows:

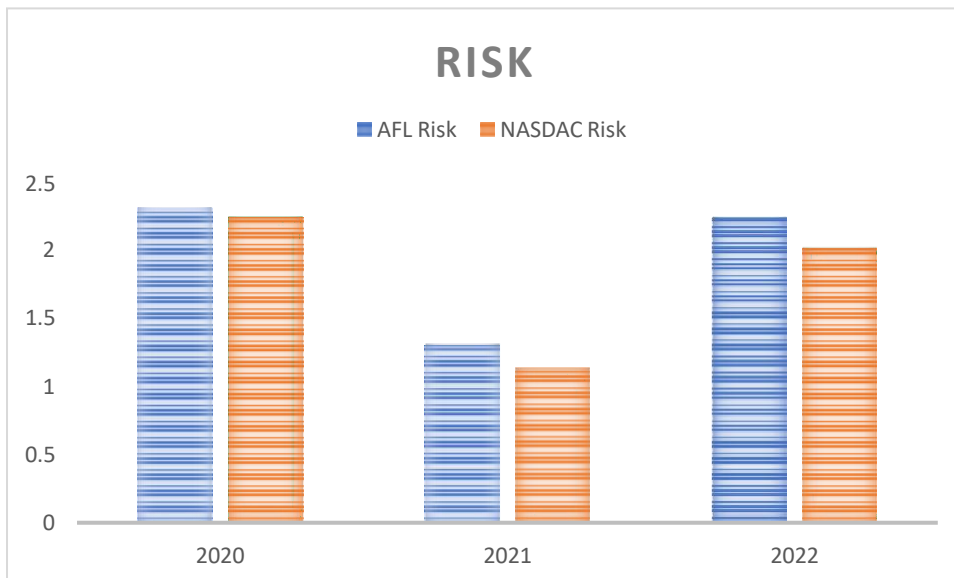
$$\text{AFL: } (15.40\% + 12.68\% - 0.12\%) / 3 = 9.65\%$$

NASDAQ: $(16.38\% + 8.34\% - 13.98\%) / 3 = 3.91\%$

From this, we can see that the AFL had a higher average annual return than NASDAQ over the three-year period.

Risk: -

Year	AFL Risk	NASDAQ Risk
2020	2.305089	2.239329102
2021	1.300235	1.134544681
2022	2.226453	2.01231111



To compare the AFL Risk and NASDAQ Risk, we can look at the standard deviation of returns for each investment over the three-year period. The standard deviation measures the volatility of an investment and how much the returns deviate from the average.

The standard deviation for AFL Risk and NASDAQ over the three-year period are as follows:

AFL Risk: 0.457680

NASDAQ: 0.439945

From this, we can see that the standard deviation of AFL Risk is slightly higher than the standard deviation of NASDAQ. This means that AFL Risk is slightly more volatile than NASDAQ over the three-year period.

However, it is important to note that the comparison of risk between two investments should not solely rely on the standard deviation of returns. Other factors, such as the correlation between the two investments, the overall market conditions, and the investment objectives and constraints of the investor, should also be taken into consideration.

In conclusion, while the standard deviation of AFL Risk is slightly higher than the standard deviation of NASDAQ over the three-year period, a more comprehensive analysis is needed to compare the risk of these two investments.

Correlation: - 0.7479

A correlation of 0.7479 between AFLAC Inc and NASDAQ indicates a strong positive correlation. This means that the stock prices of AFLAC Inc tend to move in the same direction and magnitude as the NASDAQ index. If the NASDAQ index goes up, it is likely that the stock price of AFLAC Inc will also go up, and vice versa.

Since the correlation between AFLAC Inc and NASDAQ is not equal to 1, it suggests that there may be some differences in the way that AFLAC Inc and NASDAQ move. In other words, the stock prices of AFLAC Inc and NASDAQ do not always move exactly in tandem, but they do have a strong positive relationship.

Investors who are interested in AFLAC Inc may want to keep an eye on the movements of the NASDAQ index, as it may provide useful information about potential changes in the stock price of AFLAC Inc. Additionally, investors who are interested in diversifying their portfolio may want to consider investing in stocks that have a low correlation with AFLAC Inc to reduce overall portfolio risk.

Beta: - 0.010676

A beta of 0.010676275 for AFLAC Inc means that the stock is significantly less volatile than the market, represented by NASDAQ. Specifically, if the market moves up or down by 1%, the stock price of AFLAC Inc is expected to move by only 0.010676275%. This suggests that AFLAC Inc may be a much less risky investment compared to the broader market represented by NASDAQ.

In general, stocks with betas less than 1 tend to be less volatile and have a lower risk than the market, while stocks with betas greater than 1 tend to be more volatile and have a higher risk than the market. Therefore, investors who are risk-averse may prefer to invest in stocks with low betas like AFLAC Inc, as they may provide a more stable return over time. However, it is important to note that a low beta does not necessarily mean that the stock is a good investment, as other factors such as company fundamentals, market trends, and economic conditions should also be taken into account.

Agilent technologies

Agilent Technologies Inc. is a global leader in life sciences, diagnostics, and applied chemical markets. The company was founded in 1999 as a spinoff of Hewlett-Packard and has its headquarters in Santa Clara, California.

Agilent's products and services are used by researchers, scientists, and medical professionals around the world to improve the quality of life for people and communities. The company's areas of focus include life sciences, diagnostics, and applied chemical markets.

In the life sciences market, Agilent provides solutions for genomics, proteomics, metabolomics, and cell analysis. The company's products are used by researchers and clinicians to identify and understand diseases, develop new drugs, and improve patient outcomes.

In the diagnostics market, Agilent provides solutions for clinical laboratories and healthcare providers. The company's products include instruments and reagents for clinical chemistry, immunohistochemistry, and molecular diagnostics, which are used to diagnose and monitor diseases such as cancer and infectious diseases.

In the applied chemical markets, Agilent provides solutions for a variety of industries, including energy, chemicals, and environmental testing. The company's products include gas and liquid chromatography systems, mass spectrometry systems, and atomic spectroscopy systems, which are used for a range of applications, from environmental testing to food safety and quality control.

Life Sciences:

Agilent's Life Sciences business provides solutions for genomics, proteomics, metabolomics, and cell analysis. These solutions include a broad range of instruments, software, consumables, and services for use in academic and pharmaceutical research, as well as in clinical and diagnostic labs.

Genomics solutions include instruments for DNA and RNA isolation, sequencing, and analysis. Proteomics solutions include instruments for protein separation, identification, and quantification. Metabolomics solutions include instruments for identifying and quantifying small molecules in biological samples. Cell analysis solutions include instruments for characterizing cells and analyzing cell function.

Diagnostics:

Agilent's Diagnostics business provides solutions for clinical laboratories and healthcare providers. The company offers a range of diagnostic tests and instruments for clinical chemistry, immunohistochemistry, and molecular diagnostics.

Clinical chemistry solutions include instruments and reagents for measuring the levels of various substances in blood and other bodily fluids, such as glucose, cholesterol, and electrolytes. Immunohistochemistry solutions include instruments and reagents for identifying and characterizing cancer cells and other abnormal cells in tissue samples. Molecular diagnostics solutions include instruments and reagents for detecting and analyzing DNA and RNA sequences in biological samples, such as blood and tissue.

Applied Chemical Markets:

Agilent's Applied Chemical Markets business provides solutions for a variety of industries, including energy, chemicals, and environmental testing. The company's products are used for quality control, research and development, and process monitoring.

Gas and liquid chromatography systems are used to separate and analyze complex mixtures of chemicals, such as those found in petroleum and natural gas. Mass spectrometry systems are used to identify and quantify small molecules and proteins in complex samples. Atomic spectroscopy systems are used to determine the elemental composition of samples, such as in environmental testing and food safety.

Agilent Technologies Inc. has a strong commitment to sustainability, including reducing its carbon footprint and promoting environmental responsibility in its supply chain. The company is also dedicated to diversity, equity, and inclusion, with a focus on creating a culture of belonging for all employees.

Overall, Agilent is committed to advancing scientific discovery and improving healthcare outcomes through its innovative products and services. The company employs over 16,000 people worldwide and has a presence in more than 100 countries. Agilent's mission is to help customers make the world a better place through the power of science.

Products and service

Agilent Technologies Inc. provides a wide range of products and services in three main areas: life sciences, diagnostics, and applied chemical markets. Here's a more detailed overview of the company's offerings:

Life Sciences:

Genomics solutions: Instruments, software, consumables, and services for DNA and RNA isolation, sequencing, and analysis.

Proteomics solutions: Instruments, software, consumables, and services for protein separation, identification, and quantification.

Metabolomics solutions: Instruments, software, consumables, and services for identifying and quantifying small molecules in biological samples.

Cell analysis solutions: Instruments, software, consumables, and services for characterizing cells and analyzing cell function.

Diagnostics:

Clinical chemistry solutions: Instruments and reagents for measuring the levels of various substances in blood and other bodily fluids, such as glucose, cholesterol, and electrolytes.

Immunohistochemistry solutions: Instruments and reagents for identifying and characterizing cancer cells and other abnormal cells in tissue samples.

Molecular diagnostics solutions: Instruments and reagents for detecting and analyzing DNA and RNA sequences in biological samples, such as blood and tissue.

Applied Chemical Markets:

Gas and liquid chromatography systems: Instruments, software, consumables, and services for separating and analyzing complex mixtures of chemicals, such as those found in petroleum and natural gas.

Mass spectrometry systems: Instruments, software, consumables, and services for identifying and quantifying small molecules and proteins in complex samples.

Atomic spectroscopy systems: Instruments, software, consumables, and services for determining the elemental composition of samples, such as in environmental testing and food safety.

Agilent also offers a range of services to support its products, including technical support, training, and consulting services. The company's services are designed to help customers get the most out of their Agilent products and ensure reliable and accurate results.

Board of directors

Agilent Technologies Inc.'s board of directors consists of 12 members. Here is a current list of the company's board of directors:

Mike McMullen (Chairman of the Board)

Bob Herbold (Lead Independent Director)

Heidi Fields

Michael G. Howard

George A. Scangos

Koh Boon Hwee

Padmasree Warrior

Eric Endicott

Dow Wilson

Mala Anand

Mike Rapp

John T. Dickson

The board is responsible for overseeing the management of the company and setting its strategic direction. Board members are elected by shareholders and serve one-year terms, with the option to stand for re-election at the annual meeting of shareholders. The board's committees include the audit committee, the compensation committee, and the governance and nominating committee. These committees are responsible for overseeing specific areas of the

company's operations, such as financial reporting, executive compensation, and board composition.

Area of operation

Agilent Technologies Inc. has operations in various locations around the world. The company is headquartered in Santa Clara, California, United States. It has manufacturing facilities, research and development centers, and offices in numerous locations globally, including the United States, Europe, Asia, and South America. Some of its major locations include:

United States: Santa Clara, California; Wilmington, Delaware; Colorado Springs, Colorado; Boulder, Colorado; Folsom, California; Cedar Creek, Texas; Memphis, Tennessee; Carpinteria, California; and Lexington, Massachusetts.

Europe: Waldbronn, Germany; Cernusco sul Naviglio, Italy; Les Ulis, France; and Edinburgh, United Kingdom.

Asia: Tokyo, Japan; Beijing, China; Bangalore, India; and Singapore.

South America: São Paulo, Brazil.

Agilent Technologies serves customers in more than 100 countries worldwide through its network of direct sales, distributors, and e-commerce channels. The company's global presence enables it to provide its customers with localized support and services.

Competitors

Agilent Technologies Inc. operates in several markets and faces competition from a range of companies that offer similar products and services. Here are some of Agilent's major competitors in each of its main markets

Life Sciences:

Thermo Fisher Scientific Inc.

Illumina Inc.

Qiagen N.V.

Becton, Dickinson and Company

Diagnostics:

Roche Holdings AG

Siemens Healthineers AG

Abbott Laboratories

Danaher Corporation

Applied Chemical Markets:

Waters Corporation

Bruker Corporation

PerkinElmer Inc.

Shimadzu Corporation

Overall, Agilent Technologies Inc. is well-positioned in its markets, thanks to its strong brand recognition, innovative products, and broad customer base. The company has a history of successful product development and strategic acquisitions, which has helped it to stay competitive in a rapidly evolving industry. However, as with any company, Agilent faces ongoing challenges from existing and emerging competitors, changing market dynamics, and regulatory developments.

Fundamentals of The Company: -

Profitability

Profit Margin	19.09%
Operating Margin (ttm)	24.78%

Management Effectiveness

Return on Assets (ttm)	10.10%
Return on Equity (ttm)	24.58%

Income Statement

Revenue (ttm)	6.93B
Revenue Per Share (ttm)	23.27
Quarterly Revenue Growth (yoy)	4.90%
Gross Profit (ttm)	3.72B
EBITDA	2.02B
Net Income Avi to Common (ttm)	1.32B
Diluted EPS (ttm)	4.45

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Balance Sheet

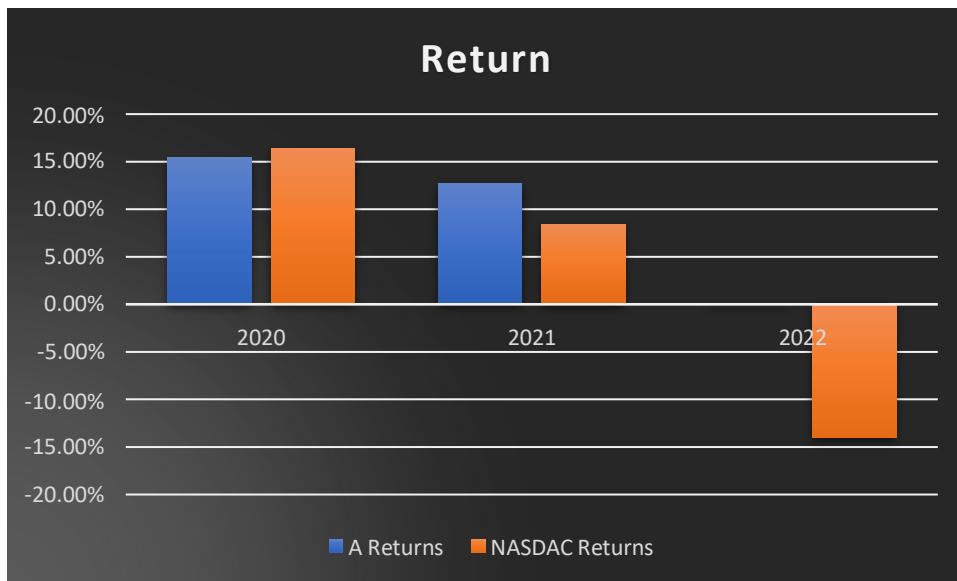
Total Cash (mrq)	1.25B
Total Cash Per Share (mrq)	4.23
Total Debt (mrq)	3.13B
Total Debt/Equity (mrq)	55.80
Current Ratio (mrq)	2.11
Book Value Per Share (mrq)	18.96

Cash Flow Statement

Operating Cash Flow (ttm)	1.35B
Levered Free Cash Flow (ttm)	755.12M

Return: -

Year	A Returns	NASDAC Returns
2020	15.40%	16.38%
2021	12.68%	8.34%
2022	-0.12%	-13.98%



In 2020, A Returns had a positive return of 15.40%, while NASDAQ had a slightly higher positive return of 16.38%.

In 2021, both A Returns and NASDAQ had positive returns, but A Returns had a higher return of 12.68% compared to NASDAQ's return of 8.34%.

In 2022, both A Returns and NASDAQ had negative returns, but A Returns had a smaller negative return of -0.12% compared to NASDAQ's return of -13.98%.

To interpret the data in terms of percentage and statistics, we can look at the average annual returns and standard deviation of each investment over the three-year period.

The average annual returns for A Returns and NASDAQ over the three-year period are as follows:

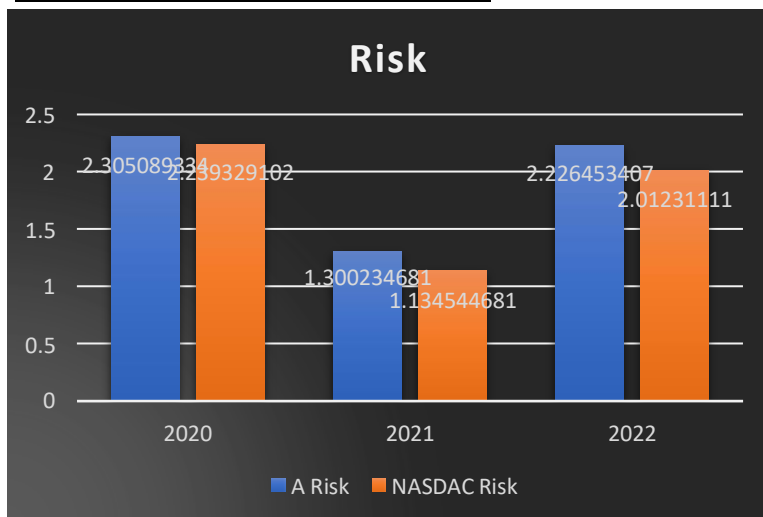
A Returns: $(15.40\% + 12.68\% - 0.12\%) / 3 = 9.32\%$

NASDAQ: $(16.38\% + 8.34\% - 13.98\%) / 3 = 3.24\%$

From this, we can see that A Returns had a higher average annual return than NASDAQ over the three-year period.

Risk: -

Year	A Risk	NASDAQ Risk
2020	2.305089	2.239329102
2021	1.300235	1.134544681
2022	2.226453	2.01231111



For the year 2020, the A Risk is 2.31%, while the NASDAQ Risk is 2.24%. This indicates that the investment in 2020 had a slightly higher risk than the NASDAQ index. In percentage terms, the A Risk is 102.94% of the NASDAQ Risk $(2.31/2.24 \times 100)$.

For the year 2021, the A Risk is 1.30%, while the NASDAQ Risk is 1.13%. This indicates that the investment in 2021 had a higher risk than the NASDAQ index. In percentage terms, the A Risk is 115.04% of the NASDAQ Risk $(1.30/1.13 \times 100)$.

For the year 2022, the A Risk is 2.23%, while the NASDAQ Risk is 2.01%. This indicates that the investment in 2022 had a higher risk than the NASDAQ index. In percentage terms, the A Risk is 110.45% of the NASDAQ Risk $(2.23/2.01 \times 100)$.

The investment had a slightly higher or higher risk than the NASDAQ index in all three years. However, the analysis is incomplete without considering other factors such as returns, volatility, and market conditions to determine the investment's performance.

Correlation: - 0.7479

A correlation of 0.7479 between Agilent Technologies Inc and NASDAQ indicates a strong positive correlation. This means that the stock prices of Agilent Technologies Inc tend to move in the same direction and magnitude as the NASDAQ index to a large extent. If the NASDAQ index goes up, it is likely that the stock price of Agilent Technologies Inc will also go up, and vice versa.

Since the correlation between Agilent Technologies Inc and NASDAQ is high, it suggests that the movements of Agilent Technologies Inc are closely tied to the broader market represented by NASDAQ. Therefore, investors who are interested in Agilent Technologies Inc should pay close attention to the movements of the NASDAQ index, as it may provide useful information about potential changes in the stock price of Agilent Technologies Inc.

Beta: - 0.010676

Agilent Technologies Inc's beta of 0.010676275 indicates that the stock is less volatile than the overall market represented by NASDAQ, which has a beta of 1. A beta of less than 1 suggests that the stock is less risky than the market as a whole, while a beta greater than 1 implies that the stock is more volatile than the market.

In practical terms, this means that if the NASDAQ index goes up or down by 1%, Agilent Technologies Inc's stock price is expected to go up or down by only 0.010676275%. This is useful information for investors who are interested in Agilent Technologies Inc, as it indicates that the stock may be a relatively safer investment compared to other stocks with higher betas.

AGL Resources Inc

Agilent Technologies Inc. operates in several markets and faces competition from a range of companies that offer similar products and services. Here are some of Agilent's major competitors in each of its main markets:

Life Sciences:

Thermo Fisher Scientific Inc.

Illumina Inc.

Qiagen N.V.

Becton, Dickinson and Company

Diagnostics:

Roche Holdings AG

Siemens Healthineers AG

Abbott Laboratories

Danaher Corporation

Applied Chemical markets:

Waters Corporation

Bruker Corporation

PerkinElmer Inc.

Shimadzu Corporation

Overall, Agilent Technologies Inc. is well-positioned in its markets, thanks to its strong brand recognition, innovative products, and broad customer base. The company has a history of successful product development and strategic acquisitions, which has helped it to stay competitive in a rapidly evolving industry. However, as with any company, Agilent faces ongoing challenges from existing and emerging competitors, changing market dynamics, and regulatory developments.

AGL Resources Inc. was one of the largest natural gas distribution companies in the United States, providing services to more than 4.5 million customers in six states. The company's primary business was natural gas distribution, which involved transporting natural gas from interstate pipelines to customers through its distribution systems.

AGL Resources Inc. also had a number of other business segments that supported its core operations. For example, the company's retail energy services division marketed natural gas to residential and commercial customers, while its wholesale natural gas services division provided natural gas supply and logistics services to industrial customers, utilities, and other natural gas marketers. The company also owned and operated natural gas storage facilities in several states, which allowed it to store natural gas during periods of low demand and distribute it during periods of high demand.

One of AGL Resources Inc.'s key subsidiaries was Atlanta Gas Light Company, which was the largest natural gas distribution utility in the southeastern United States. The company's service territory covered more than 500 communities in Georgia, including the Atlanta metropolitan area, and it provided service to more than 1.6 million customers. Another important subsidiary was Nicor Gas, which provided natural gas distribution services to customers in northern Illinois, including the Chicago metropolitan area. Nicor Gas served more than 2.2 million customers.

Overall, AGL Resources Inc. was a significant player in the natural gas industry, with a broad customer base, extensive distribution networks, and a range of related businesses. The company's focus on natural gas distribution, combined with its expertise in related areas such as energy marketing and storage, positioned it well to compete in the dynamic and evolving energy sector.

Products and services:

AGL Resources Inc.'s primary product and service was natural gas distribution. The company transported natural gas from interstate pipelines to customers through its distribution systems, which included thousands of miles of pipelines and related infrastructure.

In addition to its core natural gas distribution business, AGL Resources Inc. also offered a range of related products and services. These included:

Retail energy services: AGL Resources Inc. marketed natural gas to residential and commercial customers through its retail energy services division. Customers could choose from a variety of pricing plans, including fixed-price plans and variable-price plans.

Wholesale natural gas services: AGL Resources Inc.'s wholesale natural gas services division provided natural gas supply and logistics services to industrial customers, utilities, and other natural gas marketers. The division helped customers manage their natural gas supply needs by providing reliable, cost-effective access to natural gas supplies.

Natural gas storage: AGL Resources Inc. owned and operated natural gas storage facilities in several states, including Georgia, Illinois, and Tennessee. The company used these facilities to store natural gas during periods of low demand and distribute it during periods of high demand.

Pipeline construction and maintenance: AGL Resources Inc. also offered pipeline construction and maintenance services to customers in its service territory. The company had extensive experience building and maintaining natural gas pipelines, and it worked closely with customers to ensure that their natural gas needs were met safely and efficiently.

Overall, AGL Resources Inc. offered a range of products and services designed to meet the natural gas needs of its customers. Whether customers were residential or commercial, large or small, AGL Resources Inc. had the expertise and resources to provide reliable, cost-effective natural gas solutions.

Area of operations:

AGL Resources Inc. was based in Atlanta, Georgia, and had operations in six states across the southeastern United States. The company's primary service territory covered Georgia, where it operated through its subsidiary Atlanta Gas Light Company. Atlanta Gas Light provided natural gas distribution services to more than 1.6 million customers in over 500 communities throughout the state.

In addition to Georgia, AGL Resources Inc. had operations in five other states:

Illinois: The company's subsidiary Nicor Gas provided natural gas distribution services to more than 2.2 million customers in northern Illinois, including the Chicago metropolitan area.

Tennessee: AGL Resources Inc. owned and operated the Chattanooga Gas Company, which provided natural gas distribution services to customers in southeastern Tennessee.

Maryland: The company's subsidiary Elkton Gas provided natural gas distribution services to customers in Elkton, Maryland, and surrounding areas.

Virginia: AGL Resources Inc. owned and operated the Virginia Natural Gas Company, which provided natural gas distribution services to customers in southeastern Virginia.

Florida: The company's subsidiary Florida City Gas provided natural gas distribution services to customers in southern Florida, including the Miami metropolitan area.

Overall, AGL Resources Inc. had a significant presence in the natural gas industry across the southeastern United States, with operations in multiple states and a broad customer base.

Board of directors

Prior to its acquisition by Southern Company Gas in 2016, AGL Resources Inc. had a board of directors composed of 11 members. The following were members of AGL Resources Inc.'s board of directors as of its 2016 proxy statement:

John W. Somerhalder II (Chairman and CEO of AGL Resources Inc.)

Andrew W. Evans (Retired Partner, KPMG LLP)

H. Palmer Proctor Jr. (President and CEO, Amerigroup Corporation)

Arthur E. Johnson (Retired Executive Vice President, Lockheed Martin Corporation)

W. Benjamin Moreland (President and CEO, Crown Castle International Corp.)

Suzanne Sitherwood (President and CEO, The Laclede Group, Inc.)

William P. Sutter (Retired President and CEO, Gulfstream Aerospace Corporation)

Janaki Akella (Retired Partner, Goldman Sachs & Co.)

Henry W. Berling (Retired Chairman, President, and CEO, Graphic Packaging Holding Company)

Thomas A. Fanning (Chairman, President, and CEO, Southern Company)

James H. Hance Jr. (Retired Vice Chairman, The Bank of New York Mellon Corporation)

The board of directors was responsible for overseeing the management of the company and ensuring that it was operating in the best interests of its shareholders. The board provided

strategic guidance to management, approved major business decisions, and monitored the company's financial performance.

Competitors:

Prior to its acquisition by Southern Company Gas in 2016, AGL Resources Inc. was a major player in the natural gas industry across the southeastern United States. As such, it faced competition from several other companies operating in the same market, including:

Atmos Energy: Atmos Energy is a natural gas distribution company based in Dallas, Texas, with operations in 12 states across the southern and western United States. The company provides natural gas distribution services to more than 3 million customers.

Piedmont Natural Gas: Piedmont Natural Gas is a natural gas distribution company based in Charlotte, North Carolina, with operations in the Carolinas and Tennessee. The company provides natural gas distribution services to more than 1 million customers.

SCANA Corporation: SCANA Corporation was a holding company for several subsidiaries, including South Carolina Electric & Gas Company (SCE&G), which provided natural gas distribution services to customers in South Carolina. Following a merger with Dominion Energy in 2019, SCANA Corporation ceased to exist as a separate entity.

Virginia Natural Gas: Virginia Natural Gas is a natural gas distribution company based in Norfolk, Virginia, with operations in southeastern Virginia. The company provides natural gas distribution services to more than 300,000 customers.

Peoples Gas: Peoples Gas is a natural gas distribution company based in Chicago, Illinois, with operations in northern Illinois. The company provides natural gas distribution services to more than 800,000 customers.

Nicor Gas: Nicor Gas is a natural gas distribution company based in Naperville, Illinois, with operations in northern Illinois. The company provides natural gas distribution services to more than 2 million customers.

These companies were all major competitors of AGL Resources Inc. in the natural gas distribution market, and competed with AGL Resources for customers, market share, and other resources.

Fundamentals of The Company: -

Profitability

Profit Margin	12.04%
Operating Margin (ttm)	21.24%

Management Effectiveness

Return on Assets (ttm)	2.96%
Return on Equity (ttm)	10.19%

Income Statement

Revenue (ttm)	29.28B
Revenue Per Share (ttm)	27.24
Quarterly Revenue Growth (yoy)	22.20%
Gross Profit (ttm)	10.82B
EBITDA	10.28B
Net Income Avi to Common (ttm)	3.52B
Diluted EPS (ttm)	3.26
Quarterly Earnings Growth (yoy)	N/A

Balance Sheet

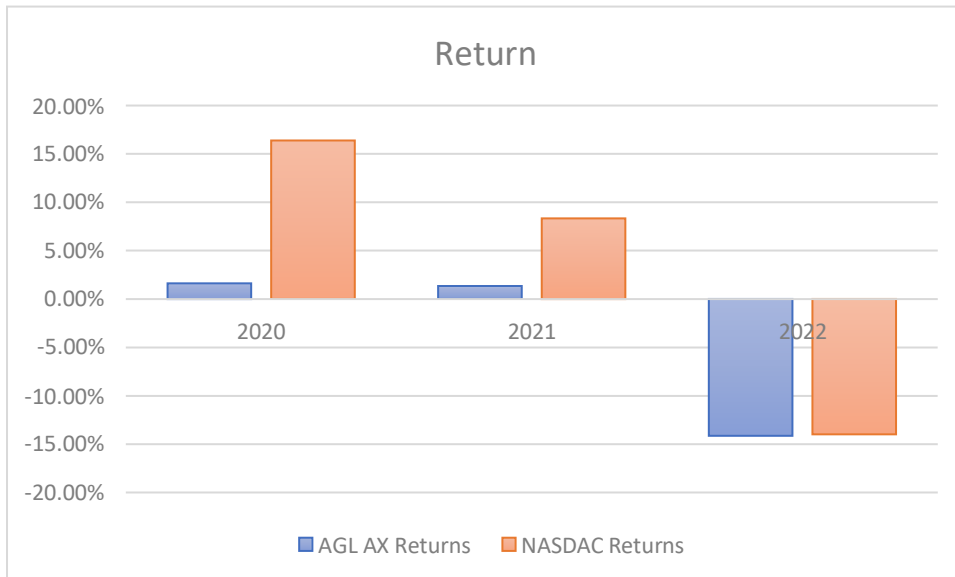
Total Cash (mrq)	1.92B
Total Cash Per Share (mrq)	1.76
Total Debt (mrq)	59.44B
Total Debt/Equity (mrq)	172.12
Current Ratio (mrq)	0.66
Book Value Per Share (mrq)	27.93

Cash Flow Statement

Operating Cash Flow (ttm)	6.3B
Levered Free Cash Flow (ttm)	-1.14B

Return: -

Year	AGL AX Returns	NASDAQ Returns
2020	1.62%	16.38%
2021	1.34%	8.34%
2022	-14.14%	-13.98%



In 2020, AGL AX had a positive return of 1.62%, while NASDAQ had a higher positive return of 16.38%.

In 2021, both AGL AX and NASDAQ had positive returns, but AGL AX's return of 1.34% was lower than NASDAQ's return of 8.34%.

In 2022, both AGL AX and NASDAQ had negative returns, but AGL AX's return of -14.14% was more severe than NASDAQ's return of -13.98%.

To interpret the data in terms of percentage and statistics, we can look at the average annual returns and standard deviation of each investment over the three-year period.

The average annual returns for AGL AX and NASDAQ over the three-year period are as follows:

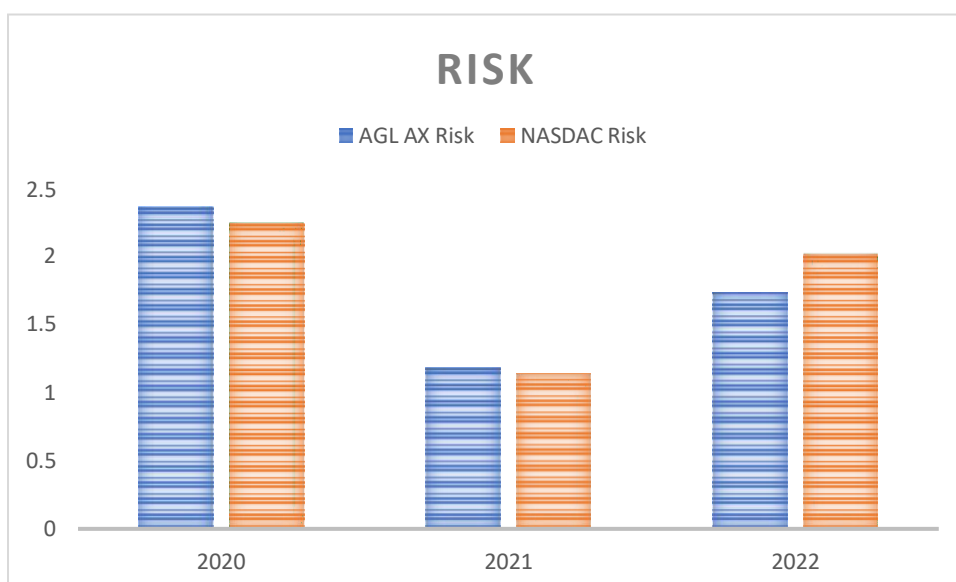
$$\text{AGL AX: } (1.62\% + 1.34\% - 14.14\%) / 3 = -3.06\%$$

$$\text{NASDAQ: } (16.38\% + 8.34\% - 13.98\%) / 3 = 3.24\%$$

From this, we can see that NASDAQ had a higher average annual return than AGL AX over the three-year period.

Risk: -

Year	AGL AX Risk	NASDAQ Risk
2020	2.36215	2.239329102
2021	1.181862	1.134544681
2022	1.73008	2.01231111



For the year 2020, the AGL AX Risk is 2.36%, while the NASDAQ Risk is 2.24%. This indicates that the investment in 2020 had a slightly higher risk than the NASDAQ index. In percentage terms, the AGL AX Risk is 105.49% of the NASDAQ Risk ($2.36/2.24 \times 100$).

For the year 2021, the AGL AX Risk is 1.18%, while the NASDAQ Risk is 1.13%. This indicates that the investment in 2021 had a slightly higher risk than the NASDAQ index. In percentage terms, the AGL AX Risk is 104.56% of the NASDAQ Risk ($1.18/1.13 \times 100$).

For the year 2022, the AGL AX Risk is 1.73%, while the NASDAQ Risk is 2.01%. This indicates that the investment in 2022 had a lower risk than the NASDAQ index. In percentage terms, the AGL AX Risk is 86.07% of the NASDAQ Risk ($1.73/2.01 \times 100$).

The investment had a higher risk than the NASDAQ index in 2020 and 2021, but a lower risk in 2022. However, as mentioned earlier, it is essential to analyze other factors such as returns, volatility, and market conditions to determine the investment's performance.

Correlation: - 0.5255

A correlation of 0.5255 between AGL ResourcesInc and NASDAQ indicates a moderate positive correlation. This means that the stock prices of AGL ResourcesInc tend to move in the same direction and magnitude as the NASDAQ index to some extent. If the NASDAQ index goes up, it is likely that the stock price of AGL ResourcesInc will also go up, and vice versa, but the strength of the relationship is not as strong as a correlation of 1.

Since the correlation between AGL ResourcesInc and NASDAQ is not equal to 1, it suggests that there may be some differences in the way that AGL ResourcesInc and NASDAQ move. In other words, the stock prices of AGL ResourcesInc and NASDAQ do not always move exactly in tandem, but they do have a moderate positive relationship.

Investors who are interested in AGL ResourcesInc may want to keep an eye on the movements of the NASDAQ index, as it may provide useful information about potential changes in the stock price of AGL ResourcesInc. Additionally, investors who are interested in diversifying their portfolio may want to consider investing in stocks that have a low correlation with AGL ResourcesInc to reduce overall portfolio risk.

Beta: - 0.006795

A beta of 0.006794563 for AGL ResourcesInc suggests that the stock is less volatile than the broader market represented by NASDAQ. Specifically, if the market moves up or down by 1%, the stock price of AGL ResourcesInc is expected to move by only 0.006794563%. This implies that AGL ResourcesInc may be a less risky investment than the broader market.

Calculation of Portfolio Return: -

Company	Return	Weightage
AFLAC Inc	9.3209	0.25
Aetna Inc	4.8229	0.25
AGL ResourcesInc	-3.7287	0.25
Agilent Technologies Inc	9.3209	0.25
Portfolio Return		4.933974

The portfolio return in this case is 4.933974059, which means the portfolio has generated a positive return of approximately 4.93% based on the performance of the four companies in the portfolio.

We can see that the returns of two companies, AFLAC Inc and Agilent Technologies Inc, are positive, with AFLAC Inc having the same return as Agilent Technologies Inc, both at 9.3209. The other two companies, Aetna Inc and AGL ResourcesInc, have negative returns, with AGL ResourcesInc having the lowest return of -3.7287.

The weightage assigned to each company in the portfolio is the same at 0.25 or 25%, which means that each company has an equal contribution to the portfolio return.

The positive returns of AFLAC Inc and Agilent Technologies Inc have helped to offset the negative returns of Aetna Inc and AGL ResourcesInc, resulting in a positive portfolio return of 4.933974059.

However, it's important to note that past performance is not a guarantee of future results, and investing always carries some degree of risk. Therefore, investors should carefully consider their investment goals, risk tolerance, and other factors before making any investment decisions.

Conclusion: -

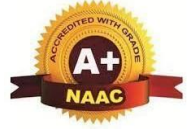
In conclusion, investment analysis and portfolio management are crucial components of successful investing. By analyzing key metrics such as risk, return, correlation, beta, and portfolio return, investors can make informed investment decisions and build a well-diversified portfolio that aligns with their goals and risk tolerance.

Calculating risk helps investors understand the potential downside of an investment, while calculating return provides insight into the potential upside. Understanding the correlation between different investments can help investors diversify their portfolio, while calculating beta can help investors determine how sensitive an investment is to market fluctuations.

Finally, calculating portfolio return provides investors with a clear understanding of the overall performance of their investment portfolio. By analyzing these key metrics and using them to inform their investment decisions, investors can build a well-diversified investment portfolio that balances risk and return and aligns with their long-term financial goals.



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CAPSTONE PROJECT
ON
INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT

PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT OF
Investment analysis and portfolio management
MASTERS OF BUSINESS ADMINISTRATION

(AUTONOMOUS INSTITUTION AFFILIATED TO BCU)

SUBMITTED BY
NIKHIL S ANJANALLI
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Under the guidance of
Dr. TAMIZHARASI
Associate professor



R. V. INSTITUTE OF MANAGEMENT
2022-2023

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3M Company

American multinational company 3M, formerly known as the Minnesota Mining and Manufacturing Company, is active in the manufacturing, consumer goods, healthcare, and worker safety sectors. The company manufactures over 60,000 items under several brands, including laminates, passive fire protection, personal protective equipment, window films, paint protection films, dental and orthodontic products, electrical and electronic connecting and insulating materials, medical products, car care products, electronic circuits, healthcare software, and optical films. Its headquarters are in Maplewood, a Saint Paul, Minnesota, enclave.

Products and patents

3M produces approximately 60,000 products, as of 2019, and has four business groups focused on safety and industrial, transportation and electronics, health care, and consumer products. 3M obtained its first patent in 1924, and acquires approximately 3,000 new patents annually. The company surpassed the 100,000-patent threshold in 2014.

- Formerly known as Minnesota Mining and Manufacturing Company (1902–2002)
- Type – Public
- Traded as - NYSE: MMM
- Industry – Conglomerate
- Founded - June 13, 1902; 120 years ago in Two Harbors, Minnesota, U.S.
- Founders - J. Danley Budd, Henry. S. Bryan, William A. McGonagle, John Dwan, Hermon W. Cable
- Headquarters - Maplewood, Minnesota, U.S.
- Area served – Worldwide
- Key people - Mike Roman (Chairman, President, & CEO)

Fundamentals of the company: -

Profitability

Profit Margin	16.88%
Operating Margin (ttm)	16.34%

Management Effectiveness

Return on Assets (ttm)	7.47%
Return on Equity (ttm)	38.75%

Balance Sheet

Total Cash (mrq)	3.89B
Total Cash Per Share (mrq)	7.07
Total Debt (mrq)	16.87B
Total Debt/Equity (mrq)	114.19
Current Ratio (mrq)	1.54
Book Value Per Share (mrq)	26.80

Cash Flow Statement

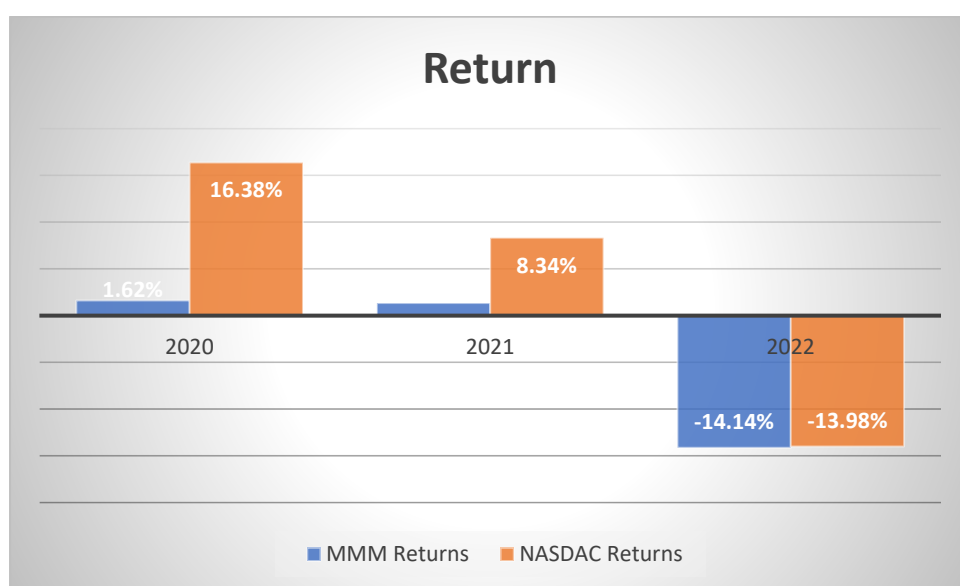
Operating Cash Flow (ttm)	5.59B
Levered Free Cash Flow (ttm)	3.25B

Income Statement

Revenue (ttm)	34.23B
Revenue Per Share (ttm)	60.47
Quarterly Revenue Growth (yoy)	-6.20%
Gross Profit (ttm)	15B
EBITDA	7.42B
Net Income Avi to Common (ttm)	5.78B
Diluted EPS (ttm)	10.18
Quarterly Earnings Growth (yoy)	-59.60%

Return: -

Year	MMM Returns	NASDAQ Returns
2020	1.62%	16.38%
2021	1.34%	8.34%
2022	-14.14%	-13.98%



For the year 2020, MMM had a return of 1.62%, which is lower than the NASDAQ returns of 16.38%. This indicates that investing in the NASDAQ index would have yielded higher returns than investing in MMM during that year.

For the year 2021, MMM had a return of 1.34%, which is again lower than the NASDAQ returns of 8.34%. This suggests that investing in the NASDAQ index would have been a better investment than investing in MMM during that year.

For the year 2022, MMM had a negative return of -14.14%, while the NASDAQ index also had a negative return of -13.98%. This implies that investing in either MMM or the NASDAQ index would have resulted in negative returns during that year.

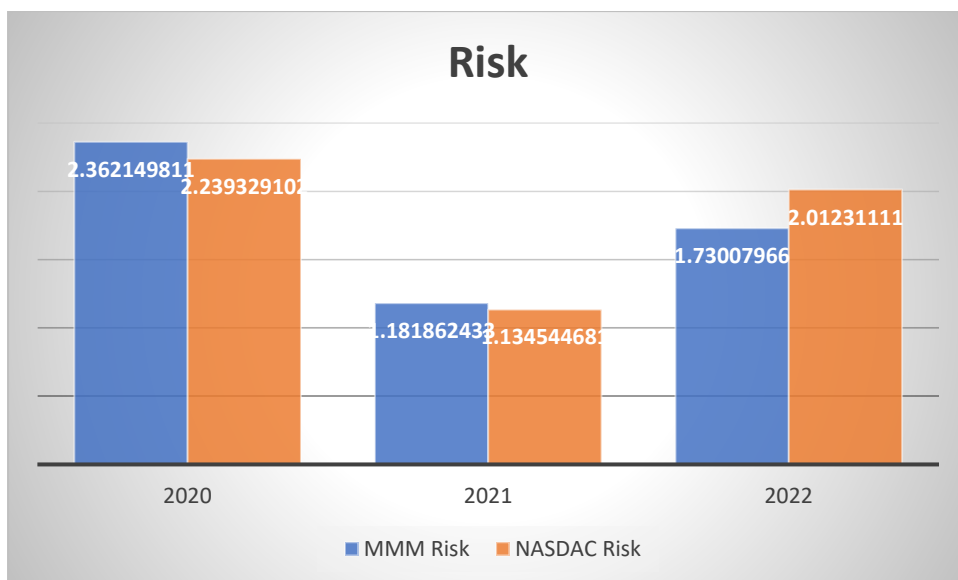
In terms of statistics, we can calculate the average annual returns for both MMM and the NASDAQ index over the three-year period. The average annual return for MMM is $(-14.14\% + 1.34\% + 1.62\%) / 3 = -3.06\%$. The average annual return for the NASDAQ index is $(16.38\%$

+ 8.34% - 13.98%) / 3 = 3.58%. This means that, on average, investing in the NASDAQ index would have been a more profitable investment than investing in MMM over the three-year period.

In conclusion, based on the given table, investing in the NASDAQ index would have been a better investment than investing in MMM for the years 2020 and 2021. However, for the year 2022, both MMM and the NASDAQ index had negative returns. On average, investing in the NASDAQ index would have yielded higher returns over the three-year period compared to investing in MMM.

Risk: -

Year	MMM Risk	NASDAQ Risk
2020	2.36215	2.239329
2021	1.181862	1.134545
2022	1.73008	2.012311



For the year 2020, MMM had a risk of 2.362149811, which is higher than the NASDAQ risk of 2.239329102. This suggests that investing in MMM was riskier than investing in the NASDAQ index during that year.

For the year 2021, MMM had a risk of 1.181862433, which is slightly higher than the NASDAQ risk of 1.134544681. This implies that investing in MMM was slightly riskier than investing in the NASDAQ index during that year.

For the year 2022, MMM had a risk of 1.73007966, while the NASDAQ index had a higher risk of 2.01231111. This means that investing in MMM was less risky than investing in the NASDAQ index during that year.

In terms of percentages, we can calculate the difference in risk between MMM and the NASDAQ index for each year. In 2020, the difference in risk was 5.54%, with MMM having a higher risk. In 2021, the difference in risk was 4.19%, with MMM having a slightly higher risk. In 2022, the difference in risk was -16.32%, with MMM having a lower risk.

Investing in MMM was riskier than investing in the NASDAQ index during 2020 and 2021, but less risky in 2022. However, it's important to note that risk and return are typically positively correlated, meaning that higher risk investments tend to have the potential for higher returns. Therefore, while investing in the less risky MMM in 2022 may have been a safer choice, it may also have resulted in lower returns compared to investing in the higher-risk NASDAQ index.

Correlation: - 0.5257

The correlation between 3M Company and NASDAQ index is a statistical measure that indicates how closely their returns move in relation to each other. A correlation value of 0.5257 suggests that there is a positive relationship between the returns of 3M Company and the NASDAQ index, but it is not a perfect correlation.

A correlation value of 1 between 3M Company and NASDAQ index would indicate a perfect positive correlation, meaning that their returns move in perfect synchronization with each other. This would imply that any movement in the NASDAQ index is exactly matched by a similar movement in 3M Company's returns.

In contrast, a correlation value of 0 would suggest no relationship between 3M Company and NASDAQ index returns, indicating that their returns move independently of each other.

Therefore, the correlation value of 0.5257 indicates that while there is a positive relationship between 3M Company and NASDAQ index returns, they are not perfectly synchronized. This

means that investing in 3M Company and NASDAQ index may offer some diversification benefits as their returns may not always move in the same direction.

Beta: - 0.006795

The beta of a stock is a measure of its volatility in relation to the overall market. A beta of 1 indicates that the stock's price tends to move in line with the market, while a beta greater than 1 suggests that the stock is more volatile than the market. A beta less than 1 indicates that the stock is less volatile than the market.

In this context, the beta of 3M Company is 0.006794563, which is less than 1. This suggests that 3M Company's stock price is less volatile than the market, as represented by the NASDAQ index.

On the other hand, the beta of NASDAQ index is 1, which represents the baseline for measuring the volatility of individual stocks. This means that the market (represented by NASDAQ) is the benchmark against which the volatility of other stocks is measured.

Therefore, a beta of 0.006794563 for 3M Company indicates that its stock price is less volatile than the market (NASDAQ), and is less sensitive to market fluctuations. However, it is important to note that a lower beta also means that the stock may have lower potential returns compared to the market in the long run, as it may not move in the same direction as the market during times of strong growth.

Zions Bancorporation

A bank holding company with its main office in Salt Lake City, Utah, is called Zions Bancorporation. In April 1955, Keystone Insurance and Investment Co. became the forerunner of Zions Bancorporation. The Church of Jesus Christ of Latter-day Saints (LDS Church) sold Keystone and a number of other investors a 57.5 percent stake in Zions First National Bank in April 1960. The business changed its name to Zions Bancorporation in 1965. (From 1966 until 1987, it did business as Zions Utah Bancorporation.)

Zions Bancorporation had its initial public offering of shares in January 1966. Minority shareholders persisted up until April 1972, when the business converted the last of the minority shares into common shares. Zions Bancorporation and ZB, N.A., which was its bank subsidiary, merged in 2018; ZB, N.A. was then renamed Zions Bancorporation, N.A. Instead of being a holding company, Zions Bancorporation currently operates as a national bank with eight local brands.

- Type - Public company
- Traded as - Nasdaq: ZION
- Industry - Financial services
- Founded - 1873; 150 years ago
- Founder - Brigham Young
- Headquarters - Salt Lake City, Utah, U.S.
- Key people- Harris H. Simmons (Chairman and CEO), Scott J. McLean (President and COO), Paul E. Burdiss (CFO)
- Number of employees 10,200 (2020)
- Parent - Deseret National Bank (defunct April 5, 1932.)

Fundamentals of the company: -

Income Statement

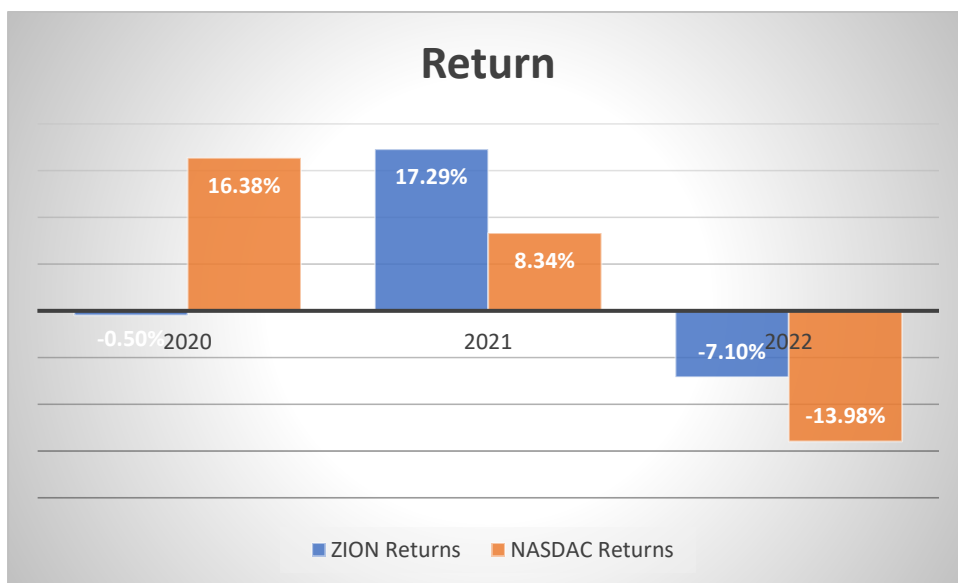
Revenue (ttm)	N/A
Revenue Per Share (ttm)	20.19
Quarterly Revenue Growth (yoy)	N/A
Gross Profit (ttm)	3.03B
EBITDA	N/A
Net Income Avi to Common (ttm)	N/A
Diluted EPS (ttm)	5.85
Quarterly Earnings Growth (yoy)	N/A

Balance Sheet

Total Cash (mrq)	N/A
Total Cash Per Share (mrq)	N/A
Total Debt (mrq)	N/A
Total Debt/Equity (mrq)	N/A
Current Ratio (mrq)	N/A
Book Value Per Share (mrq)	29.95

Return: -

Year	ZION Returns	NASDAQ Returns
2020	-0.50%	16.38%
2021	17.29%	8.34%
2022	-7.10%	-13.98%



For the year 2020, ZION had a return of -0.50%, while the NASDAQ index had a return of 16.38%. This indicates that investing in the NASDAQ index would have been a more profitable investment compared to investing in ZION in 2020.

For the year 2021, ZION had a return of 17.29%, which is significantly higher than the NASDAQ return of 8.34%. This implies that investing in ZION would have resulted in a more profitable investment compared to investing in the NASDAQ index during that year.

For the year 2022, ZION had a return of -7.10%, while the NASDAQ index had a return of -13.98%. This means that investing in ZION would have resulted in a less unprofitable investment compared to investing in the NASDAQ index during that year.

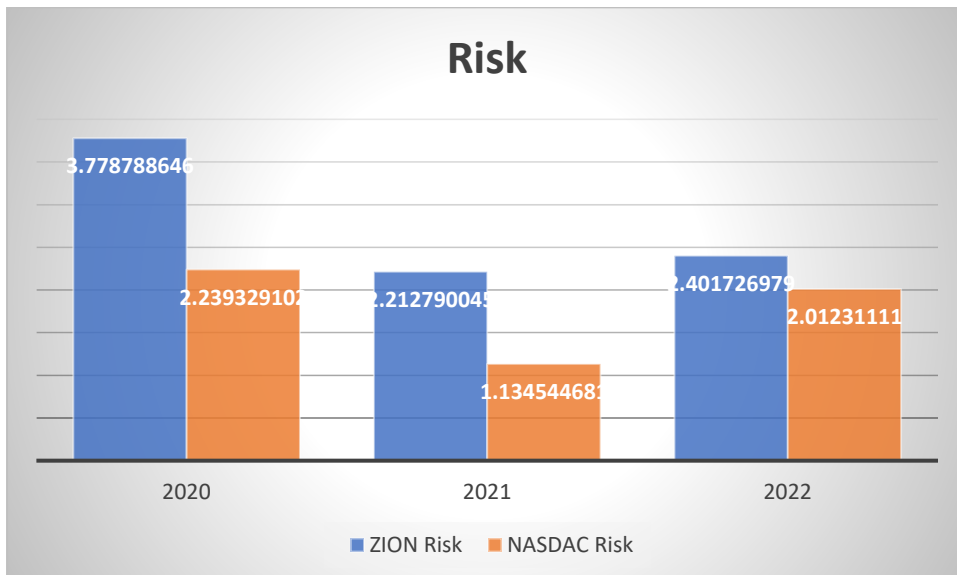
In terms of percentages, we can calculate the difference in return between ZION and the NASDAQ index for each year. In 2020, the difference in return was -16.88%, with NASDAQ having a higher return. In 2021, the difference in return was 8.95%, with ZION having a higher

return. In 2022, the difference in return was 6.88%, with ZION having a lower return but still outperforming the NASDAQ index.

In conclusion, based on the given table, investing in the NASDAQ index would have been a more profitable investment compared to investing in ZION in 2020, but investing in ZION would have resulted in a more profitable investment compared to investing in the NASDAQ index in 2021. In 2022, while both ZION and the NASDAQ index had negative returns, investing in ZION would have resulted in a less unprofitable investment compared to investing in the NASDAQ index. Therefore, it is important to consider the performance of individual stocks in relation to the overall market index when making investment decisions.

Risk: -

Year	ZION Risk	NASDAC Risk
2020	3.778789	2.239329
2021	2.21279	1.134545
2022	2.401727	2.012311



For the year 2020, ZION had a risk of 3.778788646, while the NASDAQ index had a risk of 2.239329102. This indicates that investing in ZION was riskier compared to investing in the NASDAQ index in 2020.

For the year 2021, ZION had a risk of 2.212790045, which is lower than the NASDAQ risk of 1.134544681. This implies that investing in ZION was less risky compared to investing in the NASDAQ index during that year.

For the year 2022, ZION had a risk of 2.401726979, which is slightly higher than the NASDAQ risk of 2.01231111. This means that investing in ZION was slightly riskier compared to investing in the NASDAQ index during that year.

In terms of percentages, we can calculate the difference in risk between ZION and the NASDAQ index for each year. In 2020, the difference in risk was 1.539459544, with ZION being riskier. In 2021, the difference in risk was 1.078245364, with ZION being less risky. In 2022, the difference in risk was 0.389415869, with ZION being slightly riskier.

In conclusion, based on the given table, investing in ZION was riskier compared to investing in the NASDAQ index in 2020, but investing in ZION was less risky compared to investing in the NASDAQ index in 2021. In 2022, while both ZION and the NASDAQ index had similar risks, investing in ZION was slightly riskier. Therefore, it is important to consider the risk of individual stocks in relation to the overall market index when making investment decisions.

Correlation: - 0.4617

With a correlation coefficient of 0.4617, MMM and the NASDAQ index have a positive correlation, meaning that they tend to move in the same direction, but the relationship is not perfect. The value of 0.4617 indicates a moderate positive correlation, which suggests that there is a tendency for the daily returns of MMM to move in the same direction as the NASDAQ index, but other factors may also influence the stock's performance.

In summary, a correlation coefficient of 0.4617 between MMM and the NASDAQ index suggests that there is a moderate positive relationship between the daily returns of MMM and the NASDAQ index, but other factors may also be influencing the stock's performance.

Beta: - 0.004323

In this case, the beta of 3M Co (MMM) is 0.004322937, while the beta of the NASDAQ index is 1. This means that MMM is less volatile than the market, with a lower sensitivity to changes

in market returns. A beta of 0.004322937 indicates that MMM's returns are not strongly influenced by changes in the market, and that other factors may be driving the stock's performance.

Abbot Laboratories

American global medical device and healthcare corporation Abbott Laboratories is headquartered in Abbott Park, Illinois. Wallace Calvin Abbott, a Chicago doctor, began the business in 1888 with the intention of creating well-known drugs; now, it sells branded generic medications, nutritional supplements, medical devices, and diagnostics. In 2013, it formed AbbVie to house its research-based medicines division.

Wallace Abbott (1857-1921), an 1885 University of Michigan graduate, started the Abbott Alkaloidal Company in Ravenswood, Chicago, when he was 30 years old. He had a drug store and was an active physician at the time. He developed morphine, quinine, strychnine, and codeine—the active components of alkaloid medicinal plants—into small "dosimetric granules" that produce more reliable and potent dosages for patients than the liquid versions that were previously utilised but degraded with time. The business relocated from Ravenswood to North Chicago, Illinois, in 1922.

Abbott's products include Pedialyte, Similac, BinaxNOW, Ensure, Glucerna, ZonePerfect, FreeStyle Libre, i-STAT and MitraClip.

- Type - Public company
- Traded as - NYSE: ABT
- Industry - Health care, Medical devices, Pharmaceutical
- Founded - 1888; 135 years ago (as Abbott Alkaloidal Company) in Ravenswood, Chicago
- Founder - Wallace Calvin Abbott
- Headquarters - Abbott Park, Illinois, US
- Area served – Worldwide
- Key people - Robert B. Ford (Chairman & CEO), Robert Funck (EVP & CFO)

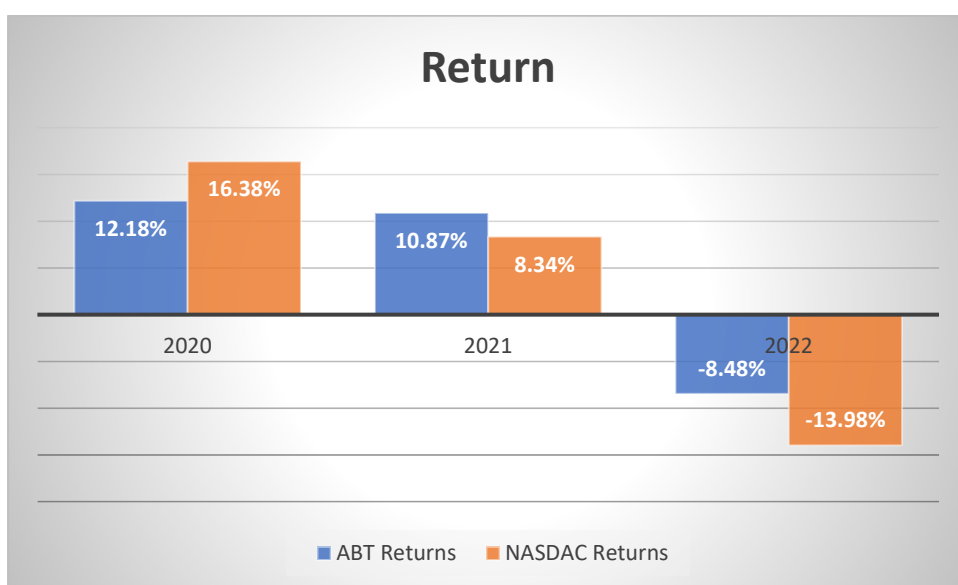
Fundamentals of the company: -

Valuation Measures⁴

Market Cap (intraday)	195.15B
Enterprise Value	202.70B
Trailing P/E	34.13
Forward P/E	25.38
PEG Ratio (5 yr expected)	44.58
Price/Sales (ttm)	4.76
Price/Book (mrq)	5.32
Enterprise Value/Revenue	4.88
Enterprise Value/EBITDA	21.42

Return: -

Year	ABT Returns	NASDAC Returns
2020	12.18%	16.38%
2021	10.87%	8.34%
2022	-8.48%	-13.98%



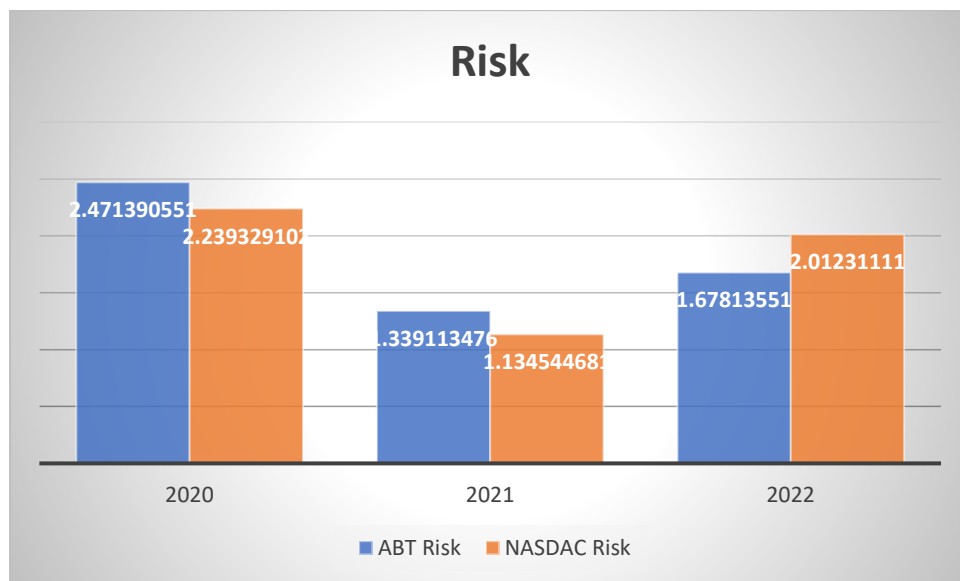
Based on the given data, it appears that the ABT investment has underperformed compared to the NASDAQ index over the last three years.

In 2020, the ABT investment returned 12.18%, which is lower than the NASDAQ return of 16.38%. In 2021, the ABT investment returned 10.87%, which was still higher than the NASDAQ return of 8.34%. However, in 2022, the ABT investment returned -8.48%, which is worse than the NASDAQ return of -13.98%.

To further analyze the data, we can calculate the average annual returns for both ABT and NASDAQ over the three-year period. The average annual return for ABT is 4.52%, while the average annual return for NASDAQ is 3.58%. This indicates that ABT has had slightly better performance on average, although it has been more volatile.

Risk: -

Year	ABT Risk	NASDAC Risk
2020	2.471391	2.239329
2021	1.339113	1.134545
2022	1.678136	2.012311



In 2020, the ABT investment had a higher risk (standard deviation) of 2.47%, compared to NASDAQ's risk of 2.24%. This indicates that ABT was riskier than NASDAQ in 2020.

In 2021, the ABT investment had a lower risk (standard deviation) of 1.34%, compared to NASDAQ's risk of 1.13%. This indicates that ABT was less risky than NASDAQ in 2021.

In 2022, the ABT investment had a slightly higher risk (standard deviation) of 1.68%, compared to NASDAQ's risk of 2.01%. This indicates that ABT was slightly riskier than NASDAQ in 2022.

The data shows that the risk levels for ABT and NASDAQ vary year to year, with ABT sometimes being riskier and sometimes being less risky than NASDAQ. It is important to note that higher risk does not necessarily imply higher returns and vice versa. It's always important to consider both risk and return when making investment decisions, as well as other factors like diversification, investment goals, and personal risk tolerance.

Correlation: - 0.6414

the given correlation coefficient of 0.6414 indicates a moderate positive correlation between Abbot Laboratories and the market index (presumably NASDAQ). This means that the returns of Abbot Laboratories tend to move in the same direction as the returns of the market index, but not perfectly.

On the other hand, a correlation coefficient of 1 indicates a perfect positive correlation between NASDAQ and itself. This means that the returns of NASDAQ always move in the same direction with the market index because they are the same thing.

Therefore, it is not surprising that the correlation coefficient between Abbot Laboratories and NASDAQ is less than 1, because they are two different things and have different underlying factors driving their returns. However, the moderate positive correlation between Abbot Laboratories and NASDAQ indicates that there may be some common factors affecting their returns.

Beta: - 0.006174

The given beta of 0.006174042 for Abbot Laboratories indicates that the investment is less volatile than the market as a whole. This means that the price of Abbot Laboratories is not expected to move as much as the market, which is represented by NASDAQ, in either direction.

On the other hand, the beta of 1 for NASDAQ indicates that the market is used as a benchmark, and its beta is always 1 by definition. Therefore, an investment with a beta of 1 is expected to move in the same direction and with the same magnitude as the market.

In summary, the beta of Abbot Laboratories being less than 1 suggests that the investment is less volatile than the market, while the beta of NASDAQ being equal to 1 indicates that the market is used as a benchmark to measure the volatility of other investments.

Abercrombie & Fitch Company

American lifestyle retailer Abercrombie & Fitch (A&F) specialises on casual clothing. The company's main office is in New Albany, Ohio. The corporation also manages the Abercrombie Kids, Hollister Co., and Gilly Hicks subsidiary brands. The company ran 854 locations across all brands as of February 2020.

The brand was once well-known for its marketing campaigns that frequently featured practically nude teen models acting in sexually provocative ways with one another, but it has since toned down sexually suggestive images and stopped using scantily clad models. These modifications, according to the company's then-Chairman Arthur Martinez (in 2016), were made to demonstrate how the business is changing along with its customers.

- Type – Public
- Traded as - NYSE: ANF (Class A)
- Industry – Retail
- Founded - June 4, 1892; 130 years ago in Manhattan, New York City, U.S.
- Founders - David T. Abercrombie, Ezra Fitch
- Headquarters - New Albany, Ohio, U.S.
- Number of locations - 854 (Feb. 2020)
- Area served – Worldwide
- Key people - Terry Burman (Non-Executive Chairman), Fran Horowitz (CEO)
- Products - Apparel Accessories Personal care Footwear
- Number of employees - 44,000 (Feb. 2020)[1]
- Divisions - Abercrombie & Fitch, Abercrombie Kids, Hollister Co., Gilly Hicks

Fundamentals of the Company: -

Profitability

Profit Margin	0.08%
Operating Margin (ttm)	2.82%

Management Effectiveness

Return on Assets (ttm)	2.31%
Return on Equity (ttm)	1.35%

Income Statement

Revenue (ttm)	3.7B
Revenue Per Share (ttm)	73.50
Quarterly Revenue Growth (yoy)	3.30%
Gross Profit (ttm)	2.1B
EBITDA	236.65M
Net Income Avi to Common (ttm)	2.82M
Diluted EPS (ttm)	0.05
Quarterly Earnings Growth (yoy)	-41.50%

Balance Sheet

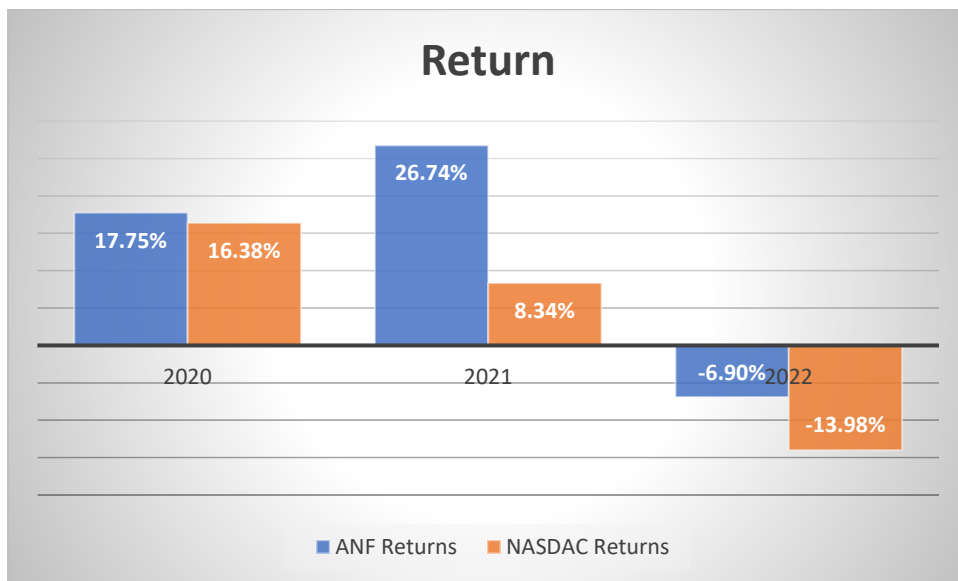
Total Cash (mrq)	517.6M
Total Cash Per Share (mrq)	10.52
Total Debt (mrq)	1.22B
Total Debt/Equity (mrq)	173.26
Current Ratio (mrq)	1.36
Book Value Per Share (mrq)	14.18

Cash Flow Statement

Operating Cash Flow (ttm)	-2.34M
Levered Free Cash Flow (ttm)	-86.96M

Return: -

Year	ANF Returns	NASDAQ Returns
2020	17.75%	16.38%
2021	26.74%	8.34%
2022	-6.90%	-13.98%



In 2020, ANF had a higher return of 17.75% compared to NASDAQ's return of 16.38%. This indicates that ANF outperformed NASDAQ in 2020.

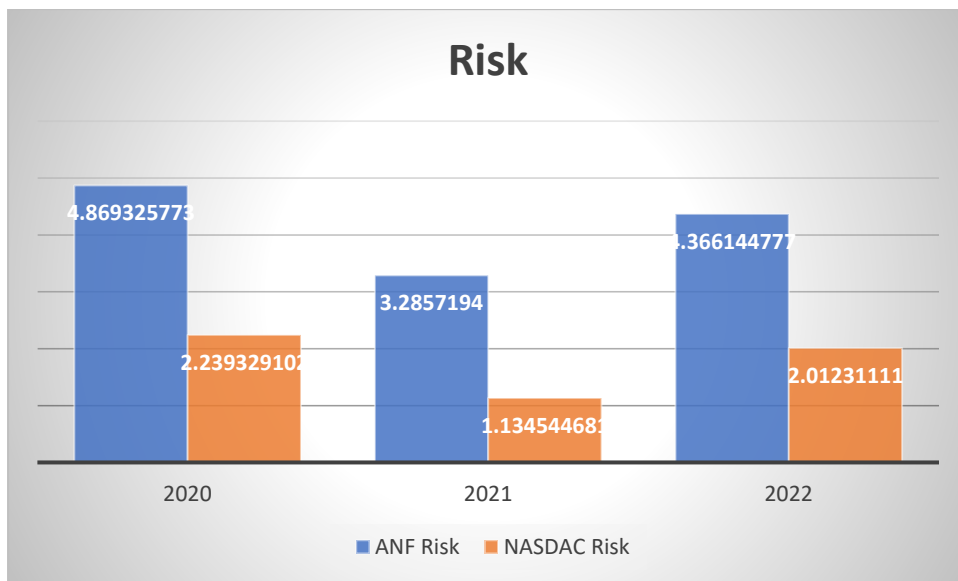
In 2021, ANF had a significantly higher return of 26.74% compared to NASDAQ's return of 8.34%. This indicates that ANF significantly outperformed NASDAQ in 2021.

In 2022, ANF had a negative return of -6.90% while NASDAQ also had a negative return of -13.98%. This indicates that ANF performed better than NASDAQ in 2022 as it had a lower negative return.

It suggests that ANF outperformed NASDAQ in 2020 and 2021 but underperformed in 2022. It is important to note that higher returns do not necessarily imply lower risk and vice versa. It's always important to consider both risk and return when making investment decisions, as well as other factors like diversification, investment goals, and personal risk tolerance.

Risk: -

Year	ANF Risk	NASDAC Risk
2020	4.869326	2.239329
2021	3.285719	1.134545
2022	4.366145	2.012311



In 2020, ANF had a higher risk of 4.869325773 compared to NASDAQ's risk of 2.239329102. This indicates that ANF was more volatile than NASDAQ in 2020.

In 2021, ANF had a lower risk of 3.2857194 compared to NASDAQ's risk of 1.134544681. This indicates that ANF was less volatile than NASDAQ in 2021.

In 2022, ANF had a higher risk of 4.366144777 while NASDAQ had a risk of 2.012311111. This indicates that ANF was more volatile than NASDAQ in 2022.

It is suggested that ANF was more volatile than NASDAQ in 2020 and 2022 but less volatile in 2021. It is important to note that higher risk does not necessarily imply higher returns and vice versa. It's always important to consider both risk and return when making investment decisions, as well as other factors like diversification, investment goals, and personal risk tolerance.

Additionally, it would be useful to calculate the Sharpe ratio for ANF and NASDAQ to compare their risk-adjusted performance over the three-year period. However, these calculations are not possible with the given data as we do not have information on the risk-free rate of return.

Correlation: - 0.4407

The correlation coefficient of 0.4407 between Abercrombie & Fitch Company (ANF) and NASDAQ indicates a positive but moderate relationship between the two variables. This suggests that ANF and NASDAQ move somewhat in the same direction, but the relationship is not strong.

On the other hand, the correlation coefficient of 1 between NASDAQ and itself indicates a perfect positive correlation, which means that NASDAQ moves in the exact same direction as itself. This is expected as the correlation of a variable with itself is always perfect positive correlation.

In general, correlation coefficients can range from -1 to +1, with -1 indicating a perfect negative correlation, 0 indicating no correlation, and +1 indicating a perfect positive correlation. A correlation coefficient of 0.4407 suggests that ANF and NASDAQ have a moderate positive relationship, but there may be other factors that influence the relationship between the two variables.

Beta: -

The beta of Abercrombie & Fitch Company (ANF) of 0.004602036 indicates that ANF's returns are less sensitive to market movements compared to the overall market (represented by NASDAQ), as its beta is less than 1. This means that ANF's returns are expected to be less volatile than the market.

On the other hand, the beta of NASDAQ is 1, which represents the market. A beta of 1 implies that the stock's returns move in tandem with the market. If the market returns increase by 1%, the stock's returns are expected to increase by 1%. Similarly, if the market returns decrease by 1%, the stock's returns are expected to decrease by 1%.

Calculation of Portfolio Return: -

Company	Return	Weightage
ABT	4.8565	0.25
ANF	12.5306	0.25
MMM	-3.7287	0.25
ZION	3.2312	0.25
Portfolio Return		4.22

The portfolio return is 4.22%. This figure is the weighted average of the returns of each company in the portfolio.

The weightage of each company in the portfolio is also given. We can see that each company has an equal weightage of 0.25 or 25%. This means that each company's performance has an equal impact on the overall performance of the portfolio.

Looking at the returns of each company, we can see that two companies, ABT and ZION, have positive returns of 4.8565% and 3.2312%, respectively. On the other hand, MMM has a negative return of -3.7287%. ANF has the highest return among the four companies with a return of 12.5306%.

The portfolio return of 4.22% is a positive return, indicating that the portfolio has performed well during the period. However, it is important to note that the portfolio return may not be representative of future performance, and it is important to consider other factors such as risk and diversification when making investment decisions.

Conclusion: -

Risk and return are two of the most important factors that investors consider when analyzing potential investment opportunities. Here are some key reasons why risk and return are crucial components of investment analysis:

- 1) Helps to manage expectations
- 2) Facilitates informed decision-making
- 3) Balancing risk and return
- 4) Diversification

Analysing the risk and return of potential investments is a critical component of investment analysis. It helps investors make informed investment decisions, balance their risk and return objectives, and build a diversified investment portfolio that aligns with their goals and risk tolerance.



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PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT OF
**INVESTMENT ANALYSIS AND PORTFOLIO
MANAGEMENT**

21MBA332

MASTER OF BUSINESS ADMINISTRATION

Autonomous Institution Affiliated to BCU

By

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Under the guidance of

Dr. Tamizharasi

Assistant Professor



RV INSTITUTE OF MANAGEMENT

2022-23

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ABOUT THE COMPANY

AMPHENOL CORP A(APH)



Amphenol is one of the world's largest providers of high-technology interconnect, sensor and antenna solutions. Their products **Enable the Electronics Revolution** across virtually every end market, including Automotive, Broadband Communications, Commercial Aerospace, Industrial, Information Technology and Data Communications, Military, Mobile Devices and Mobile Networks. Founded in 1932, Amphenol trades on the New York Stock Exchange under the ticker APH and is headquartered in Wallingford, Connecticut, USA

FUNDEMENTALS

Valuation		Margins	
Price / Earnings	25.70	Sales	\$12.6B
Book Value	11.11	Gross Margin	31.91%
Earnings Per Share	\$3.09	Net Profit Margin	15.07%
Price To Sales Ratio	3.63	EBIT Margin	20.66%
Price To Book Ratio	6.36	EBITDA Margin	23.77%
Price To Tangible Book Ratio	N/A	Operating Margins	20.66%
Price/Cash Flow Ratio	24.06		
Price/Free Cash Flow Ratio	96.23		

Effectiveness	
Return on Equity	28.74%
Return on Assets	30.16%
Asset Turnover	2.00
Receivables Turnover	4.82
Inventory Turnover	4.19

NEWPARK RESOURCES



Newpark is driven to help the customers improve the efficiencies and sustainability of their operations by delivering reliable and environmentally responsible solutions. This drive is the catalyst for innovation and the development of next-generation products and services.

Newpark is a leading provider of sustainable technologies and services primarily supporting energy infrastructure markets. They have a global presence in large-scale, long-term markets with business segments positioned across the spectrum of the energy transition.

Headquartered in The Woodlands, Texas, they serve markets around the world, with an established presence in all continents, demonstrating our commitment to be a strong and reliable partner for our customers, wherever they need us to be.

FUNDEMENTALS

Valuation		Profile	
Price / Earnings	N/A	Market Capitalization	356.1M
Book Value	4.76	Float (MRQ)	84.36%
Earnings Per Share	\$0.06	Shares Outstanding (MRQ)	92.3M
Price To Sales Ratio	0.43	Short Interest as a % of Float (MRQ)	1.05%
Price To Book Ratio	0.70	Shares Held By Institutions (MRQ)	62.6M
Price To Tangible Book Ratio	0.83	Margins	
Price/Cash Flow Ratio	N/A	Sales	\$815.6M
Price/Free Cash Flow Ratio	N/A	Gross Margin	14.90%
		Net Profit Margin	-2.55%
		EBIT Margin	2.93%
		EBITDA Margin	11.38%
		Operating Margins	2.93%

ANALOG DEVICES INC



AHEAD OF WHAT'S POSSIBLE™

Analog Devices, Inc. (ADI), also known simply as Analog, is an American multinational semiconductor company specializing in data conversion, signal processing, and power management technology, headquartered in Wilmington, Massachusetts.

The company manufactures analog, mixed-signal and digital signal processing (DSP) integrated circuits (ICs) used in electronic equipment. These technologies are used to convert, condition and process real-world phenomena, such as light, sound, temperature, motion, and pressure into electrical signals.

Analog Devices has approximately 100,000 customers[7] in the following industries: communications, computer, instrumentation, military/aerospace, automotive, and consumer electronics applications.

FUNDEMENTALS

Valuation		Financial Strength	
Price / Earnings	28.59	Current Ratio (MRQ)	2.02
Book Value	71.61	Quick Ratio (MRQ)	1.45
Earnings Per Share	\$6.91	Total Debt/Equity Ratio (MRQ)	17.91
Price To Sales Ratio	7.39	Debt/Common Equity Ratio (MRQ)	17.91
Price To Book Ratio	2.24	Effectiveness	
Price To Tangible Book Ratio	N/A	Return on Equity	9.35%
Price/Cash Flow Ratio	19.33	Return on Assets	70.64%
Price/Free Cash Flow Ratio	77.32	Asset Turnover	2.59
		Receivables Turnover	7.42
		Inventory Turnover	4.11

AON PLC



Our world is changing. Uncertainty has become the new constant in a world that is increasingly volatile and where new business models are rising and falling at an ever-increasing speed. With this change comes a pressing need for businesses to make important decisions more often. Some will be easy, others difficult. There'll be some that may seem small, but all have the potential to have a profound impact.

FUNDEMENTALS

Valuation	
Price / Earnings	27.21
Book Value	0.60
Earnings Per Share	\$12.12
Price To Sales Ratio	5.00
Price To Book Ratio	35.58
Price To Tangible Book Ratio	N/A
Price/Cash Flow Ratio	28.73
Price/Free Cash Flow Ratio	114.91

Profile	
Market Capitalization	67.7B
Float (MRQ)	97.90%
Shares Outstanding (MRQ)	207.5M
Short Interest as a % of Float (MRQ)	1.07%
Shares Held By Institutions (MRQ)	177.8M

Margins	
Sales	\$12.5B
Gross Margin	N/A
Net Profit Margin	20.75%
EBIT Margin	29.26%
EBITDA Margin	31.38%
Operating Margins	29.26%

COLLECTION OF DATA (2020-2022)

The data of close price of all the companies as well as market is collected on a daily basis from Jan 1 2020.

The return of each of the companies as well as the market is calculated using the close price.

The return on stock is given by the formula

$$\text{Return} = (\text{Today's Price} - \text{Yesterday's Price}) / \text{Yesterday's Price} * 100$$

- Amphenol corp A (APH)
- Newpark Resources (NR)
- Analog Devices Inc (ADI)
- AON plc (AON)
- NASDAQ (market)

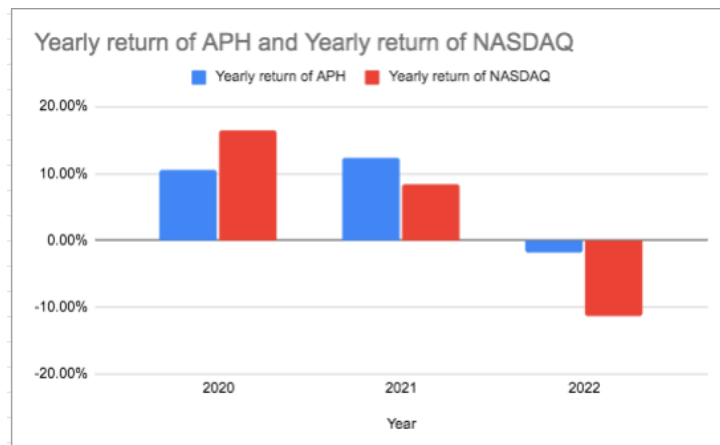
Date	Returns of APH	Returns on NR	Returns on ADI	Returns on AON	Returns of NASDAQ	Returns on AON2
02/01/20						
03/01/20	-1.043676607	0.1610305958	-1.760360375	-0.3927352974	-0.7855191722	-0.3927352974
06/01/20	-0.5180849484	2.090032154	-1.174879574	0.2885060331	0.5620384805	0.2885060331
07/01/20	0.5393862278	-2.677165354	2.27506333	-0.8486378389	-0.03185425391	-0.8486378389
08/01/20	0.2404976413	-3.55987055	0.9031627211	0.4110207871	0.6689046739	0.4110207871
09/01/20	0.350648697	-2.348993289	0	0.6982961916	0.8126574841	0.6982961916
10/01/20	-0.3954022989	-2.233676976	-1.732143155	-0.4973734912	-0.26695848	-0.4973734912
13/01/20	0.7293205318	-2.108963093	0.4132563043	0.4854412235	1.035742264	0.4854412235
14/01/20	0.3574374484	-1.436265709	0.3947597916	-0.6792045499	-0.2436896845	-0.6792045499
15/01/20	-0.7214611872	-3.460837887	-1.689949818	0.6645822489	0.07966548526	0.6645822489
16/01/20	0.9934688621	2.641509434	1.378601798	0.5358058678	1.06310482	0.5358058678
17/01/20	-0.3096857637	-3.308823529	0.2854058663	0.8089517243	0.3399605156	0.8089517243
21/01/20	-1.087249012	0.3802281369	-0.1339273447	-0.2785041224	-0.1931086914	-0.2785041224
22/01/20	-1.50563825	-1.893939394	0.9303495253	0.3076820105	0.1383014018	0.3076820105
23/01/20	-0.2719703699	0.9652509653	0.3653903067	0.5615600857	0.1993968196	0.5615600857
24/01/20	-0.9215685884	-2.485659656	-2.722158673	0.1501604838	-0.9313533093	0.1501604838
27/01/20	-2.591118071	2.549019608	-4.558986986	-0.688783157	-1.885155982	-0.688783157
28/01/20	0.7600175535	-0.3824091778	1.87149008	2.175041786	1.426476661	2.175041786
29/01/20	0.009664442137	-1.343570058	-0.9447948726	0.009237162996	0.05912251755	0.009237162996
30/01/20	-1.498739151	-2.723735409	-0.7595160092	1.408256982	0.2562708525	1.408256982
31/01/20	-2.355943804	0	-2.33158577	0.2822906642	-1.591465502	0.2822906642
03/02/20	0.4825515134	3.4	0.2277904328	2.170260613	1.338222688	2.170260613
04/02/20	3.891946129	0.7736943907	2.236362727	0.715460164	2.098144454	0.715460164
05/02/20	0.7607877797	3.454894434	3.752446236	0.7324408786	0.4299756143	0.7324408786
06/02/20	-0.6403498163	-4.26716141	-0.7627691121	0.5694275002	0.6675027983	0.5694275002
07/02/20	-0.5771450558	-13.17829457	-3.03998961	0.2308357954	-0.539488233	0.2308357954
10/02/20	-0.5417917957	-4.017857143	0.5611517029	0.408465641	1.133131362	0.408465641
11/02/20	-0.175099215	-3.255813953	3.525239087	0.06491279502	0.1095799234	0.06491279502
12/02/20	0.9062580217	7.932692308	1.651267154	-0.1297478586	0.9027914596	-0.1297478586
13/02/20	0.7918860148	-3.118040089	0.05891675884	1.584966236	-0.1438442483	1.584966236
14/02/20	-0.28744083	-2.75862069	-1.034652617	0.49023531	0.1977967553	0.49023531
18/02/20	-2.575189776	1.182033097	0.7819787372	-0.1951351155	0.0160365518	-0.1951351155
19/02/20	1.696419765	-0.2336448598	4.486800202	0.9180894136	0.8675815029	0.9180894136
20/02/20	0.5819028222	-5.386416862	0.5327338811	-1.305644228	-0.6744295521	-1.305644228
21/02/20	-1.889885257	-7.920792079	-1.437174594	-1.203434036	-1.788333754	-1.203434036
24/02/20	-4.009829975	-5.913978495	-4.398827722	-3.546279719	-3.710188875	-3.546279719
25/02/20	2.252478801	4.571429874	2.200810924	0.2851226510	2.772807826	0.2851226510

CALCULATION OF RISK AND RETURN (Average and Standard Deviation)

Amphenol corp A(APH)

Year	Yearly return of APH	Yearly return of NASDAQ
2020	10.51%	16.38%
2021	12.41%	8.34%
2022	-1.86%	-11.39%

Year	Yearly risk of APH	Yearly risk of NASDAQ
2020	2.582062587	2.239329102
2021	1.309162812	1.457591764
2022	1.892688421	2.058184016



INTERPRETATION

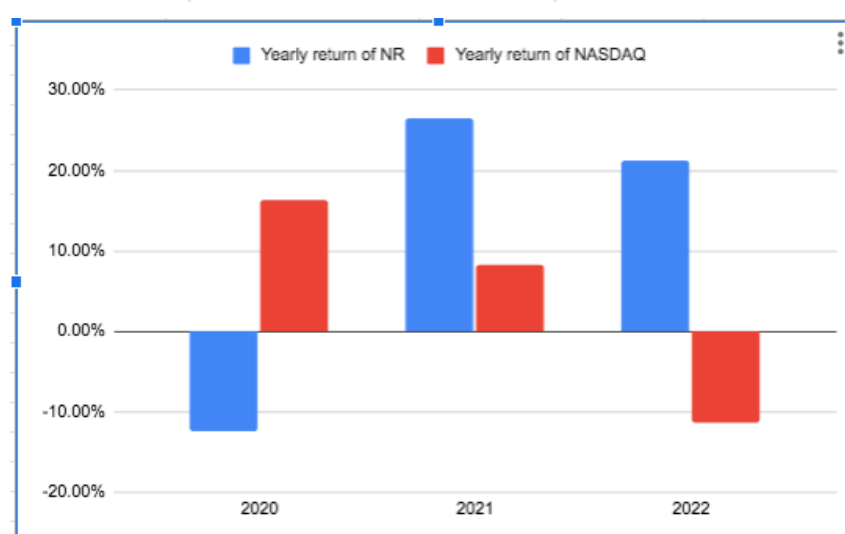
- The market return and market risk are NASDAQ return and risk.
- We can see that in the year 2020 the returns of Amphenol corp A is slightly lesser than the market return(**0.10511<0.16380**).
- This means that the stock has underperformed relative to broader market
- This could be due to a variety of factors, such as company-specific news or events, changes in the industry or sector, or general market conditions.
- As we already know there was a COVID19 breakout during 2020 ,that can be one of the reasons for the underperformance.
- Investors who hold that particular stock may experience a lower return on their investment than they would have earned by investing in a market index fund.

- In 2021 we can see that the returns of Amphenol corp A is higher than the market return (12.41>8.34)
- This means that the stock has outperformed relative to broader market.
- One of the reasons of increase in returns in 2021 can be that the electronics and telecommunications industries, in which Amphenol operates, have experienced strong growth and increased demand for their products in 2021. As a result, companies like Amphenol that supply components to these industries may have seen their stock prices rise.
- In 2022 both the stock and market returns are in negative
- In 2022 there was a 33.1% decline in NASDAQ ,it is also know to be the 7th worst year for NASDAQ
- Global central banks responded to stubbornly high price pressures with one of the strongest hiking cycles in decades. Over 80 central banks tightened in 2022, including 15 of the 20 most important central banks for markets globally. The Federal Reserve hiked the overnight FFR by 425bps across the final seven meetings in 2022 or the equivalent of 17 25bp rate hikes. At the start of 2022, markets were pricing in just three 25bp rate hikes.
- The stock of Amphenol corp A still performed better compared to market (-1.86<11.39)
- Though it performed better than the market it is still A negative return indicates that the stock has lost value over a particular period, which can be a red flag for investors. It's important to understand the reasons behind the negative return and assess the potential for the stock to recover in the future.
- When we see the risk factors, In 2020 the risk is comparatively higher to the market(2.582>2.23)
- It means that the company's stock is more volatile than the overall 4 stock market. This can be interpreted as a negative sign for investors who are looking for more stable investments.
- In 2021,the risk is slightly lower than that of the overall market(1.30<1.45)
- In 2021,the risk is slightly lower than that of the overall market(1.89<2.05)
- it means that the stock has a lower level of volatility or fluctuation compared to the overall market. This could occur for various reasons such as the company having stable earnings, a strong balance sheet, or operating in a less cyclical or less volatile industry.
- When we compare all the years the company gives highest returns during 2021 when compared to other years
- The risk factor is highest during the year 2020 due to which it is suggested to investors to take a wise decision while investing.

NEWPARK RESOURCES

Year	Yearly return of NR	Yearly return of NASDAQ
2020	-12.41%	16.38%
2021	26.47%	8.34%
2022	21.30%	-11.39%

Year	Yearly risk of NR	Yearly risk of NASDAQ
2020	8.102794955	2.239329102
2021	4.359314276	1.457591764
2022	3.951039552	2.058184016



INTERPRETATION

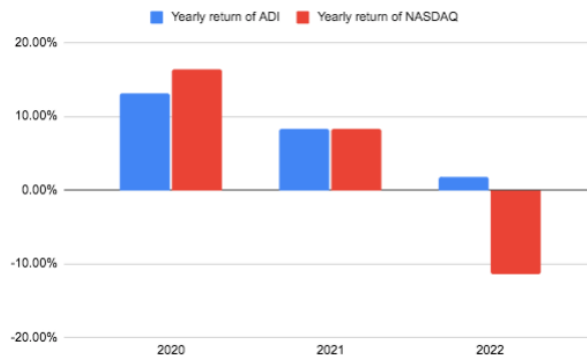
- The market return and market risk are NASDAQ return and risk.
- We can see that in the year 2020 the returns of Newpark Resources is highly lesser than the market return(-12.41<16.38)
- This means that the stock has extremely underperformed relative to broader market.
- The negative return of Newpark Resources can be due to
Reduced demand for oil and gas: The COVID-19 pandemic led to reduced demand for oil and gas, which resulted in lower prices and reduced drilling activity. As a result, companies like Newpark Resources that serve the oil and gas industry experienced reduced demand for their products and services.
High debt levels: Newpark Resources has a relatively high debt-to-equity ratio, which can make the company more vulnerable to economic downturns and market fluctuations. This may have contributed to the negative stock returns in 2020.

- It is highly not recommended for the investors to invest in Newpark Resources.
- The return from 2020 to 2021 has drastically increased from -12.41% to 26.47%, which is very drastic jump and also 26.47% is greater than the overall market returns.
- The company returns have outperformed the market return.
- Also in 2022 the company return is 21.30% which is way higher than the market return which is negative -11.39%.
- In 2020 the risk is extremely high compared to that of the market (8.10>2.239)
- The major reason of this can be the negative returns during 2020.
- The negative returns are highly volatile in nature.
- The risk in 2021 and 2022 are also greater than that of the overall market risk **(4.35>1.45 and 3.95>2.01)**
- It means that the stock is more volatile or fluctuates more than the overall market. This could be due to various reasons, such as the company having a high debt-to-equity ratio, operating in a cyclical or highly competitive industry, or having a history of volatile earnings or revenue.
- It is generally recommended that investors who are considering investing in high-risk stocks have a higher risk tolerance and a longer-term investment horizon.
- The higher stock return is provided in the year 2021

ANALOG DEVICES INC

Year	Yearly return of ADI	Yearly return of NASDAQ
2020	13.14%	16.38%
2021	8.36%	8.34%
2022	1.84%	-11.39%

Year	Yearly risk of ADI	Yearly risk of NASDAQ
2020	3.164456515	2.239329102
2021	1.71342741	1.457591764
2022	2.373453123	2.058184016



INTERPRETATION

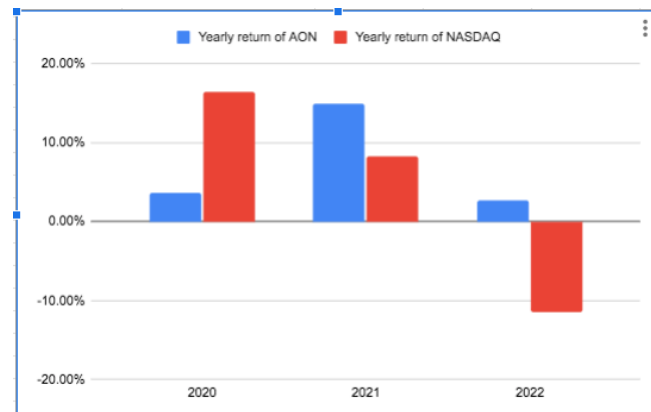
- The market return and market risk are NASDAQ return and risk.
- We can see that in the year 2020 the returns of Analog Devices Inc is very slightly lesser than the market return(13.14<16.38)
- This means that the stock has underperformed relative to broader market but there is no drastic difference.
- Investors who hold that particular stock may experience a lower return on their investment than they would have earned by investing in a market index fund.
- From the investors point of view who wants to newly invest in in the stock it is slightly risk for them to invest,yet it is important to note that past performance does not guarantee future results.
- The return in 2021 is 8.36% which is approximately equal or slightly greater than the market return which is given by 8.34%.
- This could mean that the company has effectively managed its operations to keep pace with the market, or that the stock's performance is driven primarily by external factors that affect the overall market. It's worth noting that a stock's return could be equal to the market return even if the stock's price has experienced significant fluctuations over the time period in question.
- For example, for passive investors who seek to track the overall market, a stock that matches the market return may be a desirable investment. However, for investors who seek to outperform the market, a stock that merely matches the market return may not be sufficient.

- In any case, investors should always conduct their own research and analysis to evaluate the performance and potential future prospects of a stock before making an investment decision.
- In 2022 the stock return is high than the market return (1.84>-11.39),which indicates a drastic difference form negative market return to positive stock return.
- It is highly recommended for the investor to invest in the company stocks as the company has outperformed the market.
- Considering the risk factor ,in all the 3 cases it is higher than that of the overall market risk
- 2020-(3.16>2.2)
- 2021-(1.71>1.45)
- 2022-(2.37>2.05)
- This says that the stock has always been volatile in nature but this can also be because of the higher returns expected.
- The return is highest during the year 2020.

AON PLC

Year	Yearly return of AON	Yearly return of NASDAQ
2020	3.63%	16.38%
2021	14.98%	8.34%
2022	2.77%	-11.39%

Year	Yearly risk of AON	Yearly risk of NASDAQ
2020	2.511496205	2.239329102
2021	1.411324967	1.457591764
2022	1.822010677	2.058184016



INTERPRETATION

- The market return and market risk are NASDAQ return and risk.
- We can see that in the year 2020 the returns of Aon plc is lesser than the market return($3.63 < 16.38$)
- This means that the stock has underperformed relative to broader market.
- Investors who hold that particular stock may experience a lower return on their investment than they would have earned by investing in a market index fund.
- From the investors point of view who wants to newly invest in in the stock it is slightly risk for them to invest,yet it is important to note that past performance does not guarantee future results.
- In 2021 , there was a drastic jump and also 14.98% is greater than the overall market returns which is 8.34%
- The company has clearly outperformed the market.
- In any case, investors should always conduct their own research and analysis to evaluate the performance and potential future prospects of a stock before making an investment decision.
- In 2022 the stock return is high than the market return ($2.77 > -11.39$),which indicates a drastic difference form negative market return to positive stock return.
- It is highly recommended for the investor to invest in the company stocks as the company has outperformed the market.
- Considering the risk factor , In 2020 the risk of the company is greater than that of the market($2.51 > 2.23$)
- This means the stock is highly volatile.
- In 2021 and 2022 the risk is comparatively lower than that of the stock market ($1.41 < 1.45$ and $1.82 < 2.05$).

CALCULATION OF CORRELATION

Correlation is a statistical term describing the degree to which two variables move in coordination with one another. If the two variables move in the same direction, then those variables are said to have a positive correlation. If they move in opposite directions, then they have a negative correlation. Correlation, in the finance and investment industries, is a statistic that measures the degree to which two securities move in relation to each other. Correlations are used in advanced portfolio management, computed as the correlation coefficient, which has a value that must fall between -1.0 and +1.0.

Amphenol corp A(APH)

APH

2020

	<i>Returns of NASDAQ</i>	<i>Returns of APH</i>
Returns of NASDAQ	1	
Returns of APH	0.8107150156	1

2021

	<i>Returns of NASDAQ</i>	<i>Returns of APH</i>
Returns of NASDAQ	1	
Returns of APH	0.7033597641	1

2022

	<i>Returns of NASDAQ</i>	<i>Returns of APH</i>
Returns of NASDAQ	1	
Returns of APH	0.861155138	1

All Years

	<i>Returns of NASDAQ</i>	<i>Returns of APH</i>
Returns of NASDAQ	1	
Returns of APH	0.8078001724	1

INTERPRETATION

- In the year 2020 ,the correlation between returns of NASDAQ and the returns of Amphenol corp A(APH) is 0.8107150156 .
- A correlation coefficient of 0.8107 indicates a strong positive relationship between the market and the stock. This means that as the market moves up or down, the stock tends to move in the same direction.
- In the year 2021,the correlation between returns of NASDAQ and the returns of Amphenol corp A(APH) is 0.7033597641
- A correlation coefficient of 0.7033 indicates a strong positive relationship between the market and the stock. This means that as the market moves up or down, the stock tends to move in the same direction.
- In the year 2022,the correlation between returns of NASDAQ and the returns of Amphenol corp A(APH) is 0.861155138
- A correlation coefficient of 0.8611 indicates a strong positive relationship between the market and the stock. This means that as the market moves up or down, the stock tends to move in the same direction.
- The correlation of all the 3 years together is 0.8078001724
- A correlation coefficient of 0.8078 indicates a strong positive relationship between the market and the stock. This means that as the market moves up or down, the stock tends to move in the same direction.
- Investors should consider other factors, such as the financial health, growth prospects, and competitive landscape of Amphenol corp A, before making any investment decisions based on this correlation coefficient.
- Only direction of movement and the strength can be observed from correlation and not the interdependency of stock and market.

NEWPARK RESOURCES

NR

2020

	<i>Returns of NASDAQ</i>	<i>Returns on NR</i>
Returns of NASDAQ	1	
Returns on NR	0.3219527617	1

2021

	<i>Returns of NASDAQ</i>	<i>Returns on NR</i>
Returns of NASDAQ	1	
Returns on NR	0.1612186477	1

2022

	<i>Returns of NASDAQ</i>	<i>Returns on NR</i>
Returns of NASDAQ	1	
Returns on NR	0.259921406	1

All years

	<i>Returns of NASDAQ</i>	<i>Returns on NR</i>
Returns of NASDAQ	1	
Returns on NR	0.2684065594	1

INTERPRETATION

- In the year 2020 ,the correlation between returns of NASDAQ and the returns of Newpark Resources is 0. 0.3219527617.
- A correlation coefficient of 0.3219 indicates a positive but relatively weak relationship between the market and the stock. This means that there is some degree of association between the movements in the market and the stock, but it is not particularly strong.
- In other words, if the market goes up, there is a tendency for the stock to go up as well, but the magnitude of the effect is not large. Similarly, if the market goes down, the stock may go down to some extent, but again, the effect is not particularly strong.
- In the year 2021,the correlation between returns of NASDAQ and the returns of Newpark Resources is 0.161286477
- A correlation coefficient of 0.1612 indicates a positive but relatively weak relationship between the market and the stock. This means that there is some degree of association between the movements in the market and the stock, but it is not particularly strong.
- In the year 2022,the correlation between returns of NASDAQ and the returns of Newpark Resources is 0.259921.

- A correlation coefficient of 0.2599 indicates a positive but relatively weak relationship between the market and the stock. This means that there is some degree of association between the movements in the market and the stock, but it is not particularly strong..
- The correlation of all the 3 years together is 0.268406554
- A correlation coefficient of 0.2684 indicates a positive but relatively weak relationship between the market and the stock. This means that there is some degree of association between the movements in the market and the stock, but it is not particularly strong..
- Investors should consider other factors, such as the financial health, growth prospects, and competitive landscape of Newpark Resources, before making any investment decisions based on this correlation coefficient.
- Only direction of movement and the strength can be observed from correlation and not the interdependency of stock and market.

ANALOG DEVICES Inc

ADI		
2020		
	Returns of NASDAQ	Returns on ADI
Returns of NASDAQ		1
Returns on ADI	0.8306781132	1

2021		
	Returns of NASDAQ	Returns on ADI
Returns of NASDAQ		1
Returns on ADI	0.709418167	1

2022		
	Returns of NASDAQ	Returns on ADI
Returns of NASDAQ		1
Returns on ADI	0.8596465863	1

ALL YAERS		
	Returns of NASDAQ	Returns on ADI
Returns of NASDAQ		1
Returns on ADI	0.8177853648	1

INTERPRETATION

- In the year 2020 ,the correlation between returns of NASDAQ and the returns of Analog Devices Inc is 0.8306781132
- A correlation coefficient of 0.8306 indicates a strong positive relationship between the market and the stock. This means that as the market moves up or down, the stock tends to move in the same direction.
- In the year 2021,the correlation between returns of NASDAQ and the returns of Analog Devices Inc is 0.709418167

- A correlation coefficient of 0.7094 indicates a strong positive relationship between the market and the stock. This means that as the market moves up or down, the stock tends to move in the same direction.
- In the year 2022, the correlation between returns of NASDAQ and the returns of Analog Devices Inc is 0.8596465863
- A correlation coefficient of 0.85964 indicates a strong positive relationship between the market and the stock. This means that as the market moves up or down, the stock tends to move in the same direction.
- The correlation of all the 3 years together is 0.8177853648
- A correlation coefficient of 0.8177 indicates a strong positive relationship between the market and the stock. This means that as the market moves up or down, the stock tends to move in the same direction.
- Investors should consider other factors, such as the financial health, growth prospects, and competitive landscape of Analog Devices Inc, before making any investment decisions based on this correlation coefficient.
- Only direction of movement and the strength can be observed from correlation and not the interdependency of stock and market.

AON PLC

AON		
2020		
	Returns of NASDAQ	Returns on AON
Returns of NASDAQ	1	
Returns on AON	0.6145459295	1

2021		
	Returns of NASDAQ	Returns on AON
Returns of NASDAQ	1	
Returns on AON	0.2914728802	1

2022		
	Returns of NASDAQ	Returns on AON
Returns of NASDAQ	1	
Returns on AON	0.6830288645	1

ALL YAERS		
	Returns of NASDAQ	Returns on AON
Returns of NASDAQ	1	
Returns on AON	0.5824427694	1

INTERPRETATION

- In the year 2020 ,the correlation between returns of NASDAQ and the returns of AON Plc is 0.61454
- A correlation coefficient of 0.61454 indicates a moderate positive correlation between the market and the stock in question.
- This means that there is a tendency for the stock to move in the same direction as the overall market, but it is not a perfect relationship. When the market is performing well, the stock is also likely to perform well to some extent, but there may be other factors that can influence the performance of the stock as well.
- In the year 2021,the correlation between returns of NASDAQ and the returns of AON Plc is 0.2914
- A correlation coefficient of 0.2914 indicates a positive but relatively weak relationship between the market and the stock. This means that there is some degree of association between the movements in the market and the stock, but it is not particularly strong.
- In other words, if the market goes up, there is a tendency for the stock to go up as well, but the magnitude of the effect is not large. Similarly, if the market goes down, the stock may go down to some extent, but again, the effect is not particularly strong.
- In the year 2022,the correlation between returns of NASDAQ and the returns of AON Plc is 0.6830288645
- A correlation coefficient of 0.6830 indicates a moderate positive correlation between the market and the stock in question.
- This means that there is a tendency for the stock to move in the same direction as the overall market, but it is not a perfect relationship. When the market is performing well, the stock is also likely to perform well to some extent, but there may be other factors that can influence the performance of the stock as well.
- The correlation of all the 3 years together is 0.5824427694
- A correlation coefficient of 0.58244 indicates a moderate positive correlation between the market and the stock in question.
- This means that there is a tendency for the stock to move in the same direction as the overall market, but it is not a perfect relationship. When the market is performing well, the stock is also likely to perform well to some extent, but there may be other factors that can influence the performance of the stock as well.

CALCULATION OF BETA VALUES

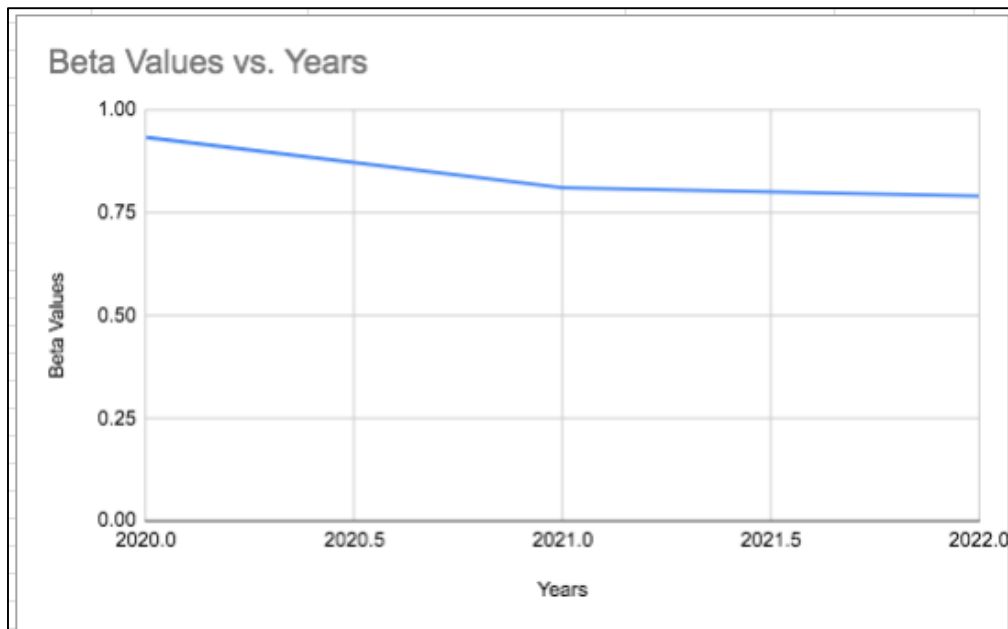
(Using Slope function)

Beta is a measure of a stock's volatility in relation to the overall market. It is a coefficient that indicates the degree to which a stock's price tends to move in response to changes in the market.

A beta value of 1 indicates that the stock's price moves in line with the market, while a beta greater than 1 suggests that the stock is more volatile than the market, and a beta less than 1 suggests that the stock is less volatile than the market.

Amphenol corp A(APH)

Years	Beta Values
2020	0.934796457
2021	0.8116140896
2022	0.7919109009
All 3 Years	0.8634765611



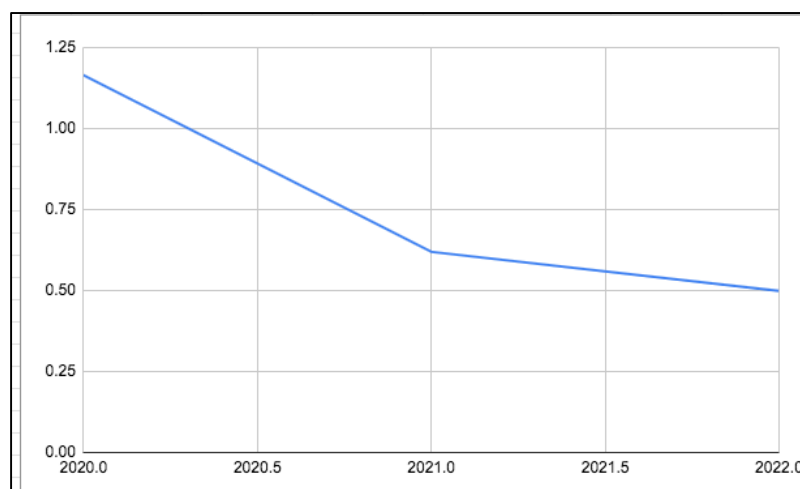
INTERPRETATION

- Beta (β) is a measure of how closely the returns of Amphenol Corp A move in relation to the returns of the NASDAQ index.
- In 2020, A beta value of 0.93 indicates that, on average, when the NASDAQ index goes up or down by 1%, we can expect Amphenol Corp A's returns to move up or down by approximately 0.93%.
- This suggests that the stock has a slightly lower level of volatility compared to the market, but it still moves in a similar direction as the market.
- Whether a beta of 0.93 is good or not depends on an individual investor's investment strategy, goals, and risk tolerance. If the investor is looking for a stock that has a lower level of risk than the overall market, then a beta of 0.93 may be desirable.
- On the other hand, if the investor is looking for a stock with higher potential returns, they may prefer a stock with a higher beta.
- In 2021, A beta value of 0.81 indicates that, on average, when the NASDAQ index goes up or down by 1%, we can expect Amphenol Corp A's returns to move up or down by approximately 0.81%.
- In 2022, A beta value of 0.79 indicates that, on average, when the NASDAQ index goes up or down by 1%, we can expect Amphenol Corp A's returns to move up or down by approximately 0.79%.
- The beta value for all 3 years is 0.86 indicates that, on average, when the NASDAQ index goes up or down by 1%, we can expect Amphenol Corp A's returns to move up or down by approximately 0.86%.
- In the graph we can see that the beta value has declined a little and has been maintaining further.
- A declining beta value of a stock indicates that the stock is becoming less volatile compared to the overall market. This means that the stock's price movements are becoming less sensitive to changes in the market, and it may be moving independently of the market or with lower magnitude.
- A constant beta value can be useful for investors in assessing the stock's risk level and in making investment decisions. For example, if the beta value remains constant, an investor may be able to predict how the stock will perform in relation to the market and may be able to make more informed investment decisions.

- However, it's important to keep in mind that beta is just one measure of risk, and other factors such as the company's financial health, industry trends, and macroeconomic conditions should also be considered when making investment decisions.

NEWPARK RESOURCES

Years	Beta Values
2020	1.164954812
2021	0.6194579774
2022	0.4990997999
All 3 Years	0.8359403733



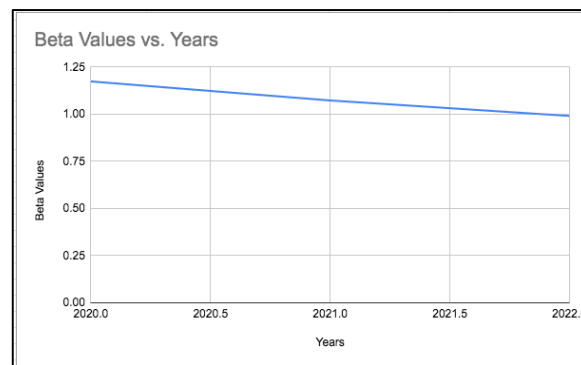
INTERPRETATION

- Beta (β) is a measure of how closely the returns of Newpark Resources move in relation to the returns of the NASDAQ index.
- In 2020, A beta value of 1.164 A beta value of 1.164 indicates that the stock is expected to be more volatile than the overall market, as it moves with a magnitude that is 1.164 times greater than the market. This means that the stock is likely to experience larger price movements in response to changes in the market compared to stocks with a beta of 1.
- Investors who are seeking higher potential returns may find stocks with higher beta values attractive, as they are generally associated with higher levels of risk. However, it's important to keep in mind that higher risk also means higher potential for losses. Therefore, investors should carefully consider their risk tolerance and investment objectives before making any investment decisions.
- In 2021, A beta value of 0.619 indicates that, on average, when the NASDAQ index goes up or down by 1%, we can expect of Newpark Resources' returns to move up or down by approximately 0.619%.

- In 2022, A beta value of 0.499 indicates that, on average, when the NASDAQ index goes up or down by 1%, we can expect of Newpark Resources' returns to move up or down by approximately 0.499%.
- In the graph we can see that the beta value has been declining over the period of time.

ANALOG DEVICES Inc

Years	Beta Values
2020	1.173853707
2021	1.07222936
2022	0.9913257798
All 3 Years	1.08895126

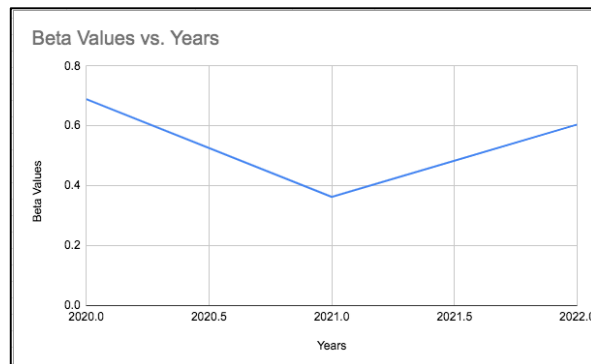


INTERPRETATION

- Beta (β) is a measure of how closely the returns of Analog Devices Inc move in relation to the returns of the NASDAQ index.
- In 2020, A beta value of 1.173 A beta value of 1.164 indicates that the stock is expected to be more volatile than the overall market, as it moves with a magnitude that is 1.173 times greater than the market. This means that the stock is likely to experience larger price movements in response to changes in the market compared to stocks with a beta of 1.
- The beta values in the year 2021 and 2022 are 1.07 and 0.99 respectively
- If a stock consistently has a beta value near or greater than 1, it suggests that the stock is expected to be more volatile than the overall market. This means that the stock's price movements are likely to be magnified compared to the market, both on the upside and downside.

AON PLC

Years	Beta Values
2020	0.6892375795
2021	0.3625797738
2022	0.6046523896
All 3 Years	0.6138970729



INTERPRETATION

- Beta (β) is a measure of how closely the returns of AON Plc move in relation to the returns of the NASDAQ index.
- In 2020, A beta value of 0.689 indicates that, on average, when the NASDAQ index goes up or down by 1%, we can expect AON Plc's returns to move up or down by approximately 0.689%.
- This suggests that the stock has a slightly lower level of volatility compared to the market, but it still moves in a similar direction as the market.
- In 2021, A beta value of 0.3625 indicates that, on average, when the NASDAQ index goes up or down by 1%, we can expect AON Plc's returns to move up or down by approximately 0.3625%.
- In 2022, A beta value of 0.604 indicates that, on average, when the NASDAQ index goes up or down by 1%, we can expect AON Plc's returns to move up or down by approximately 0.604%.
- The beta value for all 3 years is 0.6138 indicates that, on average, when the NASDAQ index goes up or down by 1%, we can expect Newpark Resources' returns to move up or down by approximately 0.6138%.
- The graph shows that initially there is decline and then there is growth in beta value.

CALCULATION OF PORTFOLIO RETURN

The Portfolio consists of

- Amphenol corp A(APH)
- Newpark Resources
- Analog Devices Inc
- AON Plc

Company	Aggregate return	weightage
Amphenol Corp A	7.02%	0.25
Newpark Resources	11.79%	0.25
Analog Devices Inc	7.78%	0.25
Aon plc	7.13%	0.25
PORTFOLIO RETURN		8.43%

Note: The weights have been assumed equally for all the 4 companies (0.25 each since there are 4 companies – ¼) The formula for calculating portfolio return is

$$R_p = \{(W_a * R_a) + (W_b * R_b) + (W_c * R_c) \dots \dots \dots + (W_n * R_n)\}$$

- A portfolio return of 8.43% for a group of four companies consisting of Amphenol corp A, Newpark Resources, Analog Device Inc and AON Plc suggests that the overall performance of the portfolio was positive over a specific period.
- Ultimately, the significance of the return depends on your investment goals and whether the return aligns with your objectives. For instance, if your goal is to grow your investments aggressively, an 8.43% return may not be sufficient. However, if you are seeking steady growth with minimal risk, it could be considered a good return.

CONCLUSION

The summary of all the calculations is given below

Company	Average Return	Average Risk
Amphenol Corp A	7.02%	1.927971273
Newpark Resources	11.79%	6.231054615
Analog Devices Inc	7.78%	2.417112349
Aon plc	7.13%	1.91494395
PORTFOLIO RETURN	8.43%	

- As the table says we can see that the highest individual return is from Newpark Resources which is 11.79% and all the other stocks give a return in the range of 7%-8% which is not as high as Newpark Resources.
- Along with the highest returns Newpark Resources also have the highest risk factor which is around 6.23 where as risk of all the other assets are in the range of 1.5-2.00 which is comparatively very less
- As an investor it is very important to have a diversified portfolio which would guarantee a moderate return but with lesser risk factor.
- The companies belong to different industries like-
Amphenol Corp A-Industrials (aerosapace)
Newpark Resources-Energy
Analog Devices Inc-Information Technology
Aon plc-Financials
- An investor who wants to take higher risk can invest in Newpark Resources but it is suggested to invest in the above portfolio for a guaranteed return.

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- <https://www.analog.com/en/index.html>

CAPSTONE PROJECT
PREDICTIVE ANALYTICS USING R

**DEMONSTRATION OF CHARTS, UNIVARIATE ANALYSIS, LINEAR REGRESSION & MULTIPLE
REGRESSION**

Marks Rubrics: (10 marks for report + 5 marks for viva)

1. About the Company – 0.5 marks
2. About the Variables – 0.5 marks
3. Construction of Line Chart, Scatter Plot & Histogram – for any one continuous variables: 1.5 marks
4. Computation of Univariate Analysis – Mean; Median; Mode; Standard deviation; Testing of Normality (for any one continuous variables): 1.5 marks
5. Construction of Linear Regression (Close Price against Open Price): 3 marks
6. Construction of Multiple Regression (Close Price against all other variables): 3 marks
7. Viva–voce : 5 marks

INSTRUCTIONS

Prepare a detailed report with proper interpretation, tables and visualizations

Prepare your report in MS word with ‘Times New Roman’ font and 12 font size

Convert Report file into PDF format and upload in quiklrn

Start Date – 12th April 2023

End Date – 25th April 2023

No time extension will be allowed

Sl. No	Student Name	Company Name	Industry
1	Team 1	ACC Ltd.	CEMENT & CEMENT PRODUCTS
2	Team 2	Adani Enterprises Ltd.	METALS
3	Team 3	Bajaj Auto Ltd.	AUTOMOBILE
4	Team 4	Bajaj Finance Ltd.	FINANCIAL SERVICES
5	Team 5	Bosch Ltd.	AUTOMOBILE
6	Team 6	Britannia Industries Ltd.	CONSUMER GOODS
7	Team 7	Castrol India Ltd.	OIL & GAS
8	Team 8	Colgate Palmolive (India) Ltd.	CONSUMER GOODS
9	Team 9	DLF Ltd.	CONSTRUCTION
10	Team 10	Dabur India Ltd.	CONSUMER GOODS
11	Team 11	Dr. Reddy's Laboratories Ltd.	PHARMA
12	Team 12	Eicher Motors Ltd.	AUTOMOBILE
13	Team 13	Emami Ltd.	CONSUMER GOODS
14	Team 14	Federal Bank Ltd.	FINANCIAL SERVICES
15	Team 15	Glenmark Pharmaceuticals Ltd.	PHARMA
16	Team 16	Godrej Consumer Products Ltd.	CONSUMER GOODS
17	Team 17	HCL Technologies Ltd.	IT
18	Team 18	HDFC Bank Ltd.	FINANCIAL SERVICES
19	Team 19	Hindustan Aeronautics Ltd.	INDUSTRIAL MANUFACTURING
20	Team 20	Hindustan Unilever Ltd.	CONSUMER GOODS
21	Team 21	ICICI Bank Ltd.	FINANCIAL SERVICES
22	Team 22	IDFC First Bank Ltd.	FINANCIAL SERVICES
23	Team 23	ITC Ltd.	CONSUMER GOODS
24	Team 24	Indian Bank	FINANCIAL SERVICES
25	Team 25	Indian Oil Corporation Ltd.	OIL & GAS



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III SEMESTER
Batch 2021-2023

SUBJECT CODE: 21MBA531

SUBJECT: PREDICTIVE ANALYSIS USING R

Topic:

“Capstone Project report on Predictive analysis using R language”

NAME OF THE STUDENT	GIRISH N NASHI
SEMESTER	3 rd
REGISTERED NUMBER	P18FW21M0036
NAME OF THE FACULTY	Dr Jahnavi M
MARKS (out of 15)	

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ACC Limited (ACC) is a leading player in the Indian building materials space, with a pan-India manufacturing and marketing presence. With 17 cement manufacturing units, 85 readymix concrete plants, over 6,600 talented employees, a vast distribution network of 56,000 dealers & retailers and a countrywide spread of sales offices, it contributes tremendously to the landscape of the country.

For over 80 years, ACC has been synonymous with cement, establishing its reputation as a pioneer organization that consistently sets new benchmarks in research and innovative product development.

History was created more than eight decades ago when the doyens of the Indian cement industry unified their operations to build the foundation of a company that has only grown stronger with every passing year. From the Bhakra Nangal Dam in 1960 to the Mumbai-Pune Expressway, ACC cement is at the heart of iconic landmarks across the country.

Our success over the years can be attributed to our unrelenting focus on customer centricity, ethical business practices and sustainable development. We pay tribute to our motto of 'Cementing Relationships' with every single interaction with our range of stakeholders.

ACC's brand architecture comprises the gold range and silver range of products assuring superior quality for general construction as well as for specialized applications and environments. The ready-mix concrete product range provides one-stop solutions from basic requirements to high grades of concrete to build the country's tallest structures.

Sustainability is an integral part of our business strategy, with our Sustainable Development 2030 Plan focused on four broad themes: Climate, Circular Economy, Water & Nature and People & Communities. Our corporate social responsibility efforts benefit local communities across the country by furthering economic and social progress. ACC's earliest initiatives in community development date back to the 1940's – long before the term 'corporate social responsibility' was coined.

ACC was among the first Indian companies to include commitment to environmental protection as one of its corporate objectives. Since inception, we have integrated this commitment into all activities of our value chain, from mining to sales to promoting the use of alternative fuels and resources, resulting in one of the lowest carbon footprints in the cement industry.

ACC Limited (ACC) is one of the leading players in the Indian building materials space with 17 modern cement factories, 90 ready mixed concrete plants, a vast distribution network of over 10,000 channel partners and a countrywide spread of sales offices. Headquartered in Mumbai, ACC's operations span the whole country with cement factories, ready mix concrete plants, regional offices, sales units and area offices

In 2022, ACC became a part of Adani Group - the largest and fastest-growing portfolio of diversified sustainable businesses

FOUNDERS OF ACC LTD.

ACC Ltd, formerly known as The Associated Cement Companies Limited, was founded in 1936 by a group of leading industrialists, including:

J.R.D. Tata - J.R.D. Tata was a renowned industrialist and philanthropist who played a key role in the development of several industries in India, including aviation, steel, and cement. He was the founder of Tata Airlines, which later became Air India, and also served as the chairman of Tata Sons.

Sir Nowroji Saklatwala - Sir Nowroji Saklatwala was a prominent industrialist and philanthropist who was the chairman of the Tata group from 1932 to 1948. He played a key role in the development of several Tata companies, including Tata Steel, Tata Power, and ACC Ltd.

Khwaja Abdul Hamied - Khwaja Abdul Hamied was a noted industrialist and philanthropist who was the founder of the Cipla pharmaceutical company. He was also a key investor in ACC Ltd and played an important role in its early development.

Walchand Hirachand - Walchand Hirachand was a pioneering Indian industrialist who founded several leading companies, including Hindustan Aircraft and Premier Automobiles. He was also a key investor in ACC Ltd and played an important role in its early development.

These founders played a crucial role in establishing ACC Ltd as one of the leading cement companies in India, and their vision and leadership helped the company grow and prosper over the years.

VISION

To be one of the most respected companies in India; recognized for challenging conventions and delivering on our promises.

PRODUCTS

ACC LTD. Has a wide range of gold range ,silver range cements. The brand ACC is a hallmark of quality and durability in Cement and Ready Mixed Concrete- to build homes for the masses of India in its cities, towns and villages as well as enduring structures for infrastructure and industry.



Key recognitions received by ACC Ltd.

ACC Limited, also known as The Associated Cement Companies Limited, is one of the leading cement manufacturers in India. Some of the key recognitions received by ACC Ltd include:

- **GreenPro Certification:** ACC's Jamul and Sindri cement plants were certified with CII GreenPro certification for being environmentally friendly.

- **National Award for Excellence in Water Management:** ACC's Wadi cement plant was awarded the National Award for Excellence in Water Management by the Confederation of Indian Industry (CII) for its efforts towards water conservation and management.

- **Greentech Environment Excellence Award:** ACC's Kymore cement works received the Greentech Environment Excellence Award for its sustainable environmental practices.

- **Golden Peacock Global Award for Sustainability:** ACC was conferred with the Golden Peacock Global Award for Sustainability for its initiatives towards sustainable development and environment-friendly practices.

- **Aon Best Employers India Award:** ACC was recognized as one of India's Best Employers by Aon Hewitt for its focus on employee engagement, development, and diversity.

- **CII-ITC Sustainability Awards:** ACC has won several CII-ITC Sustainability Awards for its sustainable business practices, including water conservation, energy efficiency, and biodiversity conservation.

These are some of the key recognitions received by ACC Ltd for its efforts towards sustainability, environmental protection, and employee engagement.

Competitors of ACC Ltd.

ACC Ltd operates in a highly competitive cement industry in India. Some of its major competitors include:

- **UltraTech Cement Ltd** - UltraTech Cement is the largest cement manufacturer in India and a subsidiary of the Aditya Birla Group. It has a strong pan-India presence, with 22 cement plants and a total capacity of 116.75 million tonnes per annum (MTPA). UltraTech is known for its strong brand presence, high-quality products, and efficient distribution network. It also has a significant international presence, with operations in the UAE, Bahrain, Bangladesh, and Sri Lanka.

- **Ambuja Cements Ltd** - Ambuja Cements is a subsidiary of Holcim, one of the world's largest cement producers. It has a strong presence in the western and northern regions of India, with 5 cement plants and a total capacity of 29.65 MTPA. Ambuja is known for its innovative products, customer-focused approach, and commitment to sustainable development. It has a significant export business, with customers in the Middle East, Africa, and Europe.

- **Shree Cement Ltd** - Shree Cement is a leading cement manufacturer in India, with a total capacity of 43.4 MTPA. It has a strong presence in the northern and eastern regions of India, with 7 cement plants and a strong distribution network. Shree Cement is known for its efficient use of resources, low-cost operations, and strong financial performance. It has also been recognized for its sustainability practices, including its focus on renewable energy, water conservation, and biodiversity conservation.

- **Dalmia Bharat Ltd** - Dalmia Bharat is a leading cement manufacturer in India, with a total capacity of 29.5 MTPA. It has a strong presence in the southern and eastern regions of India, with 13 cement plants and a significant export business. Dalmia Bharat is known for its focus on sustainability, innovation, and customer satisfaction. It has been recognized for its sustainable practices, including its use of renewable energy, water conservation, and waste management.

- **The India Cements Ltd** - The India Cements is one of the oldest cement manufacturers in India, with a total capacity of 15.5 MTPA. It has a strong presence in the southern and eastern regions of India, with 8 cement plants and a significant export business. The India Cements is known for its high-quality products, strong brand reputation, and efficient operations. It has also been recognized for its sustainable practices, including its use of renewable energy, water conservation, and waste management.

- **JK Cement Ltd** - JK Cement is a leading cement manufacturer in India, with a total capacity of 14.7 MTPA. It has a strong presence in the northern and western regions of India, with 10 cement plants and a significant export business. JK Cement is known for its innovation in product development, customer service, and sustainable practices. It has been recognized for its sustainable practices, including its use of renewable energy, water conservation, and waste management.

These companies are the major competitors of ACC Ltd in the Indian cement industry, and they compete in terms of pricing, product quality, distribution, and customer service. The competition is intense, and each company has its unique strengths and strategies to gain a competitive edge in the market.

ABOUT THE DATASET:

- **"Month"**: This column represents the month in which the stock prices were recorded. It is likely that the data was collected over a period of time and organized in a chronological order in this column.
- **"Open_Price"**: This column represents the opening price of the stock at the beginning of each month. This is the price at which the stock started trading for the day or month and is an important metric for investors and traders to analyze trends and patterns.
- **"High_Price"**: This column represents the highest price that the stock reached during the month. This is important information for investors as it shows the highest possible return that could have been made if the stock was sold at its peak.
- **"Low_Price"**: This column represents the lowest price that the stock reached during the month. This is important information for investors as it shows the lowest possible price that the stock was trading at during the month.
- **"Close_Price"**: This column represents the closing price of the stock at the end of each month. This is the price at which the stock finished trading for the day or month and is an important metric for investors and traders to analyze trends and patterns.
- **"NumberOfShares"**: This column represents the total number of shares of the stock that were traded during the month. This information can be used to calculate the stock's liquidity and demand.
- **"NumberOfTrades"**: This column represents the total number of trades that were executed for the stock during the month. This information can be used to determine the trading activity and overall interest in the stock.
- **"Total_Turnover"**: This column represents the total value of all the shares that were traded during the month. This information is useful for determining the overall financial health of the stock and the market as a whole.

Univariate analysis

```
> mean(Data$ClosePrice)
[1] 1195.653
> median(Data$ClosePrice)
[1] 1250.25
> mode(Data$ClosePrice)
[1] "numeric"
> sd(Data$ClosePrice)
[1] 557.8419
> |
```

INTERPRETATION

- **Mean** :The mean of the "ClosePrice" variable is 1195.653. This means that the average value of the "ClosePrice" variable in the dataset is 1195.653.
- **Median**:The median of the "ClosePrice" variable is 1250.25. This means that half of the observations in the "ClosePrice" variable are greater than or equal to 1250.25 and half of them are less than or equal to 1250.25.

Alternatively stated, the median value (1250.25) would be the middle value of the sorted list if all the "Close Price" values were arranged in ascending order. This is a helpful indicator of central tendency, particularly when the data includes anomalies that could distort the mean.

- **Mode**: The mode is the most frequently occurring value in a dataset. In this case, since there is no value that occurs more frequently than any other, the mode cannot be determined.
- **Standard deviation**:The standard deviation of the "ClosePrice" variable is 557.8419. The standard deviation is a measure of how spread out the values in a dataset is from the mean. In this case, the standard deviation of 557.8419 indicates that the "ClosePrice" variable has a relatively large spread, with values ranging quite widely from the mean.

If the standard deviation is high, it suggests that the data points are more spread out and less clustered around the mean. Conversely, if the standard deviation is low, it suggests that the data points are more tightly clustered around the mean. The standard deviation is a useful measure for quantifying the variability of the data in a dataset.

Univariate analysis

```
> var(Data$ClosePrice)
[1] 311187.6
> min(Data$ClosePrice)
[1] 128
> max(Data$ClosePrice)
[1] 2747.7
> shapiro.test(Data$ClosePrice)

      shapiro-wilk normality test

data:  Data$ClosePrice
W = 0.9792, p-value < 2.2e-16
```

- **Variance** :The variance of the "ClosePrice" variable is 311187.6. The variance is a measure of how much the values in a dataset vary from the mean.
- **Minimum**:The minimum value of the "ClosePrice" variable is 128. This means that the smallest "ClosePrice" value in the dataset is 128. The minimum value can be useful for identifying outliers or extreme values in the dataset.
- **Maximum** :The "ClosePrice" variable can have a maximum value of 2747.7. This indicates that 2747.7 is the highest "ClosePrice" value in the dataset. For locating outliers or extreme values in the dataset, the maximum value can be helpful.
- **Normality test**: The W value of 0.9792 indicates the test statistic calculated by the Shapiro-Wilk test. The closer the W value is to 1, the more likely it is that the dataset follows a normal distribution. In this case, the W value of 0.9792 indicates that the "ClosePrice" variable is relatively normally distributed.
- The p-value of less than 2.2e-16 indicates the statistical significance of the test. Specifically, the p-value is the probability of obtaining a test statistic as extreme as the one observed, assuming that the null hypothesis (i.e., that the data is normally distributed) is true. A small p-value indicates strong evidence against the null hypothesis, meaning that we can reject the idea that the data is normally distributed. In this case, the p-value is less than 0.05, which is a commonly used threshold for statistical significance, so we can conclude that the "ClosePrice" variable is not normally distributed.

Correlation

```
> cor(Data$ClosePrice,Data$OpenPrice)
[1] 0.999089
> cor.test(Data$ClosePrice,Data$OpenPrice)

Pearson's product-moment correlation

data: Data$ClosePrice and Data$OpenPrice
t = 1622.1, df = 4801, p-value < 2.2e-16
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.9990360 0.9991391
sample estimates:
      cor
0.999089
```

- **Correlation** : The correlation coefficient is a measure of the strength and direction of the linear relationship between two variables. A correlation coefficient of 1 indicates a perfect positive linear relationship, a correlation coefficient of -1 indicates a perfect negative linear relationship, and a correlation coefficient of 0 indicates no linear relationship.
- In this case, a correlation coefficient of 0.999089 indicates a very strong positive linear relationship between the "ClosePrice" and "OpenPrice" variables. This means that as the "OpenPrice" increases, the "ClosePrice" tends to increase as well. The strength of this relationship suggests that the "ClosePrice" and "OpenPrice" variables are likely highly dependent on one another and they may be redundant in some statistical analyses.
- The Pearson correlation coefficient between the "ClosePrice" and "OpenPrice" variables is very high at 0.999, indicating a very strong positive correlation between these variables. The p-value is less than $2.2e-16$, which means there is strong evidence to reject the null hypothesis that the correlation between the two variables is zero.
- The confidence interval, which ranges from 0.9990360 to 0.9991391, also indicates that the correlation coefficient is significantly different from zero. Specifically, we can be 95% confident that the true correlation between the "ClosePrice" and "OpenPrice" variables falls within this interval.

Linear Regression:

Linear regression is a statistical technique used to model the relationship between two variables by fitting a straight line to the data points that best represents the pattern of the data. It assumes that the relationship between the variables can be approximated by a linear equation of the form $Y = m(X) + b$, where Y is the response (or dependent) variable, X is the predictor (or independent) variable, m is the slope of the line, and b is the intercept on the Y -axis.

In R Studio, the `lm()` function is used to perform linear regression, which is a statistical technique used to model the relationship between two variables, typically denoted as the predictor (independent) variable and the response (dependent) variable.

By using the summary function on the variable, we can conduct a more thorough analysis of the regression analysis. The R square value of 0.7794 which means that 77.94% of all dependent variable values can be predicted by the independent variable. Hence, we can say that the Opening Price is a predictor of 77.94% of closing prices. Residuals are values that deviate from the regression line. We can identify that it has a minimum of -923.83 and a maximum of 320.31.

```
> summary(linregmodel)
```

```
Call:
```

```
lm(formula = Data$ClosePrice ~ Data$OpenPrice)
```

```
Residuals:
```

```
      Min       1Q   Median       3Q      Max
-293.448 -10.480   -0.296   11.086  197.363
```

```
Coefficients:
```

```
              Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.662077   0.812281    2.046  0.0408 *
Data$OpenPrice 0.997696   0.000615 1622.145 <2e-16 ***
```

```
---
```

```
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Residual standard error: 23.81 on 4801 degrees of freedom
```

```
Multiple R-squared:  0.9982,    Adjusted R-squared:  0.9982
```

```
F-statistic: 2.631e+06 on 1 and 4801 DF,  p-value: < 2.2e-16
```

By using the summary function on the variable, we can conduct a more thorough analysis of the regression analysis. The R square value of 0.9982 which means that 99.82% of all dependent variable values can be predicted by the independent variable. Hence, we can say that the Opening Price is a predictor of 99.82% of closing prices. Residuals are values that deviate from the regression line. We can identify that it has a minimum of -293.448 and a maximum of 197.363.

We can also hypothesize the following:

Hypothesis1:

H0 = There is no significant impact of Open Price on Closing Price ($B = 0$)

H1 = There is a significant impact of Open Price on Closing Price ($B \neq 0$) The p-value of Open Price is $< 2.2e-16$ which is less than 0.05.

So, accept H1.

It is concluded that the given independent variable (Open Price) has a significant impact on the dependent variable (Open Price).

Anova Analysis:

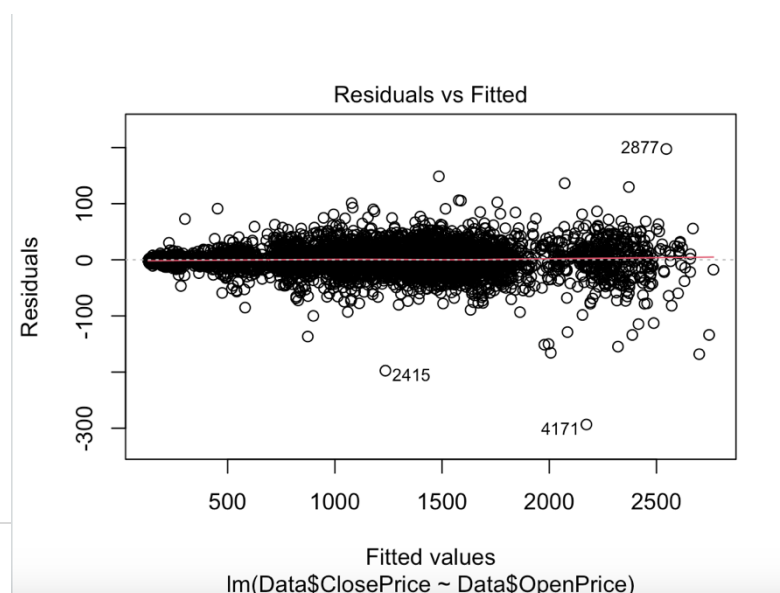
The `Anova()` function in R is used to perform analysis of variance (ANOVA) on a fitted model object. The result of the ANOVA is typically presented in an "Analysis of Variance Table" which provides information on the significance of the variables in the model.

```
> anova(linregmodel)
Analysis of Variance Table

Response: Data$ClosePrice
      Df Sum Sq Mean Sq F value Pr(>F)
Data$OpenPrice  1 1491601553 1491601553 2631355 < 2.2e-16 ***
Residuals    4801  2721480      567
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
> coefficients(linregmodel)
(Intercept) Data$OpenPrice
  1.6620770    0.9976963
```

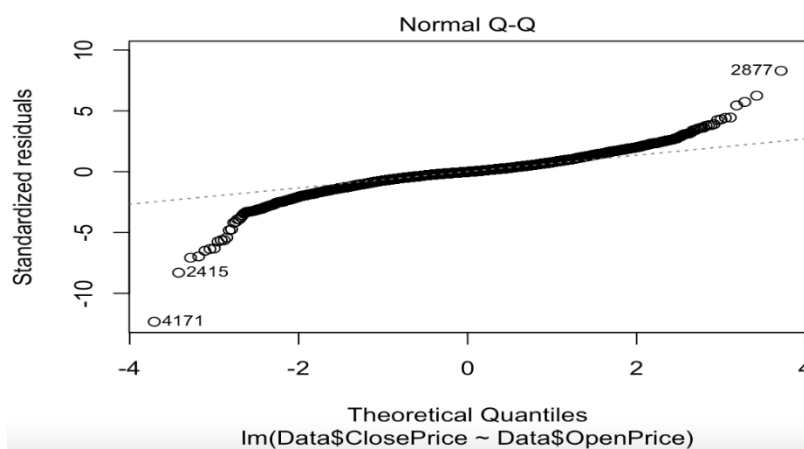
The p-value is extremely small ($< 2.2 \times 10^{-16}$) this indicates that the `Data$Open_Price` predictor variable is highly significant in explaining the variability in the `Data$Close_Price` response variable. It has a degree of freedom of 1.

The ANOVA table provides important information for assessing the overall significance of the linear regression model and its individual predictor variables. The small p-value for `Data$Open_Price` indicates that it is a significant predictor of `Data$Close_Price`, and the residual error suggests that the model is capturing a significant portion of the variability in the response variable.



In the context of linear regression analysis, a residual vs. fitted plot is a graphical tool used to assess the quality of the regression model by examining the residuals, which are the differences between the observed values and the predicted values (i.e., the residuals are the errors of the model). The plot displays the residuals on the y-axis and the fitted values (predicted values) on the x-axis.

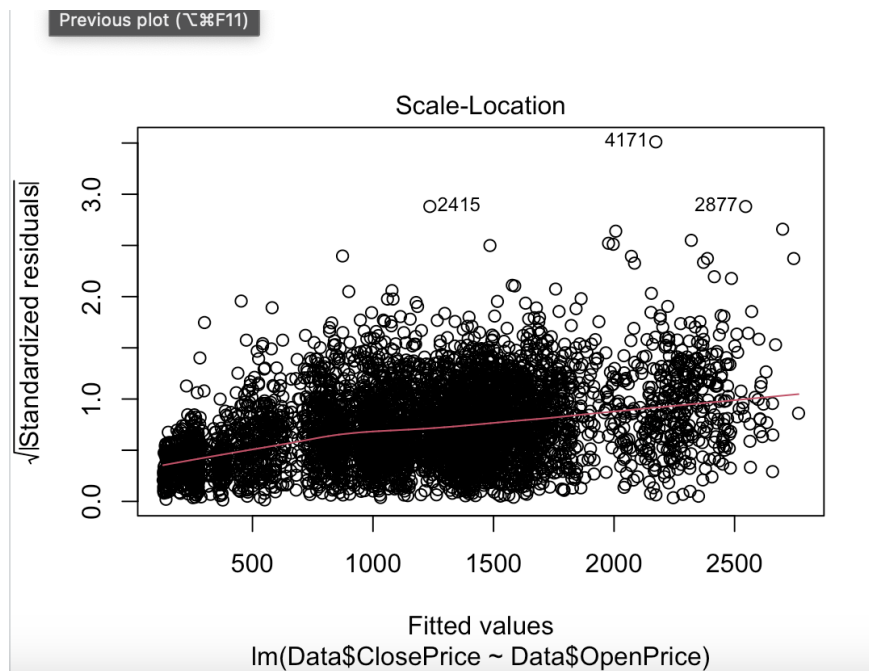
In the above graph we can see that most of the values fall on the Regression line. The line is well fitted and the opening price is a good predictor of closing price.



In the context of linear regression analysis, a normal Q-Q (quantile-quantile) plot is a graphical tool used to assess the normality of the residuals, which are the differences between the observed values and the predicted values (i.e., the residuals are the errors of the model). The plot compares the observed residuals to the expected residuals under the assumption of normal distribution.

Here we observe that most of the values fall in a straight line and we can analyze that the residuals of the regression model are normally distributed.

In the context of statistical analysis, a scale-location plot (also known as a scale-



location or spread-location plot) is a graphical tool used to assess the homoscedasticity (constant variance of residuals) of a linear regression model. It is a type of residual plot that displays the square root of the absolute residuals on the y-axis, and the fitted values (predicted values) or other measure of location on the x-axis.

Since most of the residuals are not significantly varying and remain a constant distance, we can observe that the regression model is well fitted.

Multiple Regression

Hit <Return> to see next plot: `multipleregmodel`
> `summary(multipleregmodel)`

Call:

```
lm(formula = Data$ClosePrice ~ Data$OpenPrice + Data$HighPrice +  
    Data$LowPrice)
```

Residuals:

Min	1Q	Median	3Q	Max
-61.832	-4.406	-0.064	4.343	115.018

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-0.192909	0.328843	-0.587	0.557
Data\$OpenPrice	-0.543593	0.009789	-55.532	<2e-16 ***
Data\$HighPrice	0.818553	0.008933	91.631	<2e-16 ***
Data\$LowPrice	0.723790	0.007539	96.012	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 9.501 on 4799 degrees of freedom

Multiple R-squared: 0.9997, Adjusted R-squared: 0.9997

F-statistic: 5.517e+06 on 3 and 4799 DF, p-value: < 2.2e-16

From the summary statistics, mean residual is determined to be zero.

The intercept value i.e., $a = -0.192$ and ' b_1 ' = -0.543, ' b_2 ' = 0.818553, ' b_3 ' = 0.723790.

Hypothesis1:

H_0 = There is no impact of Open Price on Closing Price

H_1 = There is a significant impact of Open Price on Closing Price

The p-value of Open Price is < 2e-16 which is less than 0.05.

So, accept H_1 .

It is concluded that the given independent variable (Open Price) has a significant impact on dependant variable (Open Price).

Hypothesis2:

H_0 = There is no impact of High Price on Closing Price

H_1 = There is a significant impact of High Price on Closing Price

The p-value of High Price is $>2e-16$ which is more than 0.05.

So, accept H0.

It is concluded that the given independent variable (Open Price) does not have a significant impact on dependant variable (Close Price).

Hypothesis3:

H0 = There is no impact of Low Price on Closing Price

H1 = There is a significant impact of Low Price on Closing Price

The p-value of Low Price is $> 2e-16$ which is greater than 0.05.

So, accept H0.

It is concluded that the given independent variable (Low Price) does not have a significant impact on dependant variable (Close Price).

R - squared value is 0.99749, which means independent variables explains 99.74% of variation of dependent variable (Close Price).

Anova Analysis:

```
> anova(multipleregmodel)
Analysis of Variance Table
```

```
Response: Data$ClosePrice
```

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Data\$OpenPrice	1	1491601553	1491601553	16525572.6	$< 2.2e-16$ ***
Data\$HighPrice	1	1456282	1456282	16134.3	$< 2.2e-16$ ***
Data\$LowPrice	1	832039	832039	9218.2	$< 2.2e-16$ ***
Residuals	4799	433159	90		

```
---
```

```
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
> coefficients(multipleregmodel)
```

```
(Intercept) Data$OpenPrice Data$HighPrice Data$LowPrice
-0.1929090 -0.5435928 0.8185530 0.7237897
```

Hypothesis1:

H0 = The variation explained by Open Price is not reliable

H1 = The variation explained by Open price is reliable

From the anova matrix, the obtained p-value is $< 2.2e-16$, which is less than 0.05.

Therefore, accept H1.

It is concluded that the variation explained by Open price is reliable.

We accept the model for prediction or the model is efficient.

Hypothesis2:

H0 = The variation explained by High Price is not reliable

H1 = The variation explained by High price is reliable

From the anova matrix, the obtained p-value is $< 2.2e-16$, which is less than 0.05.

Therefore, accept H1.

It is concluded that the variation explained by High price is reliable.

We accept the model for prediction or the model is efficient.

Hypothesis3:

H0 = The variation explained by Low Price is not reliable

H1 = The variation explained by Low price is reliable

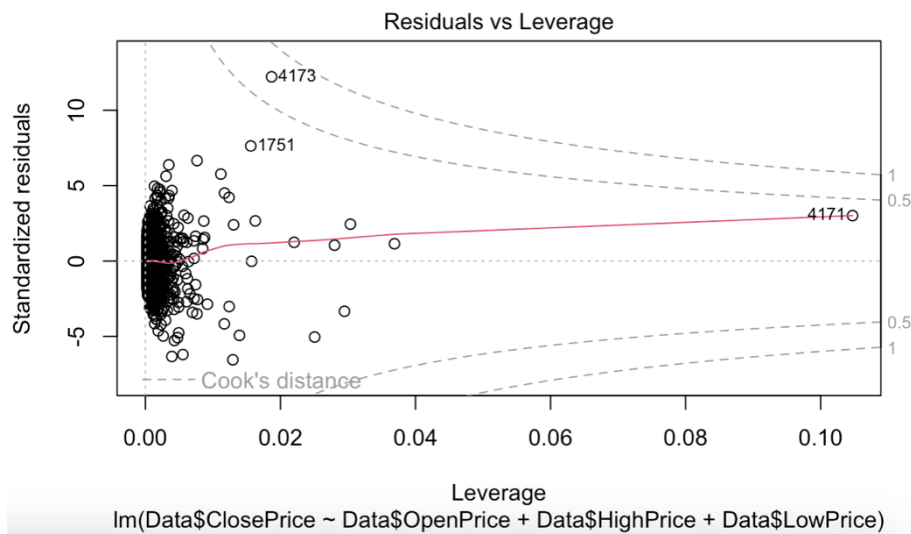
From the anova matrix, the obtained p-value is $< 2.2e-16$, which is less than 0.05.

Therefore, accept H1.

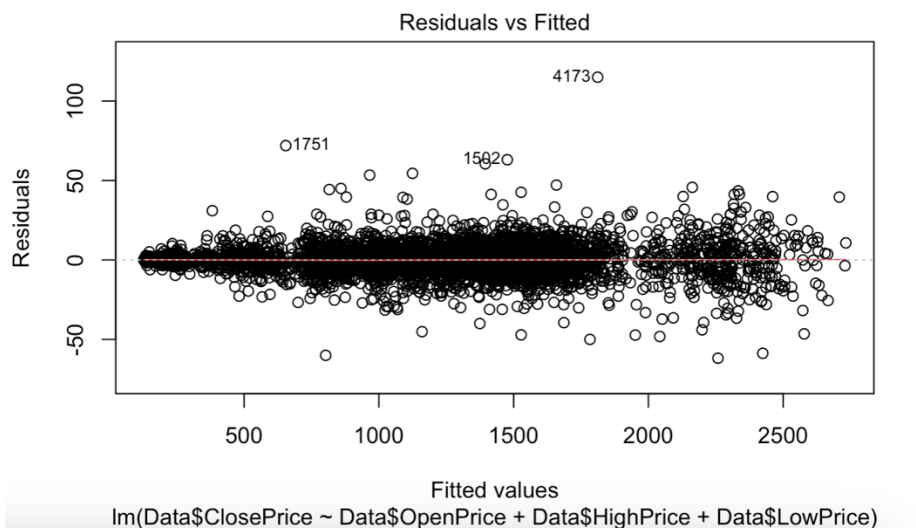
It is concluded that the variation explained by Low price is reliable.

We accept the model for prediction or the model is efficient.

Plot analysis

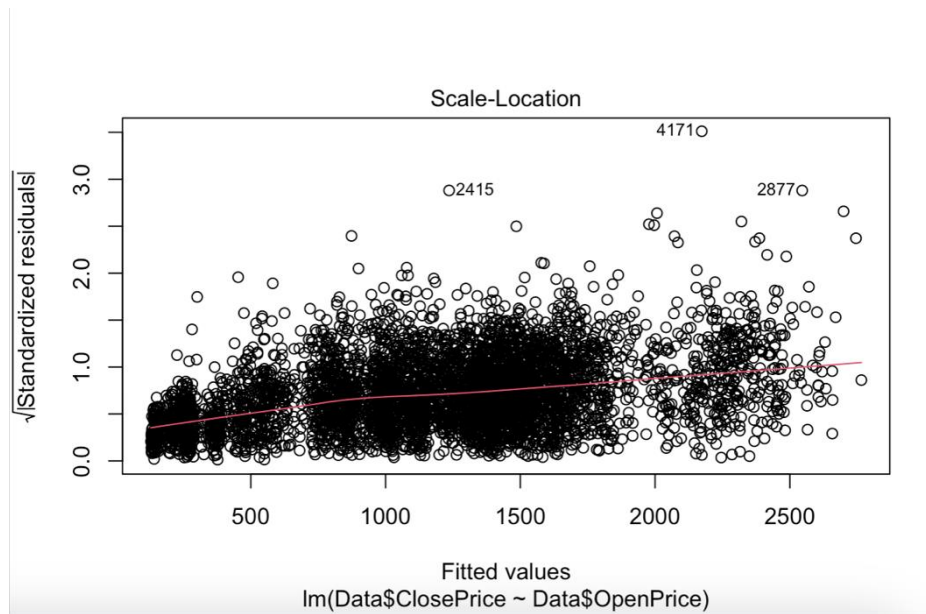


Residual vs Leverage is used to find the outliers in the dataset. From the plot we can treat records 4173, 1751, and 4171 as outliers.



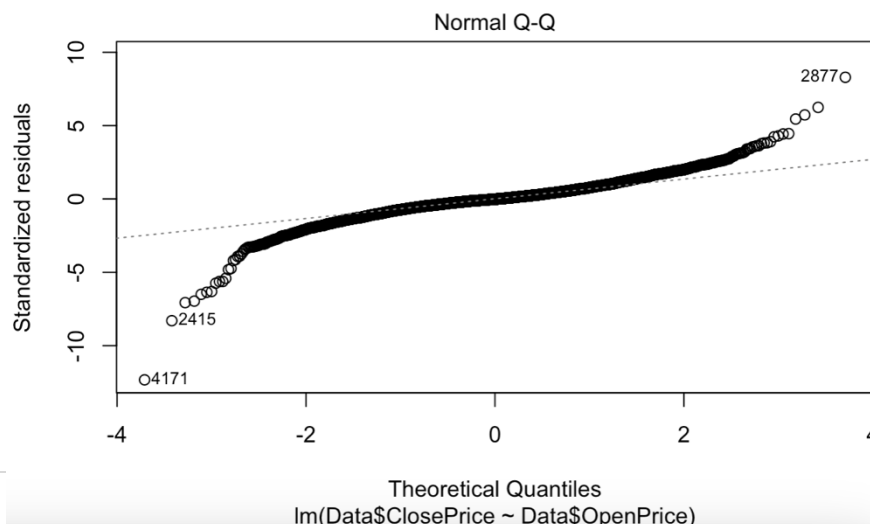
In Residual vs Fitted plot, if the points in the plot are randomly scattered around the horizontal line at zero, then this indicates that the model is a good fit for the data.

From Residual vs Fitted plot, we can see that the data is scattered across in the graph. We failed to identify a particular pattern in the plot. We can say that there is a linear relationship between dependent and independent variables



A scale-location plot, also known as a spread-location plot or a spread-level plot, is a graphical tool used to assess the homoscedasticity assumption (i.e., constant variance of the errors) in multiple regression analysis.

The data is scattered across the graph. We can say that the assumption of multiple regression i.e., constant variance are satisfied.



In multiple regression analysis, a normal quantile-quantile (Q-Q) plot is a graphical tool used to assess whether the residuals (the differences between the observed values and the predicted values) follow a normal distribution.

From the graph we can say that the data is thin-tailed and not normally distributed.

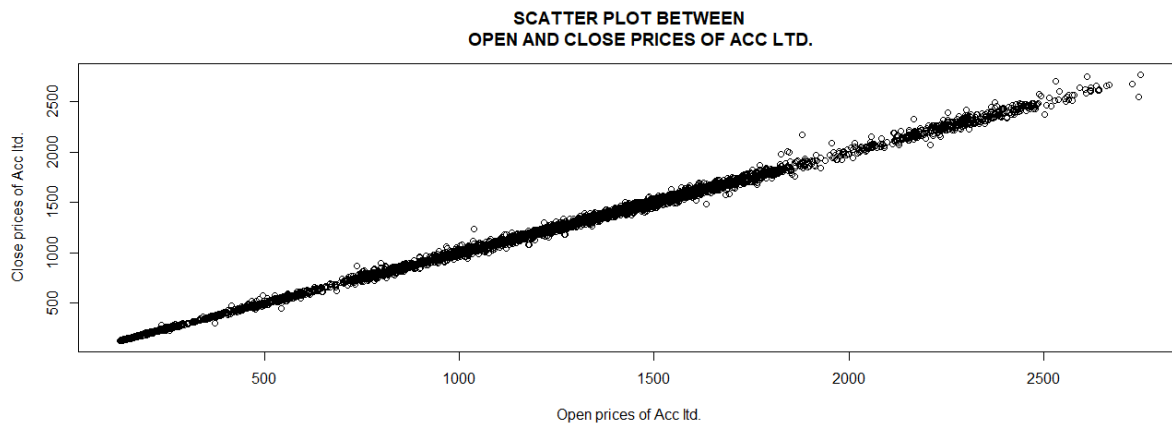
Residual:

The function is used to determine errors which is nothing but difference between actual and predicted values.

```
> resid(multipleregmodel)
```

1	2	3	4	5	6	7
3.560431832	1.533073869	0.361387298	2.422123313	5.073449214	-3.811606051	-4.297565791
8	9	10	11	12	13	14
-4.044563829	-5.650308174	-6.383439210	-3.370664347	-2.478335341	-0.739707549	3.641004240
15	16	17	18	19	20	21
4.891954833	1.192280674	-6.695019851	-2.277391927	1.796609969	12.598495056	8.463169813
22	23	24	25	26	27	28
-3.422120550	5.221168426	-6.930550626	0.346533898	3.438100013	-2.277644427	-0.750270891
29	30	31	32	33	34	35
-6.039028005	7.305739713	5.753235759	-0.758038237	-0.742900304	-0.366195827	1.324533274
36	37	38	39	40	41	42
-7.241674059	1.173159013	2.386877076	-15.934530059	9.911377404	-6.122333599	12.240677266
43	44	45	46	47	48	49
1.269675451	-21.181069561	1.910349796	-9.707983569	-0.364426235	11.863320069	-10.436818137
50	51	52	53	54	55	56
2.471280115	0.276657494	9.931158021	0.194188658	5.575874291	9.176751297	-5.500808678
57	58	59	60	61	62	63
0.999028161	-9.001437169	-11.538099390	21.650700491	0.285122923	-2.359316147	-0.457272634
64	65	66	67	68	69	70
13.558984969	-2.490517299	3.323388847	-5.602278329	-2.719747621	6.232759558	6.121936185
71	72	73	74	75	76	77
-13.921025648	-0.381796378	-1.178948308	-0.175216073	0.170799182	-9.584747000	-3.757799999
78	79	80	81	82	83	84
1.138131655	6.549895858	-3.722681259	13.270971102	-2.892033130	-6.235302459	-1.682041172
85	86	87	88	89	90	91
5.354179493	-12.561345521	-4.811372043	5.016603843	-1.496471045	-3.708344246	3.994246648
92	93	94	95	96	97	98

SCATTER PLOT



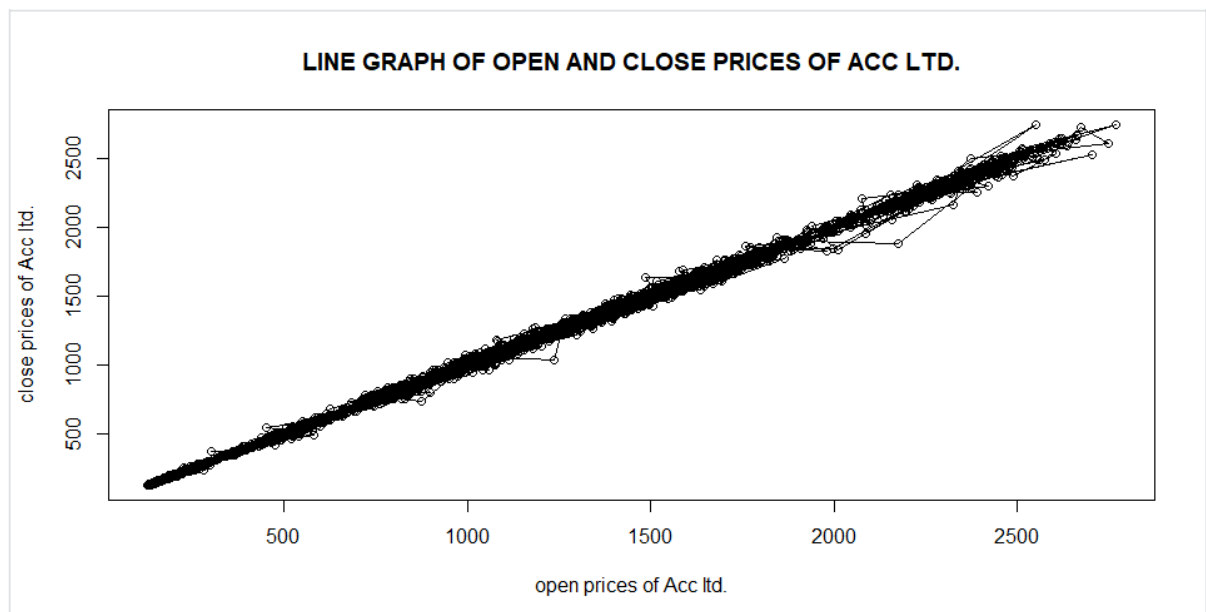
INTERPRETATION:

The scatter plot displays the relationship between the open price on the x-axis and the close price on the y-axis for a stock. The x-axis ranges from 0 to 2500, representing the open price range, while the y-axis ranges from 0 to 2500, representing the close price range.

From the scatter plot, we can see that the bulk of data points form a dense concentration of dots around the range of 1000 to 2000 for both the open and close prices. In other words, if the initial price rises, the close price tends to rise as well, indicating a strong positive correlation between the open and close values. The sloping line that crosses the scatter plot from right to left, showing a positive linear relationship between the two variables, further supports this positive correlation.

The scatter plot, with the majority of the data points clustering in the range of 1000 to 2000, suggests a substantial positive correlation between the stock's open and close prices. Outliers and a positive slope on the scatter plot line may signify important occurrences or causes that affect the performance of the stock.

LINE GRAPH



INTERPRETATION:

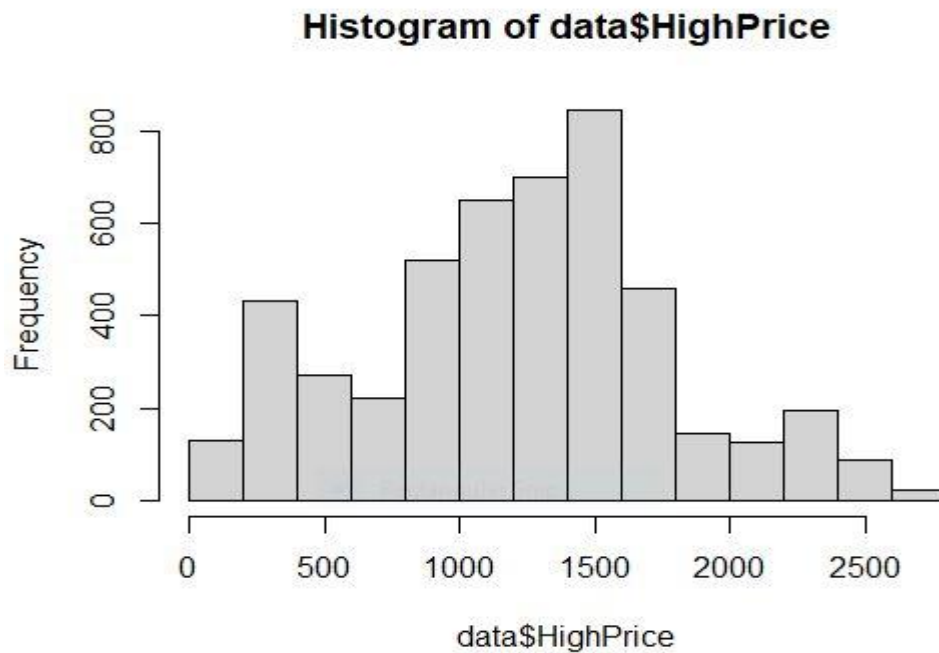
The line graph displays the relationship between the open price on the x-axis and the close price on the y-axis for a stock. The x-axis ranges from 0 to 2500, representing the open price range, while the y-axis ranges from 0 to 2500, representing the close price range.

From the line graph, we can observe that the majority of data points fall within the range of 1500 to 2500 for both the open and close prices. This indicates that the stock's opening and closing prices tend to be within this range most frequently, suggesting a consistent pattern or trend.

However, the graph also contains some outliers, or data points that are dispersed outside of the main cluster of points. These data points that depart from the general trend may be considered outliers because they are exceptional or extraordinary. These anomalies can be a sign of important occurrences or influences that influenced the stock's open and close prices.

HISTOGRAM

`hist(data$HighPrice)`



INTERPRETATION

The histogram shows the distribution of high prices for a stock, with the x-axis representing the high price range from 0 to 2500 and the y-axis representing the frequency (or count) of high prices falling within each range. The histogram indicates that the majority of high prices fall within the range of 1000 to 1500, with a frequency of 800. This suggests that the stock has a relatively high frequency of high prices in the middle range, between 1000 and 1500. There are also some high prices in the lower range, between 0 and 1000, but with lower frequency compared to the higher range.

Conclusion:

In conclusion, R programming is a powerful tool for data analysis and statistical computing. Its open-source nature and vast library of packages make it a popular choice for data scientists, statisticians, and researchers. With its easy-to-learn syntax and interactive environment, R enables users to analyze and visualize complex data sets, build predictive models, and create informative visualizations.

R is widely used in academia, research, and industry, and has applications in various fields, including healthcare, finance, marketing, and social sciences. The ability to customize and extend R through packages and user-defined functions makes it a versatile tool for solving a wide range of problems.

While there are challenges to using R, such as the need for a solid understanding of programming concepts and the potential for memory issues with large data sets, the benefits outweigh the challenges for many users.

The use of various R functions such as mean, median, lm(), plot(), and cor() can greatly enhance

one's understanding of the R programming language. These functions provide essential tools for data analysis, visualization, and statistical modelling.

The mean() function is useful for calculating the average of a set of values, providing a measure of central tendency. The median() function calculates the middle value in a dataset, which is a robust measure of central tendency that is less affected by outliers. These functions are commonly used to summarize and describe data.

The lm() function in R is used to perform linear regression, a statistical method for modelling the relationship between two or more variables. This function allows for the estimation of regression coefficients, prediction of values, and assessment of model fit. Linear regression is a powerful tool for understanding the linear relationship between variables and making predictions based on the observed data.

The plot() function in R is a versatile tool for creating various types of plots, such as scatter plots, line charts, bar charts, and histograms. These plots are essential for visualizing data and gaining insights into patterns and trends. Plots can be customized with different colors, labels, and formatting options to effectively communicate results.

The cor() function in R is used to calculate the correlation coefficient between two variables, which measures the strength and direction of their linear relationship. Correlation coefficients range from -1 to 1, with positive values indicating a positive correlation, negative values indicating a negative correlation, and 0 indicating no correlation. The cor() function is valuable for examining the association between variables and identifying potential relationships in the data.

By leveraging these R functions, analysts and data scientists can gain a comprehensive understanding of their data, perform statistical analysis, create visualizations, and develop

predictive models. These functions provide essential tools for exploring and analyzing data, making R a powerful programming language for data analysis and visualization tasks.

Overall, R programming provides a powerful and flexible environment for data analysis and statistical computing, and its popularity is likely to continue to grow as more users become aware of its capabilities and potential applications.

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A REPORT ON BAJAJ FINANCE LTD- USING R PROGRAMING

SUBMITTED TO

DR. JAHNAVI

R V INSTITUTE OF MANAGEMENT

(Autonomous Institution Affiliated to BCU)

IN PARTIAL FULFILLMENT OF THE
REQUIREMENT FOR THE DEGREE OF
MASTER OF BUSINESS ADMINISTRATION

SUBMITTED BY

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Bajaj Finance

ABOUT THE COMPANY



Bajaj Finance Limited is a financial services company based in Pune, India. It was founded in 1987 as Bajaj Auto Finance Limited, a subsidiary of Bajaj Auto Limited. In 2007, the company changed its name to Bajaj Finance Limited and became a separate entity from Bajaj Auto Limited.

Bajaj Finance Limited offers a wide range of financial products and services to customers in India, including consumer finance, small and medium enterprise (SME) finance, commercial lending, wealth management, and insurance. The company has a presence in over 1,800 cities and towns across India, with more than 40,000 distribution points and 25,000+ employees.

Bajaj Finance Limited is known for its innovative and customer-centric approach to finance. It was one of the first companies in India to offer zero percent interest EMI schemes on consumer products, which helped to popularize the concept of buying on EMI. The company also offers a range of digital products and services, including online loans, mobile wallets, and digital insurance.

Over the years, Bajaj Finance Limited has received numerous awards and recognitions for its financial performance, innovation, and customer service. It is listed on the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE), and has a market capitalization of over \$50 billion as of 2021.

Products and Service offered by Bajaj Finance Ltd

- **Consumer Finance:** Bajaj Finance Limited offers a range of consumer finance products, including personal loans, home loans, loans against property, two-wheeler loans, and small business loans.
- **SME Finance:** Bajaj Finance Limited provides financial assistance to small and medium-sized enterprises in India. The company offers business loans, working capital finance, and equipment finance to SMEs.
- **Commercial Lending:** Bajaj Finance Limited offers loans to corporate customers for various business purposes such as expansion, working capital, and acquisition financing.
- **Wealth Management:** The company offers a range of wealth management services, including investment products like mutual funds and fixed deposits, and advisory services like financial planning, retirement planning, and tax planning.
- **Insurance:** Bajaj Finance Limited provides various insurance products like life insurance, health insurance, and general insurance.
- **Digital Products:** Bajaj Finance Limited offers various digital products and services, including online loans, mobile wallets, and digital insurance.
- **Credit Cards:** Bajaj Finance Limited also provides credit cards that offer various benefits like reward points, cashback, and discounts on purchases.
- **EMI Network:** Bajaj Finance Limited's EMI Network allows customers to buy various consumer products on easy monthly installments (EMIs) with zero down payment and no cost EMI options.

ABOUT THE DATASET

Bajaj Finance Limited is a leading financial services company in India, and the performance of its stock is of great interest to investors and stakeholders. To track this performance over time, the company's stock prices over the past 10 years were gathered from the Bombay Stock Exchange (BSE) website and stored in an Excel format.

The dataset contains 124 rows of data with 12 variables, including the month, open price, high price, low price, close price, number of shares, number of trades, total turnover in Indian Rupees, deliverable quantity percentage, deliverable quantity to traded quantity percentage, spread between the high and low prices, and the spread between the close and open prices.

By analyzing this data, investors and analysts can gain insights into the performance of Bajaj Finance Limited's stock over the past decade, including its volatility, trends, and growth. This information can be used to make informed decisions about investing in the company's stock, as well as to evaluate its financial health and potential for future growth.

ABOUT THE VARIABLES

- **Month:** The month variable is a categorical variable that represents the 12 months of the year over the 10-year period. It allows for analysis of trends over time, such as seasonal patterns or changes in performance over specific months.
- **Open Price:** The open price is a continuous variable that represents the price at which the stock opens in the market when trading begins. It is an important variable because it provides information about the demand for the stock at the beginning of the trading day.
- **High Price:** The high price variable is also a continuous variable that represents the highest price a buyer paid to buy a specified number of shares of the stock during that trading day. It provides important information about the maximum level of demand for the stock during the trading day.
- **Low Price:** The low price variable is a continuous variable that represents the lowest price a buyer paid to buy a specified number of shares of the stock during that trading day. It provides important information about the minimum level of demand for the stock during the trading day.
- **Close Price:** The close price variable is a continuous variable that represents the price at which the stock closes in the market when trading ends. It is an important variable because it provides information about the demand for the stock at the end of the trading day.

- **Total turnover:** It is a continuous variable that represents the total amount of money your business receives from the sale of goods and services – minus discounts and VAT.
- **No of Shares:** It is a continuous variable that represents, the number of shares outstanding represents the amount of stock on the open market, including shares held by institutional investors and restricted shares held by insiders and company officers
- **Total Deliverables:** It is a continuous variable that represents the total number of shares that were marked for delivery on a certain date.
- **Percentage Deliverable Quantity:** It is a continuous variable
- **Spread.HighLow**
- **Spread.Close.Open**

IMPORTING THE DATA

	Month	Open.Price	High.Price	Low.Price	Close.Price	No.of.Shares	No..of.Trades	Total.Turnover..Rs.	Deliverable.Quantity
1	Jan-13	1355.00	1458.70	1280.00	1290.60	222061	12569	305729454	147786
2	Feb-13	1309.70	1326.00	1234.05	1274.70	84131	6177	107342010	59827
3	Mar-13	1278.00	1310.95	1102.00	1154.35	79767	4192	96796195	65784
4	Apr-13	1157.00	1305.00	1090.00	1222.15	116631	7098	137211701	91568
5	May-13	1230.00	1591.20	1230.00	1470.15	348507	15917	519263802	254890
6	Jun-13	1476.00	1516.00	1305.00	1376.40	319872	8049	468067003	289348
7	Jul-13	1390.00	1485.00	1105.25	1145.10	265137	15534	363652698	215422
8	Aug-13	1155.00	1273.75	965.50	1025.50	234435	20302	260110721	169014
9	Sep-13	1055.60	1307.00	976.00	1169.25	141434	16068	162132584	92869
10	Oct-13	1161.00	1365.00	1145.00	1350.65	71110	9033	90593658	38001
11	Nov-13	1350.00	1459.50	1330.50	1407.45	65772	6679	91761869	50169
12	Dec-13	1415.00	1589.00	1395.00	1574.25	86698	7190	129245471	69118
13	Jan-14	1575.00	1612.20	1475.00	1525.00	94829	9986	147935544	59589
14	Feb-14	1525.00	1592.00	1460.00	1568.65	102245	4134	153814497	96556
15	Mar-14	1577.30	1822.60	1510.00	1790.05	266915	9083	436006282	243474
16	Apr-14	1786.00	1890.00	1672.20	1874.30	369773	6461	664075768	354122
17	May-14	1880.50	2100.00	1710.00	2020.85	125859	17734	236305330	87109
18	Jun-14	2003.80	2224.70	1910.00	2001.05	87804	14963	179848253	60967
19	Jul-14	2049.00	2370.00	1999.00	2205.50	113970	15978	250145808	86033
20	Aug-14	2219.95	2503.00	2151.00	2468.80	45227	9544	103728072	28762

Showing 1 to 20 of 124 entries

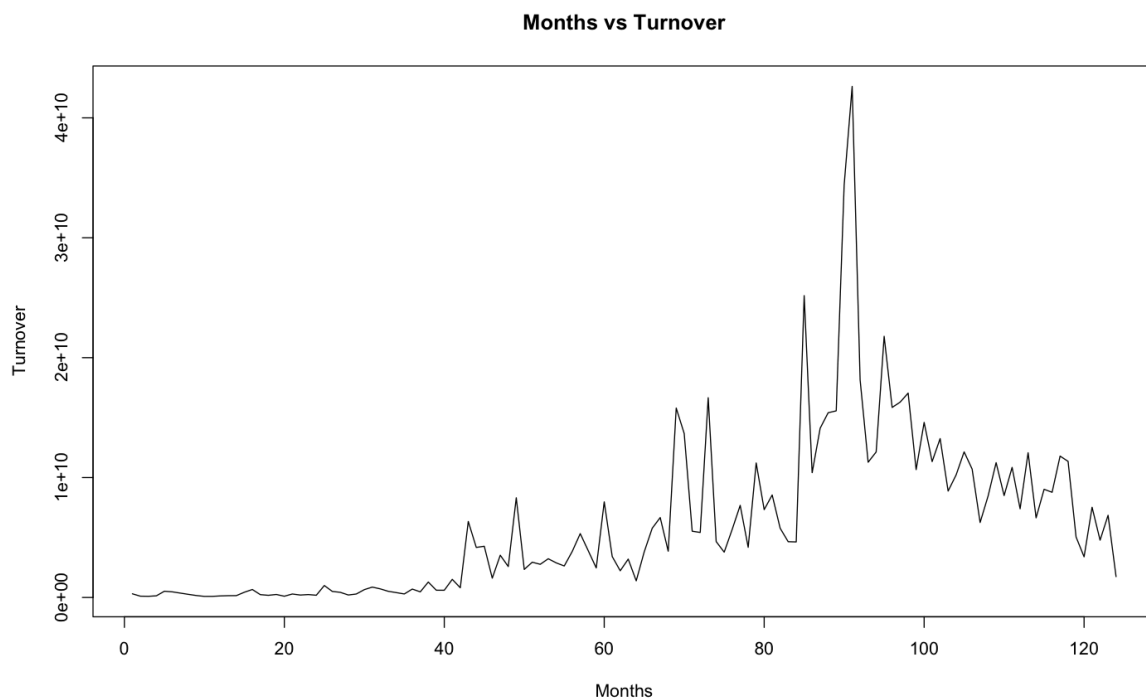
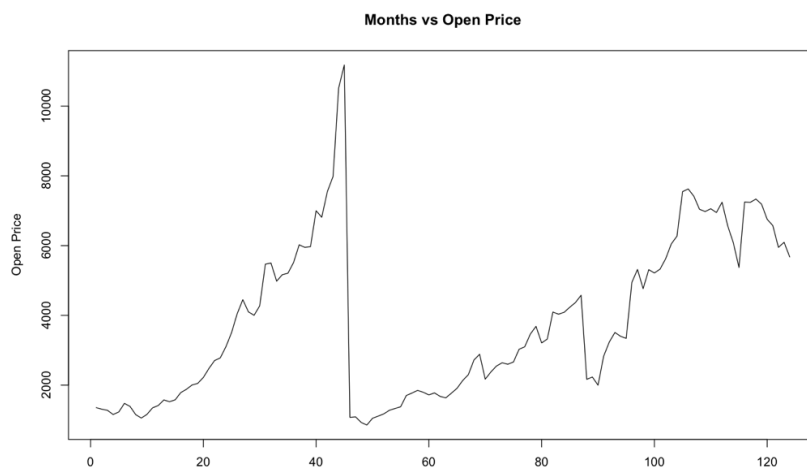
```
> bajajfin<-read.csv("/Users/satishkumar/Downloads/BAJAJ FINANCE.csv")
> names(bajajfin)
[1] "Month"           "Open.Price"      "High.Price"
[4] "Low.Price"       "Close.Price"     "No.of.Shares"
[7] "No..of.Trades"  "Total.Turnover..Rs.." "Deliverable.Quantity"
[10] "X..Deli..Qty.to.Traded.Qty" "Spread.High.Low" "Spread.Close.Open"
> View(bajajfin)
> str(bajajfin)
'data.frame': 124 obs. of 12 variables:
 $ Month          : chr  "Jan-13" "Feb-13" "Mar-13" "Apr-13" ...
 $ Open.Price     : num  1355 1310 1278 1157 1230 ...
 $ High.Price     : num  1459 1326 1311 1305 1591 ...
 $ Low.Price      : num  1280 1234 1102 1090 1230 ...
 $ Close.Price    : num  1291 1275 1154 1222 1470 ...
 $ No.of.Shares   : int  222061 84131 79767 116631 348507 319872 265137 234435 141434 71110 ...
 $ No..of.Trades  : int  12569 6177 4192 7098 15917 8049 15534 20302 16068 9033 ...
 $ Total.Turnover..Rs.. : num  3.06e+08 1.07e+08 9.68e+07 1.37e+08 5.19e+08 ...
 $ Deliverable.Quantity : int  147786 59827 65784 91568 254890 289348 215422 169014 92869 38001 ...
 $ X..Deli..Qty.to.Traded.Qty: num  66.5 71.1 82.5 78.5 73.1 ...
 $ Spread.High.Low  : num  179 92 209 215 361 ...
 $ Spread.Close.Open : num  -64.4 -35 -123.7 65.2 240.2 ...
```

We use `read.csv()` which is a built in function of `r` in order to import the dataset. We use `names` function to get the column names of the dataset.`str` function is used to understand the data type of the variables here we can see all are continuous variables except month.

LINE GRAPH

A line chart is a graph that connects a series of points by drawing line segments between them. These points are ordered in one of their coordinate (usually the x-coordinate) value. Line charts are usually used in identifying the trends in data.

The `plot()` function in `R` is used to create the line graph.



In order to construct the line graph 1 we used months and open price, Months represent from Jan 2013 till date which is about 124 months' period of time. First 12 months fall under the year 2013 next 2014 and so on. We can see the trend of open price over the period of time, it has reached it's maximum in almost 40th month which is nothing but in the year 2015. Immediately after raising it has also collapsed in the upcoming months. Currently we can see a decreasing trend from past few months.

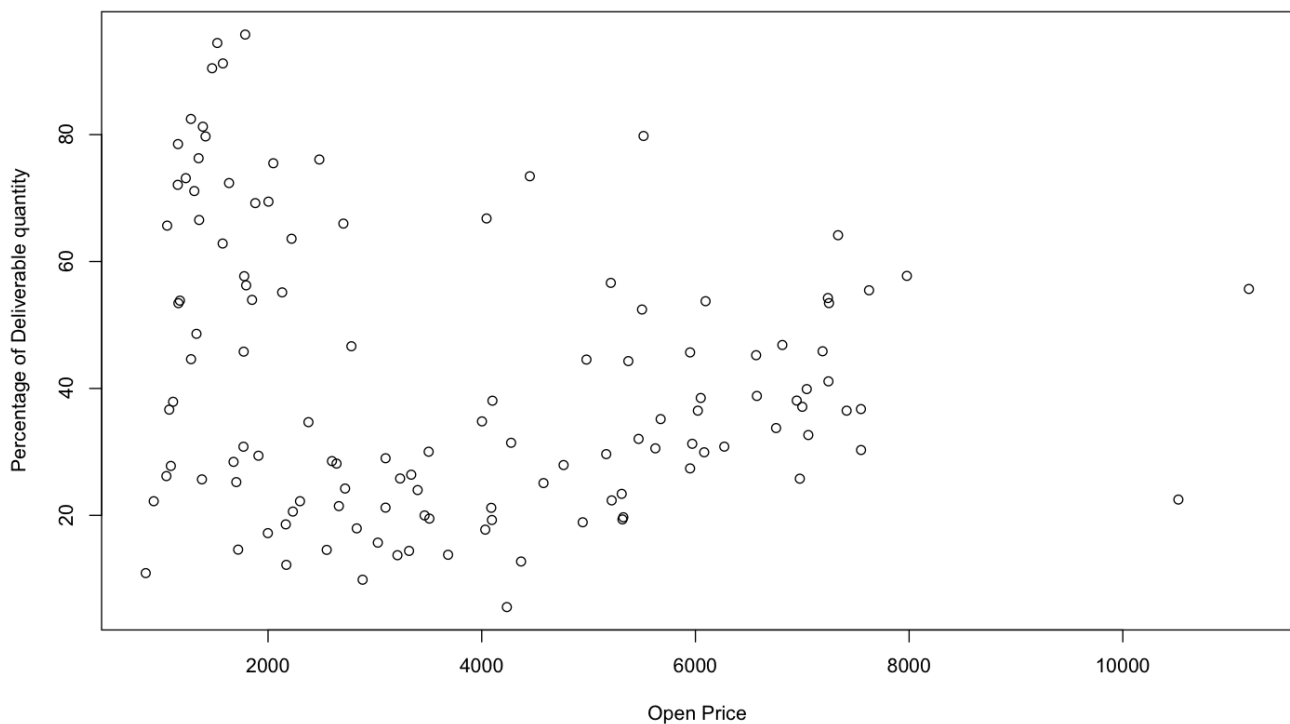
In order to construct the line graph 2 we used months and total turnover, Months represent from Jan 2013 till date which is about 124 months' period of time.

We can see that initially the turnover was extremely less and then has raised up drastically in the 90th month which is in the year of 2018. The turnover of Bajaj Finance Ltd is currently decreasing.

SCATTER PLOT

A scatterplot shows the relationship between two quantitative variables measured for the same individuals. The values of one variable appear on the horizontal axis, and the values of the other variable appear on the vertical axis. Each individual in the data appears as a point on the graph.

Open price VS Percentage of deliverable quantity



In the above scatter plot we take 2 variables which are open price on x axis and percentage of Deliverable Quantity on y axis. A scatterplot with no correlation has data that does not follow a pattern, neither positive nor negative.

HISTOGRAM

A histogram is a graphical representation of data points organized into user-specified ranges. Similar in appearance to a bar graph, the histogram condenses a data series into an easily interpreted visual by taking many data points and grouping them into logical ranges or bins.



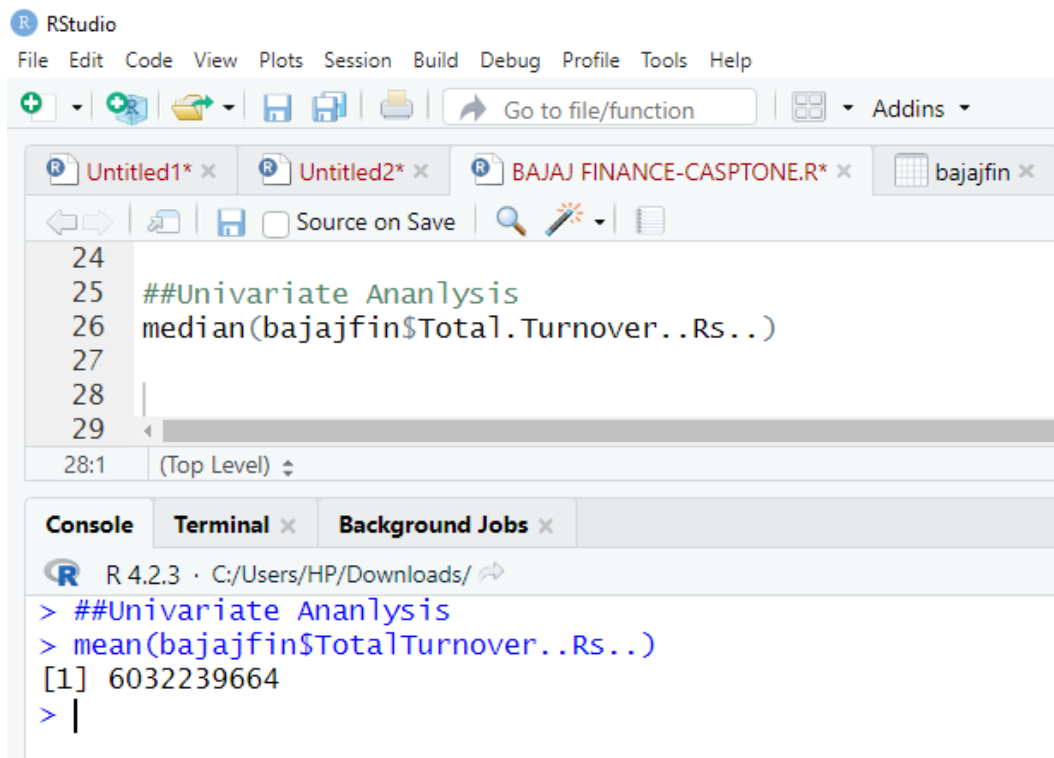
The close price over a period of 10 years are considered and mapped .In the span of 10 years the close price was in the range of 1000-2000 for 35 times ,in the range of 2000-3000 for approximately 20 times ,of the range 6000-8000 on an average of 13 times ,it was 10,000 to 12,000 for less than 5 times.

Univariate Analysis

Code for executing mean of TotalTurnover (Rs.) in Baja Finance stock is :

- `mean(bajajfin$TotalTurnover..Rs..)`
- Mean ans = 6,032,239,664

Output



```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
+ Addins
BAJAJ FINANCE-CASPTONE.R* x bajajfin x
Source on Save
24
25 ##Univariate Ananlysis
26 median(bajajfin$Total.Turnover..Rs..)
27
28
29
28:1 (Top Level)
Console Terminal x Background Jobs x
R 4.2.3 · C:/Users/HP/Downloads/
> ##Univariate Ananlysis
> mean(bajajfin$TotalTurnover..Rs..)
[1] 6032239664
> |
```

Interpretation:

The value 6032239664 represents the average turnover of Bajaj Finance's stocks in rupees over the period of time covered by the data. This means that on average, the total value of Bajaj Finance's stocks traded in the market is approximately Rs 6,032,239,664.

This value can provide insights into the liquidity and investor interest in the company's stocks. A higher turnover generally indicates greater market activity and liquidity, while a lower turnover may indicate lower trading volume and less investor interest.

Code for executing median of TotalTurnover (Rs.) in Baja Finance stock is :

- `median(bajajfin$Total.Turnover..Rs..)`
- Median ans = 3879013152

Interpretation:

The value 3879013152 represents the median turnover of Bajaj Finance stock in rupees over the period of time covered by the data. This means that when the turnover values of the company's stock are arranged in ascending or descending order, the median value is the middle value. Specifically, 50% of the turnover values in the dataset are above the median that is Rs 3879013152 and 50% are below it.

This value provides insight into the typical or representative value middle amount / median of the total turnover of Bajaj Finance's stock traded in the market. It can be used to compare the stock's liquidity and investor interest with other companies in the same industry or sector.

Code for executing mode of TotalTurnover (Rs.) in Baja Finance stock is :

```
mode(bajajfin$Total.Turnover..Rs..)
Mode ans = NULL
```

Interpretation:

The result of the mode function for the column of Total Turnover(Rs) in the data is NULL, which means there are no values that occur more frequently than others(or more than once). In other words, there are no repeated values in the dataset for the total turnover of Bajaj Finance stock.

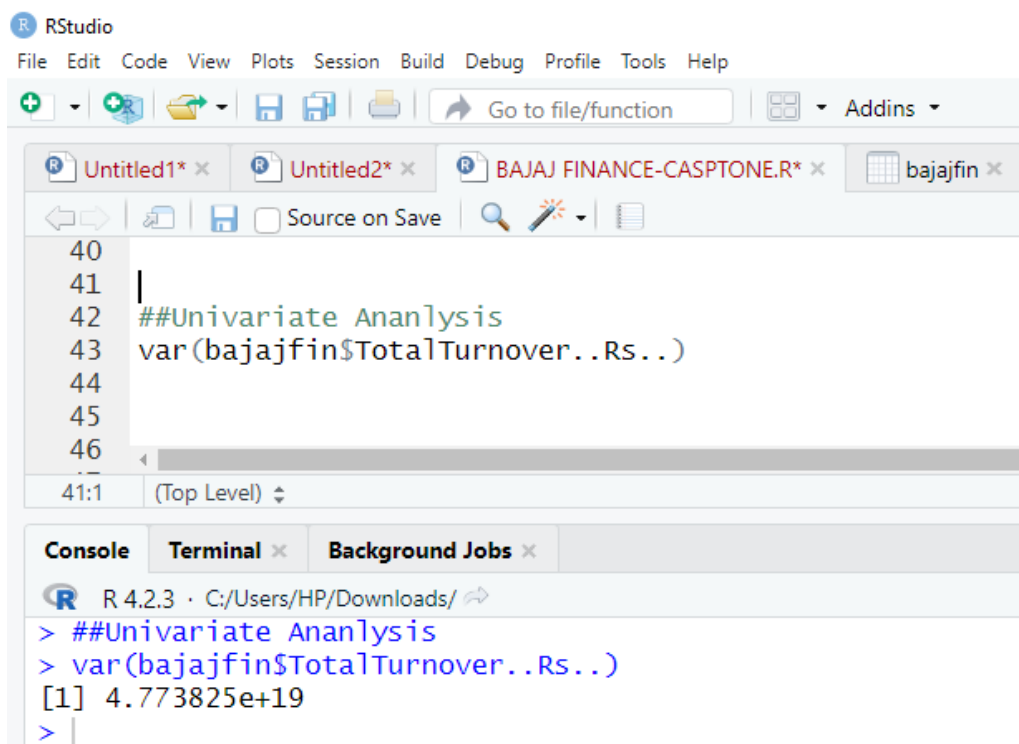
The mode is a measure of central tendency that represents the most frequently occurring value in a dataset. It can provide insight into the typical or most common value of a variable. However, in cases where there are no repeated values, such as in our case, the mode is undefined, and the result of the mode function is NULL.

It's important to note that the absence of a mode in this case does not necessarily mean that the data is not useful or informative. It simply indicates that there is no single value that occurs more frequently than others in the dataset for the total turnover of Bajaj Finance's stock. Other measures of central tendency and variability, such as the mean, median, and standard deviation, can still be used to analyze the data and gain insights into the stock's liquidity and investor interest.

Code for executing Variance of TotalTurnover (Rs.) in Baja Finance stock is:

- `var(bajajfin$TotalTurnover..Rs..)`
- Variance ans = 4.773825e+19

Output



The screenshot shows the RStudio interface. The script editor contains the following code:

```
40  
41 |  
42 ##Univariate Ananlysis  
43 var(bajajfin$TotalTurnover..Rs..)  
44  
45  
46
```

The console shows the execution of the code:

```
> ##Univariate Ananlysis  
> var(bajajfin$TotalTurnover..Rs..)  
[1] 4.773825e+19  
> |
```

Interpretation:

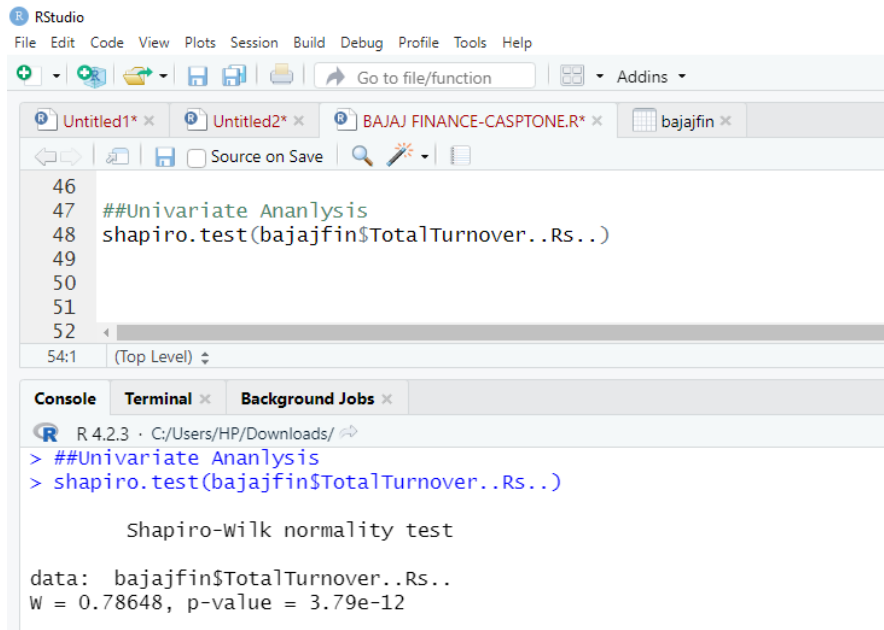
The variance for the total turnover of Bajaj Finance stock , and the value we got is "4.773825e+19".

Since variance is calculated in square units, the variance value obtained suggests that the total turnover of Bajaj Finance's stock in rupees is highly dispersed, meaning that the data points are far away from the mean. This may indicate high volatility in the stock's performance, which is a crucial aspect to consider for investors and traders. A high variance value can also affect the stability of any statistical models built on the data.

Code for executing Shapiro Test of TotalTurnover (Rs.) in Baja Finance stock is:

- `shapiro.test(bajajfin$TotalTurnover..Rs..)`
- Shapiro Test ans => $W = 0.78648$, $p\text{-value} = 3.79e-12$

Output



```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
BAJAJ FINANCE-CASPTONE.R
bajajfin
Source on Save
46
47 ##Univariate Ananlysis
48 shapiro.test(bajajfin$TotalTurnover..Rs..)
49
50
51
52
54:1 (Top Level)
Console Terminal Background Jobs
R 4.2.3 · C:/Users/HP/Downloads/
> ##Univariate Ananlysis
> shapiro.test(bajajfin$TotalTurnover..Rs..)

Shapiro-Wilk normality test

data: bajajfin$TotalTurnover..Rs..
W = 0.78648, p-value = 3.79e-12
```

Interpretation:

The Shapiro-Wilk test is a statistical test used to check if a given sample data follows a normal distribution. The null hypothesis of the test is that the data follows a normal distribution. In this case, we have applied the Shapiro-Wilk test on the total turnover of Bajaj Finance's stock in rupees. The value " $W = 0.78648$ " represents the test statistic of the Shapiro-Wilk test. The test statistic is used to calculate the p-value which measures the level of statistical significance of the test. The value " $p\text{-value} = 3.79e-12$ " indicates that the probability of observing such a deviation from normality by chance alone is extremely low, given that the null hypothesis is true. In other words, the p-value is less than 0.05 (typical significance level) which suggests that the null hypothesis can be rejected in favour of the alternative hypothesis that the data does not follow a normal distribution. H_0 : The data is not normally distributed.

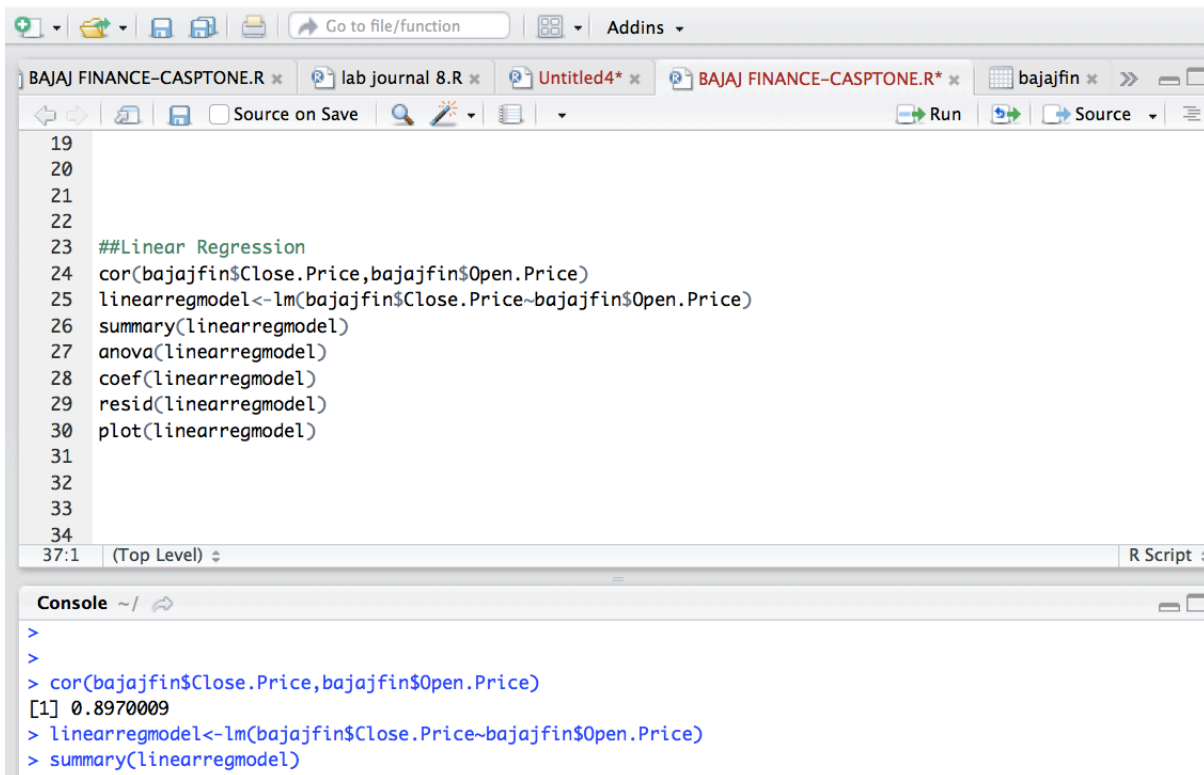
H_1 : The data is normally distributed.

Accept $H_1(P\text{ value} < 0.05)$

Therefore, based on the Shapiro-Wilk test results, it can be inferred that the total turnover of Bajaj Finance's stock in rupees is not normally distributed. This can have implications for the analysis of the data as statistical tests and models that assume normality may not be appropriate.

REFRESSION ANALYSIS

Output



```
19
20
21
22
23 ##Linear Regression
24 cor(bajajfin$Close.Price,bajajfin$Open.Price)
25 linearregmodel<-lm(bajajfin$Close.Price~bajajfin$Open.Price)
26 summary(linearregmodel)
27 anova(linearregmodel)
28 coef(linearregmodel)
29 resid(linearregmodel)
30 plot(linearregmodel)
31
32
33
34
37:1 (Top Level)
R Script
```

```
>
>
> cor(bajajfin$Close.Price,bajajfin$Open.Price)
[1] 0.8970009
> linearregmodel<-lm(bajajfin$Close.Price~bajajfin$Open.Price)
> summary(linearregmodel)
```

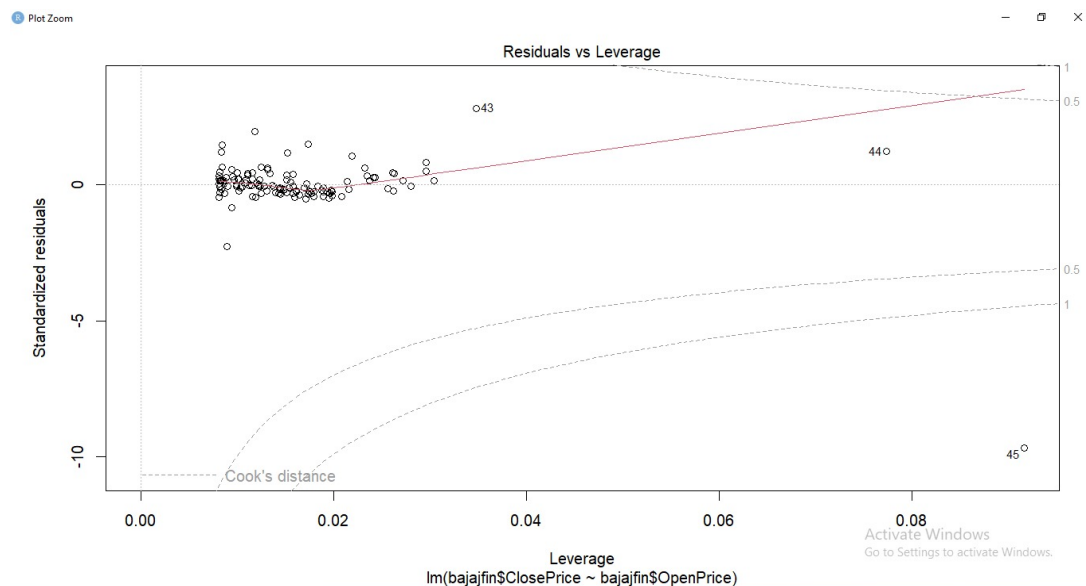
Interpretation

The correlation coefficient is the specific measure that quantifies the strength of the linear relationship between two variables in a correlation analysis. The coefficient is what we symbolize with the r in a correlation report.

Here we are finding the correlation between the close and open price of Bajaj Finance.

Here we got correlation coefficient $r=0.897009$, which means that the variables open and close price have a strong positive relationship. This also says that the variables will be moving in the same direction, if open price is increasing the close price also increases and vice versa.

Plot of correlation



From the above chart we can find the outliers in the data set. We can see that the outliers are 43, 440 and -45.

Linear Regression

Linear regression analysis involves examining the relationship between one independent and dependent variable. Statistically, the relationship between one independent variable (x) and a dependent variable (y) is expressed as: $y = a + bx$

From the dataset we have the close price is the dependent variable(y) and open price is an independent variable(x).

```
> linearregmodel<-lm(bajajfin$Close.Price~bajajfin$Open.Price)
> summary(linearregmodel)
```

```
Call:
lm(formula = bajajfin$Close.Price ~ bajajfin$Open.Price)
```

```
Residuals:
    Min       1Q   Median       3Q      Max
-9355.5  -235.6   -41.6    268.8   2801.7
```

```
Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  434.98595  177.05276   2.457  0.0154 *
bajajfin$Open.Price  0.89241    0.03981  22.414 <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Residual standard error: 1015 on 122 degrees of freedom
Multiple R-squared:  0.8046,    Adjusted R-squared:  0.803
F-statistic: 502.4 on 1 and 122 DF,  p-value: < 2.2e-16
```

```
> anova(linearregmodel)
Analysis of Variance Table
```

```
Response: bajajfin$Close.Price
              Df Sum Sq Mean Sq F value Pr(>F)
bajajfin$Open.Price  1 517082541 517082541  502.39 < 2.2e-16 ***
Residuals          122 125566872  1029237
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
> coef(linearregmodel)
(Intercept) bajajfin$Open.Price
 434.9859547      0.8924089
> resid(linearregmodel)
 1      2      3      4      5      6      7
-353.599985 -329.073863 -421.134502 -245.353027 -62.498875 -375.781460 -530.334296
 8      9     10     11     12
-440.218210 -207.762767 -120.422663 -232.287941 -123.494518 -315.529939 -227.259495
15     16     17     18     19     20     21
-52.532479 -154.528212 -92.310851 -222.144866 -58.031747  52.710955  62.929267
22     23     24     25     26     27     28
-50.451971  167.967363  279.996521  482.777262  318.020131 -309.910844 -84.412357
29     30     31     32     33     34     35
212.299092 1206.705330  182.022297 -319.184787  218.617830  170.049085  424.298605
36     37     38     39     40     41     42
657.114525  98.736953  182.631217 1166.533040  150.351895 1059.975392  816.477011
43     44     45     46     47     48     49
2801.733603 1196.872642 -9355.517218 -313.725499 -488.356253 -425.676212 -161.795546
50     51     52     53     54     55     56
-263.376664 -252.352219 -207.716387 -251.426911 -247.689763  34.697384 -170.929793
57     58     59     60     61     62     63
-181.384488 -286.337001 -307.509892 -213.129226 -343.118050 -289.455644 -124.324471
64     65     66     67     68     69     70
-108.276568 -31.386913 -40.651684  211.916033 -4.035893 -842.140949  2.294370
71     72     73     74     75     76     77
-28.734268 -68.586186 -221.532424 -106.064221  213.557683 -42.503835  268.603485
78     79     80     81     82     83     84
155.117281 -472.612673  31.044515  652.545050 -64.500313  39.268279  151.054140
85     86     87     88     89     90     91
150.912444  130.072063 -2304.383801 -50.893586 -474.142572  610.881106  291.096919
92     93     94     95     96     97     98
166.628914 -290.091119 -161.526142 1487.668391  448.052140 -443.973962  550.048709
99     100    101    102    103    104    105
-24.777100  364.009334  434.086766  561.364103  395.108052 1489.560376  498.919420
106    107    108    109    110    111    112
162.746346 -60.681651  257.615342  340.916540  269.580793  623.657156 -228.288281
113    114    115    116    117    118    119
-217.477470 -462.166755 1979.893549  398.849675  441.523764  158.894920 -128.305792
120    121    122    123    124
110.942070 -416.974332  371.631217 -258.818070  402.029104
> plot(linearregmodel)
Hit <Return> to see next plot:
```

H0: There is no significant relationship between the close price and open price of Bajaj Finance. ($b=0$)

H1: There is a significant relationship between the close price and open price of Bajaj Finance. ($b \neq 0$)

The intercept value of the independent variable which is open price is given as 434.98595, it is the y value when the $x=0$. The coefficient b is the regression coefficient and denotes that the estimated increase in the dependent variable for every unit increase in the independent variable. The p value of the independent variable (open price) is $2.2e-16$ which is less than 0.05 (5%).

Hence Accept H1.

The 1st quartile is given as -235.6 and the 3rd quartile is given as 268.8

We can also see that the DF value is 122 which means the total no of observations are 123 ($df+1$).

The linear regression equation is given as $Y=434.98595+0.89241(x)$

We can see that the Adjusted R^2 is given as 0.803 which means that 80.3% of the dependent variable is explained using the independent variable.

This clearly says that the model is an efficient model.

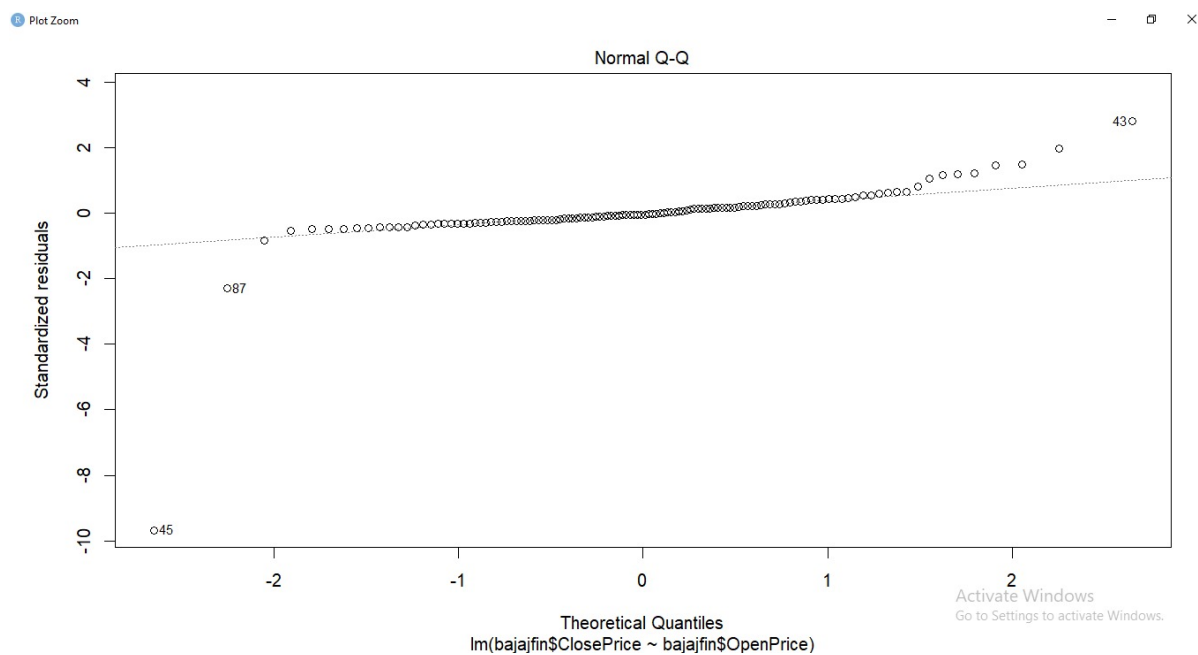
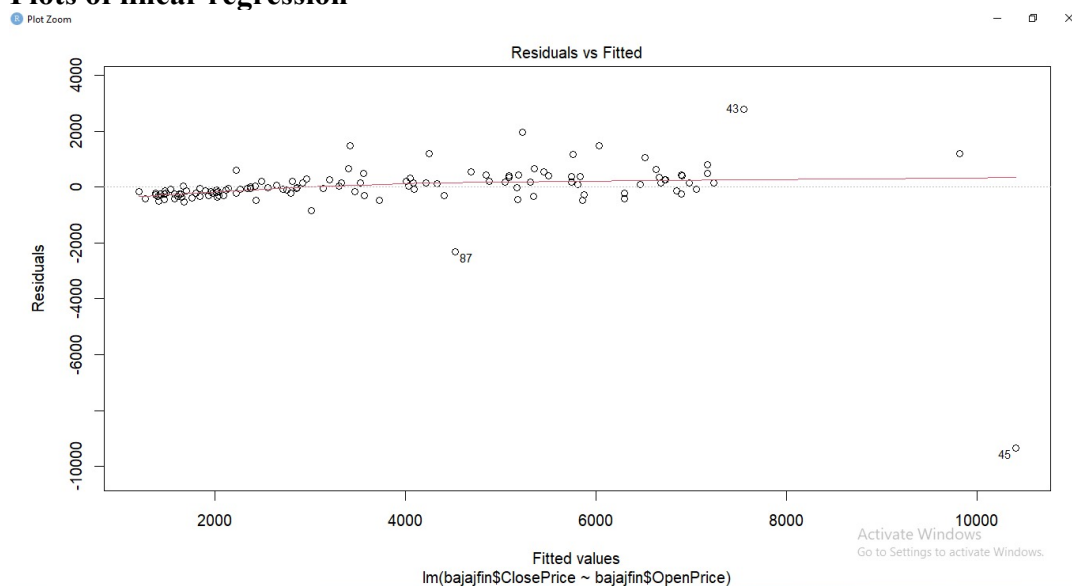
From the anova we can understand that the following

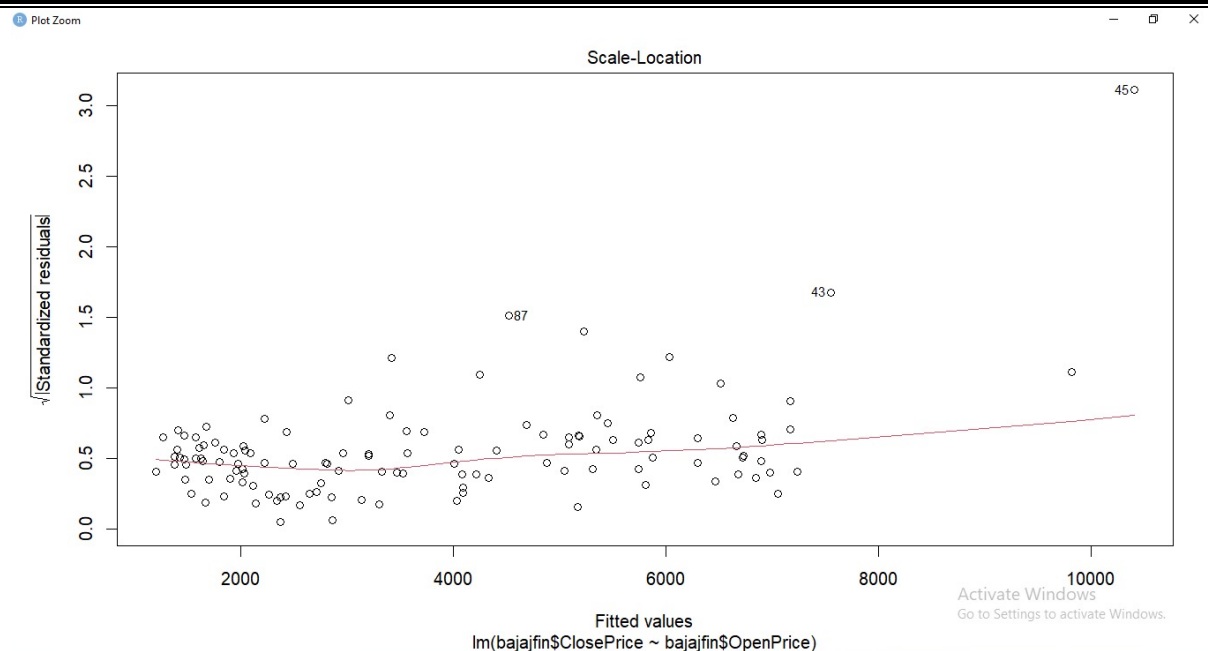
The ANOVA output provides an estimate of how much variation in the dependent variable that can be explained by the independent variable.

- The first column lists the independent variable along with the model residuals (aka the model error).
- The Df column displays the degrees of freedom for the independent variable (open price of Bajaj Finance), calculated by taking the number of levels within the variable and subtracting 1, and the degrees of freedom for the residuals (calculated by taking the total number of observations minus 1, then subtracting the number of levels in each of the independent variables). We can see that the total no of observations is 123.
- The Sum Sq column displays the sum of squares (a.k.a. the total variation) between the group means and the overall mean explained by that variable. The sum of squares for the open price variable is 517082541, while the sum of squares of the residuals is 125566872.
- The Mean Sq column is the mean of the sum of squares, which is calculated by dividing the sum of squares by the degrees of freedom.
- The F value column is the test statistic from the F test: the mean square of each independent variable divided by the mean square of the residuals. The larger the F value, the more likely it is that the variation associated with the independent variable is real and not due to chance.

- The $\text{Pr}(>F)$ column is the p value of the F statistic. This shows how likely it is that the F value calculated from the test would have occurred if the null hypothesis of no difference among group means were true.
- H_0 : There is no significant impact of open price on close price of Bajaj finance Ltd
- H_1 : There is a significant impact of open price on close price of Bajaj finance Ltd
- Because the p value of the independent variable, open price is statistically significant ($p < 0.05$), it is likely that open price does have a significant effect on the close price.
- Accept H_1 .

Plots of linear regression





In the residual vs fitted chart the data is not scattered across the graph. If the data points in the residual vs. fitted chart are not scattered across the graph and are tightly clustered, it is important to carefully evaluate the model and consider potential issues such as underfitting, overfitting, data quality, or homoscedasticity.

In the QQ plot all the points lie on the line so we assume that the data is normally distributed.

We want to check two things in the scale-location chart.

- That the red line is approximately horizontal. Then the average magnitude of the standardized residuals isn't changing much as a function of the fitted values.
- That the spread around the red line doesn't vary with the fitted values. Then the variability of magnitudes doesn't vary much as a function of the fitted values.

We see that for this plot, the first condition is satisfied, while the second condition is a bit less clear. It's likely still good enough to use though.

Multiple Regression

Multiple regression is a statistical technique that can be used to analyze the relationship between a single dependent variable and several independent variables. The objective of multiple regression analysis is to use the independent variables whose values are known to predict the value of the single dependent value.

Output

```
28
29 ##Multiple regression
30 cor(bajajfin$Close.Price,bajajfin$Low.Price)
31 cor(bajajfin$Close.Price,bajajfin$High.Price)
32 multregmodel<-lm(bajajfin$Close.Price~bajajfin$Open.Price+bajajfin$High.Price+bajajfin$Low.Price)
33 summary(multregmodel)
34 anova(multregmodel)
35 resid(multreg)
36 plot(multregmodel)
37 qqplot(multregmodel)
38 coef(multregmodel)
39
```

```
> cor(bajajfin$Close.Price,bajajfin$Low.Price)
[1] 0.9890318
> cor(bajajfin$Close.Price,bajajfin$High.Price)
[1] 0.9183555
> multregmodel<-lm(bajajfin$Close.Price~bajajfin$Open.Price+bajajfin$High.Price+bajajfin$Low.Price)
> summary(multregmodel)
```

Call:

```
lm(formula = bajajfin$Close.Price ~ bajajfin$Open.Price + bajajfin$High.Price +
    bajajfin$Low.Price)
```

Residuals:

Min	1Q	Median	3Q	Max
-653.40	-72.83	0.75	85.40	869.56

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	27.42381	35.66896	0.769	0.443
bajajfin\$Open.Price	-0.79841	0.05450	-14.649	<2e-16 ***
bajajfin\$High.Price	0.77983	0.05150	15.142	<2e-16 ***
bajajfin\$Low.Price	1.03219	0.02155	47.900	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 199.9 on 120 degrees of freedom
Multiple R-squared: 0.9925, Adjusted R-squared: 0.9924
F-statistic: 5323 on 3 and 120 DF, p-value: < 2.2e-16

Here we are finding the correlation between the close and high price, close price and low price of Bajaj Finance.

Here we got correlation coefficient $r_1(\text{close price and low price})=0.9890318$, which means that the variables open and close price have a strong positive relationship. This also says that the variables will be moving in the same direction, if low price is increasing the close price also increases and vice versa.

Here we got correlation coefficient $r_2(\text{close price and high price})=0.9183555$, which means that the variables open and close price have a strong positive relationship. This also says that the variables will be moving in the same direction, if high price is increasing the close price also increases and vice versa.

H0: There is no significant relationship between the close price and the combination of open price, low price & high price of Bajaj Finance.

H1: There is a significant relationship between the close price and the combination of open price, low price & high price of Bajaj Finance.

We can see that all the variables i.e open, high and low price have p value ($<2e-16$ less than 0.05)

Accept H1

The linear regression equation is given as $Y=27.42381-0.79841(x_1)+0.77983(x_2)+1.03219(x_3)$

Y-Dependent variable(Close Price)

X1- Independent variable(Open Price)

X2-Independent variable(High Price)

X3-Independent variable(Low Price)

We can see that the Adjusted R² is given as 0.9924 which means that 99.24% of the dependent variable is explained using the independent variable.

This clearly says that the model is an efficient model.

```
> anova(multregmodel)
```

Analysis of Variance Table

Response: bajajfin\$Close.Price

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
bajajfin\$Open.Price	1	517082541	517082541	12946.13	< 2.2e-16 ***
bajajfin\$High.Price	1	29134596	29134596	729.44	< 2.2e-16 ***
bajajfin\$Low.Price	1	91639347	91639347	2294.36	< 2.2e-16 ***
Residuals	120	4792929	39941		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```
> resid(multreg)
```

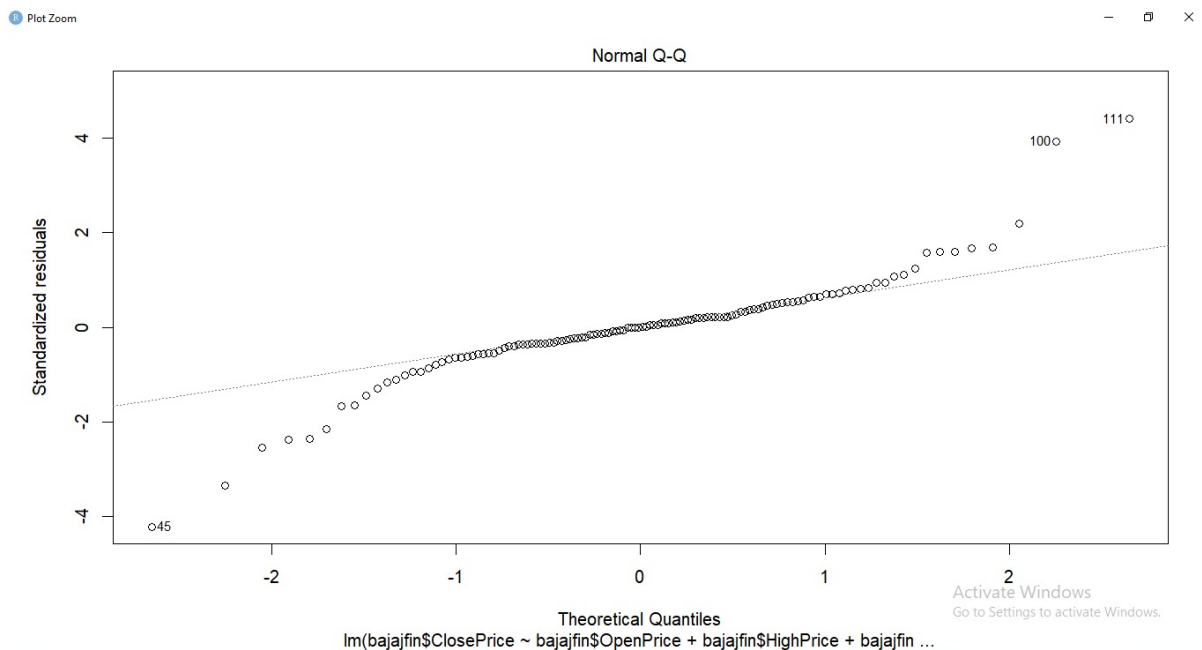
1	2	3	4	5	6	7	8
-4583.8539	11110.0353	9620.5299	12367.1234	6495.1445	-17589.8418	-16115.6754	9967.0382
9	10	11	12	13	14	15	16
-5459.0747	-4615.2988	6960.4417	1823.1379	-7071.1507	-4638.1346	-1152.1952	-4000.1472
17	18	19	20	21	22	23	24
4791.4308	-5257.2529	-9970.2952	157.3672	12597.7417	-1919.0553	3190.8540	3684.9413
25	26	27	28	29	30	31	32
1264.2394	9368.7471	-289.3993	17096.5060	-7419.0509	-4416.1342	-11734.2426	-33645.4945
33	34	35	36	37	38	39	40
-538.6286	2017.4005	9645.0119	9460.6812	-4939.6832	-5888.1908	-1905.6205	-4703.1389
41	42	43	44	45	46	47	48
-106.0337	-1435.7841	852.3704	-830.9889	-1436.8223	-821.8104	6450.1588	6703.0157
49	50						
14883.9561	1975.1255						

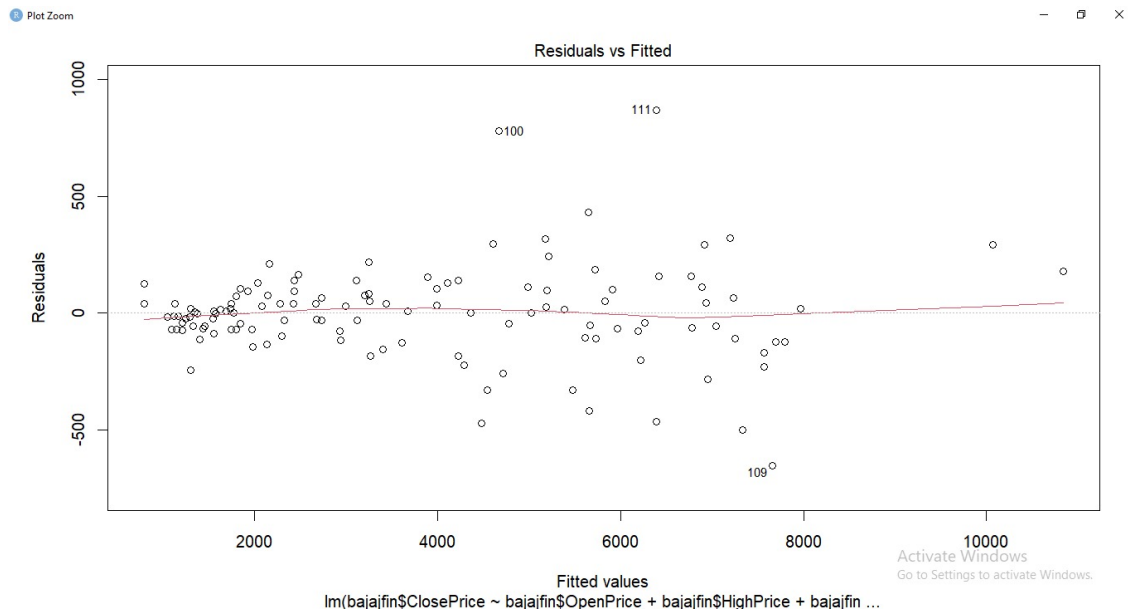
```
> coef(multregmodel)
```

(Intercept)	bajajfin\$Open.Price	bajajfin\$High.Price	bajajfin\$Low.Price
27.4238131	-0.7984121	0.7798341	1.0321861

```
>
```

Plots of multiple regression





In the QQ plot all the points lie on the line so we assume that the data is normally distributed.

We want to check two things in the scale-location chart.

- That the red line is approximately horizontal. Then the average magnitude of the standardized residuals isn't changing much as a function of the fitted values.
- That the spread around the red line doesn't vary with the fitted values. Then the variability of magnitudes doesn't vary much as a function of the fitted values.

We see that for this plot, the first condition is satisfied, while the second condition is also satisfied. It's likely still good enough.

CONCLUSION

- R is a popular programming language and environment for statistical computing and graphics.
- R was created by Ross Ihaka and Robert Gentleman at the University of Auckland, New Zealand, in the early 1990s.
- R is open-source and freely available, making it accessible to a wide range of users.
- R provides a vast ecosystem of packages for various data analysis, visualization, and machine learning tasks.
- R has a large and active community of users and developers, who contribute to its development and share resources and knowledge.
- R is widely used in academia, industry, and research for data analysis, statistical modeling, and scientific computing.
- R has a rich syntax for data manipulation and visualization, making it a powerful tool for exploring and analyzing data.
- R is known for its extensive graphics capabilities, allowing users to create a wide variety of plots and visualizations.
- R has a steep learning curve for beginners, but it offers powerful capabilities for data analysis and statistical computing once mastered.
- R is compatible with other programming languages and tools, making it suitable for integration into data workflows and pipelines.



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III SEMESTER
Batch 2021-2023

SUBJECT CODE: 21MBA531

SUBJECT: PREDICTIVE ANALYSIS USING R

Topic:

“Capstone Project report on Predictive analysis using R language”

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SEMESTER	3 rd
REGISTERED NUMBER	P18FW21M0009
NAME OF THE FACULTY	Dr Jahnvi M
MARKS (out of 15)	

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ACC Limited (ACC) is a leading player in the Indian building materials space, with a pan-India manufacturing and marketing presence. With 17 cement manufacturing units, 85 ready mix concrete plants, over 6,600 talented employees, a vast distribution network of 56,000 dealers & retailers and a country widespread of sales offices, it contributes tremendously to the landscape of the country.

For over 80 years, ACC has been synonymous with cement, establishing its reputation as a pioneer organization that consistently sets new benchmarks in research and innovative product development.

History was created more than eight decades ago when the doyens of the Indian cement industry unified their operations to build the foundation of a company that has only grown stronger with every passing year. From the Bhakra Nangal Dam in 1960 to the Mumbai-Pune Expressway, ACC cement is at the heart of iconic landmarks across the country.

Our success over the years can be attributed to our unrelenting focus on customer centricity, ethical business practices and sustainable development. We pay tribute to our motto of ‘Cementing Relationships’ with every single interaction with our range of stakeholders.

ACC's brand architecture comprises the gold range and silver range of products assuring superior quality for general construction as well as for specialized applications and environments. The ready-mix concrete product range provides one-stop solutions from basic requirements to high grades of concrete to build the country's tallest structures.

Sustainability is an integral part of our business strategy, with our Sustainable Development 2030 Plan focused on four broad themes: Climate, Circular Economy, Water & Nature and People & Communities. Our corporate social responsibility efforts benefit local communities across the country by furthering economic and social progress. ACC's earliest initiatives in community development date back to the 1940's – long before the term 'corporate social responsibility' was coined.

ACC was among the first Indian companies to include commitment to environmental protection as one of its corporate objectives. Since inception, we have integrated this commitment into all activities of our value chain, from mining to sales to promoting the use of alternative fuels and resources, resulting in one of the lowest carbon footprints in the cement industry.

ACC Limited (ACC) is one of the leading players in the Indian building materials space with 17 modern cement factories, 90 ready mixed concrete plants, a vast distribution network of over 10,000 channel partners and a countrywide spread of sales offices. Headquartered in Mumbai, ACC's operations span the whole country with cement factories, ready mix concrete plants, regional offices, sales units and area offices

In 2022, ACC became a part of Adani Group - the largest and fastest-growing portfolio of diversified sustainable businesses

FOUNDERS OF ACC LTD.

ACC Ltd, formerly known as The Associated Cement Companies Limited, was founded in 1936 by a group of leading industrialists, including:

- **J.R.D. Tata** - J.R.D. Tata was a renowned industrialist and philanthropist who played a key role in the development of several industries in India, including aviation, steel, and cement. He was the founder of Tata Airlines, which later became Air India, and also served as the chairman of Tata Sons.
- **Sir Nowroji Saklatwala** - Sir Nowroji Saklatwala was a prominent industrialist and philanthropist who was the chairman of the Tata group from 1932 to 1948. He played a key role in the development of several Tata companies, including Tata Steel, Tata Power, and ACC Ltd.
- **Khwaja Abdul Hamied** - Khwaja Abdul Hamied was a noted industrialist and philanthropist who was the founder of the Cipla pharmaceutical company. He was also a key investor in ACC Ltd and played an important role in its early development.
- **Walchand Hirachand** – Walchand Hirachand was a pioneering Indian industrialist who founded several leading companies, including Hindustan Aircraft and Premier Automobiles. He was also a key investor in ACC Ltd and played an important role in its early development.

These founders played a crucial role in establishing ACC Ltd as one of the leading cement companies in India, and their vision and leadership helped the company grow and prosper over the years.

VISION

To be one of the most respected companies in India; recognized for challenging conventions and delivering on our promises.

PRODUCTS

ACC LTD. Has a wide range of gold range ,silver range cements. The brand ACC is a hallmark of quality and durability in Cement and Ready Mixed Concrete- to build homes for the masses of India in its cities, towns and villages as well as enduring structures for infrastructure and industry.



Key recognitions received by ACC Ltd.

ACC Limited, also known as The Associated Cement Companies Limited, is one of the leading cement manufacturers in India. Some of the key recognitions received by ACC Ltd include:

- **GreenPro Certification:** ACC's Jamul and Sindri cement plants were certified with CII GreenPro certification for being environmentally friendly.
- **National Award for Excellence in Water Management:** ACC's Wadi cement plant was awarded the National Award for Excellence in Water Management by the Confederation of Indian Industry (CII) for its efforts towards water conservation and management.
- **Greentech Environment Excellence Award:** ACC's Kymore cement works received the Greentech Environment Excellence Award for its sustainable environmental practices.
- **Golden Peacock Global Award for Sustainability:** ACC was conferred with the Golden Peacock Global Award for Sustainability for its initiatives towards sustainable development and environment-friendly practices.
- **Aon Best Employers India Award:** ACC was recognized as one of India's Best Employers by Aon Hewitt for its focus on employee engagement, development, and diversity.
- **CII-ITC Sustainability Awards:** ACC has won several CII-ITC Sustainability Awards for its sustainable business practices, including water conservation, energy efficiency, and biodiversity conservation.

These are some of the key recognitions received by ACC Ltd for its efforts towards sustainability, environmental protection, and employee engagement.

Competitors of ACC Ltd.

ACC Ltd operates in a highly competitive cement industry in India. Some of its major competitors include:

- **UltraTech Cement Ltd** - UltraTech Cement is the largest cement manufacturer in India and a subsidiary of the Aditya Birla Group. It has a strong pan-India presence, with 22 cement plants and a total capacity of 116.75 million tonnes per annum (MTPA). UltraTech is known for its strong brand presence, high-quality products, and efficient distribution network. It also has a significant international presence, with operations in the UAE, Bahrain, Bangladesh, and Sri Lanka.

- **Ambuja Cements Ltd** - Ambuja Cements is a subsidiary of Holcim, one of the world's largest cement producers. It has a strong presence in the western and northern regions of India, with 5 cement plants and a total capacity of 29.65 MTPA. Ambuja is known for its innovative products, customer-focused approach, and commitment to sustainable development. It has a significant export business, with customers in the Middle East, Africa, and Europe.

- **Shree Cement Ltd** - Shree Cement is a leading cement manufacturer in India, with a total capacity of 43.4 MTPA. It has a strong presence in the northern and eastern regions of India, with 7 cement plants and a strong distribution network. Shree Cement is known for its efficient use of resources, low-cost operations, and strong financial performance. It has also been recognized for its sustainability practices, including its focus on renewable energy, water conservation, and biodiversity conservation.

- **Dalmia Bharat Ltd** - Dalmia Bharat is a leading cement manufacturer in India, with a total capacity of 29.5 MTPA. It has a strong presence in the southern and eastern regions of India, with 13 cement plants and a significant export business. Dalmia Bharat is known for its focus on sustainability, innovation, and customer satisfaction. It has been recognized for its sustainable practices, including its use of renewable energy, water conservation, and waste management.

- **The India Cements Ltd** - The India Cements is one of the oldest cement manufacturers in India, with a total capacity of 15.5 MTPA. It has a strong presence in the southern and eastern regions of India, with 8 cement plants and a significant export business. The India Cements is known for its high-quality products, strong brand reputation, and efficient operations. It has also been recognized for its sustainable practices, including its use of renewable energy, water conservation, and waste management.

- **JK Cement Ltd** - JK Cement is a leading cement manufacturer in India, with a total capacity of 14.7 MTPA. It has a strong presence in the northern and western regions of India, with 10 cement plants and a significant export business. JK Cement is known for its innovation in product development, customer service, and sustainable practices. It has been recognized for its sustainable practices, including its use of renewable energy, water conservation, and waste management.

These companies are the major competitors of ACC Ltd in the Indian cement industry, and they compete in terms of pricing, product quality, distribution, and customer service. The competition is intense, and each company has its unique strengths and strategies to gain a competitive edge in the market.

ABOUT THE DATASET:

- **"Month"**: This column represents the month in which the stock prices were recorded. It is likely that the data was collected over a period of time and organized in a chronological order in this column.
- **"Open_Price"**: This column represents the opening price of the stock at the beginning of each month. This is the price at which the stock started trading for the day or month and is an important metric for investors and traders to analyze trends and patterns.
- **"High_Price"**: This column represents the highest price that the stock reached during the month. This is important information for investors as it shows the highest possible return that could have been made if the stock was sold at its peak.
- **"Low_Price"**: This column represents the lowest price that the stock reached during the month. This is important information for investors as it shows the lowest possible price that the stock was trading at during the month.
- **"Close_Price"**: This column represents the closing price of the stock at the end of each month. This is the price at which the stock finished trading for the day or month and is an important metric for investors and traders to analyze trends and patterns.
- **"NumberOfShares"**: This column represents the total number of shares of the stock that were traded during the month. This information can be used to calculate the stock's liquidity and demand.
- **"NumberOfTrades"**: This column represents the total number of trades that were executed for the stock during the month. This information can be used to determine the trading activity and overall interest in the stock.
- **"Total_Turnover"**: This column represents the total value of all the shares that were traded during the month. This information is useful for determining the overall financial health of the stock and the market as a whole.

Univariate analysis

```
> mean(Data$ClosePrice)
[1] 1195.653
> median(Data$ClosePrice)
[1] 1250.25
> mode(Data$ClosePrice)
[1] "numeric"
> sd(Data$ClosePrice)
[1] 557.8419
> |
```

INTERPRETATION

- **Mean :** The mean of the "ClosePrice" variable is 1195.653. This means that the average value of the "ClosePrice" variable in the dataset is 1195.653.
- **Median:** The median of the "ClosePrice" variable is 1250.25. This means that half of the observations in the "ClosePrice" variable are greater than or equal to 1250.25 and half of them are less than or equal to 1250.25.

Alternatively stated, the median value (1250.25) would be the middle value of the sorted list if all the "Close Price" values were arranged in ascending order. This is a helpful indicator of central tendency, particularly when the data includes anomalies that could distort the mean.

- **Mode:** The mode is the most frequently occurring value in a dataset. In this case, since there is no value that occurs more frequently than any other, the mode cannot be determined.
- **Standard deviation:** The standard deviation of the "ClosePrice" variable is 557.8419. The standard deviation is a measure of how spread out the values in a dataset is from the mean. In this case, the standard deviation of 557.8419 indicates that the "ClosePrice" variable has a relatively large spread, with values ranging quite widely from the mean.

If the standard deviation is high, it suggests that the data points are more spread out and less clustered around the mean. Conversely, if the standard deviation is low, it suggests that the data points are more tightly clustered around the mean. The standard deviation is a useful measure for quantifying the variability of the data in a dataset.

Univariate analysis

```
> var(Data$ClosePrice)
[1] 311187.6
> min(Data$ClosePrice)
[1] 128
> max(Data$ClosePrice)
[1] 2747.7
> shapiro.test(Data$ClosePrice)

      shapiro-wilk normality test

data:  Data$ClosePrice
W = 0.9792, p-value < 2.2e-16
```

- **Variance** :The variance of the "ClosePrice" variable is 311187.6. The variance is a measure of how much the values in a dataset vary from the mean.
- **Minimum**: The minimum value of the "ClosePrice" variable is 128. This means that the smallest "ClosePrice" value in the dataset is 128. The minimum value can be useful for identifying outliers or extreme values in the dataset.
- **Maximum** :The "ClosePrice" variable can have a maximum value of 2747.7. This indicates that 2747.7 is the highest "ClosePrice" value in the dataset. For locating outliers or extreme values in the dataset, the maximum value can be helpful.
- **Normality test**: The W value of 0.9792 indicates the test statistic calculated by the Shapiro-Wilk test. The closer the W value is to 1, the more likely it is that the dataset follows a normal distribution. In this case, the W value of 0.9792 indicates that the "ClosePrice" variable is relatively normally distributed.
- The p-value of less than 2.2e-16 indicates the statistical significance of the test. Specifically, the p-value is the probability of obtaining a test statistic as extreme as the one observed, assuming that the null hypothesis (i.e., that the data is normally distributed) is true. A small p-value indicates strong evidence against the null hypothesis, meaning that we can reject the idea that the data is normally distributed. In this case, the p-value is less than 0.05, which is a commonly used threshold for statistical significance, so we can conclude that the "ClosePrice" variable is not normally distributed.

Correlation

```
> cor(Data$ClosePrice,Data$OpenPrice)
[1] 0.999089
> cor.test(Data$ClosePrice,Data$OpenPrice)

Pearson's product-moment correlation

data: Data$ClosePrice and Data$OpenPrice
t = 1622.1, df = 4801, p-value < 2.2e-16
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.9990360 0.9991391
sample estimates:
      cor
0.999089
```

- **Correlation** : The correlation coefficient is a measure of the strength and direction of the linear relationship between two variables. A correlation coefficient of 1 indicates a perfect positive linear relationship, a correlation coefficient of -1 indicates a perfect negative linear relationship, and a correlation coefficient of 0 indicates no linear relationship.
- In this case, a correlation coefficient of 0.999089 indicates a very strong positive linear relationship between the "ClosePrice" and "OpenPrice" variables. This means that as the "OpenPrice" increases, the "ClosePrice" tends to increase as well. The strength of this relationship suggests that the "ClosePrice" and "OpenPrice" variables are likely highly dependent on one another and they may be redundant in some statistical analyses.
- The Pearson correlation coefficient between the "ClosePrice" and "OpenPrice" variables is very high at 0.999, indicating a very strong positive correlation between these variables. The p-value is less than $2.2e-16$, which means there is strong evidence to reject the null hypothesis that the correlation between the two variables is zero.
- The confidence interval, which ranges from 0.9990360 to 0.9991391, also indicates that the correlation coefficient is significantly different from zero. Specifically, we can be 95% confident that the true correlation between the "ClosePrice" and "OpenPrice" variables falls within this interval.

Linear Regression:

Linear regression is a statistical technique used to model the relationship between two variables by fitting a straight line to the data points that best represents the pattern of the data. It assumes that the relationship between the variables can be approximated by a linear equation of the form $Y = m(X) + b$, where Y is the response (or dependent) variable, X is the predictor (or independent) variable, m is the slope of the line, and b is the intercept on the Y -axis.

In R Studio, the `lm()` function is used to perform linear regression, which is a statistical technique used to model the relationship between two variables, typically denoted as the predictor (independent) variable and the response (dependent) variable.

By using the summary function on the variable, we can conduct a more thorough analysis of the regression analysis. The R square value of 0.7794 which means that 77.94% of all dependent variable values can be predicted by the independent variable. Hence, we can say that the Opening Price is a predictor of 77.94% of closing prices. Residuals are values that deviate from the regression line. We can identify that it has a minimum of -923.83 and a maximum of 320.31.

```
> summary(linregmodel)
```

```
Call:
```

```
lm(formula = Data$ClosePrice ~ Data$OpenPrice)
```

```
Residuals:
```

```
      Min       1Q   Median       3Q      Max
-293.448 -10.480   -0.296   11.086  197.363
```

```
Coefficients:
```

```
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    1.662077    0.812281    2.046  0.0408 *
Data$OpenPrice 0.997696    0.000615 1622.145 <2e-16 ***
```

```
---
```

```
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Residual standard error: 23.81 on 4801 degrees of freedom
```

```
Multiple R-squared:  0.9982,    Adjusted R-squared:  0.9982
```

```
F-statistic: 2.631e+06 on 1 and 4801 DF,  p-value: < 2.2e-16
```


By using the summary function on the variable, we can conduct a more thorough analysis of the regression analysis. The R square value of 0.9982 which means that 99.82% of all dependent variable values can be predicted by the independent variable. Hence, we can say that the Opening Price is a predictor of 99.82% of closing prices. Residuals are values that deviate from the regression line. We can identify that it has a minimum of -293.448 and a maximum of 197.363.

We can also hypothesize the following:

Hypothesis1:

H0 = There is no significant impact of Open Price on Closing Price ($B = 0$)

H1 = There is a significant impact of Open Price on Closing Price (B is not = 0) The p-value of Open Price is $< 2.2e-16$ which is less than 0.05.

So, accept H1.

It is concluded that the given independent variable (Open Price) has a significant impact on the dependent variable (Open Price).

Anova Analysis:

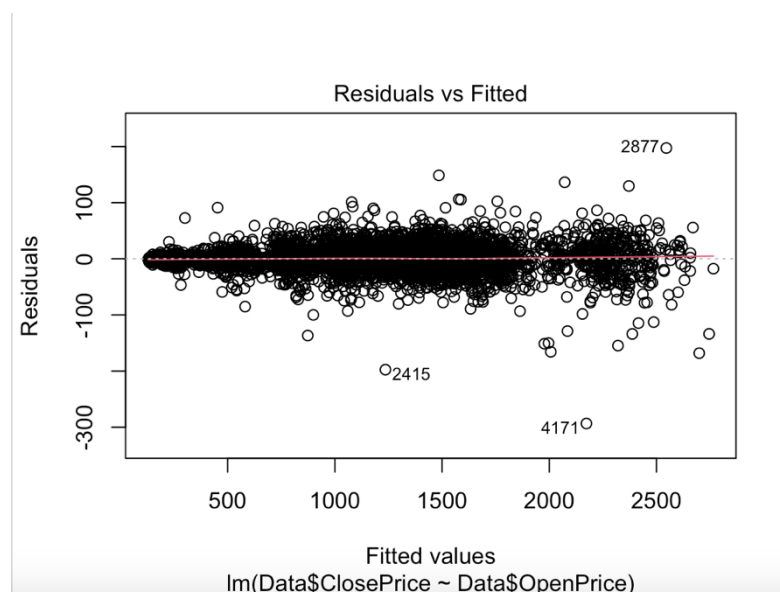
The Anova() function in R is used to perform analysis of variance (ANOVA) on a fitted model object. The result of the ANOVA is typically presented in an "Analysis of Variance Table" which provides information on the significance of the variables in the model.

```
> anova(linregmodel)
Analysis of Variance Table

Response: Data$ClosePrice
      Df Sum Sq Mean Sq F value Pr(>F)
Data$OpenPrice  1 1491601553 1491601553 2631355 < 2.2e-16 ***
Residuals    4801  2721480      567
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
> coefficients(linregmodel)
(Intercept) Data$OpenPrice
  1.6620770    0.9976963
```

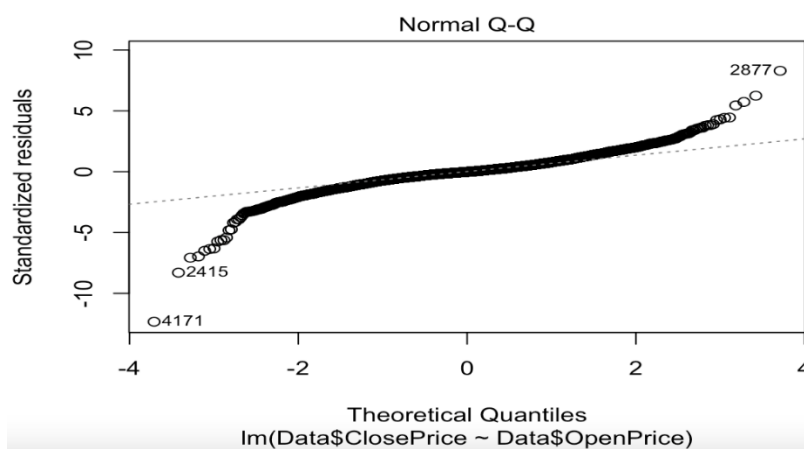
The p-value is extremely small (" $<2.2e-16$ ") this indicates that the Data\$Open_Price predictor variable is highly significant in explaining the variability in the Data\$Close_Price response variable. It has a degree of freedom of 1.

The ANOVA table provides important information for assessing the overall significance of the linear regression model and its individual predictor variables. The small p-value for Data\$Open_Price indicates that it is a significant predictor of Data\$Close_Price, and the residual error suggests that the model is capturing a significant portion of the variability in the response variable.



In the context of linear regression analysis, a residual vs. fitted plot is a graphical tool used to assess the quality of the regression model by examining the residuals, which are the differences between the observed values and the predicted values (i.e., the residuals are the errors of the model). The plot displays the residuals on the y-axis and the fitted values (predicted values) on the x-axis.

In the above graph we can see that most of the values fall on the Regression line. The line is well fitted and the opening price is a good predictor of closing price.

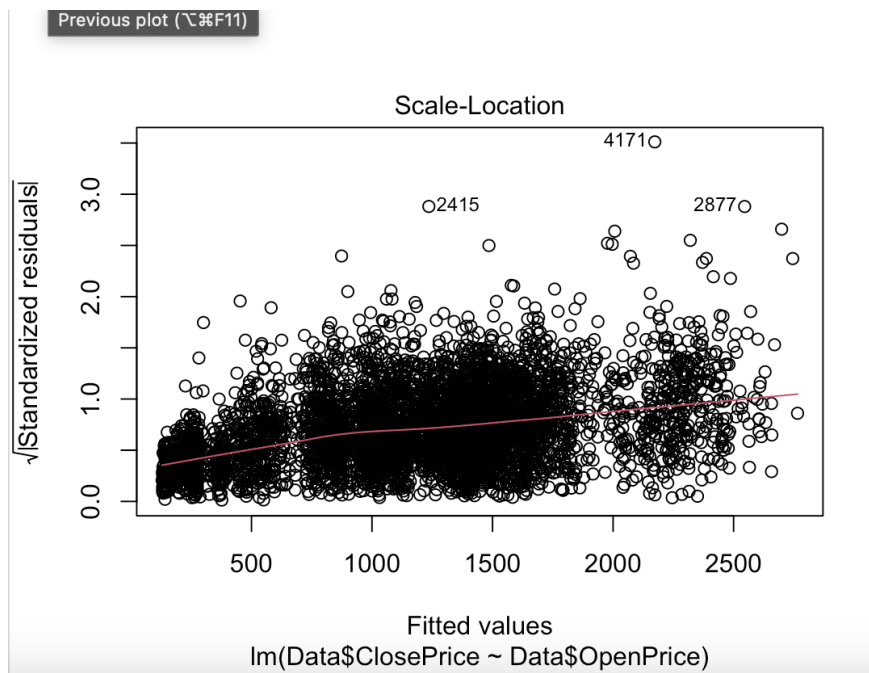


In the context of linear regression analysis, a normal Q-Q (quantile-quantile) plot is a graphical tool used to assess the normality of the residuals, which are the differences between the observed values and the predicted values (i.e., the residuals are the errors of the model). The plot compares the observed residuals to the expected residuals under the assumption of normal distribution.

Here we observe that most of the values fall in a straight line and we can analyze that the residuals of the regression model are normally distributed.

In the context of statistical analysis, a scale-location plot (also known as a scale-location or spread-location plot) is a graphical tool used to assess the homoscedasticity (constant variance of residuals) of a linear regression model. It is a type of residual plot that

displays the square root of the absolute residuals on the y-axis, and the fitted



values(predicted values) or other measure of location on the x-axis

Since most of the residuals are not significantly varying and remain a constant distance, we can observe that the regression model is well fitted.

Multiple Regression

Hit <Return> to see next plot: `multipleregmodel`
> `summary(multipleregmodel)`

Call:

```
lm(formula = Data$ClosePrice ~ Data$OpenPrice + Data$HighPrice +  
    Data$LowPrice)
```

Residuals:

Min	1Q	Median	3Q	Max
-61.832	-4.406	-0.064	4.343	115.018

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-0.192909	0.328843	-0.587	0.557
Data\$OpenPrice	-0.543593	0.009789	-55.532	<2e-16 ***
Data\$HighPrice	0.818553	0.008933	91.631	<2e-16 ***
Data\$LowPrice	0.723790	0.007539	96.012	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 9.501 on 4799 degrees of freedom

Multiple R-squared: 0.9997, Adjusted R-squared: 0.9997

F-statistic: 5.517e+06 on 3 and 4799 DF, p-value: < 2.2e-16

From the summary statistics, mean residual is determined to be zero.

The intercept value i.e., $a = -0.192$ and ' b_1 ' = -0.543, ' b_2 ' = 0.818553, ' b_3 ' = 0.723790.

Hypothesis1:

H_0 = There is no impact of Open Price on Closing Price

H_1 = There is a significant impact of Open Price on Closing Price

The p-value of Open Price is < 2e-16 which is less than 0.05.

So, accept H_1 .

It is concluded that the given independent variable (Open Price) has a significant impact on dependant variable (Open Price).

Hypothesis2:

H_0 = There is no impact of High Price on Closing Price

H_1 = There is a significant impact of High Price on Closing Price

The p-value of High Price is >2e-16 which is more than 0.05.

So, accept H0.

It is concluded that the given independent variable (Open Price) does not have a significant impact on dependant variable (Close Price).

Hypothesis3:

H0 = There is no impact of Low Price on Closing Price

H1 = There is a significant impact of Low Price on Closing Price

The p-value of Low Price is $> 2e-16$ which is greater than 0.05.

So, accept H0.

It is concluded that the given independent variable (Low Price) does not have a significant impact on dependant variable (Close Price).

R - squared value is 0.99749, which means independent variables explains 99.74% of variation of dependent variable (Close Price).

Anova Analysis:

```
> anova(multipleregmodel)
Analysis of Variance Table
```

```
Response: Data$ClosePrice
      Df  Sum Sq  Mean Sq  F value  Pr(>F)
Data$OpenPrice  1 1491601553 1491601553 16525572.6 < 2.2e-16 ***
Data$HighPrice  1  1456282  1456282  16134.3 < 2.2e-16 ***
Data$LowPrice   1   832039   832039   9218.2 < 2.2e-16 ***
Residuals      4799   433159     90
```

```
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
> coefficients(multipleregmodel)
(Intercept) Data$OpenPrice Data$HighPrice Data$LowPrice
-0.1929090 -0.5435928 0.8185530 0.7237897
```

Hypothesis1:

H0 = The variation explained by Open Price is not reliable

H1 = The variation explained by Open price is reliable

From the anova matrix, the obtained p-value is $< 2.2e-16$, which is less than 0.05.

Therefore, accept H1.

It is concluded that the variation explained by Open price is reliable.

We accept the model for prediction or the model is efficient.

Hypothesis2:

H0 = The variation explained by High Price is not reliable

H1 = The variation explained by High price is reliable

From the anova matrix, the obtained p-value is $< 2.2e-16$, which is less than 0.05.

Therefore, accept H1.

It is concluded that the variation explained by High price is reliable.

We accept the model for prediction or the model is efficient.

Hypothesis3:

H0 = The variation explained by Low Price is not reliable

H1 = The variation explained by Low price is reliable

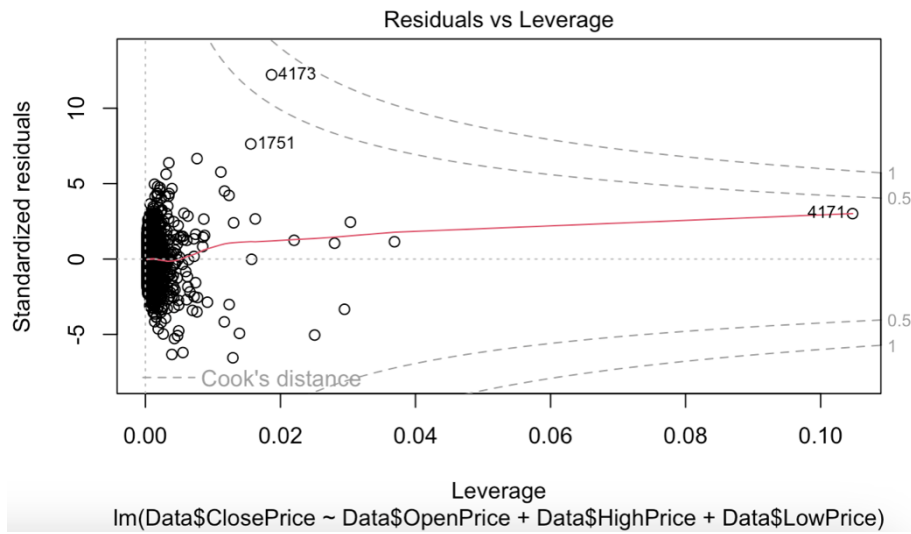
From the anova matrix, the obtained p-value is $< 2.2e-16$, which is less than 0.05.

Therefore, accept H1.

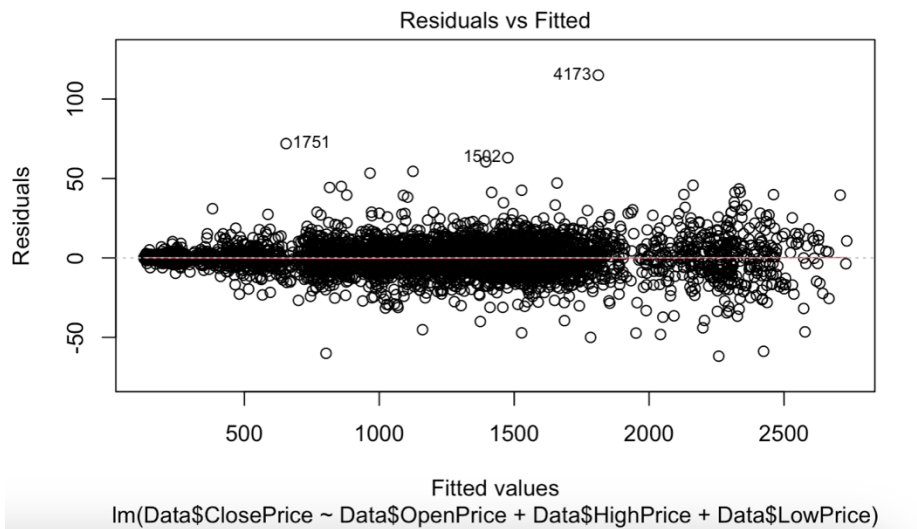
It is concluded that the variation explained by Low price is reliable.

We accept the model for prediction or the model is efficient.

Plot analysis

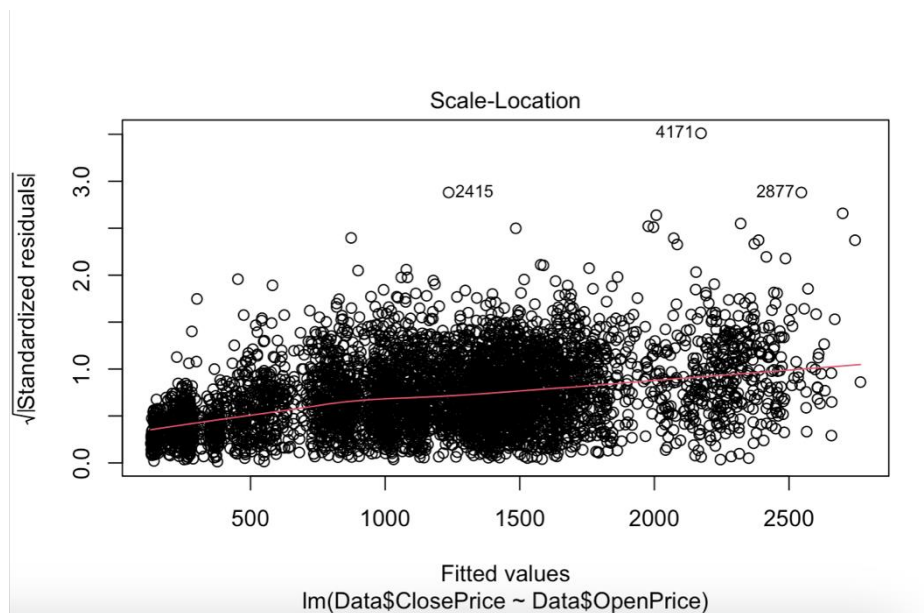


Residual vs Leverage is used to find the outliers in the dataset. From the plot we can treat records 4173, 1751, and 4171 as outliers.



In Residual vs Fitted plot, if the points in the plot are randomly scattered around the horizontal line at zero, then this indicates that the model is a good fit for the data.

From Residual vs Fitted plot, we can see that the data is scattered across in the graph. We failed to identify a particular pattern in the plot. We can say that there is a linear relationship between dependent and independent variables

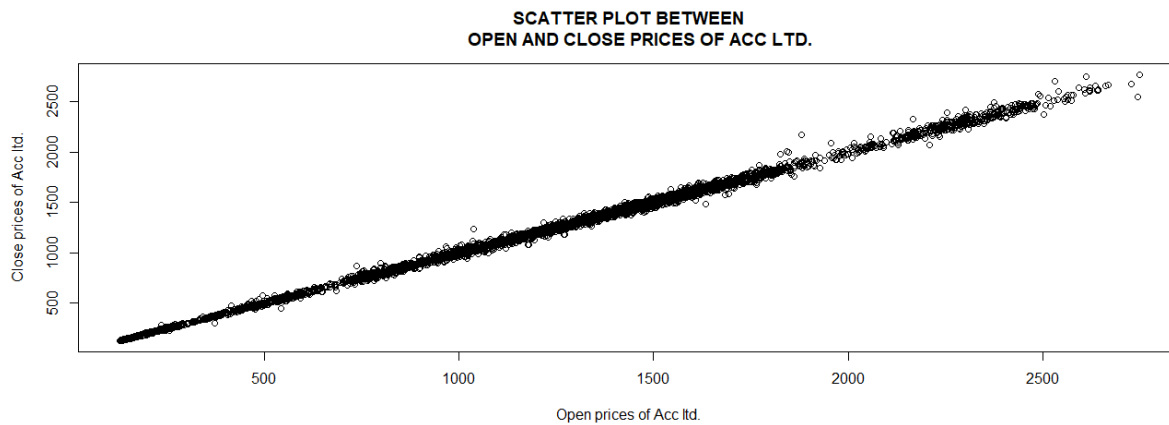


A scale-location plot, also known as a spread-location plot or a spread-level plot, is a graphical tool used to assess the homoscedasticity assumption (i.e., constant variance of the errors) in multiple regression analysis.


```
> resid(multipleregmodel)
```

1	2	3	4	5	6	7
3.560431832	1.533073869	0.361387298	2.422123313	5.073449214	-3.811606051	-4.297565791
8	9	10	11	12	13	14
-4.044563829	-5.650308174	-6.383439210	-3.370664347	-2.478335341	-0.739707549	3.641004240
15	16	17	18	19	20	21
4.891954833	1.192280674	-6.695019851	-2.277391927	1.796609969	12.598495056	8.463169813
22	23	24	25	26	27	28
-3.422120550	5.221168426	-6.930550626	0.346533898	3.438100013	-2.277644427	-0.750270891
29	30	31	32	33	34	35
-6.039028005	7.305739713	5.753235759	-0.758038237	-0.742900304	-0.366195827	1.324533274
36	37	38	39	40	41	42
-7.241674059	1.173159013	2.386877076	-15.934530059	9.911377404	-6.122333599	12.240677266
43	44	45	46	47	48	49
1.269675451	-21.181069561	1.910349796	-9.707983569	-0.364426235	11.863320069	-10.436818137
50	51	52	53	54	55	56
2.471280115	0.276657494	9.931158021	0.194188658	5.575874291	9.176751297	-5.500808678
57	58	59	60	61	62	63
0.999028161	-9.001437169	-11.538099390	21.650700491	0.285122923	-2.359316147	-0.457272634
64	65	66	67	68	69	70
13.558984969	-2.490517299	3.323388847	-5.602278329	-2.719747621	6.232759558	6.121936185
71	72	73	74	75	76	77
-13.921025648	-0.381796378	-1.178948308	-0.175216073	0.170799182	-9.584747000	-3.757799999
78	79	80	81	82	83	84
1.138131655	6.549895858	-3.722681259	13.270971102	-2.892033130	-6.235302459	-1.682041172
85	86	87	88	89	90	91
5.354179493	-12.561345521	-4.811372043	5.016603843	-1.496471045	-3.708344246	3.994246648
92	93	94	95	96	97	98

SCATTER PLOT



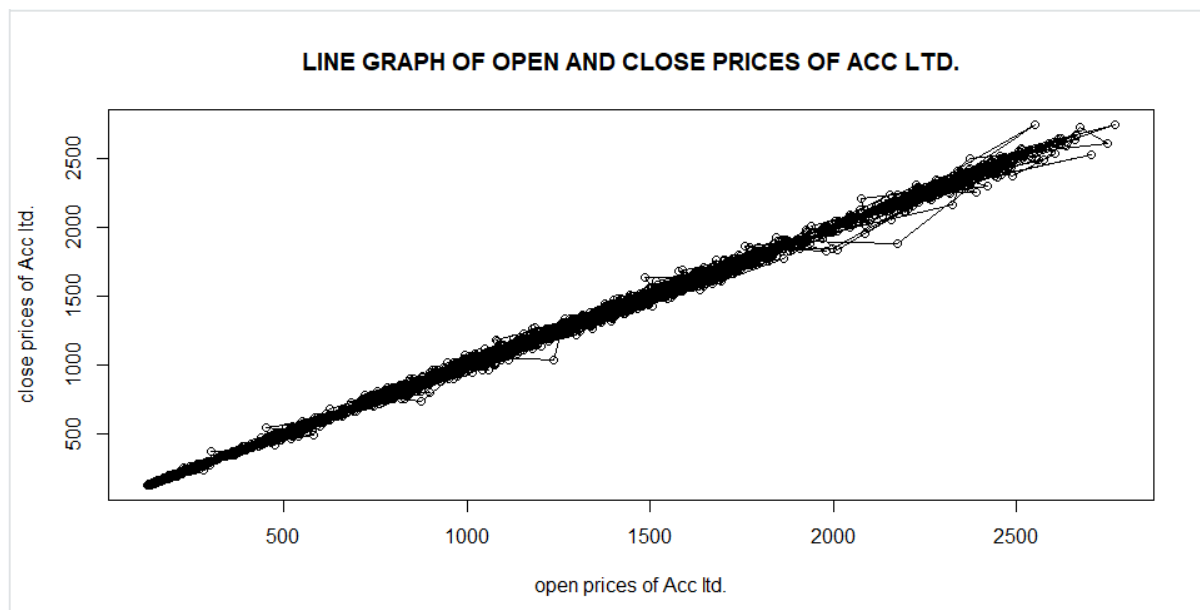
INTERPRETATION:

The scatter plot displays the relationship between the open price on the x-axis and the close price on the y-axis for a stock. The x-axis ranges from 0 to 2500, representing the open price range, while the y-axis ranges from 0 to 2500, representing the close price range.

From the scatter plot, we can see that the bulk of data points form a dense concentration of dots around the range of 1000 to 2000 for both the open and close prices. In other words, if the initial price rises, the close price tends to rise as well, indicating a strong positive correlation between the open and close values. The sloping line that crosses the scatter plot from right to left, showing a positive linear relationship between the two variables, further supports this positive correlation.

The scatter plot, with the majority of the data points clustering in the range of 1000 to 2000, suggests a substantial positive correlation between the stock's open and close prices. Outliers and a positive slope on the scatter plot line may signify important occurrences or causes that affect the performance of the stock.

LINE GRAPH



INTERPRETATION:

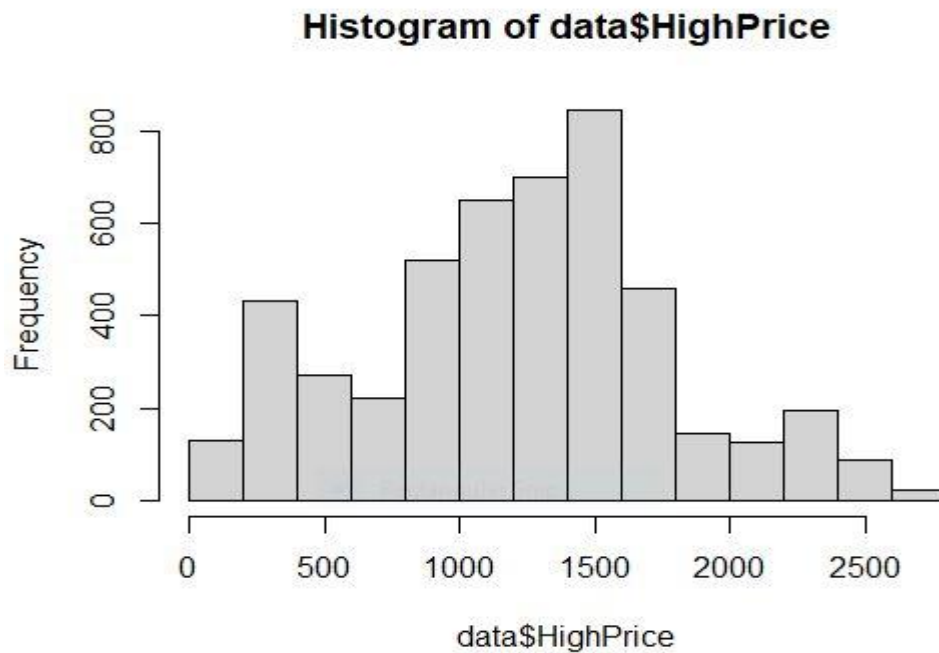
The line graph displays the relationship between the open price on the x-axis and the close price on the y-axis for a stock. The x-axis ranges from 0 to 2500, representing the open price range, while the y-axis ranges from 0 to 2500, representing the close price range.

From the line graph, we can observe that the majority of data points fall within the range of 1500 to 2500 for both the open and close prices. This indicates that the stock's opening and closing prices tend to be within this range most frequently, suggesting a consistent pattern or trend.

However, the graph also contains some outliers, or data points that are dispersed outside of the main cluster of points. These data points that depart from the general trend may be considered outliers because they are exceptional or extraordinary. These anomalies can be a sign of important occurrences or influences that influenced the stock's open and close prices.

HISTOGRAM

```
hist(data$HighPrice)
```



INTERPRETATION

The histogram shows the distribution of high prices for a stock, with the x-axis representing the high price range from 0 to 2500 and the y-axis representing the frequency (or count) of high prices falling within each range. The histogram indicates that the majority of high prices fall within the range of 1000 to 1500, with a frequency of 800. This suggests that the stock has a relatively high frequency of high prices in the middle range, between 1000 and 1500. There are also some high prices in the lower range, between 0 and 1000, but with lower frequency compared to the higher range.

Conclusion:

In conclusion, R programming is a powerful tool for data analysis and statistical computing. Its open-source nature and vast library of packages make it a popular choice for data scientists, statisticians, and researchers. With its easy-to-learn syntax and interactive environment, R enables users to analyze and visualize complex data sets, build predictive models, and create informative visualizations.

R is widely used in academia, research, and industry, and has applications in various fields, including healthcare, finance, marketing, and social sciences. The ability to customize and extend R through packages and user-defined functions makes it a versatile tool for solving a wide range of problems.

While there are challenges to using R, such as the need for a solid understanding of programming concepts and the potential for memory issues with large data sets, the benefits outweigh the challenges for many users.

The use of various R functions such as `mean()`, `median()`, `lm()`, `plot()`, and `cor()` can greatly enhance one's understanding of the R programming language. These functions provide essential tools for data analysis, visualization, and statistical modelling.

The `mean()` function is useful for calculating the average of a set of values, providing a measure of central tendency. The `median()` function calculates the middle value in a dataset, which is a robust measure of central tendency that is less affected by outliers. These functions are commonly used to summarize and describe data.

The `lm()` function in R is used to perform linear regression, a statistical method for modelling the relationship between two or more variables. This function allows for the estimation of regression coefficients, prediction of values, and assessment of model fit. Linear regression is a powerful tool for understanding the linear relationship between variables and making predictions based on the observed data.

The `plot()` function in R is a versatile tool for creating various types of plots, such as scatter plots, line charts, bar charts, and histograms. These plots are essential for visualizing data and gaining insights into patterns and trends. Plots can be customized with different colors, labels, and formatting options to effectively communicate results.

The `cor()` function in R is used to calculate the correlation coefficient between two variables, which measures the strength and direction of their linear relationship. Correlation coefficients range from -1 to 1, with positive values indicating a positive correlation, negative values indicating a negative correlation, and 0 indicating no correlation. The `cor()` function is valuable for examining the association between variables and identifying potential relationships in the data.

By leveraging these R functions, analysts and data scientists can gain a comprehensive understanding of their data, perform statistical analysis, create visualizations, and develop

predictive models. These functions provide essential tools for exploring and analyzing data, making R a powerful programming language for data analysis and visualization tasks.

Overall, R programming provides a powerful and flexible environment for data analysis and statistical computing, and its popularity is likely to continue to grow as more users become aware of its capabilities and potential applications.



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CA-17, 36th Cross, 26th Main, 4th 'T' Block, Jayanagar, Bangalore-41



III Semester PREDICTIVE ANALYTICS USING R (Course Id : 21MBA531)
Capstone Project work submitted in partial fulfilment of the requirements
for the award of the degree of

MASTER OF BUSINESS ADMINISTRATION

of

BANGALORE CITY UNIVERSITY



By

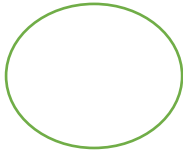
Nikhil S Anjanalli: P18FW21M0003
Nishanth Krishna: P18FW21M0012
Amogha Y G: P18FW21M0059

Under the guidance of

Dr. Jahnavi M

ASSOCIATE PROFESSOR

DEPARTMENT OF FINANCE



College seal

Dr. Jahnavi M

Name and Signature of Evaluators



Rashreeya Sikshana Samithi Trust
R V INSTITUTE OF MANAGEMENT

Autonomous Institute affiliated to Bengaluru City University
CA-17, 36th Cross, 26th Main, 4th 'T' Block, Jayanagar, Bangalore-41



DECLARATION BY THE STUDENT

I hereby declare that the **III Semester PREDICTIVE ANALYTICS USING R (Course Id: 21MBA531) Capstone Project work** is prepared by me under the guidance **Dr. JAHNAVI M, ASSOCIATE PROFESSOR DEPARTMENT OF FINANCE** in partial fulfilment for the award of Master's Degree in Business Administration by Bangalore City University. I also declare that this **III Semester PREDICTIVE ANALYTICS USING R (Course Id: 21MBA531) Capstone Project work** is the outcome of my own efforts.

I also declare that this project is the outcome of my own efforts and that it has not been submitted to any other university or Institute for the award of any other degree or Diploma or Certificate.

Nikhil S Anjanalli (P18FW21M0003)

Nishanth Krishna (P18FW21M0012)

Place: Bangalore

Date: 19-04-2023

Amogha Y G (P18FW21M0059)



Rashtreeya Sikshana Samithi Trust
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ABOUT COLGATE PALMOLIVE

Colgate-Palmolive is a leading consumer goods company that specializes in the production and distribution of personal care, home care, and pet nutrition products. The company was founded in 1806 by William Colgate in New York City and has since grown to become a global brand with a presence in over 200 countries.

The company's product portfolio includes well-known brands such as Colgate toothpaste, Palmolive dish soap, Speed Stick deodorant, Softsoap hand soap, and Hill's Science Diet pet food. Colgate-Palmolive is known for its commitment to innovation, sustainability, and ethical business practices.



COLGATE-PALMOLIVE (INDIA) LIMITED

The company has a strong presence in both developed and developing markets and has been recognized for its efforts to improve oral health and hygiene through initiatives such as its Bright Smiles, Bright Futures program. Colgate-Palmolive is also committed to reducing its environmental impact and has set ambitious sustainability goals, including achieving 100% recyclable packaging by 2025.

ABOUT THE VARIABLES

- The data set constitute information concerning the Share Prices of Colgate Palmolive (India) Ltd. from April 2013 to March 2023.
- The Dataset constitute of 120 observations over 5 variables.
- The 5 variables are categorised as:
 1. Month
 2. Open_Price
 3. High_Price
 4. Low_Price
 5. Close_Price
- All the variables in the dataset are continuous variables.

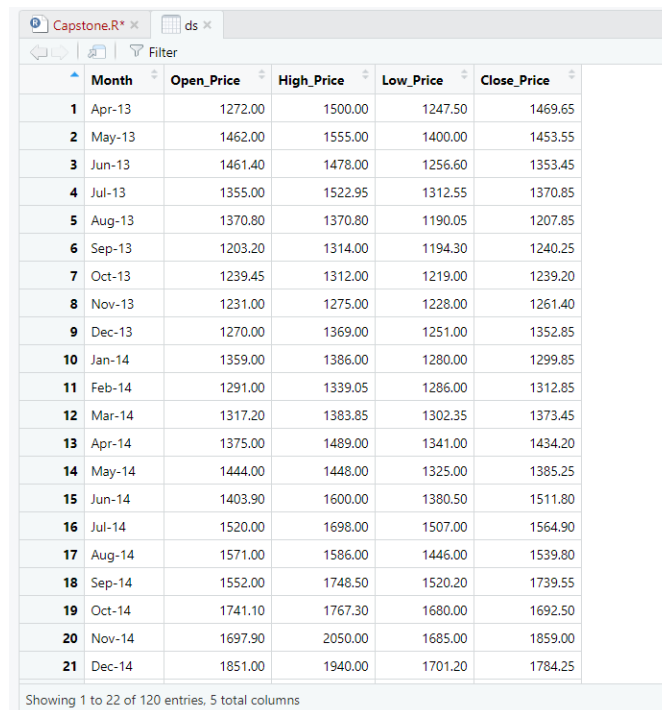
IMPORTING AND VIEWING DATA IN R STUDIO

CODE:

```
ds<-read.csv("D:/RVIM/3rd Semester/R Programming Capstone/Data.csv")
```

```
View(ds)
```

OUTPUT:



	Month	Open_Price	High_Price	Low_Price	Close_Price
1	Apr-13	1272.00	1500.00	1247.50	1469.65
2	May-13	1462.00	1555.00	1400.00	1453.55
3	Jun-13	1461.40	1478.00	1256.60	1353.45
4	Jul-13	1355.00	1522.95	1312.55	1370.85
5	Aug-13	1370.80	1370.80	1190.05	1207.85
6	Sep-13	1203.20	1314.00	1194.30	1240.25
7	Oct-13	1239.45	1312.00	1219.00	1239.20
8	Nov-13	1231.00	1275.00	1228.00	1261.40
9	Dec-13	1270.00	1369.00	1251.00	1352.85
10	Jan-14	1359.00	1386.00	1280.00	1299.85
11	Feb-14	1291.00	1339.05	1286.00	1312.85
12	Mar-14	1317.20	1383.85	1302.35	1373.45
13	Apr-14	1375.00	1489.00	1341.00	1434.20
14	May-14	1444.00	1448.00	1325.00	1385.25
15	Jun-14	1403.90	1600.00	1380.50	1511.80
16	Jul-14	1520.00	1698.00	1507.00	1564.90
17	Aug-14	1571.00	1586.00	1446.00	1539.80
18	Sep-14	1552.00	1748.50	1520.20	1739.55
19	Oct-14	1741.10	1767.30	1680.00	1692.50
20	Nov-14	1697.90	2050.00	1685.00	1859.00
21	Dec-14	1851.00	1940.00	1701.20	1784.25

Showing 1 to 22 of 120 entries, 5 total columns

INTERPRETATION:

The dataset is being imported from a csv format file to R Studio and the on viewing the dataset we can come to know that the dataset is imported properly. We can also get to know the number of observations to be 120 over 5 columns.

STRUCTURE OF THE DATASET

CODE:

```
str(ds)
```

OUTPUT:

```
> str(ds)
'data.frame': 120 obs. of 5 variables:
 $ Month : chr "Apr-13" "May-13" "Jun-13" "Jul-13" ...
 $ Open_Price : num 1272 1462 1461 1355 1371 ...
 $ High_Price : num 1500 1555 1478 1523 1371 ...
 $ Low_Price : num 1248 1400 1257 1313 1190 ...
 $ Close_Price: num 1470 1454 1353 1371 1208 ...
>
```

INTERPRETATION:

The output shows the structure of the data frame with 120 observations and 5 variables. The variables are:

Month: a character vector indicating the month and year of the observation in the format "MMM-YY".

Open_Price: a numeric vector indicating the opening price of the security for each month.

High_Price: a numeric vector indicating the highest price of the security for each month.

Low_Price: a numeric vector indicating the lowest price of the security for each month.

Close_Price: a numeric vector indicating the closing price of the security for each month.

LINE CHART

A line chart, also known as a line graph or a time-series plot, is a type of graph used to visualize trends or patterns in data over time. It consists of a series of data points connected by straight line segments, with time represented on the x-axis and the data values represented on the y-axis.

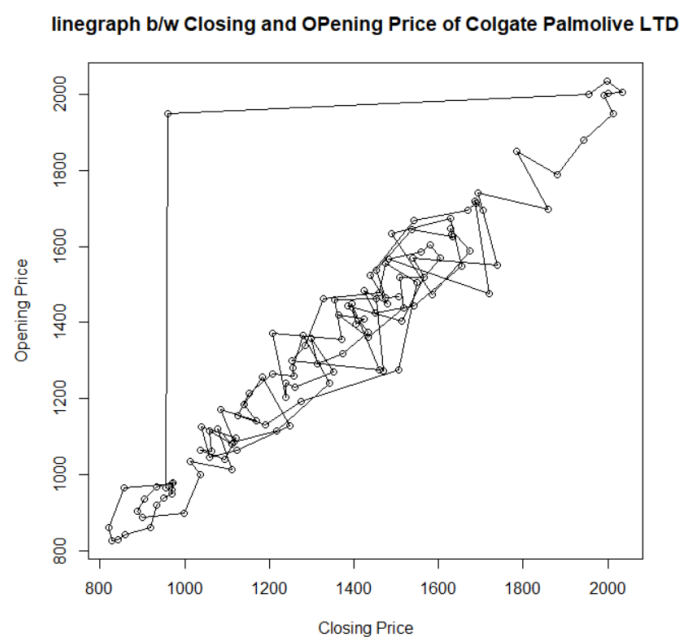
SYNTAX:

```
plot(continuous variable 1 , continuous variable 2)
```

CODE:

```
plot(ds$Close_Price,ds$Open_Price,xlab="Closing Price",ylab="Opening Price",main="linegraph b/w Closing and OPening Price of Colgate Palmolive LTD",type ='o')
```

OUTPUT:



INTERPRETATION:

The variables considered in the above graph are Open_Price and Close_Price.

Line Graph is a technique which is used to measure the trend or movement of the variables against time period if not we can identify the type of association b/w two continuous variables we depend on line graph.

SCATTER PLOT

A scatter plot is a type of graph used to display the relationship between two continuous variables. It is used to visualize the distribution of the data points in a two-dimensional space. Each point on the plot represents a single observation or data point, and its position on the graph represents the values of the two variables being plotted. The x-axis represents one variable and the y-axis represents the other variable.

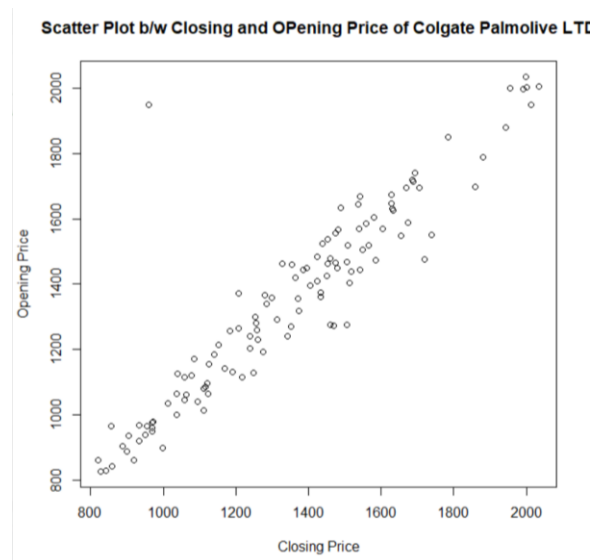
SYNTAX:

```
plot(continuous variable1, continuous variable2,main='scatter plot',xlab= x axis name,ylab= y axis name)
```

CODE:

```
plot(ds$Close_Price,ds$Open_Price,xlab="Closing Price",ylab="Opening Price",main="Scatter Plot b/w Closing and OPening Price of Colgate Palmolive LTD")
```

OUTPUT:



INTERPRETATION:

The variables considered in the above graph are Open_Price and Close_Price.

The resulting scatter plot is showing the relationship between Opening Price and Closing Price, with each data point representing a different time period in the dataset.

HISTOGRAM

A histogram is a graphical representation of the distribution of a dataset. It is a chart that displays the frequency distribution of continuous or discrete data. Histograms are commonly used to show the distribution of numerical data, such as the range and frequency of values within a given range.

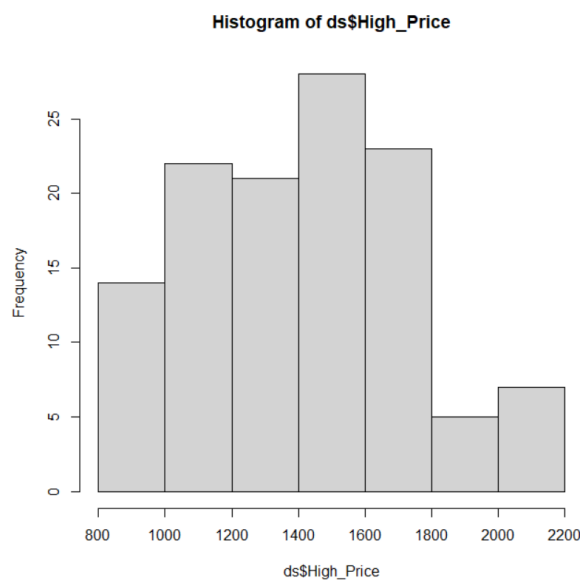
SYNTAX:

```
hist(continuous variable)
```

CODE:

```
hist(ds$High_Price)
```

OUTPUT:



INTERPRETATION:

The variable considered in the above graph is High_Price.

From the above obtained graph, we can study the distribution of high prices of Colgate Palmolive (India) Ltd. over the time period.

UNIVARIATE ANALYSIS

MEAN

In statistics, the mean is a measure of central tendency of a set of numerical data. It is calculated by adding up all the values in the dataset and dividing the sum by the total number of values. The mean is also known as the arithmetic average.

MEDIAN

The median is a measure of central tendency that represents the value that separates a dataset into two equal halves. To find the median of a dataset, the values are first arranged in order of increasing or decreasing magnitude, and then the middle value is identified. If the dataset has an odd number of values, the middle value is the median. If the dataset has an even number of values, the median is the average of the two middle values.

MODE

The mode is a measure of central tendency that represents the most frequently occurring value or values in a dataset. In other words, the mode is the value that occurs with the highest frequency in a dataset. A dataset can have one mode (unimodal) or multiple modes (multimodal) depending on the frequency of values.

STANDARD DEVIATION

Standard deviation is a statistical measure that is used to quantify the amount of variation or dispersion of a set of data values from its mean or average value. It measures the extent to which the values in a data set are spread out from the mean value. In other words, it shows how much the individual data points deviate from the mean value.

VARIANCE

Variance is a statistical measure that measures the variability or spread of a set of data. It is calculated as the average squared deviation of each number from its mean. The variance can be used to compare the distribution of two or more data sets. A higher variance indicates that the data is more spread out, while a lower variance indicates that the data is more clustered around the mean. Variance is commonly used in finance to measure risk and in quality control to measure variability in a manufacturing process.

NORMALITY TEST

In statistics, a normality test is used to determine whether a sample data set is normally distributed. A normal distribution is a bell-shaped curve that is symmetrical and characterized by a mean (average) and standard deviation.

SYNTAX:

Mean - mean(variable name)

Median - median(variable name)

Mode - mode(variable name)

Standard deviation - sd(variable name)

Variance - var(variable name)

Normality test - shapiro.test(continuous variable)

CODE:

```
mean(ds$Low_Price)
```

```
median(ds$Low_Price)
```

```
min(ds$Low_Price)
```

```
max(ds$Low_Price)
```

```
sd(ds$Low_Price)
```

```
var(ds$Low_Price)
```

```
shapiro.test(ds$Low_Price)
```

OUTPUT:

```
> mean(ds$Low_Price)
[1] 1282.873
> median(ds$Low_Price)
[1] 1280.4
> mode(ds$Low_Price)
[1] "numeric"
> min(ds$Low_Price)
[1] 787.6
> max(ds$Low_Price)
[1] 1952.55
> sd(ds$Low_Price)
[1] 286.6912
> var(ds$Low_Price)
[1] 82191.86
> shapiro.test(ds$Low_Price)

      Shapiro-Wilk normality test

data:  ds$Low_Price
W = 0.97361, p-value = 0.0184
> |
```

INTERPRETATION:

- The obtained minimum value of Low_Price is Rs.787.60 and the obtained maximum value of Low_Price is Rs.1952.55, which depicts that all the values of Low_Price lie between Rs.787.60 and Rs.1952.55.
- The obtained mean of Low_Price is Rs.1282.873, which means that the average of Low_Price over the dataset is Rs.1282.873.
- The obtained median of Low_Price is Rs.1280.40 showing that half of the Low_Price lies between Rs.787.60 and Rs.1280.40 and the remaining half lies between Rs.1280.40 and Rs.1952.55.
- The obtained mode of Low_Price is “numeric”, which tells that no Low_Price value is repeated more than once.

- The obtained Standard Deviation of Low_Price is Rs.286.6912, which represents that the individual observations deviated from the Mean roughly by Rs.286.6912.
- The obtained variance of Low_Price is Rs.82191.86 which indicates that the dataset is spread out.
- Shapiro-Wilk test
Null Hypothesis: The data is not normally distributed.
Alternate Hypothesis: The data is normally distributed.
The obtained p-value is 0.0184.
p-value<0.05, hence accept Alternate hypothesis.
So, the data is normally distributed.

LINEAR REGRESSION

Linear regression is a statistical technique used to study the relationship between two continuous variables. It is based on the assumption that there exists a linear relationship between the dependent variable (Y) and one independent variable (X). The goal of linear regression is to find the best fitting line that describes the relationship between the variables. This line is known as the regression line or the line of best fit.

The equation of linear regression is $y = a + bx$.

SYNTAX:

`lm(dependent variable~independent variable)`

CODE:

Checking Null Values

```
is.na(ds)
```

```
sum(is.na(ds))/prod(dim(ds))
```

Linear Regression

```
linearregmodel<-lm(ds$Close_Price~ds$Open_Price)
```

```
linearregmodel
```

```
summary(linearregmodel)
```

```
anova(linearregmodel)
```

```
coefficients(linearregmodel)
```

```
plot(linearregmodel)
```

```
resid(linearregmodel)
```

OUTPUT:

```
> is.na(ds)
      Month Open_Price High_Price Low_Price Close_Price
[1,] FALSE FALSE FALSE FALSE FALSE
[2,] FALSE FALSE FALSE FALSE FALSE
[3,] FALSE FALSE FALSE FALSE FALSE
[4,] FALSE FALSE FALSE FALSE FALSE
[5,] FALSE FALSE FALSE FALSE FALSE
[6,] FALSE FALSE FALSE FALSE FALSE
[7,] FALSE FALSE FALSE FALSE FALSE
[8,] FALSE FALSE FALSE FALSE FALSE
[9,] FALSE FALSE FALSE FALSE FALSE
[10,] FALSE FALSE FALSE FALSE FALSE
[11,] FALSE FALSE FALSE FALSE FALSE
[12,] FALSE FALSE FALSE FALSE FALSE
[13,] FALSE FALSE FALSE FALSE FALSE
[14,] FALSE FALSE FALSE FALSE FALSE
[15,] FALSE FALSE FALSE FALSE FALSE
[16,] FALSE FALSE FALSE FALSE FALSE
[17,] FALSE FALSE FALSE FALSE FALSE
[18,] FALSE FALSE FALSE FALSE FALSE
[19,] FALSE FALSE FALSE FALSE FALSE
[20,] FALSE FALSE FALSE FALSE FALSE
[21,] FALSE FALSE FALSE FALSE FALSE
[22,] FALSE FALSE FALSE FALSE FALSE
[23,] FALSE FALSE FALSE FALSE FALSE
[24,] FALSE FALSE FALSE FALSE FALSE
[25,] FALSE FALSE FALSE FALSE FALSE
[26,] FALSE FALSE FALSE FALSE FALSE
[27,] FALSE FALSE FALSE FALSE FALSE
[28,] FALSE FALSE FALSE FALSE FALSE
[29,] FALSE FALSE FALSE FALSE FALSE
[30,] FALSE FALSE FALSE FALSE FALSE
[31,] FALSE FALSE FALSE FALSE FALSE
[32,] FALSE FALSE FALSE FALSE FALSE
[33,] FALSE FALSE FALSE FALSE FALSE
[34,] FALSE FALSE FALSE FALSE FALSE
[35,] FALSE FALSE FALSE FALSE FALSE
[36,] FALSE FALSE FALSE FALSE FALSE
[37,] FALSE FALSE FALSE FALSE FALSE
[38,] FALSE FALSE FALSE FALSE FALSE
[39,] FALSE FALSE FALSE FALSE FALSE
[40,] FALSE FALSE FALSE FALSE FALSE
[41,] FALSE FALSE FALSE FALSE FALSE
[42,] FALSE FALSE FALSE FALSE FALSE
[43,] FALSE FALSE FALSE FALSE FALSE
[44,] FALSE FALSE FALSE FALSE FALSE
```

```
[79,] FALSE FALSE FALSE FALSE FALSE
[80,] FALSE FALSE FALSE FALSE FALSE
[81,] FALSE FALSE FALSE FALSE FALSE
[82,] FALSE FALSE FALSE FALSE FALSE
[83,] FALSE FALSE FALSE FALSE FALSE
[84,] FALSE FALSE FALSE FALSE FALSE
[85,] FALSE FALSE FALSE FALSE FALSE
[86,] FALSE FALSE FALSE FALSE FALSE
[87,] FALSE FALSE FALSE FALSE FALSE
[88,] FALSE FALSE FALSE FALSE FALSE
[89,] FALSE FALSE FALSE FALSE FALSE
[90,] FALSE FALSE FALSE FALSE FALSE
[91,] FALSE FALSE FALSE FALSE FALSE
[92,] FALSE FALSE FALSE FALSE FALSE
[93,] FALSE FALSE FALSE FALSE FALSE
[94,] FALSE FALSE FALSE FALSE FALSE
[95,] FALSE FALSE FALSE FALSE FALSE
[96,] FALSE FALSE FALSE FALSE FALSE
[97,] FALSE FALSE FALSE FALSE FALSE
[98,] FALSE FALSE FALSE FALSE FALSE
[99,] FALSE FALSE FALSE FALSE FALSE
[100,] FALSE FALSE FALSE FALSE FALSE
[101,] FALSE FALSE FALSE FALSE FALSE
[102,] FALSE FALSE FALSE FALSE FALSE
[103,] FALSE FALSE FALSE FALSE FALSE
[104,] FALSE FALSE FALSE FALSE FALSE
[105,] FALSE FALSE FALSE FALSE FALSE
[106,] FALSE FALSE FALSE FALSE FALSE
[107,] FALSE FALSE FALSE FALSE FALSE
[108,] FALSE FALSE FALSE FALSE FALSE
[109,] FALSE FALSE FALSE FALSE FALSE
[110,] FALSE FALSE FALSE FALSE FALSE
[111,] FALSE FALSE FALSE FALSE FALSE
[112,] FALSE FALSE FALSE FALSE FALSE
[113,] FALSE FALSE FALSE FALSE FALSE
[114,] FALSE FALSE FALSE FALSE FALSE
[115,] FALSE FALSE FALSE FALSE FALSE
[116,] FALSE FALSE FALSE FALSE FALSE
[117,] FALSE FALSE FALSE FALSE FALSE
[118,] FALSE FALSE FALSE FALSE FALSE
[119,] FALSE FALSE FALSE FALSE FALSE
[120,] FALSE FALSE FALSE FALSE FALSE
> sum(is.na(ds))/prod(dim(ds))
[1] 0
>
```

```
> linearregmodel<-lm(ds$Close_Price~ds$Open_Price)
> linearregmodel

Call:
lm(formula = ds$Close_Price ~ ds$Open_Price)

Coefficients:
(Intercept)  ds$Open_Price
 101.0395      0.9248

> summary(linearregmodel)

Call:
lm(formula = ds$Close_Price ~ ds$Open_Price)

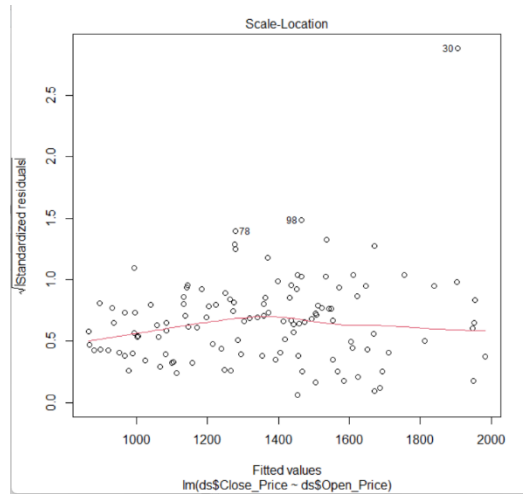
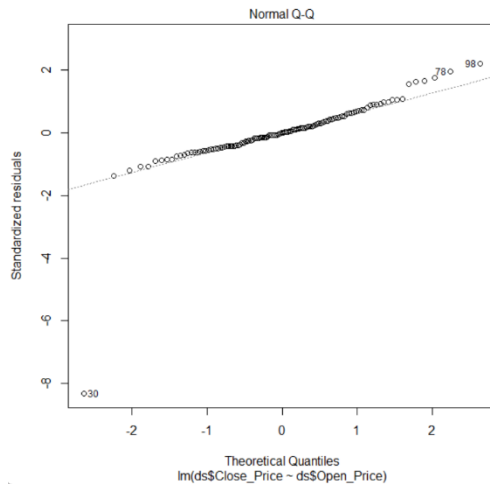
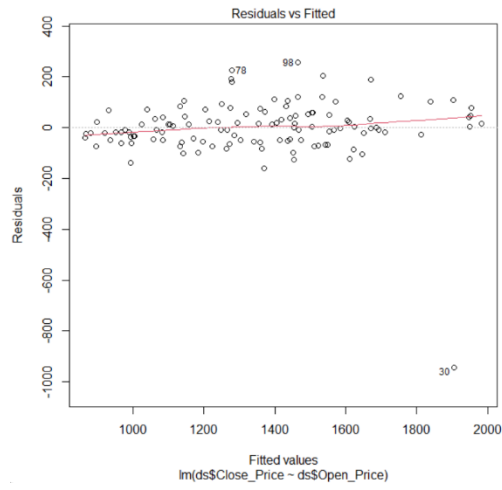
Residuals:
    Min       1Q   Median       3Q      Max
-944.79  -48.85   -0.30   48.69  255.37

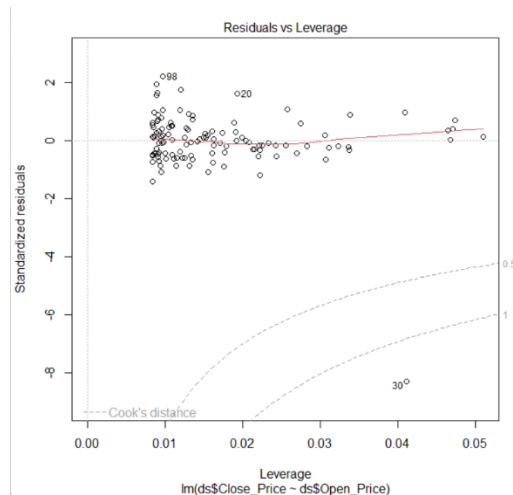
Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  101.03945    48.77715   2.071  0.0405 *
ds$Open_Price  0.92481    0.03519  26.283 <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 116.1 on 118 degrees of freedom
Multiple R-squared:  0.8541,    Adjusted R-squared:  0.8529
F-statistic: 690.8 on 1 and 118 DF,  p-value: < 2.2e-16

> anova(linearregmodel)
Analysis of Variance Table

Response: ds$Close_Price
          Df Sum Sq Mean Sq F value    Pr(>F)
ds$Open_Price  1 9314492 9314492 690.79 < 2.2e-16 ***
Residuals    118 1591094  13484
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
> coefficients(linearregmodel)
(Intercept) ds$Open_Price
 101.0394509    0.9248083
> plot(linearregmodel)
waiting to confirm page change...
waiting to confirm page change...
waiting to confirm page change...
```





```
> plot(linearregmodel)
waiting to confirm page change...
waiting to confirm page change...
waiting to confirm page change...
waiting to confirm page change...
> resid(linearregmodel)
```

1	2	3	4	5	6	7	8	9
192.2543993	0.4408235	-99.1042915	16.6953110	-160.9166601	26.4812100	-8.0930907	21.9215394	77.3040159
10	11	12	13	14	15	16	17	18
-58.0039222	17.8830418	54.2530645	61.5491451	-51.2126272	112.4221854	58.1519425	-14.1132805	203.2080771
19	20	21	22	23	24	25	26	27
-18.7231713	187.7285470	-28.6096028	124.2285115	103.4209567	109.9591844	41.3860589	47.5819407	79.1199200
28	29	30	31	32	33	34	35	36
15.9256712	3.5439615	-944.7904321	-37.1294545	-18.2054130	-32.3775374	-137.0794545	-74.4245836	-38.2059099
37	38	39	40	41	42	43	44	45
-25.3307182	-20.7043514	21.4006081	-18.9055621	-16.8348222	-7.7825218	-33.1594814	-61.7801964	-61.0600139
46	47	48	49	50	51	52	53	54
-48.5251765	-20.8444075	67.7575095	13.3270636	-45.7660350	72.8049391	-57.8247400	11.8175918	-73.8006985
55	56	57	58	59	60	61	62	63
-17.9862424	-48.0354755	33.0373660	6.7454673	-100.8487815	-9.7641180	39.2070053	105.6516019	-81.4982845
64	65	66	67	68	69	70	71	72
-55.7372791	12.1042858	-98.9437226	12.4435503	85.0493015	92.3185715	-83.9377336	-29.5440670	-7.8479011
73	74	75	76	77	78	79	80	81
-64.4429913	-72.5815279	-42.8178386	44.1034942	70.9390628	225.4810999	53.6744503	-66.7746089	-7.4061092
82	83	84	85	86	87	88	89	90
-124.6591765	-55.3325646	-50.3402329	180.8074170	-46.9614770	14.2529792	18.9894994	-50.3097090	73.7712695
91	92	93	94	95	96	97	98	99
84.5866060	3.0767508	60.5515591	51.2615278	-3.5319542	-7.2605966	-67.0892390	255.3683157	-7.3845246
100	101	102	103	104	105	106	107	108
35.6142507	1.5568060	-1.0391255	-103.0193016	-72.2720990	38.0385230	-49.8297672	30.7775283	105.0373728
109	110	111	112	113	114	115	116	117
120.9674636	-21.6933431	-124.2262030	121.2882390	101.3653619	5.0512892	23.0380685	28.3797825	-86.2490942
118	119	120						
-68.9197985	16.6603883	47.8295696						

INTERPRETATION:

- From the summary statistics, mean residual is 0.
- Intercept Value: a = 101.03945
- Slope Value: b = 0.92481
- Null Hypothesis: There is no impact of Open_Price on Close_Price.
 Alternate Hypothesis: There is an impact of Open_Price on Close_Price.
 The obtained p-value is 2.2e-16.
 p-value < 0.05, accept Alternate Hypothesis.
- The adjusted R square value is 0.8529 which indicates that Open_Price is explaining 85.29% variation of Close_Price.
- The Regression Line – $Y = a + bx$
 $Y = 101.03945 + 0.92481 (x)$
- From the ANOVA matrix, the obtained p-value is 2.2e-16 which is less than 0.05, accept Alternate Hypothesis. It is concluded that the variation explained by Open_Price is reliable. Hence, we accept model for prediction.
- Plot Analysis:
 From the Residual vs Fitted Plot, the data scattered across the graph says that there is a linear relationship between Open_Price and Close_Price.
 From Q-Q plot all the points lie on the line, so we assume that the data follows normal distribution.

From the Scale Location Plot, the data scattered across we can say that the assumption of linear regression is satisfied.

- The function residual helps in determining the value of an error which is the difference between actual values and the predicted values.

MULTIPLE REGRESSION

Multiple regression is a statistical method used to analyze the relationship between a dependent variable and multiple independent variables. In other words, it is used to determine how several independent variables relate to a single dependent variable.

In multiple regression, a linear equation is created to predict the value of the dependent variable based on the values of the independent variables. The equation takes the form of:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_kX_k$$

where Y is the dependent variable, X1 through Xk are the independent variables, β_0 is the intercept or constant term, β_1 through β_k are the coefficients or regression weights.

SYNTAX:

`lm(dependent variable~1st independent variable+2nd independent variable+3rd independent variable...)`

CODE:

```
multipleregmodel<-lm(ds$Close_Price~ds$Open_Price+ds$High_Price+ds$Low_Price)
```

```
multipleregmodel
```

```
summary(multipleregmodel)
```

```
anova(multipleregmodel)
```

```
coefficients(multipleregmodel)
```

```
plot(multipleregmodel)
```

```
resid(multipleregmodel)
```

OUTPUT:

```

> multipleregmodel<-lm(ds$Close_Price~ds$Open_Price+ds$High_Price+ds$Low_Price)
> multipleregmodel

Call:
lm(formula = ds$Close_Price ~ ds$Open_Price + ds$High_Price + ds$Low_Price)

Coefficients:
(Intercept) ds$Open_Price ds$High_Price ds$Low_Price
 26.6339    -0.5401     0.5925     0.9456

> summary(multipleregmodel)

Call:
lm(formula = ds$Close_Price ~ ds$Open_Price + ds$High_Price + ds$Low_Price)

Residuals:
    Min       1Q   Median       3Q      Max
-74.789 -26.919  -2.167   28.136  121.958

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  26.63390    17.64556   1.509   0.134
ds$Open_Price -0.54014    0.06387  -8.456 < 2e-16 ***
ds$High_Price  0.59250    0.05996   9.881 < 2e-16 ***
ds$Low_Price  0.94561    0.04202  22.504 < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 41.42 on 116 degrees of freedom
Multiple R-squared:  0.9817,    Adjusted R-squared:  0.9813
F-statistic: 2080 on 3 and 116 DF,  p-value: < 2.2e-16

> anova(multipleregmodel)
Analysis of Variance Table

Response: ds$Close_Price
          Df Sum Sq Mean Sq F value    Pr(>F)
ds$Open_Price  1  9314492  9314492  5428.17 < 2.2e-16 ***
ds$High_Price  1  523062  523062  304.82 < 2.2e-16 ***
ds$Low_Price  1  868981  868981  506.41 < 2.2e-16 ***
Residuals    116 199051  1716
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
> coefficients(multipleregmodel)

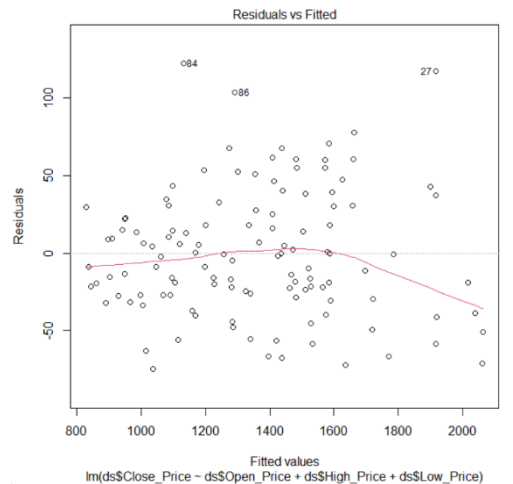
```

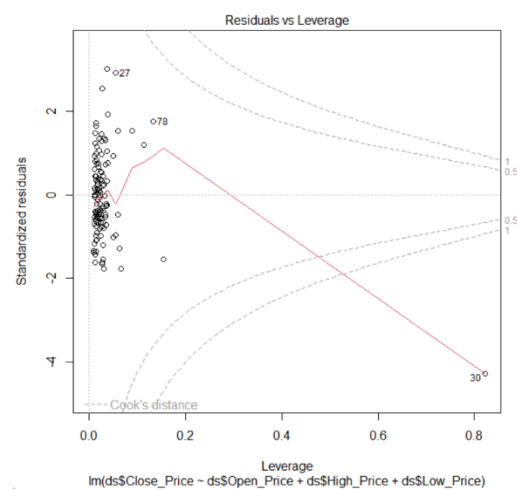
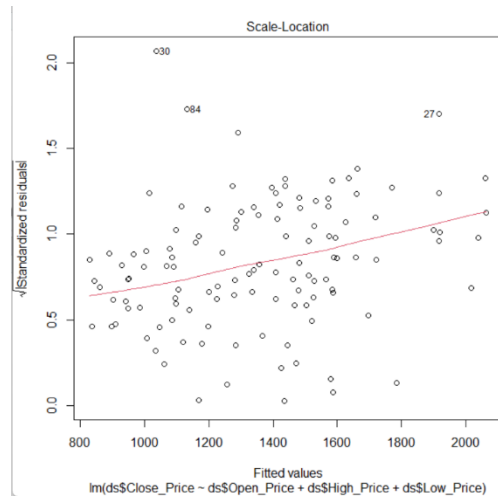
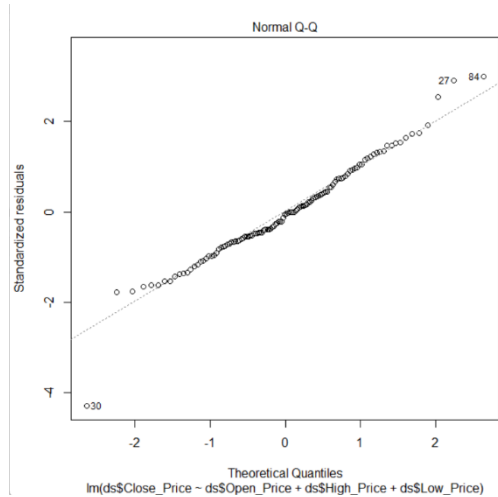
```

> coefficients(multipleregmodel)
(Intercept) ds$Open_Price ds$High_Price ds$Low_Price
 26.6338968    -0.5401418     0.5924999     0.9456062

> plot(multipleregmodel)
waiting to confirm page change...
waiting to confirm page change...
waiting to confirm page change...
> resid(multipleregmodel)
 1          2          3          4          5          6          7          8          9
61.68299118 -28.58249395  52.21583684 -67.39478988 -15.87493492 -44.36753933 -48.00887022 -16.96102824  18.11057178
 10         11         12         13         14         15         16         17         18
-24.31188160 -25.89729366   6.84976652  -0.02907720  27.71290386  -9.93790965 -71.81161167  54.67758612  77.71968122
 19         20         21         22         23         24         25         26         27
-29.43636049 -58.49823821  -0.69635455 -41.36241110  42.59217031 -51.02857041 -70.83133891 -38.79306362  117.12767226
 28         29         30         31         32         33         34         35         36
-18.79209894  37.12782162  -74.78947669  15.10105795  22.11475452 -33.36870270 -32.11344584 -21.45931654  -8.62598132
 37         38         39         40         41         42         43         44         45
-19.38719301  29.40465833  9.27512259 -31.80375374  -62.80305311 -26.82840914  22.47590967 -13.17196182  8.71976142
 46         47         48         49         50         51         52         53         54
-15.45690228 -27.37802170  13.34490487  4.14674487  6.27028789  14.43334312 -16.02430018  34.46377035  -55.67680681
 55         56         57         58         59         60         61         62         63
-26.85316024  -8.61271540  10.14188667 -37.25175356 -27.11478825  -2.38036569  5.64916399  53.16696507  5.36061177
 64         65         66         67         68         69         70         71         72
 43.08722714  0.03544083 -18.80815695  30.65814675  17.85798643  67.42279107  -5.00972907  -0.60155237  -22.19008564
 73         74         75         76         77         78         79         80         81
-19.77877182  12.83598638 -40.25314896  -8.66123817  32.86096978  67.52438177  38.02272921 -58.59614993 -18.52083340
 82         83         84         85         86         87         88         89         90
-66.62568557 -55.50431050  121.95845041  46.45836186  103.68085316  50.77407802  -1.95370251  -56.44118949  24.81869928
 91         92         93         94         95         96         97         98         99
 14.04889293 -16.29624662 -18.81341636  17.81696382  0.97938657 -30.80265162 -45.21259569  60.27141714 -11.17927274
 100        101        102        103        104        105        106        107        108
-66.24791539  30.52260105 -49.23597506 -22.14967717 -22.26718066  40.27066446  15.79195719  5.02111933  60.58765146
 109        110        111        112        113        114        115        116        117
 70.81762350  54.94876848 -23.59104204  -0.22741941  47.14516677  30.33776904  59.79064681  39.38743418 -39.84030824
 118        119        120
-13.94645568  2.45404778 -21.60347208
> |

```





INTERPRETATION:

- From the summary statistics, mean residual is 0.
- Intercept Value: $a = 26.6339$
- Slope Value: $b_1 = -0.5401$
 $b_2 = 0.5925$
 $b_3 = 0.9456$
- Null Hypothesis: There is no impact of Open_Price, High_Price and Low_Price on Close_Price.
Alternate Hypothesis: There is an impact of Open_Price, High_Price and Low_Price on Close_Price.
The obtained p-value for Open_Price is $9.45e-14$.
The obtained p-value for High_Price is $< 2e-16$.
The obtained p-value for Low_Price is $< 2e-16$.
All p-value < 0.05 , accept Alternate Hypothesis.
Therefore, Open_Price, High_Price and Low_Price has an impact on Close_Price.
- The adjusted R square value is 0.9813 which indicates that Open_Price, High_Price and Low_Price is explaining 98.13% variation of Close_Price.
- The Regression Line – $Y = a + b_1x_1 + b_2x_2 + b_3x_3$
 $Y = 26.6339 + -0.5401 (x_1) + 0.5925 (x_2) + 0.9456 (x_3)$
- From the ANOVA matrix, the obtained p-value is $2.2e-16$ which is less than 0.05, accept Alternate Hypothesis. It is concluded that the variation explained by Open_Price, High_Price and Low_Price is reliable. Hence, we accept model for prediction.
- Plot Analysis:
From the Residual vs Fitted Plot, the data scattered across the graph says that there is a linear relationship between Open_Price and Close_Price.
From Q-Q plot all the points lie on the line, so we assume that the data follows normal distribution.
From the Scale Location Plot, the data scattered across we can say that the assumption of linear regression is satisfied.
- The function residual helps in determining the value of an error which is the difference between actual values and the predicted values.



Rashtreeya Sikshana Samithi Trust

R V Institute of Management

DEPARTMENT OF MARKETING IN ASSOCIATION WITH

makeintern.com **B-Plan Championship** **BPLAN CHAMPIONSHIP.COM**
Finale @
(E-Cell IIM Calcutta)
(91-9582668797 (Priyanka Malhotra) (91-9211922243 (Vibha) 011-49095855

Organized Two days' Workshop on Business Analytics On 16th and 17th September, 2022

The Department of Marketing, RVIM organized First Round (Technical round) of International Business Plan Championship 2022 on the behalf of makeintern.com in collaboration with IIM Calcutta. The first Round was consists of two days' workshop on Business Analytics conducted on 16th and 17th September, 2022

Total 43 students from our college participated in the event. The trainer for the workshop was Mr. Kushal Sharma, Trainer and consultant in Business Analytics.

All the participants got to learn both theory and practical concepts of Business Analytics course. During the workshop the assessment was also done by the trainer based on student's class room participation, group discussion etc. and selected the five winners of this first round and announced the names at the end of the second day of the workshop. The workshop was concluded with Valedictory programme. All the students got the certificate for completing the workshop and winners got the Merit certificate as ticket to finale. At the end the, Dr. Noor Firdoos Jahan thanked resource person and Dr. Purushottam Bung, Professor & Director, RVIM for their support to conduct this workshop.

The five winners of the first round are:

Sl. No	Name of the Student	Section
1	SAGI SAMPI	A
2	KAUSTUBH LACHAPPANAVAR	A

3	NAGARAJ GAJANAN HEGDE	B
4	VARUN S BHARADWAJ	C
5	YOGASHREE C N	C

Photos



Dr. Noor Firdoos Jahan, Professor, RVIM welcoming Mr. Kushal Sharma, Trainer



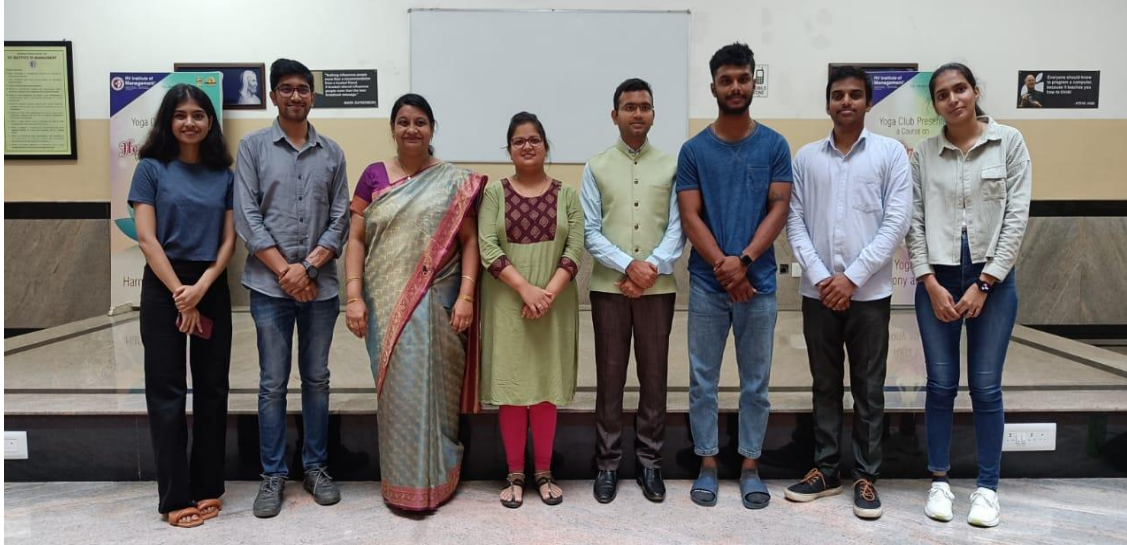
Students during the Training session



Dr. Purushottam Bung, Director during valedictory



Group Photo of all the Participants of the workshop with the Mr. Kushal Singh, Trainer, Dr. Noor Firdoos Jahan Coordinator of the workshop and Dr. Purushottam Bung, Director of RVIM



Five Winners of the First Round (Technical round) of the International Business Plan Championship 2022 of with Mr. Kushal Sharma, Dr. Noor Firdoos Jahan and student coordinator Ms. Chaitanya

Prepared by

Dr. Noor Firdoos Jahah



Director, RVIM



2.3.1 STUDENT CENTRIC METHODS

LAB BASED TEACHING

List of Subjects where Lab Based Pedagogy Followed

S.No	Name of the Course	Semester	Attached Document
1	Business Statistics	I	Syllabus
2	Business Research Methods	I	Syllabus
3	IT Skills	I	Syllabus
4	Production and Operations Research	II	Syllabus
5	Investment Analysis and Portfolio Management	III	Syllabus
6	Corporate Valuation and Financial Modelling	III	Syllabus
7	Predictive Analytics Using R	III	Session Plan
8	Data Warehousing and Data Mining	III	Syllabus
9	Risk Management and Derivatives	IV	Session Plan
10	Big Data Analytics	IV	Syllabus
11	Data Visualization and Business Reporting Using Tableau	IV	Syllabus
12	Emerging Technologies and Future Skills for Business Leaders	IV	Syllabus



Course Title	IT SKILLS
Term/Semester	I
Course ID	21MBA711
Credits	2

Introduction:

This course aims to increase student’s computer knowledge and skills so as to develop attributes that enhance an individual’s interactions and job performance. The objective of the course is to inculcate potential skills in the student’s to prepare them to deal with the external world in a collaborative manner, take initiative, solve problems, and demonstrate a sound IT skills so as to hold a good impression and positive impact

Course Outcomes (COs):

After successful completion the course the students will be able to:

- CO1:** Understand and apply various tools and techniques embedded in MS-Word
- CO2:** Understand and apply various tools and techniques embedded in MS-excel
- CO3:** Understand and apply various tools and techniques embedded in PowerPoint
- CO4:** Understand and apply various online tools for information exchange, collaborative working environment and other presentation tools.

Course content and Structure:

(24 hours)

Module 1: Building basic proficiency in MS Word

6 Hours

- Getting Started With Word: Navigate in Microsoft Word; Create and Save Word Documents; Manage Your Workspace; Edit Documents; Preview and Print Documents
- Formatting Text and Paragraphs: Apply Character Formatting; Control Paragraph Layout; Align Text Using Tabs; Display Text in Bulleted or Numbered Lists; Apply Borders and Shading
- Managing Lists: Sort a List; Format a List
- Adding Tables: Insert a Table; Modify a Table; Format a Table; Convert Text to a Table
- Inserting Graphic Objects: Insert Symbols and Special Characters; Add Images to a Document.
- Controlling Page Appearance: Apply a Page Border and Color; Add Headers and Footers; Control Page Layout; Add a Watermark
- Preparing To Publish a Document: Check Spelling, Grammar, and Readability; Use Research Tools; Check Accessibility; Save a Document to Other Formats

Module 2: Building basic proficiency in MS-Excel

(6 Hours)

- Getting started with Excel: The Ribbon; The Work Surface; Navigation; Formatting; Basic Math
- Understanding Formulas: Formula Anatomy; Cell Referencing; Math Functions(SUM, ROUND and SUBTOTAL); Basic Statistics (COUNT, COUNTA, AVERAGE, MAX, MIN, MEDIAN and MODE); Logic Functions; Text Functions; Understanding Dates and time
- Intermediate Formula Knowledge: Conditional Math (SUMIF and COUNTIF); External Links; Lookup
- Data Analysis: Creating PivotTables; Formatting PivotTables

- Presenting and Reporting: Cell Formatting; Outlining; Custom Number Formats; Conditional Formats; Building Charts.

Module 3: Building basic proficiency in PowerPoint

(6 Hours)

- Modifying the PowerPoint Environment: Customize the User Interface; Set PowerPoint Options
- Customizing Design Templates: Modify Slide Masters and Slide Layouts; Add Headers and Footers; Modify the Notes Master and the Handout Master
- Adding SmartArt and Math Equations to a Presentation: Create SmartArt; Modify SmartArt; Write Math Equations
- Working With Media and Animations: Add Audio to a Presentation; Add Video to a Presentation; Customize Animations and Transitions
- Collaborating on a Presentation: Review a Presentation; Store and Share Presentations on the Web
- Customizing a Slide Show: Annotate a Presentation; Set Up a Slide Show; Create a Custom Slide Show; Add Hyperlinks and Action Buttons; Record a Presentation

Module 4: Building basic proficiency in using Social media, E-mail and other online tools

(6 Hours)

- Creating and updating profiles on various social media platforms (Facebook, LinkedIn, Instagram, YouTube and Twitter); etiquettes to be followed.
- Email etiquettes.
- Online Tools: Google: Drive, Scholar, Classrooms, Current, Slides, Calendar, Groups, Forms, Keeps; Zoom; Microsoft teams etc.
- Prezi: Interactive power point slide
- Canva- Creating Brochure, Logos, Business Card, Business Presentation, Info graphs.

Pedagogy:

- 1) Practice Based Teaching
- 2) Lab Based teaching
- 3) Classroom Discussion
- 4) Project based teaching

Teaching Learning Resources:

Essential readings-

1. Paul Mc Fedries, "My Office 2016", Pearson education. ISBN: 9789332582781
2. Learn Microsoft Office 2019: Comprehensive Guide to Getting Started with Word, PowerPoint, Excel, Access, and Outlook, By Linda Foulkes. 2020
3. Learning Computer Fundamentals, MS Office and Internet & Web Tech. By Dinesh Maidasani · 2005. ISBN:9788170087809



Course Title	DATA WAREHOUSING AND DATA MINING
Term/Semester	III
Course ID	21MBA536
Credits	3

Introduction:

Data mining is the computational process of discovering patterns from large data sets. This course discusses concepts and techniques of data warehousing and mining. Data mining is one of the most advanced tools used by IT industries. The topics covered include introduction to data warehousing, data pre-processing and foundational data mining techniques such as supervised learning including regression and classification, and unsupervised learning such as clustering and association rules. Students are introduced to design data warehouse and perform data mining tasks with neural networks, as well as exposed to open-source data mining software.

Course Outcomes (COs):

Upon completion of this course, the students will be able to:

CO1: Design a Data warehouse system and perform business analysis with OLAP tools

CO2: Understand Architecture of a Data Mining System.

CO3: Apply frequent pattern and association rule mining techniques for data analysis

CO4: Apply appropriate classification and clustering techniques for data analysis

CO5: Understand the latest trends in Data warehousing and data mining

Course content and Structure:

(36 hours)

Module 1: Data Warehousing, Business Analysis and OL

12 Hours

- Basic Concepts: Data Warehousing Components; Building a Data Warehouse
- Database Architectures for Parallel Processing; DBMS Schemas for Decision Support
- Data Extraction; Cleanup and Transformation tools; Meta data; reporting
- Query tools and Applications
- Multidimensional Data Model
- Data Warehouse Schemas for Decision Support; Concept Hierarchies; Characteristics of OLAP Systems
- Typical OLAP Operations, OLAP and OLTP.
- Planning Data Warehouse and Key Issues
- Planning and Project Management in constructing Data warehouse
- Data Warehouse Project
- Data Warehouse Development Life Cycle, Kimball Lifecycle Diagram
- Requirements Gathering Approaches: Team organization; Roles; and Responsibilities
- Data Warehouse Architecture: MOLAP, ROLAP, HOLAP
- ETL Overview or Introduction to ETL: ETL requirements and Steps

Module 2: Introduction to WEKA and Applications

6 Hours

- Downloading and/or installation of WEKA data mining toolkit
- Understand the features of WEKA toolkit such as Explorer, Knowledge Flow interface, Experimenter, command-line interface.

- Navigate the options available in the WEKA (ex. Select attributes panel, Preprocess panel, Classify panel, Cluster panel, Associate panel and Visualize panel) Study the arff file format
- Explore the available data sets in WEKA.

Module 3: Introduction to Data Mining and Applications 4 Hours

- Introduction to Data Mining, Importance of Data Mining, Challenges in Data Mining, Data Mining functionalities
- Classification of Data mining systems, Data Mining architecture, Knowledge Discovery in Databases(KDD), CRISP- DM.
- Ethical issues in Data Mining and their Analysis; Global issues in Data Mining
- Data Mining Applications: Risk management and targeted marketing; Health Care Sector; Retail Sector; Financial Services and other sectors

Module 4: Data Mining Techniques: an Overview 10 Hours

- **Classification and Prediction:** Issues Regarding Classification and Prediction; Classification by Decision Tree Introduction; Bayesian Classification – Rule Based Classification; Classification by Back propagation; Support Vector Machines; Associative Classification; Lazy Learners; Other Classification Methods; Prediction; Accuracy and Error Measures; Evaluating the Accuracy of a Classifier or Predictor; Model Selection.
- **Cluster Analysis:** - Types of Data in Cluster Analysis; A Categorization of Major Clustering Methods; Partitioning Methods; Hierarchical methods; Density-Based Methods; Grid-Based Methods; Model-Based Clustering Methods; Clustering High-Dimensional Data; Constraint-Based Cluster Analysis; Outlier Analysis.

Module 5: Emerging Trends 4 Hours

- Multimedia Data Mining
- Text Mining
- Web Mining
- Data Warehouse Services (e.g. Amazon Red Shift, Azure SQL Data Warehouse.).

Pedagogy:

- 1) Classroom discussion
- 2) Case based teaching (Text and Multimedia)
- 3) Project based teaching
- 4) Practice based learning
- 5) Software linked Practice based Teaching
- 6) Industry expert interaction

Teaching Learning Resources:

Essential readings-

1. M.H. Dunham, "Data Mining Introductory and Advanced Topics", Pearson Education, ISBN : 978-8177587852
2. Ralph Kimball and Margy Ross, "The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling", (Third Edition). John Wiley and Sons, ISBN : 978-1118530801
3. J. Han and M. Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufman, 3/E, 2011, ISBN: 978-0-12-381479-1.
4. Vaisman, Alejandro; Zimanyi, Esteban, "Data Warehouse Systems", Springer, 2014, ISBN : 978-3-642-54655-6
5. Paulraj Ponniah, –Data Warehousing: Fundamentals for IT Professionals, Wiley India, ISBN : 0-471-41254-6

6. Han, Kamber, "Data Mining Concepts and Techniques", Morgan Kaufmann 3rd edition, ISBN : 978-0-12-381479-1
7. Reema Theraja –Data warehousing, Oxford University Press, ISBN : 978-0195699616
8. Introduction to data mining by Tan, Steinbach & Kumar, ISBN : 978-0133128901
9. Instant Weka : How to , Bostjan Kaluza, Packt Publishing Limited

References-

1. Vaisman, Alejandro; Zimanyi, Esteban, "Data Warehouse Systems", Springer, 2014, ISBN : 978-3-642-54655-6
2. Golfarelli, Matteo; Rizzi, Stefano, "Data Warehouse Design : modern principles and methodologies", McGraw Hill, 2009, ISBN : 978-0071610391
3. Jensen, Christian S; Pedersen, Torben Bach; Thomsen, Christian W, Morgan & Claypool, "Multidimensional Databases and Data warehousing", cop. 2010, ISBN : 9781608456017
4. Kimball, Ralph, "The Data warehouse lifecycle toolkit: expert methods for designing, developing, and deploying data warehouses", John Wiley & Sons, 1998, ISBN : 0471255475
5. Alex Berson, StephenJ. Smith, "Data Warehousing, Data Mining, and OLAP", MGH, 1998. ISBN : 0-201-177-676
6. Learn By Examples – A Quick Guide to Data Mining with RapidmIner and Weka, Eric Goh, SV Book Pte. Ltd.

Supplementary Resources

Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory and Impartus – LCS

1. <https://nptel.ac.in/courses/106/105/106105174/>
2. Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)
3. Decision Trees (Source: Tan, MSU) Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)
4. <https://www.cs.waikato.ac.nz>
5. <https://jgateplus.com>
6. <https://search.ebscohost.com>
7. <https://www.guru99.com>
8. <https://www.javapoint.com>
9. <https://www.kaggle.com>
10. <https://www.github.com>
11. Coursera course on "Data Warehousing for Business Intelligence Specialization" by Michael Mannino and Jahangir Karimi offered by the University of Colorado System
12. Coursera course on "Data Mining" by John C. Hart offered by the University of Illinois at Urbana-Champaign
13. <https://elibrary.in.pearson.com>

Capstone project:

Each group of 3 Students (max) assigned one topic for this; A Data Warehouse and Data Mining report must be prepared outlining the following steps:

- a) Problem definition, identifying which Data Warehouse and data mining task is needed.
- b) Identify and use a standard data mining dataset available for the problem

- c) Interpret and visualize the results.
- d) Provide clearly the Data Mining decision that is to be taken as a result of mining.

Lab Exercises

1. Explore and compare various data mining tools
2. Preparing data sets for WEKA.
3. Application of pre-processing methods on data sets using WEKA
4. Preprocessing on real and synthetic datasets.
5. Apply filters on the customer dataset using WEKA.
6. To predict with the smallest total error using rules based on One attribute
7. Apply classification technique to find association rules.
8. Demonstration of various classification algorithms.
9. Performance measurement of various classification algorithms
10. Demonstration of Clustering methods



4.7.2. DATA VISUALIZATION AND BUSINESS REPORTING USING TABLEAU

1.GENERAL INFORMATION

No.of.Credits : 4

No.of Hours Per Week : 4

2.COURSE PERSPECTIVE

This course will help students to learn one of most user-friendly and straight forward visualization tool Tableau. Tableau is considered to be the market leader when it comes to Data Visualization. It allows users for the production of interactive data visualization in a very effective manner at fast speed. Complicated charts and graphs can be easily created in Tableau Software.

3.COURSE OBJECTIVES AND OUTCOMES

OBJECTIVES

1. To enable the students to be able to understand and describe the main concepts of data visualization.
2. To enable the students with best practices of data visualization and how to apply them to solve analytics problems
3. To enable them to Create ad-hoc reports, data visualizations, and dashboards in Tableau
4. To enable them to be able to apply business analytics using tableau that support the decision making in business operations

OUTCOMES

By successfully completing the course the students will be able to:

Understand and describe the main concepts of data visualization

Understand the best practices of data visualization and how to apply them to solve analytics problems.

Create ad-hoc reports, data visualizations, and dashboards in Tableau

Apply business analytics using tableau that support the decision making in business operations

4.COURSE CONTENT AND STRUCTURE

MODULE1:INTRODUCTION AND GETTING STARTED WITH TABLEAU 10 HOURS

The Advantages of a modern Analytics platform, Types of Tableau, The Tableau application suite, Installing Tableau Desktop, Data Preparation, the sample dataset, The Tableau workspace, working with measures and dimensions, Working with marks, Saving, Opening and sharing workbooks

MODULE 2 : CONNECTING TO DATA 10 HOURS

Setting up a data connector, selecting data tables, Data cleaning and formatting, Joins and Unions, data extracts and Live Connections, Editing the model's Meta data, Data Types, Adding hierarchies, Calculated Fields and table calculations and Data Collection, Checklist for increasing performance.

MODULE 3: BUILDING FIRST VISUALIZATION USING VARIOUS FEATURES OF TABLEAU 10 HOURS

Chart types, Ready, Set, Show Me, Bar charts, Legends, Sorting, Totals, Sub Totals, Data Spotighting, Sets, Groups, Bins Filters And Hierarchies Line Charts, Highlight Tables, Heat Maps, Sankey charts, Bullet Charts, Cumulative sums with waterfall charts, Market Basket Analysis and Pareto Analysis

MODULE 4: ANALYSIS USING TABLEAU 10 HOURS

Aggregate functions, aggregate in calculated fields, Text operators, Date fields, Logical functions in calculated fields Parameters, Searching text fields.

Symbol maps, Filled maps, Density maps, Map Layers, Maps with Pie charts Viz in Tooltip, Overview of the Tableau analytics Pane, Constant, Average, and reference lines, Trend lines, Forecasts, Cluster Analysis and R.

MODULE 5: CREATING DASHBOARDS

8 HOURS

Creating a new dashboard, the dashboard Pane, Placing charts on the Dashboard, Dashboard titles, Navigation buttons, Dashboard actions, Dashboard Best Practices and Inspiration.

MODULE 6: CONTEMPORARY DEVELOPMENTS IN VISUALIZATION AND BUSINESS REPORTING

8 HOURS

Introduction to other visualizations tools: Fusion charts, Highcharts, Datawrapper, and Power BI, etc. Creating story point, reporting in video format, Marketing reporting, Finance reporting, HR reporting, Supply chain reporting, Production and Operations reporting.

Data Visualization and Business Reporting using Tableau – Laboratory

PART - A

1. Importing data set into Tableau, Data Cleaning and Tooltip option
2. Demonstration of types of joins and unions
3. Demonstration of Normal Distribution
4. Demonstration of Calculated Fields and Table calculations
5. Demonstration of Ratios and Blending of Data sources
6. Demonstration of Logical functions and Aggregate functions
7. Demonstration of Reference lines Forecasting and Trend lines
8. Demonstration of Heat Maps, Sankey charts
9. Demonstration of sorting, filtering and types of charts
10. Demonstration of Market Basket Analysis and Pareto analysis
11. Creating Dashboards in Tableau
12. Designing and engaging stories in Tableau

PART - B

1. Demonstration of Sales and Marketing Analytics
2. Demonstration of Human Resource Analytics
3. Demonstration of Financial Analytics
4. Demonstration of Supply Chain Analytics
5. Demonstration of Production and Operations Analytics

Examples of Data sets: Purchase of office supplies, Bank Customers, Health and Hospitals Corporation (HHC) facilities, US Cities Population, Finance entities, online purchase, Airline revenue, Election result, PC, iPhone sales, Data for a Superstore, Financial data, Supply chain data, Human Resource data, Production and Operations data for any business firm.

Note :

- For all the above Exercises Students can use their own datasets and Use Cases
- For all Exercises taking final print of the output and Writing Interpretation is compulsory in the Lab Journal
- In the practical Examination student are expected to execute and write Interpretation for one or more exercises from Part A out of 12 exercises using Tableau.

- In the practical Examination student are expected to execute and write Interpretation for one or more exercise from Part B out of 5 exercises using Tableau.
- Change of exercise is not permitted in the Practical Examination.

PEDAGOGY

- **Hands-On Demonstration using Tableau**
- Lectures and discussions
- Group Assignments and presentations
- Use cases
- Talk by the industry experts and industrial visits
- Assignment and Projects

SCHEME OF EXAMINATION - LABORATORY

The components of Laboratory 70 Marks are as follows:

Details	Marks
Execution of the program and drawing insights from any one exercise Part A	20
Execution of the program and drawing insights from any one exercise Part B	20
Viva Voice	10
Lab Journal	20
Total	70

EXAMINER PROFILE

A person should be proficient in Tableau and should have some experience in analytics using Tableau. BOE Chairperson will have discretion of selecting examiners.

TEACHING/LEARNING RESOURCES

1. Ryan Sleeper ,Practical Tableau: 100 Tips, Tutorials, and Strategies from a Tableau Zen Master 1st Edition, OREILLY publication
2. Daniel G. Murray, Tableau Your Data!: Fast and Easy Visual Analysis with Tableau Software 2nd Edition, WILEY publication
3. Joshua N. Milligan, Learning Tableau: Tools for Business Intelligence, data prep, and visual analytics, 3rd Edition, Packt publication
4. Jane A Crofts, Tableau Desktop: A Practical Guide for Business Users [Print Replica] Kindle Edition
5. Alexander Loth ,Visual Analytics with Tableau 1st Edition, Kindle Edition
6. Learning Tableau by Joshua Milligan.
7. Tableau Your Data!: Fast and Easy Visual Analysis with Tableau Software by Daniel G. Murray.
8. Communicating Data with Tableau by Ben Jones.
9. Tableau Dashboard Cookbook by Jennifer Jane Stirrup.



1.5 BUSINESS STATISTICS

COURSE OBJECTIVES

60 Hours

1. To elevate students' awareness of data in everyday life and prepare them for a career in today's age of information. To develop statistical literacy skills in students in order to comprehend and practice statistical ideas to solve problems.
2. To promote the practice of the scientific method in our students: the ability to identify questions, collect evidence (data), discover and apply tools to interpret the data, and communicate and exchange results.

LEARNING OUTCOMES

1. At the end of this course, students will achieve statistical literacy and will be able to find ways to move beyond the-what of statistics to the how and why of statistics.
2. The techniques and tools used to come at different decisions.
3. The various analytical techniques that can be for decision making.

MODULE 1: INTRODUCTION TO STATISTICS:

12 Hours

Definition, Importance of Statistics; Statistical Data – Sources and Types - Classification of data, Frequency Distribution, Diagrammatic and Graphic Representation - Histograms, Frequency Polygon, Cumulative Frequency Curves or Ogives, Numerical descriptive techniques: Measures of Central Tendencies. Measures of Variability - Range, Standard Deviation, Variance, and Coefficient of Variance; Skewness—Karl Pearson's Co-efficient of Skewness, Bowley's Co-efficient of Skewness.

MODULE 2: TIME SERIES ANALYSIS AND INDEX NUMBERS

10 Hours

Time Series: Introduction, Objectives of Time Series, Identification of Trend - Methods of measuring: Semi averages, Moving averages, Method of Least squares, Non-linear trend. Application of time series in business.

Index numbers: Meaning, types and uses of Index numbers, Construction of Price, Quantity and Value indices, fixed base and Chain base method. TRT& FRT test. Consumer price index.

MODULE 3: CORRELATION AND REGRESSION ANALYSIS

10 Hours

Introduction and significance, Scatter diagram, Karl Pearson's coefficient of Correlation for Uni-variate and Bi-variate series, Spearman's Rank Correlation. Regression analysis: Regression equations.

MODULE 4: HYPOTHESIS TESTING, PARAMETRIC & NON PARAMETRIC TESTS

14 Hours

Hypothesis Testing, Formulation of Hypotheses, Type I and II error, z-test, t-test, f-test and Chi-Square test, Analysis of Variance(ANOVA) -one and two way. Design of experiments, Non-parametric tests – Sign test, Wilcoxon test, Mann-Whitney U test, Median test, Run test and Kolmogorov –Smirnov one sample test

MODULE 5: THEORY OF PROBABILITY

08 Hours

Concept and Definition - Relevance to Management Decisions law of independence - Sample Space and Events – Union of events, Relevance of Permutations and Combinations to Probability - Rules of Probability, Bayes' theorem & its applications, basics of Random Variables and Concept of Probability Distribution. Theoretical Probability Distributions: Binomial, Poisson and Normal.

MODULE 6: DECISION THEORY

Decision Theory – Decision under certainty, Decision making under risk (EMV criteria) and Decision making under uncertainty. Decision tree (Problems).

SKILL DEVELOPMENT EXERCISES

Students are expected to perform these activities or find the following parameters for a given dataset using MS Excel and SPSS.

Exp 1. Draw all types of Diagrams and Graphs

Exp 2. Construction of one way and two way tables

Exp 3. Arithmetic Mean

Exp 4. Geometric Mean

Exp 5. Harmonic Mean

Exp 6. Median, Mode

Exp 7. Minimum, Maximum, Range

Exp 8. Quartile Deviation, Mean Deviation, Standard Deviation, Variance, Coefficient of Variance

Exp 9. Co-efficient of Skewness: - Karl- Pearson, Bowley, Kelly,

Exp 10. Correlation coefficient

Exp 11. Regression coefficient - Slope (b in $y = a + bx$)

Exp 12. Regression Constant - Intercept (a in $y = a + bx$)

RECOMMENDED BOOKS (Latest Editions)

1. James R. Evans, "Business Analytics – Methods, Models and Decisions", Prentice Hall
2. T N Srivastava, Shailaja Rego, "Statistics for Management", Tata McGraw Hill
3. SP Gupta, "Statistical Methods", Sultan Chand & Sons
4. Glynn Davis and Branko Pecar, "Business Statistics using excel", Oxford University Press
5. J K Sharma, "Fundamentals of Business Statistics", Vikas Publication

REFERENCE BOOKS (Latest Editions)

1. Keller/Arora, "BSTAT: A South-Asian Perspective", Cengage Learning
2. S C Gupta, "Fundamentals of Statistics", Himalaya Publications
3. N D Vohra, "Business Statistics", Tata McGraw Hill
4. Levin & Rubin, "Statistics for Management", Prentice-Hall
5. Richard I. Levin, David S. Rubin, Masood H. Siddiqui, Sanjay Rastogi, "Statistics for Management", Pearson India
6. Amir D Aczel, Jayavel Sounderpandian, Palaniswamy Saravanan, Rohit Joshi, "Complete Business Statistics", McGraw Hill Education

2.2 BUSINESS RESEARCH METHODS

COURSE OBJECTIVES

60 Hours

1. To enable students acquire thought process in research,
2. To imprint on them the paradigm of research in business & to make them use research as base for decisions

LEARNING OUTCOMES

1. Demonstrate proficiency in defining a research problem, identifying variables or phenomena, identifying research designs, and developing purpose statements, research questions, hypotheses, and data collection.
2. Demonstrate proficiency in developing a research methodology for qualitative or quantitative designs, using appropriate statistical methods for data analysis.

MODULE 1: INTRODUCTION TO BUSINESS RESEARCH

06 Hours

Nature and role of Business Research, Types of Research based on Purpose, Process, Outcome, Nature, Action and Logic, Theory Building – constructs, propositions, variables and hypotheses, Features of a good Research Study, Research Process, Internet and research

MODULE 2: RESEARCH PROBLEM, HYPOTHESIS AND DESIGN

10 Hours

Identification and Selection of the Problem, Definition and Statement of the Problem, Evaluation of the Problem, Criteria and sources for identifying the problem, process of defining the problem. Nature, Definition and Characteristics of Good Hypothesis & types of hypotheses, Formulation and testing of hypothesis, The Design of Research, Meaning, Need, dimensions, types of research design.

MODULE 3: DATA COLLECTION AND MEASUREMENT

15 Hours

Primary Data Collection, Classification of Survey methods, Evaluation Criteria for Survey Methods; Observation Techniques, Classification of Observation Methods, Advantages and Limitations of Observation Techniques, Secondary Data Collection, Classification of Secondary Data Sources, Evaluation of Secondary Data, Roadmap to use Secondary Data & Benefits and Drawbacks of Secondary data. Qualitative methods, Observational Methods, Focus Group Method, Personal Interview Method and Projective Techniques

Scales of Measurement, Classification of Scales - Single Item v/s Multi Item Scales, Comparative v/s Non-Comparative scales, Continuous Rating Scales; Criteria for Good Measurement, Criteria for Questionnaire Designing; Types of Questionnaire; Questionnaire Design Procedure, Pilot test, validity and reliability of Questionnaire, Cronbach's alpha, interview schedule.

MODULE 4: SAMPLING AND DATA PREPARATION

10 Hours

Sampling, Concept of Sample and Target Population, Census and Sampling, Sample frame, Sample unit and sample element, Sample size, Determination of Sample Size, Characteristics of a Good Sample, Sampling Design; Probability and Non Probability, Sampling v/s Non-Sampling Error

Data Preparation, Field Validation, Data editing, Coding, Content Analysis, Classification and Tabulation of Data, data transformation

MODULE 5: DATA ANALYSIS

14 Hours

Basic data analysis: Descriptive Statistics, Univariate and Bivariate, Parametric & Non-Parametric Tests; Null & Alternative Hypothesis, Error in Testing of Hypothesis, Critical Region, Degrees of Freedom, One Tailed & Two Tailed Tests, Standard Error; Procedure for Testing of Hypothesis. Parametric test, Non parametric test (Conditions for applicability, practical applicability, Implementation and statistical Inference of all the above tests)

MODULE 6: RESEARCH REPORT

05 Hours

Types of Research Report, Report Format, Report Writing – Insight from the communication models, Report Formulation, Guidelines for effective Documentation and visual representation and Research Briefing –Oral Presentation, reports on the internet

SKILL DEVELOPMENT EXERCISES

Using MS Excel, SPSS/SYSTAT/MINITAB for Data Analysis: Entering data from questionnaire, types of analysis, types and applicability of graphs. Advanced tools of analysis: Concepts of discriminant analysis - factor analysis - cluster analysis - conjoint analysis - multi dimensional scaling - perceptual mapping to be taught through practical/real business problems

Exp 1. Z-Test, t-test, F-test Values

Exp 2. Chi-Square test Values

Exp 3. Analysis of Variance (ANOVA) Values

Exp 4. Research Proposal writing

Exp 5. Data Interpretation and report writing: Short and Long reports:

Exp 6. Report presentation methods, ex: Power Point Presentation, etc.

RECOMMENDED BOOKS (Latest Editions)

1. Zikmund/Adhikari, “Business Research Methods: A Soith-Asian Perspective”, Cengage
2. Deepak Chawla & Neena Sondhi, “Research Methodology-Concepts & Cases”, Vikas Publishing House
3. Donald R Cooper, Pamela S Schneider, J K Sharma, “Business Research Methods”, McGraw Hill Education

REFERENCE BOOKS (Latest Editions)

1. Naval Bajpai, “Business Research Methods”, Pearson India
2. Rummel & Ballaine, “Research Methodology in Business”, Harper & Row Publishers
3. C.R.Kothari , “Research Methodology (Methods and Techniques)”, New Age International
4. R.Pannerselvam, “Research Methodology”, Prentice-Hall of India

2.6 PRODUCTION AND OPERATIONS RESEARCH

COURSE OBJECTIVES

60 Hours

1. To provide a formal quantitative approach to problem solving and an intuition about situations where such an approach is appropriate.
2. To introduce some widely-used mathematical models. The understanding of these models will allow the students derive solutions by logic demonstrated through numbers & equip them with techniques for finding solutions.

LEARNING OUTCOMES

1. The students acquire quantitative tools, and use these tools for the analysis and solution of business problems.
2. The emphasis will be on the concepts and application rather than derivations.

MODULE 1: PRODUCTION AND OPERATIONS MANAGEMENT

10 Hours

Functions of Production and material management, Types of production Systems.

Forecasting – Forecasting types, Exponential smoothening, Measurement of errors, Box-Jenkins Method.

Facility Planning – Facilities location decisions

Facility layout planning: Layout, types of plant layouts – product layout, process layout, fixed position layout, cellular manufacturing layouts, hybrid layouts

Quality – Six Sigma, and elimination of 7 wastes (Mudas), Lean operations, JIT, KANBAN

MODULE 2: FACILITY MANAGEMENT

10 Hours

Productivity and types of productivity

Materials Management – Purchase functions, Procurement procedures including bid systems, Vendor selection and development, Vendor rating, ethics in purchasing.

Concepts of lead time, purchase requisition, purchase order, amendments, forms used and records maintained.

Inventory Management: Classification, ABC, VED and FSN analysis. Inventory costs, Inventory models – EOQ, safety stocks, Re order point, Quantity discounts

Maintenance: TPM, breakdown maintenance, continuous maintenance.

MODULE 3: INTRODUCTION AND LINEAR PROGRAMMING TECHNIQUES

10 Hours

Introduction Decision Making, Quantitative Approach to Decision Making, Nature and Significance of OR in Decision Making, Scientific Methods in Operations Research, Models in Operations Research, Application Areas of OR in Management.

Linear Programming: Model Formulation, Graphical Methods, Simplex Method, Maximization and Minimization of L.P.P, Degeneracy in L.P.P.

MODULE 4: TRANSPORTATION MODELS

10 Hours

General Structure; Various methods for finding initial solution: North West Corner Method, Least Cost Method, Vogel's Approximation Method; Test for optimality (MODI method only) Alternate Optimal solutions. Variations: Balanced Transportation Problem, Maximization problem, Degenerate Solution.

MODULE 5: ASSIGNMENT PROBLEMS

10 Hours

Concepts, Mathematical Formulation of an Assignment Problem, The Assignment Algorithm (Hungarian Assignment method), Balanced and Unbalanced Assignment Problems, Travelling Salesman Problem as an Assignment Problem.

Sequencing: Terminology and notations, types of sequencing problems, processing n jobs through 2 machines, processing N jobs in N Machine.

MODULE 6: NETWORK ANALYSIS

10 Hours

Terminology; Networking Concepts; Rules for drawing network diagram; CPM Computations: CPM Terminology, Finding critical path – Different Floats; PERT Computations: Probability of meeting the scheduled dates; difference between PERT and CPM, Crashing of a Project.

Replacement Models Types of Failure, Replacement of Items whose efficiency deteriorates with Time, Replacement of Items that Fail Completely

SKILL DEVELOPMENT EXERCISES

1. Linear programming is a general method usable for a wide range of problems. Visit any nutrition center which sells health-food. Bring into play the applications of LP in formation and building
2. Transportation programming techniques facilitates in maintaining traffic rules. Apply with the help of illustrations
3. Visit your nearest fast moving consumer goods manufacturing company like LG, Samsung, Videocon etc. and apply the concept of assignment model to increase its produce line.
4. Visit one of the construction companies and analyze its modus-operandi to function. Apply the concept of network model (PERT and CPM) to proper completion of work in time
5. Apply the queueing theory to regulate the problem of huge waiting lines at the railway reservation counters

PEDAGOGY

Use of case studies and Methods to solve the problems of OR using MS Excel or TORA.

RECOMMENDED BOOKS (Latest Editions)

1. Hillier, Lieberman, Nag & Basu, "Introduction to Operations Research", McGraw Hill Education(India)
2. Ravindran, Phillips & Solberg , "Operations Research – Principles & Practice", Wiley India
3. Hamdy A. Taha, "Operations Research: An Introduction", Pearson
4. H.M. Wagner, "Principles of Operations Research with Application to Managerial Decisions" , Prentice Hall of India

REFERENCE BOOKS (Latest Editions)

1. Srinivas Reddy, "Operations Research", Cengage Learning
2. J. K. Sharma, "Operations Research-Theory & Applications", MacMillan. India Ltd
3. V. K. Kapoor, "Operations Research-Techniques for Management", Sultan Chand & Sons
4. Hiller & Lieberman, "Introduction to Operations Research-Concepts & Cases", Tata-McGraw Hill
5. Gupta & Hira , "Operations Research", S.Chand& Co

6. Chawla, "Operation Research", Kalyani Publishers
7. Mahadevan B, "Production and Operations Management", Pearson Education India, 2010
8. J.P Saxena, "Production and Operations Management", Tata Mcgraw-Hill Education Pvt Ltd.,
9. Ajay K.Garg, "Production and Operations Management", Tata McGraw-Hill Education Pvt Ltd.,
10. Norman Gaither and Greg Frazier, "Operations Management", South – Western College Pub.1999
11. Clifford Gray and Larson, "Project Management", MC Graw-Hill/Irwin,2008.

ELECTIVE SUBJECTS	
3.2	FINANCE 3.2.1 INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT 3.2.2 CORPORATE TAXATION FOR MANAGERS 3.2.3 CORPORATE VALUATION AND FINANCIAL MODELLING

3.2.1. INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT

1. GENERAL INFORMATION

No. of Credits per week 4

No. of Hours per week 4

2. PERSPECTIVE OF THE COURSE

Good return is the hallmark of a good investment. Investing surplus funds for generating some returns is common among individuals and organizations. When a business enterprise has idle funds for a certain period of time, it is prudent on the part of the enterprise to invest it wisely and generate decent returns, the onus of which lies on finance manager. Hence, it is essential for finance professional to have knowledge on the process of making and managing investments.

3. COURSE OBJECTIVES AND OUTCOMES

OBJECTIVES

To provide knowledge and skill in identifying various investment alternatives and choosing the suitable one.

To orient on the procedures and formalities involved in investing.

OUTCOME

By the end of this course, a student would learn

- Identifying investment goals and constraints
- Identifying investment alternatives
- Choosing the best / suitable alternatives
- Portfolio Management

4. COURSE CONTENT AND STRUCTURE

MODULE1: THE INVESTMENT BACKGROUND AND FINANCIAL MARKETS

6 HOURS

Concepts of Investments, Investment objectives, Process, Planning, Investment Vs Speculation, Gambling and Arbitrage: investment alternatives, Macro economic factors influencing investment, Investment environment in India : Individual Investment Life Cycle, the need for Investment Policy Statement. Approaches to Investment Decisions: Code of Ethics and Standards for investment professionals.

Financial Markets and Participants in Securities Market in India, New issue Market, Secondary market, Stock market Indices, Debt market, Money market Instruments and Recent development in Indian capital markets

MODULE 2: RISK AND RETURN ANALYSIS

6 HOURS

Concept of Realised and Expected Return. Real and Nominal rate of return Required return, Excess Return and holding period return ,Measurement of Ex -post and Expected Return, Continuous probability Distribution, Concept of Risk, Upside and Downside Risk, Sources of Risk, Types of Risk-Systematic and unsystematic Risk; Risk Aversion. Measurement of Risk of individual security, Standard Deviation, Coefficient of variation; Beta as a measure of Risk.

Module3: PORTFOLIO ANALYSIS: THE MECHANICS OF INVESTMENT

12 HOURS

Modern Portfolio Theory: Conceptual framework, Diversification and Portfolio Risk; Markowitz Risk Return optimization: The Mathematical Model, Quantification of Portfolio Risk and Return: Effect of combining securities in Portfolio, Efficient Frontier, Computing Utility and Selection of Optimal Portfolio. Single Index Model- Concept of alpha and Beta- Corner Portfolio, Sharpe's Portfolio Risk and Return, Security Characteristics line, Portfolio optimization and selection

MODULE 4: CAPM AND ARBITRAGE PRICING THEORY**10 HOURS**

Capital Asset Pricing Model, Construction of optimal portfolio with Risky and riskless assets, The separation Theorem, Capital Market Line and Security Market Line - Applications of Security Market Line, Empirical Evidence of Capital Asset Pricing Model, Beta of CAPM.

Arbitrage Pricing Theory, Building of Arbitrage Portfolio, Return Generating process, Factor Model for Security Return volatility.

MODULE 5: PERFORMANCE EVALUATION AND REVISION OF PORTFOLIOS**10 HOURS**

Performance Evaluation- Sharpe's Performance Index, Treynor's Performance Index and Jensen's Measure to identify the predictive ability, Information Ratio, Sortino's Ratio, Challenges in Performance management .

Portfolio Revision Methods- Investment Timing, Formula Plans Constant Dollar Value Plan, Constant Ratio Plan, Variable Ratio Plan

MODULE 6: SECURITY ANALYSIS AND BEHAVIOURAL FINANCE**12 HOURS**

Fundamental Analysis: E-I-C approach. Variables used in E-I-C analysis. Technical Analysis Vs Fundamental Analysis. Efficient Market Hypothesis; Concept and Forms of Market Efficiency.

Technical Analysis: Basic tenets and Premises of Technical Analysis; Dow Theory, Price and volume charts, Moving Averages, Relative Strength Index, Rate of change, Stochastic Oscillators .

Behavioural finance and Technical Analysis, Introduction to Behavioural finance and how it differs from the tenets of traditional finance, Assumptions, Biases, Errors and Irrationalities that can affect Investment Behaviour, Takeaway from Behaviourist arguments.

5. PEDAGOGY

- a) Lectures
- b) Demonstrations using Excel
- c) Practical Exercises – Individual and Group
- d) Case Studies

6. TEACHING/LEARNING RESOURCES**ESSENTIAL READINGS**

1. Shalini Talwar –Security Analysis and Portfolio Managementl, CENGAGE
2. Punithavathy Pandian, —Security Analysis and Portfolio Managementl, Vikas Publishing House Private Limited, Fifth Reprint Edition.
3. Fischer, E Donald and Jordan, J Ronald (2005); –Security Analysis and Portfolio Managementl, Prentice Hall of India Private Ltd., 6th Edition.
4. Bodie, Kane, Marcus and Mohanty (2009); –Investmentsl, McGraw Hill Education (India) Private Limited, 8th Edition.
5. Ranganatham and Madhumathi (2005); –Investment Analysis and Portfolio Managementl, Pearson Education, First Edition.
6. Chandra, Prasanna , –Investment Analysis and Portfolio Managementl, McGraw Hill Education (India) Private Limited, 4th Edition.

REFERENCES

1. Haugen Robert (2003); –Modern Investment Theoryl, Pearson Education, 5th Edition.
2. Bhalla, V.K. (2006); –Investment Managementl, S. Chand; 12th Edition.
3. Hirschey and Nofsinger (2008); –Investments – Analysis and Behaviourl, Tata McGraw Hill Publishing Company Limited, Special Indian Edition.
4. Avadhani V.A (2006), –Securities Analysis and Portfolio Managementl, Himalaya Publishing House, Eighth Revised Edition.
5. Sharpe, Alexander and Bailey (1996); –Investmentsl, Prentice Hall of India Private Limited, 5th Edition.
6. Kevin (2008); –Security Analysis and Portfolio Managementl, Prentice Hall of India Private Limited, First Reprint Edition.
7. Maheshwari, Yogesh (2008); –Investment Managementl, PHI Learning Private Limited, First Edition.
8. Indian Institute of Banking and Finance (2004); –Technical and Fundamental Analysis of Companiesl, Taxmann Publications, First Edition.
9. Stock Market Bookl (2005); Dalal Street Journal.
10. –Survey of Indian Industry (2008); The Hindu.
11. –The Layman's Guide to Mutual Fundsl (2004), Outlook Publishing (India) Private Limited, First Edition

LAB BASED LEARNING



SESSION PLAN
RISK MANAGEMENT & DERIVATIVES

MODULE 1: RISK ANALYSIS IN CAPITAL BUDGETING

Session	Coverage of the Key Concept	Pedagogy/Activity (Discussion Points)	Reading material to be Referred
1	Meaning of Risk and types of Risks of a Business Enterprise	Classroom discussion	Book "Project Appraisal" by Prasanna Chandra
2	Risk Analysis in Capital Budgeting	Classroom discussion	Book "Project Appraisal" by Prasanna Chandra
3	Risk measurement : 1. Standard Deviation 2. Co-efficient of Variation,	Solving Problems in classroom	Book "Project Appraisal" by Prasanna Chandra And CA Material
4	Risk measurement : Sensitivity Analysis,	Solving Problems in classroom	Book "Project Appraisal" by Prasanna Chandra And CA Material
5	Risk measurement : Scenario Analysis & Simulation	Solving Problems in classroom	Book "Project Appraisal" by Prasanna Chandra And CA Material
6	Risk Evaluation Adjusted Discount Rate Method	Solving Problems in classroom	Book "Project Appraisal" by Prasanna Chandra And CA Material
7	Risk Evaluation Certainty Equivalent Co-efficient Method	Solving Problems in classroom	Book "Project Appraisal" by Prasanna Chandra And CA Material
6	Risk Evaluation Decision Tree Analysis	Solving Problems in classroom	Book "Project Appraisal" by Prasanna Chandra And CA Material
7	Risk Evaluation Probability Distribution	Solving Problems in classroom	Book "Project Appraisal" by Prasanna



	Method Variation		Chandra And CA Material
8	Risk Evaluation Probability Distribution Method Variation	Solving Problems in classroom	Book "Project Appraisal" by Prasanna Chandra And CA Material

MODULE 2: INVESTMENT RISK AND DERIVATIVES

Session	Coverage of the Key Concept	Pedagogy/Activity (Discussion Points)	Reading material to be Referred
9	Meaning of Derivatives. Types of Derivatives	Classroom discussion	Book "Futures and Other Derivatives Options" by Hull J
10	Forward Agreements, Future Contracts	Classroom discussion with practical exposure of NSE India Website	Book "Futures and Other Derivatives Options" by Hull J
11	Terms associated with Futures Stock Futures and Index Futures	Classroom discussion with practical exposure of NSE India Website	Book "Futures and Other Derivatives Options" by Hull J
12	Differences between Forwards and Futures	Classroom discussion	Book "Futures and Other Derivatives Options" by Hull J
13	Margin and Settlement Mechanism of Futures	Classroom discussion and solving basic problems on Margin	Book "Futures and Other Derivatives Options" by Hull J
14	Margin and Settlement Mechanism of Futures	Classroom discussion and solving basic problems on Margin	Book "Futures and Other Derivatives Options" by Hull J

MODULE 3: FUTURE CONTRACT HEDGING AND TRADING

Session	Coverage of the Key Concept	Pedagogy/Activity (Discussion Points)	Reading material to be Referred
15	Hedging with Futures Stock Hedging	Stock Hedging (When there is a future contract available on the stock)	Book "Futures and Options" by Vohra, and Bagri
	Hedging with Futures	Stock Hedging (When	Book "Futures and Options"



16	Stock Hedging	there is no future contract available on the stock)	by Vohra, and Bagri
17	Hedging with Futures Stock Hedging	Stock Hedging (When there is no future contract available on the stock)	Book "Futures and Options" by Vohra, and Bagri
18	Portfolio Hedging: Adjusting Portfolio Risk,	Hedging Calculation and solving basic problems	Book "Futures and Options" by Vohra, and Bagri And CA material
19	Portfolio Hedging: Adjusting Portfolio Risk,	Hedging Calculation and solving basic problems	Book "Futures and Options" by Vohra, and Bagri And CA material
17	Pricing of Futures	Solving basic problems based on – No income	Book "Futures and Options" by Vohra, and Bagri And CA material
18	Pricing of Futures	Solving basic problems based on - Income in terms of amount.	Book "Futures and Options" by Vohra, and Bagri And CA material
19	Pricing of Futures	Solving basic problems based on –Income in terms yield.	Book "Futures and Options" by Vohra, and Bagri And CA material

MODULE 4: OPTIONS- BASICS AND STRATEGIES

Session	Coverage of the Key Concept	Pedagogy/Activity (Discussion Points)	Reading material to be Referred
20	Option Contracts Meaning	Classroom discussion on Options with practical exposure with NSE India website	Book "Futures and Options" by Vohra, and Bagri
21	Types of Option – Call, Put, American, European.	Classroom discussion on Options with practical exposure with NSE India website	Book "Futures and Options" by Vohra, and Bagri
22	Pay-off and Pay-off Diagrams	Classroom discussion on Options with practical exposure with NSE India website Calculation by using MS-Excel	Book "Futures and Options" by Vohra, and Bagri
	Hedging Strategies	Classroom discussion on	Book "Futures and



23	Protective Put Strategy and Covered Call Strategy.	Options with practical exposure with NSE India website (ITM, ATM, OTM) Calculation by using MS-Excel	Options" by Vohra, and Bagri
24	Hedging Strategies Protective Put Strategy and Covered Call Strategy.	Classroom discussion on Options with practical exposure with NSE India website (ITM, ATM, OTM) Calculation by using MS-Excel	Book "Futures and Options" by Vohra, and Bagri
25	Hedging Strategies Protective Put Strategy and Covered Call Strategy.	Classroom discussion on Options with practical exposure with NSE India website (ITM, ATM, OTM) Calculation by using MS-Excel	Book "Futures and Options" by Vohra, and Bagri
26	Trading Strategies with Options – Basic Spread Long and Short	Classroom discussion on Problems on Long and Short Positions Calculation by using MS-Excel	Book "Futures and Options" by Vohra, and Bagri and Book "Futures and Other Derivatives Options" by Hull J
27	Trading Strategies with Options – Long Straddle Short Straddle	Classroom discussion on Options with practical exposure with NSE India website (ITM, ATM, OTM) Calculation by using MS-Excel	Book "Futures and Options" by Vohra, and Bagri and Book "Futures and Other Derivatives Options" by Hull J
28	Trading Strategies with Options – Strip, Strap,	Classroom discussion on Options with practical exposure with NSE India website (ITM, ATM, OTM) Calculation by using MS-Excel	Book "Futures and Options" by Vohra, and Bagri and Book "Futures and Other Derivatives Options" by Hull J
29	Trading Strategies with Options – Long Strangle and Short Strangle	Classroom discussion on Options with practical exposure with NSE India website (ITM, ATM, OTM) Calculation by using MS-Excel	Book "Futures and Options" by Vohra, and Bagri and Book "Futures and Other Derivatives Options" by Hull J
30	Trading Strategies with Options – Spreads	Classroom discussion on Options with practical exposure with NSE India	Book "Futures and Options" by Vohra, and Bagri and Book "Futures



		website (ITM, ATM, OTM) Calculation by using MS-Excel	and Other Derivatives Options” by Hull J
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MODULE 5: OPTION PRICING

Session	Coverage of the Key Concept	Pedagogy/Activity (Discussion Points)	Reading material to be Referred
31	Put-Call Parity Theory	Solving Problems on put-call parity by using MS Excel	Book “Futures and Options” by Vohra, and Bagri and Book “Futures and Other Derivatives Options” by Hull J and also CA Material
32	Risk Neutralization Method of Option Valuation	Classroom discussion and solving basic problems on Risk Neutralization Method	Book “Futures and Options” by Vohra, and Bagri and Book “Futures and Other Derivatives Options” by Hull J and also CA Material
33	Portfolio Replication Method of Option Valuation	Solving Problems on Portfolio Replication Method	Book “Futures and Options” by Vohra, and Bagri and Book “Futures and Other Derivatives Options” by Hull J and also CA Material
34	Portfolio Replication Method of Option Valuation	Solving Problems on Portfolio Replication Method	Book “Futures and Options” by Vohra, and Bagri and Book “Futures and Other Derivatives Options” by Hull J and also CA Material
35	Binomial Method of Option Valuation	Solving Problems on Binomial Method	Book “Futures and Options” by Vohra, and Bagri and Book “Futures and Other Derivatives Options” by Hull J and also CA Material
36	Black-Scholes Method of Option Valuation	Solving Problems on Black-Scholes Method	Book “Futures and Options” by Vohra, and Bagri and Book “Futures

		Using Software model on Black-Scholes	and Other Derivatives Options” by Hull J and also CA Material
37	Option Greeks	Solving Problems on Option Greeks (Delta, Gamma, Theta, Rho Vega) Using Software model of Vega, Gamma, Theta, Delta, Rho	Book “Futures and Options” by Vohra, and Bagri and Book “Futures and Other Derivatives Options” by Hull J and also CA Material

MODULE 6: COMMODITY RISK AND COMMODITY DERIVATIVES

Session	Coverage of the Key Concept	Pedagogy/Activity (Discussion Points)	Reading material to be Referred
38	Commodity Markets	Classroom discussion Practical exposure of Multi Commodity Exchange(MCX)	Book “Commodity Markets – Operations, Instruments and Applications” by Chatnani, Niti and CA material
39	Commodity Derivatives	Classroom discussion Practical exposure of Multi Commodity Exchange(MCX)	Book “Commodity Markets – Operations, Instruments and Applications” by Chatnani, Niti and CA material
40	Revision of the syllabus and Discussion on Case Study		



PART B
SESSION PLAN

MODULE 1: INTRODUCTION TO PREDICTIVE ANALYTICS

Session	Coverage of the Key Concept	Pedagogy/Activity (Discussion Points)	Reading material to be Referred
1	Introduction to R <ul style="list-style-type: none">• Applications of R• Basic Programing Terminology• R Environment WalkThrough	Classroom discussion with PPT	Rstudio Documentation Article https://data-flair.training/blogs/r-applications/
2	Installing R software	Classroom discussion with PPT Lab Session	Video https://youtu.be/NZxSA80IF11
3	Vector Manipulation	Classroom discussion with PPT Lab Session	Website www.datacamp.com
4	Factors - Categorical Variable Analysis Business Decision Matrix Manipulation of a Business Decision Matrix	Classroom discussion with PPT Lab Session	Website www.datacamp.com
5	Lists and Data Frames	Classroom discussion with PPT Lab Session	Website www.datacamp.com
6	Introduction to Data Visualization Ggplot2 package Types of Graphical Representation.	Classroom discussion with PPT Lab Session	Rstudio Documentation ggplot2 official documentation Data Inbuilt





MODULE 2: EXPLORATORY DATA ANALYSIS

Session	Coverage of the Key Concept	Pedagogy/Activity (Discussion Points)	Reading material to be Referred
8	Data Cleaning	Classroom discussion with PPT	Book R Cookbook Paul Teetor
9	Data Cleaning: Simple Method of Imputation	Classroom discussion with PPT Lab Session	RStudio Documentation Book R Cookbook Paul Teetor
10	Data Cleaning: Mean Imputation	Classroom discussion with PPT Lab Session	RStudio Documentation Book R Cookbook Paul Teetor
11	Data Cleaning: Median Imputation	Classroom discussion with PPT Lab Session	RStudio Documentation Book R Cookbook Paul Teetor
12	Data Cleaning: Mode Imputation	Classroom discussion with PPT Lab Session	RStudio Documentation Book R Cookbook Paul Teetor
13	Data Cleaning: Imputation Through Package- MICE	Classroom discussion with PPT Lab Session	RStudio Documentation Book R Cookbook Paul Teetor
14	Outliers : Graphical Method of Identification of Outliers	Classroom discussion with PPT Lab Session	RStudio Documentation Book R Cookbook Paul Teetor





15	Outliers : Min-Max Method of Outliers Manual Treatment of Outliers	Classroom discussion with PPT Lab Session	RStudio Documentation Book R Cookbook Paul Teetor
16	Univariate Analysis	Classroom discussion with PPT Lab Session	RStudio Documentation Book R Cookbook Paul Teetor Data Kaggle
17	Time Series Modeling	Classroom discussion with PPT Lab Session	RStudio Documentation Book R Cookbook Paul Teetor Data Inbuilt
18	Autocorrelation Factor Partial Autocorrelation Factor	Classroom discussion with PPT Lab Session	RStudio Documentation Book R Cookbook Paul Teetor Data Inbuilt
20	ARIMA Modelling	Classroom discussion with PPT Lab Session	RStudio Documentation Book R Cookbook Paul Teetor Data Inbuilt





MODULE 3: PREDICTION- LINEAR REGRESSION

Session	Coverage of the Key Concept	Pedagogy/Activity (Discussion Points)	Reading material to be Referred
21	Linear Regression	Classroom discussion with PPT Lab Session	RStudio Documentation Books Statistics For Management David S. Rubin and Levin R Cookbook Paul Teetor Data Kaggle
22	Residuals	Classroom discussion with PPT Lab Session	RStudio Documentation Books Statistics For Management David S. Rubin and Levin R Cookbook Paul Teetor Data Kaggle
23	Ordinary Least Squares	Classroom discussion with PPT Lab Session	RStudio Documentation Books Statistics For Management David S. Rubin and Levin R Cookbook Paul Teetor Data Kaggle
24	P Value	Classroom discussion with PPT Lab Session	RStudio Documentation Books Statistics For Management David S. Rubin and Levin Data Kaggle
25	T Test	Classroom discussion with PPT Lab Session	RStudio Documentation Books Statistics For Management David S. Rubin and Levin R Cookbook Paul Teetor Data Kaggle
26	F Test	Classroom discussion with PPT Lab Session	RStudio Documentation Books Statistics For Management David S. Rubin and Levin R Cookbook





			Paul Teetor Data Kaggle
27	R Squared	Classroom discussion with PPT Lab Session	RStudio Documentation Books Statistics For Management David S. Rubin and Levin R Cookbook Paul Teetor Data Kaggle
28	R Squared	Classroom discussion with PPT Lab Session	RStudio Documentation Books Statistics For Management David S. Rubin and Levin R Cookbook Paul Teetor Data Kaggle
29	Multiple Regression Analysis	Classroom discussion with PPT Lab Session	Books Statistics For Management David S. Rubin and Levin
30	Residual Analysis	Classroom discussion with PPT Lab Session	RStudio Documentation Data Kaggle
31	Residual Analysis	Classroom discussion with PPT Lab Session	RStudio Documentation Data Kaggle
32	Variance Inflation Factor	Classroom discussion with PPT Lab Session	RStudio Documentation Data Kaggle
33	Variance Inflation Factor	Classroom discussion with PPT Lab Session	RStudio Documentation Data Kaggle





MODULE 4: DECISION TREES & LOGISTIC REGRESSION

Session	Coverage of the Key Concept	Pedagogy/Activity (Discussion Points)	Reading material to be Referred
34	Decision Trees	Classroom discussion with PPT Lab Session , Board Work	RStudio Documentation
35	ID3 method	Classroom discussion with PPT Lab Session , Board Work	RStudio Documentation
36	ID3 method	Classroom discussion with PPT Lab Session , Board Work	RStudio Documentation
37	Gini Index	Classroom discussion with PPT Lab Session , Board Work	RStudio Documentation Video https://youtu.be/7VeUPuFGJHk
38	Logistic Regression	Classroom discussion with PPT Lab Session , Board Work	RStudio Documentation Video https://youtu.be/yIYKR4sgzI8
39	Akaike Information Criteria	Classroom discussion with PPT Lab Session , Board Work	RStudio Documentation Book R Cookbook Paul Teetor
40	Interpretation	Classroom discussion with PPT Lab Session , Board Work	RStudio Documentation Book R Cookbook Paul Teetor
41	Interpretation	Classroom discussion with PPT Lab Session , Board Work	RStudio Documentation Book R Cookbook Paul Teetor





42	P Value	Classroom discussion with PPT Lab Session . Board Work	RStudio Documentation Book R Cookbook Paul Teetor
43	F statistic	Classroom discussion with PPT Lab Session . Board Work	RStudio Documentation Book R Cookbook Paul Teetor
44	Predicting Logistic Equations	Classroom discussion with PPT Lab Session . Board Work	RStudio Documentation Book R Cookbook Paul Teetor

MODULE 5: NEURAL NETWORKS

Session	Coverage of the Key Concept	Pedagogy/Activity (Discussion Points)	Reading material to be Referred
45	Artificial Neural Network	Classroom discussion Board Lab Session	RStudio Documentation Book Machine Learning: A Guide to Current Research Tom M .Mitchelle Video https://youtu.be/aircArUvnKk
46	Structure of neural networks	Classroom discussion Board Lab Session	RStudio Documentation Book Machine Learning: A Guide to Current Research Tom M .Mitchelle



47	Information Flow	Classroom discussion Board Lab Session	RStudio Documentation Book Machine Learning: A Guide to Current Research Tom M .Mitchelle
48	Hidden Layers	Classroom discussion Board Lab Session	RStudio Documentation Book Machine Learning: A Guide to Current Research Tom M .Mitchelle
49	Training a Neural Network	Classroom discussion Board Lab Session	RStudio Documentation Book Machine Learning: A Guide to Current Research Tom M .Mitchelle
50	Backpropagation	Classroom discussion Board Lab Session	RStudio Documentation Book Machine Learning: A Guide to Current Research Tom M .Mitchelle
51	Interpreting a Neural Network	Classroom discussion Board Lab Session	RStudio Documentation Book Machine Learning: A Guide to Current Research Tom M .Mitchelle



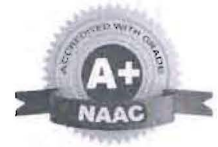


52	Interpreting a Neural Network	Classroom discussion Board Lab Session	RStudio Documentation Book Machine Learning: A Guide to Current Research Tom M .Mitchelle
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MODULE 6:INTRODUCTION TO OTHER REGRESSION ANALYSIS

Session	Coverage of the Key Concept	Pedagogy/Activity (Discussion Points)	Reading material to be Referred
53	Introduction to other regression anal	Classroom discussion, Study Material	Book Statistics For Management David S. Rubin and Levin
54	Polynomial Regression	Classroom discussion, Study Material	Book Statistics For Management David S. Rubin and Levin
55	Poisson Regression	Classroom discussion, Study Material	Book Statistics For Management David S. Rubin and Levin
56	Non Linear Regression	Classroom discussion, Study Material	Book Statistics For Management David S. Rubin and Levin
57	Non Parametric Tests	Classroom discussion, Study Material	Book Statistics For Management David S. Rubin and Levin
58	Non Parametric Tests	Classroom discussion, Study Material	Book Statistics For Management David S. Rubin and Levin





Webinar Organized by
Centre For Business Analytics - RVIM
on
Advanced Deep Learning using Tensor flow and Keras
By
Mr. Mithun D J
Coordinator – Business Analytics Program

Date: 02 nd May 2023	Venue: Online over zoom – Business Analytics Lab
Time: 02:30 pm to 04:30 pm	Event : Webinar
No. of Participants: 267	Event Coordinator: Mr. Mithun D J, Dr. Jahnavi & Ms. Ankita Shrivastava

Objectives

- Explore Real-world Implementations.
- Understanding Algorithmic Techniques.
- Optimizing Business Outcomes.

The flow of the Event

- Introduction and information on Advanced Deep Learning using Tensor flow and Keras.
- Hands on exposure.

Outcome Achieved:

Attendees gain an elevated level of proficiency in harnessing the power of cutting-edge deep learning techniques. By delving into the intricacies of TensorFlow and Keras, participants unlock the potential to build and deploy intricate neural network architectures with confidence. They master advanced concepts such as transfer learning, generative adversarial networks (GANs), and recurrent neural networks (RNNs), equipping them with the skills to address complex real-world challenges across various domains. This newfound expertise not only enhances participants' technical prowess but also broadens their problem-solving capabilities, enabling them to tackle diverse tasks ranging from image recognition to natural language processing.

The webinar fosters a community of practitioners well-versed in advanced deep learning methodologies. Attendees have the opportunity to engage with seasoned experts and fellow enthusiasts, fostering valuable networking and collaborative prospects. Through interactive Q&A sessions and shared insights, participants can clarify doubts, exchange innovative ideas, and potentially embark on joint projects. This collaborative environment extends beyond the webinar, nurturing an ongoing culture of knowledge sharing and mutual support within the realm of deep learning.

Consequently, the outcomes of the webinar transcend individual skill development, catalyzing the growth of a dynamic community of learners and practitioners who drive the evolution of deep learning applications across diverse industries.

Feedback & Coordinator Comment:

Mr. Mithun has very rich experience in the corporate sector having built more than 100 Machine Learning models in a career spanning more than a decade. He has served in SPSS South Asia Pvt Ltd, WNs Global Services, Target Pvt. Ltd, and Blueocean Market Intelligence after completing his master's in Statistics from Bangalore University.

Event Coordinators




Centre for Business Analytics


Director





Annexure 1	Mail communication
Annexure 2	Brief profile of the speaker



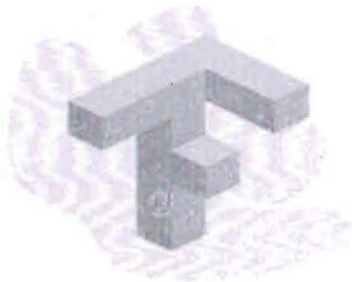
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Centre for Business Analytics
In Association with
Boston IT Solutions Indian Pvt. Ltd.
is Organizing a
WEBINAR ON
Advanced Deep Learning Using
TensorFlow and Keras



Date: 2nd May 2023 Time: 2.30 pm – 4.30 pm

Click Here for Registration:
<https://forms.gle/mQqv6bosh8t6Mu1m6>

Note: • The link for participation will be shared on the day of the webinar to all the registered participants
• E-Certificates will be given to the participants after filling the feedback form

For any queries contact:
Prof. Mithun - 9844284240

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Annexure 2

Brief Profile of the Resources Persons

Mr. Mithun holds a rich experience in the corporate sector having built more than 100 Machine Learning models in a career spanning more than a decade. He has served in SPSS South Asia Pvt Ltd, WNS Global Services, Target Pvt. Ltd, and Blue ocean Market Intelligence. He is an AWS certified Trainer, IBM Certified Trainer, Machine Learning certified by AWS and Design Thinking certified. He possesses an extensive repertoire of software skills, encompassing over 25 applications including IBM SPSS, PASW Modeler, Tableau, and Power BI, Amos, WEKA, Rapid Miner, Python to name a few. He has had the fortune to train and conduct workshops in some of the prestigious institutions like planning commission of India, National Hydrological Institute of India, IIM Bangalore and JNTU Hyderabad. He has also been an international trainer and conducted workshops in Qatar National Research Institute (QNRF) and Dubai Customs to name a few.

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Manjunath S K	Others	RV Institute of Manage Bangalore
GHANSHAM DOS	Academician / Research Scholar	Khwaja Moinuddin Chis Lucknow
RAMAKRISHNA SUDALAIMANI YADAV	Student	N.R SWAMY COLLEG WADALA
PANKAJ KUMAR BARMAN	Student	Ramakrishna Mission \ Howrah,WB
Priyanka paniyar	Industry	IDC technologies sol p Bangalore
Vignesh Murugaveeran	Student	S.I.W.S College Of Sci Wadala, Mumbai, Mah:
Puneethashree. K, p	Student	Mla AHL Bangalore
Subramanian.M.S	Student	Abdur Rahman Cresce Chennai
Khaja Thameem Ahmed	Others	BS ABDUR RAHMAN (Chennai
Tushar	Student	Vkit Bangalore
Trupti Gangakhedkar	Academician / Research Scholar	Vivekananda Institute c Bangalore
Harshitha S	Student	Vivekananda Institute c Bengaluru
Shivaram M	Student	Vivekananda Institute c Bangalore
Vaishnavi L	Student	Vivekananda Institute c Kumbalagodu kengeri E
Prathap Ns	Student	Vivekananda institute c Banglore
Naveen Naik	Student	VKIT Bangalore
Deshwanth S	Student	Vkit Bangalore
Lavanya	Student	Vivekananda institute c Bangalore
Rajeev s	Student	Vkit Kumbalagudu
Trupti Gangakhedkar	Academician / Research Scholar	Vivekananda Institute c Bangalore
Radha.N	Student	Vivekananda institute c Bangalore
Abhishek Anand	Student	Vivekananda institute c Bangalore
Sneha G P	Student	Vivekananda Institute c Bangalore

Name of the Participant	Profession/Job Role	Name of the Institution/ Place
Bhuvan R Chandra	Others	Vivekananda Institute c Bangalore
Deepak kumar Mallick	Academician / Research Scholar	Tata Institutes of Socia Mumbai
Kavya V	Student	Vivekananda institute c Kumbalagodu
Lavanya G K	Student	Vivekananda Institute c Bangalore
Mahadev Metre	Student	Vivekananda institute c Bengaluru
Divya R	Student	Vivekananda institute c Kumbalagodu
Sumukha R Kashyap	Student	Vivekananda Institute c Bangalore
PAVITHRA S	Student	Vivekananda Institute c Bangalore
Janani Yadav Y K	Student	Vivekanada institute of Bangalore
Nagaraj S	Student	Vivekananda institute c Banglore
Poorvika B C	Student	Vivekananda Institute c Banglore
Amruth M	Student	Vivekananda Institute (Kumbalagodu Bengalur
Neetha R	Student	Vivekananda institute c Kumbalagodu
Chandana L	Student	Vivekananda institute c Banglore
Ankitha R	Student	Vivekananda Institute c Bangalore
Ashutosh Sharma	Student	ITS, Mohan Nagar Vasundhara, Ghaziaba
K Kiran Kumari	Others	RV Institute of Manage Bangalore
Shweta	Student	VKIT Gudimavu , Kengeri
Dr. Purushottam Bung	Academician / Research Scholar	RV Institute of Manage Bangalore
S Kala	Academician / Research Scholar	Bishop Cotton Academ Bengaluru
LAKSHMI A	Others	R.V. Institute of Manag Bengaluru South

Webinar on Real Time Application of Machine Learning and Deep Learning Models in E-Commerce and Retail

Date: 27th April 2023

Time: 2.00 pm to 4.00 pm

Number of Participants: 286

Event Coordinators:

Dr. Jahnavi M, Prof. Mithun D J, Prof. Nagasubba Reddy & Prof. Ankitha

Objectives:

1. To equip participants with practical knowledge and skills to leverage these technologies effectively in their respective domains
2. To provide participants with a sound understanding of the fundamentals of machine learning and deep learning models
3. To train the participants how machine learning and deep learning models can be applied in real-time scenarios within the e-commerce and retail industries.

About the Session:

The event aimed to showcase how artificial intelligence (AI) technologies, particularly machine learning and deep learning models, have revolutionized the e-commerce and retail industries, enabling businesses to provide personalized experiences, optimize operations, and improve customer satisfaction.

Webinar provided valuable insights into the cutting-edge applications of AI technologies in the e-commerce and retail sectors. It highlighted how machine learning and deep learning models are transforming these industries by improving personalization, enhancing inventory management, ensuring security, and extracting meaningful insights.

The e-commerce and retail industries have undergone a paradigm shift with the advent of artificial intelligence, particularly machine learning and deep learning models. These technologies have revolutionized how businesses engage with customers, optimize operations, and stay competitive in the digital landscape. This section introduces the importance of real-time applications of AI.

The event highlighted the significance of data-driven decision-making, leveraging AI-driven insights, and adopting a customer-centric approach to stay competitive in today's fast-paced business landscape.

The session concludes by summarizing the key insights from the real-time application of machine learning and deep learning models in e-commerce and retail. It emphasizes the transformative impact of AI technologies in these industries and encourages businesses to embrace data-driven approaches to stay ahead in the highly competitive market.

As AI technologies continue to evolve, the future of e-commerce and retail looks promising. This section also highlighted the potential areas for further innovation, including augmented reality in shopping experiences, supply chain automation, and the integration of AI with Internet of Things (IoT) devices.


Some of the key areas highlighted during the session are as follows:

1. How do e-commerce platforms use these models to recommend products and services based on individual preferences, browsing behavior, and historical data, thereby increasing customer engagement and conversion rate?
2. Application of deep learning models for inventory management and demand forecasting in the retail sector.
3. Significance of machine learning algorithms in fraudulent activities.
4. How NLP, sentiment classification, and text mining are applied to analyze customer reviews and social media comments in real-time.

Feedback/Coordinators Comment:


As the webinar concluded, attendees gained a deeper understanding of ML and DL's real-world applications in e-commerce and the retail sector. The success stories and expert advice showcased the limitless possibilities of AI technologies. The speakers encouraged attendees to leverage data-driven approaches and embrace AI technologies to unlock new opportunities and achieve sustainable growth in the rapidly evolving business landscape.

Annexure - 1 Invitation

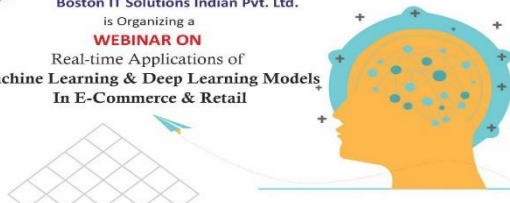


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Centre for Business Analytics
In Association with
Boston IT Solutions Indian Pvt. Ltd.
is Organizing a
WEBINAR ON
Real-time Applications of
**Machine Learning & Deep Learning Models
In E-Commerce & Retail**



Date: 27th April 2023, Time: 2.30 pm – 5.30 pm

Click Here for Registration:
<https://forms.gle/aTXZ9v9wQczRgHFVA>

Note:

- The link for participation will be shared on the day of the webinar with all the registered participants
- E Certificates will given to participants

For any queries contact:
Prof. Mithun - 9844284240

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Annexure – 2

List of the Participants:

Name of the Participant	Profession/Job Role	Name of the Institution/Organization	Name of the Participant	Profession/Job Role	Name of the Institution/Organization
Guruprasad	Student	R v institute of management	Sonali Gaur	Academician / Research Scholar	Satyug Darshan Institute of Engineering & Technology
Dinesh G	Student	R V Institute of Management	Dr. B. K. Verma	Academician / Research Scholar	Head Librarian, Sanskriti University, Mathura, Uttar Pradesh, India.
Revathi Ravi	Academician / Research Scholar	PES University	Uma Verma	Academician / Research Scholar	MRA, Medical College, Ambedkar Nagar, Uttar Pradesh, India.
Shakunthala	Others	Na	Dr.R.Dayanandan	Academician / Research Scholar	Hawassa University
Nagesha R	Others	RV University	VANAJA.S	Academician / Research Scholar	Dr.Ambedkar Government Arts College, Chennai
S.Vishnu Shankar	Student	Dr.Y.S.Parmar University of Horticulture and Forestry, Solan, Himachal Pradesh	Pradeep Kumar K	Academician / Research Scholar	Indian Institute of Information Technology and Management- Kerala
Varalakshmi J	Academician / Research Scholar	Saveetha Engineering College	EKTA SINGHA ROY	Academician / Research Scholar	Global College of Science & Technology
Immaculate Joyce Palavi	Academician / Research Scholar	St Aloysius Degree college	Dr.Aditi Aljapurkar	Academician / Research Scholar	Dr. D .Y. Patil B-School Pune
Sudheer Sannikanti	Academician / Research Scholar	VFSTR Deemed to be University	Vishnu Priya L V	Academician / Research Scholar	ISBR
Nisarga M A	Student	Maharanis Women's Commerce and Management College, Mysore	Dr.Meera.B	Academician / Research Scholar	SJRC Bangalore
Harshitha Srinivas	Student	RV INSTITUTE OF MANAGEMENT	Dr. Shraddha Purandare	Academician / Research Scholar	Dr. D .Y. Patil B School
Mayur D Naik	Student	RV Institute Of Management	Dr. Shraddha Purandare	Academician / Research Scholar	Dr. D .Y. Patil B School
Koishik kumar R	Student	Rv institute of management	Ms.Jijabai R Dateerot	Academician / Research Scholar	International Academy of Management and Entrepreneurship
Dr. Sumit Mall	Student	Central University of Haryana	Prof.N.Gurunatha Naidu	Academician / Research Scholar	MOHAN BABU UNIVERSITY, TIRUPATHI.
Akshay S Raikar	Student	RV Institute of Management	Manjunath S K	Others	RV Institute of Management
LIKITHA A	Student	Rv Institute of management	Lakpa Dorjee Sherpa	Academician / Research Scholar	Acharya School of Design
Pavithra Gowtham NS	Academician / Research Scholar	GSSSIETW, Mysuru	Vishnu Priya L V	Academician / Research Scholar	ISBR Research Centre
Puneethashree. K. P	Student	MLA Academy of higher learning	Dr. Maheshkumar Shankar Kedar	Academician / Research Scholar	Sinhgad College of Science
Sneha jadhav	Student	Academy of higher learning	V.SUDHA	Academician / Research Scholar	SIVANANDA SARMA MEMORIAL RV COLLEGE
Nikitha K A	Student	MLA academy of higher learning	Geetika Bhati	Student	Parul institute of design
Megha S	Student	MLAAHL	Fatema Poonawala	Student	Parul institute of design
K Mareya selceya	Student	MLA Academy of higher learning	Deepa Dwivedi	Student	Parul Institute of Design
Sirisha. B. S	Student	MLA Academy of higher learning	Dr.R.Sathiyamoorthy	Academician / Research Scholar	PONDICHERRY UNIVERSITY COMMUNITY COLLEGE
Chaitra B	Student	MLA Academy of Higher Learning	Lakshmi A	Others	R.V. Institute of Management
Monica G	Student	Malleswaram Ladies Association, Academy of Higher Learning	Kiran Kumari K	Others	RV Institute of Management



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Raksha.S	Student	MLA academy of higher learning	Dr. Veena R	Academician / Research Scholar	ISBR Bangalore
Pavan Kumar j	Student	Rv institute of management	DR.MOHAMMED QUADIR MOHIUDDIN	Academician / Research Scholar	University of Technology and Applied Sciences- OMAN
Puvitha. S	Student	MLA AHL	Pradeep Sdarpatil	Academician / Research Scholar	ICFAI Business School , Pune
Anjana V Rao	Student	MLA Academy of Higher Learning	Prof. (Dr.) CA. Haresh Kothari	Academician / Research Scholar	Former Vice-Chancellor of KK Modi University
Shreya R	Student	MLA Academy of Higher Learning	Elizabeth P Mathew	Academician / Research Scholar	International School of Business and Media
Shreya R	Student	MLA Academy of Higher Learning	Dr. IRSHAD NAZEER	Academician / Research Scholar	PRESIDENCY COLLEGE
Jitu Sharma	Academician / Research Scholar	Amity University Noida	Savitri K	Others	East West School Of Business Management
Kishore	Student	MLA academy of higher learning	Kiran Mishra	Academician / Research Scholar	University of Calcutta
Annapoorna N	Student	MLAAHL	Jeevitha M	Academician / Research Scholar	Bangalore Institute of Technology
Hemanth	Student	Mla Academy of higher learning	SRINIVAS VEMURI	Academician / Research Scholar	SRK FOUNDATION
Dr. Rohini S Nair	Academician / Research Scholar	Bhavan's Royal Institute of Management	Harshitha Srinivas	Student	RV INSTITUTE OF MANAGEMENT
Dr. Ambanna Malkappa	Academician / Research Scholar	Government First Grade College Sedam	Tapan Deka	Academician / Research Scholar	Medhavi Skills University
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Harshitha B	Student	MLA academy of higher learning	Dr M.Balasubramanian	Industry	Lilavati Hospital Mumbai
Erudaya Petrisa	Student	MLA-AHL	Dr. Ranjeet Kumar Raman	Academician / Research Scholar	Central University of Jammu
Varsha.V	Student	MLA Academy of Higher Learning	Asiya Bi	Student	MLA Academy of Higher Learning
Harshitha R	Student	MLA academy of higher learning	Akila S	Others	SB College of management studies
Gurubasavva math	Others	Nidavani college dharwad	Dr. Mohit Sharma	Academician / Research Scholar	Shri Venkateshwara University Amroha
Manjula s	Student	MLA Academy of Higher learning	Rajesh s/o sharanappa	Student	Government first grade degree college Humanabad
RISHI SAGAR B K	Student	RVIM	Priyajit Ray	Academician / Research Scholar	University of Calcutta
Rajesh s/o sharanappa	Student	Government first grade degree college Humanabad	Charu Goyal	Academician / Research Scholar	PIBA, Parul university
Priyanka nimmane	Student	Government first grade degree college humnabad	Pranay Prasoon	Student	C M College, Darbhanga
Laxmi	Student	Government first grade college Humnabad	Ms. S Kavitha	Academician / Research Scholar	Dr. Ambedkar Institute of Technology
Ajay N	Academician / Research Scholar	PES University	Prof.SHAKEELA M K	Academician / Research Scholar	SIVANANDA SARMA MEMORIAL R V College
DEEPAK	Student	Government first grade college Humanabad Dist Bidar,karnataka	Urfana Amin	Academician / Research Scholar	BHSS Soura
Ashwini Ashok kamble	Student	Govt first grade college humnabad commerce	Rajeshwari MC	Academician / Research Scholar	Bangalore University
Shamanth Kumar B U	Academician / Research Scholar	GSSSIETW	Dr CHANDANA H S	Academician / Research Scholar	MAHARANI CLUSTER UNIVERSITY
Dr.Om Prakash C	Academician / Research Scholar	CMR University	T MALLIKARJUNAPP A	Academician / Research Scholar	Nitte (Deemed to be University), Justice KS Hegde Institute of Management
Anjali Vithale	Student	College	S. SWATHIKA	Student	Kanchi Mamunivar Government Institute for Post Graduate Studies and Research, Puducherry.
Anjali Vithale	Student	College	Manish Kothari	Academician / Research Scholar	DVHIMSR
Savita. L	Student	Government first grade college Humnabad	Manish Kothari	Academician / Research Scholar	DVHIMSR
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Shraddha Deori	Student	Indian Institute of Technology, Kharagpur	Kiran Shankar Nayak	Others	Ramaiah college of arts science and commerce
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DR. BRIJESH S	Academician / Research Scholar	COEP TECHNOLOGICAL UNIVERSITY, PUNE	Dr. Atiya Bukhari	Academician / Research Scholar	Princess Nourah Bint Abdulrahman University, Riyadh
Timmareddy	Student	RV Institute of Management Bangalore	Dr. Chitra Isac	Academician / Research Scholar	Nirmala College for Women, Coimbatore
Dr. Veena Pradip Bhosale	Academician / Research Scholar	KCES'S College of Engineering and Management ,Jalgaon	Dr G Ravi	Academician / Research Scholar	Ekalavya Multiversity
MANJUNATHA R A KATTE	Academician / Research Scholar	Sri D Devaraja Urs Government First Grade College, Hunsur-571105	PRACHI PACHAURY	Academician / Research Scholar	Gurukula Kangri University HNB GARHWAL UNIVERSITY SRINAGAR (a central university)
SHRIDHAR N HULLATTI	Industry	Motilal Oswal Financial Services Ltd	SHUBHAM GOSWAMI GIRI	Academician / Research Scholar	



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Dr. M R Jhansi Rani	Academician / Research Scholar	ISBR Business School, Bangalore.	Somesh shrivastava	Student	Geeklurn
Sapna	Academician / Research Scholar	BBD University Lucknow	Sanjay Halder	Industry	Shree cement
Kummarie Mahitha	Student	Indur institute of engineering and technology	VENKATESH PRASANNA B R	Student	NEW HORIZON COLLEGE OF ENGINEERING
Pramukh I	Student	Vidhya vahani first grade college	Mohammed altamash	Student	Geeklurn institute
Dr.Prasanna Raravi	Academician / Research Scholar	SKSVMACET -LAXMESHVAR	Saima Khuhro	Academician / Research Scholar	Dawood University of Engineering and Technology Pakistan
Kummarie Mahitha	Student	Indur institute of engineering and technology	Manoranjan Dash	Academician / Research Scholar	Siksha O Anusandhan Deemed to be University
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Richa Mishra	Academician / Research Scholar	BBAU	Spandana Reddy	Student	Universal Business School
Dr.G.Uma	Academician / Research Scholar	Acharya Nagarjuna University	Stency Rajan	Student	Geeklurn
Dr Laxmalla Madhu	Academician / Research Scholar	MAHATMAGANDHI University, Telangana	Saniya Iram	Student	Mount Carmel College
Abimbola Olaniran	Academician / Research Scholar	KIT	Ranjitha.L	Student	MLA Academy of higher learning
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MANCHALA RAMESH	Others	Sadhana college of Education lecturer in Biological science	Anandan D	Academician / Research Scholar	VSB Engineering College, Karur
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Dr.M.Ganeshkumar	Academician / Research Scholar	TNJFU - Fisheris Business School	K.S.IMRANULLAH	Academician / Research Scholar	M.G.R.COLLEGE OF ARTS AND SCIENCE, HOSUR
R.Siddhan	Academician / Research Scholar	JJ Art and Science College	Richa Agarwal	Academician / Research Scholar	H N B Garhwal (A Central) University, Srinagar Garhwal, Uttarakhand
Vipul Naik	Student	R V Institute of Management	Shankar HN	Academician / Research Scholar	SCMS - Dayananda Sagar University
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Dr Monica Gupta	Academician / Research Scholar	VED Eduversity	Chetan Singh	Student	RVIM
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Prof. Dr. Shruti Tiwari	Academician / Research Scholar	Parul University	Savitha G	Others	Nagarjuna college of management studies, Chickballapur
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Shristi Singh	Student	Parul University	Pooja Kohli	Academician / Research Scholar	Hemvati Nandan Bahuguna Garhwal University
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Ganesh Kalmene	Student	KLE Institute Of Management Studies and Research	Deeksha Tripathi	Academician / Research Scholar	University of Lucknow
Dr.Yogita Satish Garwal	Academician / Research Scholar	Manipal University Jaipur	Shrasty Katiyar	Academician / Research Scholar	University of Lucknow
Ritu kaushik	Academician / Research Scholar	BMU, Rohtak	Mahashweta Chakravarty	Others	Dayanand Sagar University
Deepalakshmi.R	Academician / Research Scholar	NMKRV college for women	Khushboo	Student	I.t.s mohan nagar ghaziabad
RAJAMAHANTI SURYA KIRAN	Academician / Research Scholar	SITAM-SANKETIKA TECHNICAL CAMPUS	Abimbola Olaniran	Academician / Research Scholar	KIT
UMA KANT	Academician / Research Scholar	University of Lucknow, Lucknow UP	Rahul Jawali	Student	RV INSTITUTE OF MANAGEMENT
Priya S	Academician / Research Scholar	The Oxford college of Science	Rahul kumar	Others	ICICI bank
Priyanka Panwar	Academician / Research Scholar	The Oxford College of Science	Kritika Chandra	Student	ISBR Bengaluru
Dr. Anju Bharti	Academician / Research Scholar	maharaja Agrasen Institute of technology, GGSIPUniversity, Delhi	Seema Rani	Academician / Research Scholar	Guru Nanak Khalsa College Yamunanagar
Richa	Academician / Research Scholar	University of Lucknow	Dr M Sendhil Kumar	Academician / Research Scholar	Dayananda Sagar University
Pranjal Rai	Student	Geeklurn Edutech	Sunil Singh	Industry	Kyndryl
Manu C V	Others	AXA XL	Pushpak kumar	Student	Institute of technology and science
Pranjal Rai	Student	Malviya National Institute of Technology	Satyaki Adak	Student	RV Institute of Management
Saunik Kumar Singh	Others	Gujrat Fluorochemicals limited	Tejashwini	Student	Nagarjuna college of management and studies



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Syed Faizul Abbas	Student	Allahabad University	C A Supradika	Student	Nagarjuna College Of Management Studies
Dr. L. RAJENDRAN	Academician / Research Scholar	VET Institute of Arts and Science, Erode	Dr.K.Sindhura	Others	MEASI Institute of Management
SHIKHA AGGARWAL	Academician / Research Scholar	Institute of Technology & Science, Ghaziabad	Anupama S M	Others	RV Institute of Management
Bali Ram Singh	Others	Dell	Naveen S Kumbhar	Student	RV Institute of Management
Manasi Pandey	Others	None	Nagbhushan shiralikar	Student	RVIM
Ankur Sharma	Others	Star Interior	Abhilash K	Student	Rvim
Vishal Dwivedi	Industry	Toshiba Elevator and Building System Corporation	Gaurav	Student	RVIM
BINESH P	Industry	PENMYWAY	Praveen S Raj	Student	RVIM
Ramadevi	Academician / Research Scholar	Oxford college of science	BHARGAVI	Student	RV institute of management
Manoj Mathpal	Student	Institute of technology and science, Ghaziabad	Saiganesh venkatesh	Student	Rv institute of management
Apoorv Bhardwaj	Student	Institute of technology and science	Priyanka Mallya	Student	RV institute of management
Sanjeev Kumar	Student	Institute of Technology and Science (I.T.S)	Tejas	Student	RV Institute of Management
Rohit Mishra	Student	ITS college Mohan nagar, Ghaziabad	Aaptha Shetty	Student	RVIM
Jeevanandham S	Academician / Research Scholar	The Oxford college of science	Vishal S	Student	RV Institute of Management
Supriya .S	Student	MLA Academy of Higher Learning	Aditi Khona	Student	RV Institute of Management
Rushali Gupta	Student	Institute of technology and science	Kristam preethika	Student	RV institute of management
Sudheer Kumar	Student	Institute of technology and science	Sushmitha D	Student	MLa academy of higher learning malleshwaram
Shrutika S Nagre	Student	PG department of commerce Government first grade college humnabad, Bidar, Karnataka	Janani. S	Student	Malleswaram ladies association academy of higher learning
Sarita	Student	N.B.G.S.M Clg, Sohna(Gurugram)	Nageshwari N K	Student	Mlaahl
Simran	Student	Institute of technology and science	Rajesh	Student	RVIM
Dr. Anshu Tyagi	Academician / Research Scholar	RDIAS	Megha S	Student	MLAAHL
Kalash Sharma	Student	Institute of technology and science	Puneethashree. K. P	Student	MLA AHL
Chethan KN	Student	RVIM	Tejaswini M	Student	MLA Academy of higher learning
Km samiksha	Student	Its mohan nagar	Rajkumar T	Student	Rc institute of management
Sweta kumari	Student	I.T.S College	Kiran Kumar T N	Academician / Research Scholar	Nagarjuna College of Management Studies
SANDEEP BANERJEE	Academician / Research Scholar	International School of Business and Media, Bangalore	Rakhendu Kanakvidu	Industry	Biometric Access India Pvt Ltd
Pramod Nadageri	Student	RVIM Bangalore	Harshitha S L	Student	RVIM
Susmitha M Jois	Student	RVIM	Nikitha Raj N	Student	RV institute of management
Vipul Kumar	Student	Universal business school	Sumukha H C	Student	RV Institute of Management
Bhavishya	Student	RV institute of management	SOWJANYA N M	Student	RV institute of management
SUPRITI PRAKASH	Student	RV institute of management	Nikitha K A	Student	MLA academy of higher learning
Rakshitha.R	Student	MLA Academy of Higher Learning	Deekshitha J	Student	MLA AHL

Director

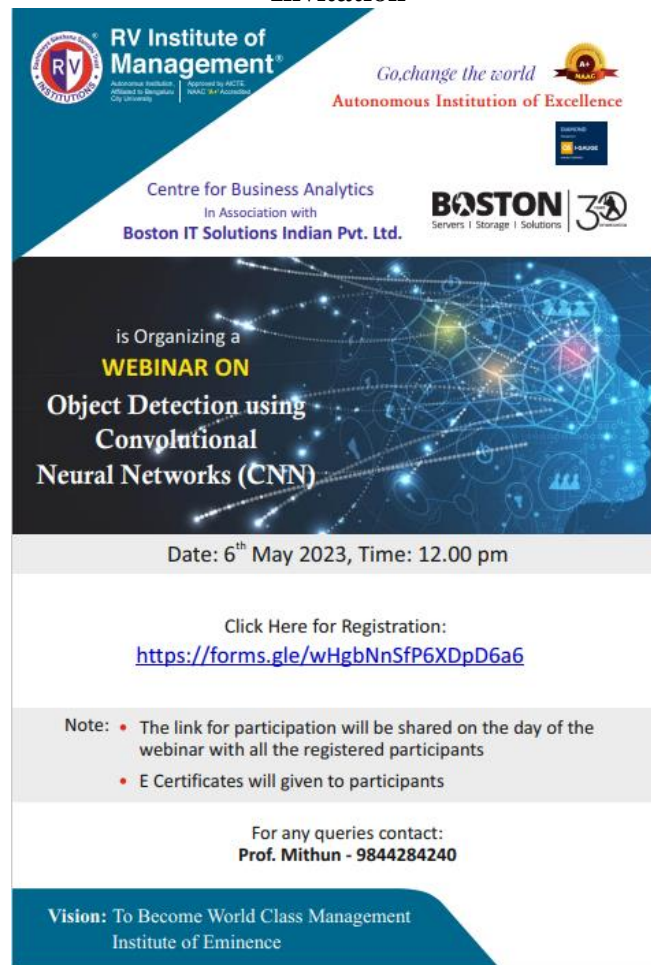


Webinar on Object Detection Using Convolutional Neural Networks (CNN)	
Date: 6 th May 2023	
Time: 2 hours	Resource Person: Prof. Mithun D J
Number of Participants: 146	Event Coordinators: Dr. Jahnvi M, Prof. Nagasubba Reddy & Prof. Ankitha
<p>Objectives:</p> <ol style="list-style-type: none"> 1. To introduce participants to the fundamentals of CNN 2. To demonstrate how CNN can be adapted and utilized for object detection tasks 3. To equip participants with hands-on training on object detection models using CNN 	
<p>About the Session:</p> <p>Object detection is a fundamental computer vision task that involves identifying and locating objects of interest within images or videos. Convolutional Neural Networks (CNNs) have emerged as a powerful approach for object detection due to their ability to automatically learn hierarchical features from data. This report explores the concept of object detection using CNNs, the key components of CNN-based object detection systems, popular architectures, evaluation metrics, and real-world applications.</p> <p>The seminar begins with an introduction to object detection and its significance in various fields, including autonomous vehicles, surveillance, robotics, and more. It explains the challenges of object detection, such as occlusion, scale variation, and complex backgrounds, and sets the stage for how CNNs address these challenges.</p> <p>The session started with introducing participants to the fundamental of CNN including its architecture, layers, and their role in image processing tasks like object detection. Followed by its importance and the challenges involved in detecting and localizing objects in images. This section provides an overview of CNNs, explaining the architecture and working principles. It covers convolutional layers, pooling layers, and fully connected layers, highlighting how CNNs automatically learn hierarchical representations of features from input images.</p> <p>The second half of the session concentrated on demonstrating how CNN can be adapted and utilized for object detection tasks with real-time examples.</p> <p>This section focuses on the training process of CNNs for object detection. It explains the importance of large labeled datasets and the use of transfer learning to fine-tune pre-trained models for specific object detection tasks. Techniques like data augmentation and learning rate scheduling are also covered.</p>	

Feedback/Coordinators Comment:

The seminar concludes by summarizing the key takeaways from the presentation on object detection using CNNs. It emphasizes the significance of CNNs in revolutionizing object detection tasks and encourages further exploration and innovation in this rapidly evolving field.

Annexure - 1 Invitation



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is Organizing a
WEBINAR ON
**Object Detection using
Convolutional
Neural Networks (CNN)**

Date: 6th May 2023, Time: 12.00 pm

Click Here for Registration:
<https://forms.gle/wHgbNnSfP6XDpD6a6>

Note:

- The link for participation will be shared on the day of the webinar with all the registered participants
- E Certificates will given to participants

For any queries contact:
Prof. Mithun - 9844284240

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Annexure – 2

List of the Participants:

S. No	Name of the Participant	Profession / Job Role	Name of the Institution/Organization	S. No	Name of the Participant	Profession / Job Role	Name of the Institution/Organization
1	Saima Khuhro	Academician / Research Scholar	Dawood University of Engineering and Technology Pakistan	74	KOVELATHOTA BHAGYALAKSH MI	Student	SV University
2	Anandkumar K Shelat	Academician / Research Scholar	Working Professional	75	Daksh Kapoor	Student	LBSIM
3	Vaibhav Sorcar	Student	New Horizon college of Engineering	76	Prakash P Nair	Academician / Research Scholar	Musaliar Institute of Management Pathanamthitta Kerala
4	Anitha BM Dsilva	Academician / Research Scholar	RV Institute of Management	77	Mohammed Junaid Ahmed	Student	Camara Bank School of Management Studies
5	Abimbola Olaniran	Academician / Research Scholar	KIT	78	Balasubramanian P	Academician / Research Scholar	Amrita School of Business
6	Kiran Shankar Nayak	Student	Ramaiah college of arts science and commerce Bangalore	79	Rajesh	Student	Rvim
7	V SUDHA	Academician / Research Scholar	SIVANANDA SARMA MEMORIAL RV COLLEGE	80	Dr N Geethanjali	Academician / Research Scholar	PSNA College of Engineering and Technology
8	Neetha R	Student	Vivekananda institute of technology	81	Prof A.Seshachalam	Academician / Research Scholar	IFIM College (Autonomous)
9	DR.MOHAMMED QUADIR MOHIUDDIN	Academician / Research Scholar	University of Technology and Applied Sciences	82	Allauddin Abdulisqaq Nadaf	Academician / Research Scholar	Kousali Institute of Management Studies Karnatak University Dharwad
10	Dr. R. SELVAKUMAR	Academician / Research Scholar	Hindusthan College of Arts and Science	83	Abdulfayyaz N Patil	Academician / Research Scholar	Kousali Institute of Management Studies Karnatak University Dharwad
11	Sapna	Academician / Research Scholar	BBD University Lucknow	84	Mahadevaswamy R M	Academician / Research Scholar	JSS Academy of Higher Education and Research
12	Prajwala R	Others	VKIT	85	Zayienu Richa	Student	Student
13	Dr.P.Nithya Devi	Academician / Research Scholar	Hindusthan college of Arts & Science	86	Bhavya S	Academician / Research Scholar	MITE Moodbidri
14	Susmitha M Jois	Student	RVIM	87	Radhaswamy AP	Others	Aurson Electricals Pvt.Ltd.,
15	Vijaya Mahadevi P	Academician / Research Scholar	Bishop Cotton Academy for Professional Management	88	Indhumathi G	Academician / Research Scholar	Rajalakshmi Engineering College
16	Dr Asha Joseph	Academician / Research Scholar	Amal Jyothi College of Engineering	89	Dr V Saravana Kumar	Academician / Research Scholar	AIMS Institutes Peenya Bangalore
17	Dr Rajesh P S	Academician / Research Scholar	Nagarjuna College of Management Studies	90	Dr. B. K. Verma	Academician / Research Scholar	Sanskriti University
18	VANAJA.S	Academician / Research Scholar	Dr.Ambedkar Government Arts College	91	Dr.S.Yavana Rani	Academician / Research Scholar	CMS Business School, JAIN (Deemed-to-be)University
19	Padmavathi S M	Academician / Research Scholar	S J C Institute of Technology	92	Vaithyanathan R	Academician / Research Scholar	ISBR Research Center

20	Suhas Kashyap V K	Student	IIIT Delhi	93	Dr.Gayathri.R	Academician / Research Scholar	CMS Business School, Jain University
21	Dr.Meera.B	Academician / Research Scholar	SJR College of Science, Arts and Commerce	94	Dr.N.muthukumar	Academician / Research Scholar	Rajarajeswari college of engineering
22	Widisha	Academician / Research Scholar	Central University of South Bihar	95	DR MOHAMMED OSAMA	Academician / Research Scholar	SCHOOL AND MASS EDUCATION DEPARTMENT ODISHA
23	Rupali Rathod	Student	Saibalaji international Institute of management and sciences	96	Varsha.V	Student	MLA AHL
24	Dr. Yashashwini. A	Academician / Research Scholar	Pearl Academy	97	Dr. K. Prasad	Academician / Research Scholar	Balaji Institute of Management Sciences
25	Dr.Smitha Rajappan	Academician / Research Scholar	Bhavan's Royal Institute of Management	98	Dr Grace Ganta	Academician / Research Scholar	SWARNANDHRA college of engineering and technology
26	BODDU SESHARAO	Academician / Research Scholar	BVC INSTITUTE OF TECHNOLOGY AND SCIENCE	99	Dr.Mansi Kukreja	Academician / Research Scholar	CMS Business School ,JAIN Deemed to be University.
27	Bhargav revalla	Student	Delhi Technological University	100	Murali	Industry	Confidential
28	Nawab Uddin	Academician / Research Scholar	M. J. P. Rohilkhand University	101	Dr.P.Vijayashree	Academician / Research Scholar	VISTAS, VELS UNIVERSITY
29	Dr.S Pragathy	Industry	Bharath Sanchar Nigam limited	102	Dr. Yogita Satish Garwal	Academician / Research Scholar	Manipal University Jaipur
30	Dr. Shiju George	Academician / Research Scholar	Amal Jyothi College of Engineering	103	Dr.M.D.RAMYAS RI	Others	Vels University
31	C.Eyamini	Academician / Research Scholar	Kathir College of Engineering	104	DR.K.MAJINI JES BELLA	Academician / Research Scholar	VELS INSTITUTE OF SCIENCE TECHNOLOGY AND ADVANCED STUDIES
32	H M Shiva Sagar	Student	Hero Vired	105	Dr.G.S.Dhanashree	Academician / Research Scholar	Vels University
33	Suryanarayan Puranchand Panda	Student	S.I.W.S Degree College, Mumbai	106	Dr.V.Geetha	Academician / Research Scholar	Mannar Thirumalai Naicker College
34	Nidhi Jain	Academician / Research Scholar	Prestige Institute of Management and Research, Gwalior, M.P.	107	S Kavitha	Academician / Research Scholar	Dr.Ambedkar Institute of Technology
35	Vijayalakshmi.S	Academician / Research Scholar	M.P.Birla Institute of Management	108	Rakesh N	Academician / Research Scholar	JAIN (DEEMED TO BE UNIVERSITY)
36	S Kala	Academician / Research Scholar	Bishop Cotton Academy of Professional Management	109	Jeevanandham S	Academician / Research Scholar	The Oxford College of Science, Bangalore
37	Prateek Ramannavar	Industry	Ocwen financial corporation	110	K.Swaminathan	Academician / Research Scholar	Perunthalaivar kamarajar Institute of engineering and technology
38	Khushboo	Student	Institute of technology and science	111	Vinson Jos Kunnankada	Academician / Research Scholar	ISBR
39	SHYAMALADEV I C	Academician / Research Scholar	SHRIMATI INDIRA GANDHI COLLEGE	112	Dr.H.KAMILAH BANU	Academician / Research Scholar	Vels Institute of Science Technology and Advanced Studies

40	Hemanth G	Student	JSS AHER DHSMS MYSORE	113	Arij Naser Abougreen	Academician / Research Scholar	University of Tripoli
41	Dr. Savita Punjabi	Academician / Research Scholar	Bharat College of Arts and Commerce	114	Atukuri Upendra	Industry	Reliance retail Ltd
42	Priyajit Ray	Academician / Research Scholar	University of Calcutta	115	Rupali Gupta	Academician / Research Scholar	IIEBM
43	Ravi Kant	Academician / Research Scholar	Uttaranchal University	116	Prof.C.Boopathy	Academician / Research Scholar	Sri Krishna College of Engineering and Technology
44	Venkata Naga Rani Bandaru	Academician / Research Scholar	Vishnu Institute of Technology	117	Mohammad Aqib	Student	Geeklurn
45	HARSHITHA SRINIVAS	Student	RV INSTITUTE OF MANAGEMENT	118	Vishnu Priya L V	Academician / Research Scholar	ISBR
46	Capt Dr.Lakshmi.T	Academician / Research Scholar	Residential Govt First Grade College	119	Vishnu Priya L V	Academician / Research Scholar	ISBR
47	MEENA G	Academician / Research Scholar	SRM INSTITUTE OF SCIENCE AND TECHNOLOGY	120	Fazal	Academician / Research Scholar	S E T Degree College
48	Sushmitha Jois	Student	Rvim	121	Dr BHARGAVA N	Academician / Research Scholar	ACHARYA INSTITUTE OF GRADUATE STUDIES
49	Chandrakanth S	Student	Oxford College of Engineering	122	Harish kumar	Others	Presidency university
50	Shrutika S Nagre	Student	PG department of commerce government first grade college humnabad. Bidar. Karnataka	123	Sheryl Mendonsa	Others	NA
51	Dr. Saroj Kumar Sahoo	Academician / Research Scholar	Sambalpur University	124	Tamilarasi	Student	Rajarajeswari college of engineering
52	Rohit Mishra	Student	ITS College Mohan Nagar Ghaziabad	125	Deepak Kumar Mallick	Others	Swayam sikshan Prayog
53	Dr B Hari Mallikarjuna Reddy	Academician / Research Scholar	DrYSRHU-College of Horticulture	126	V Lakshmi Suneetha	Academician / Research Scholar	The Oxford College of Engineering
54	Dr. Sandhyarani Sahoo	Academician / Research Scholar	Sambalpur University	127	Abhijin	Student	Bms
55	Rohit Mishra	Student	ITS College Mohan Nagar Ghaziabad	128	V Venu Madhav	Student	Guru Nanak Institute of Technology
56	V V S Ramakrishna	Student	Tata Institute of Social Sciences	129	Arpitha S N	Student	Winner design solutions
57	Shraddha Deori	Student	IIT Kharagpur	130	Suchita revankar	Academician / Research Scholar	Siws college
58	K S Subash	Academician / Research Scholar	Brindavan Group of Institutions	131	Dr.M.S.VASU	Academician / Research Scholar	Sree Rama Engineering College
59	K. Geetha	Academician / Research Scholar	Sri sankara arts and science college	132	Anand Mohan	Academician / Research Scholar	RACE REVA University
60	Dr. Veena P Bhosale	Academician / Research Scholar	KCESs College of Engg and Management ,Jalgaon	133	Shashank Patel	Others	Forest Department
61	Prof Dr Rudra	Academician / Research Scholar	CSD	134	Ibrahim B	Student	Universal School of Administration

62	Dr. Anil Kumar	Academician / Research Scholar	Kurukshetra University, Kurukshetra	135	Manasi y	Others	None
63	Dr.S.TAMILARA SI	Academician / Research Scholar	Hindusthan College of Arts & Science	136	Sanjay Halder	Industry	Shree cement
64	Dr.M.Parveen Roja	Academician / Research Scholar	PSNA College of Engineering and Technology	137	AKSHAYA S DAS	Academician / Research Scholar	BHARATHIAR UNIVERSITY
65	Sagar Dash	Academician / Research Scholar	IGIT SARANG	138	S. Vishnu Shankar	Student	Dr.Y.S.Parmar University of Horticulture & Forestry, Nauni, Solan
66	Meghendra Kumar Gajpal	Industry	Aspirtek Technology Pvt Ltd., Navi Mumbai	139	Tapan Deka	Academician / Research Scholar	Medhavi Skills University
67	MANCHALA RAMESH	Academician / Research Scholar	Sadhana college of Education lecturer in Biological science	140	A.M Rajendra Prasad	Others	Sai Gokula Seva Samsthe
68	Richa Agarwal	Academician / Research Scholar	H N B Garhwal (A Central) University, Uttarakhand	141	Vishal Dwivedi	Others	Toshiba Building systems
69	Kishore	Student	MLA academy of higher learning	142	Vijay kumar R	Student	S.E.T degree college
70	Ibrahim B	Student	Universal School of Administration	143	Vidya Shree	Student	SET collage
71	Prof. (Dr.) CA. Haresh Kothari	Academician / Research Scholar	Former Vice-Chancellor (KK Modi University)	144	Navneet Kumar Rathore	Industry	GodAura devices privet limited
72	Abhinav Srivastava	Academician / Research Scholar	Noida International University	145	Lavanya k	Academician / Research Scholar	C.B.Bhandari Jain College
73	Pammi Kumari	Academician / Research Scholar	GNS UNIVERSITY	146	Bhavana. S	Student	Degree college

Director





Seminar Organized by RVIM
on
Human Anatomy for (MBA Batch 2021-23)
By
Dr Jahan Zeb (HOD-Department of Human Anatomy)
KLE Institute of Dental Sciences, Bangalore

Date: 28 th October 2022	Venue: Seminar Hall (RV Institute of Management)
Time: 07.30 am to 09.30 am	Event : Seminar
No. of Participants: 124 Section: A, B and C (MBA Batch 2021-23)	Event Coordinator: Asst. Professor Ankita Shrivastava

Objectives

- To impart knowledge on gross human structure.
- To brief about all the systems of human body.
- To understand various biological systems that carry out specific functions necessary for everyday healthy living.

The flow of the Event

- Introduction to anatomy and identification and description of the structures of human beings.
- Different types of systems & It's importance as group of organs.

Outcome Achieved:

The resource person commenced with explanation of why it is important to be aware of various systems that results in healthy functioning of a human body.

The session was then started with musculoskeletal system includes bones, muscles, tendons, ligaments and soft tissues which work together to support your body's weight and help you move. Injuries, disease and aging can cause pain, stiffness and other problems with movement and function.

Further cardiovascular system was discussed which delivers oxygen, nutrients, hormones, and other important substances to cells and organs in the body, also as it plays an important role in helping the body meet the demands of activity, exercise, and stress. It also helps maintain body temperature, among other things.

The resource person further described about respiratory system being the network of organs and tissues that help you breathe. This system helps your body absorb oxygen from the air so your organs can work. It also cleans waste gases, such as carbon dioxide, from your blood. Common problems include allergies, diseases or infections.

Further session included nervous system which has cells called neurons to send signals, or messages, all over

your body. These electrical signals travel between your brain, skin, organs, glands and muscles.

The session further included the description on digestive system which breaks down food into nutrients such as carbohydrates, fats and proteins. They can then be absorbed into the bloodstream so the body can use them for energy, growth and repair.

The session further included discussion on urinary system, endocrine system, lymphatic system, reproductive system and integumentary system.

Feedback & Coordinator Comment:

The resource person had a rich expertise in teaching and imparting knowledge on Human Anatomy and the basic human structure required for a healthy and fulfilling life. The seminar was excellent, and the resource person was very good and well versed in their knowledge on the topic. It was a great program including demonstration of the scenarios and the resource person has delivered in a very simple manner, the participants have got a great insight on overall wellbeing.

Event Coordinators



Prof. Ankita Shrivastava



Director

Annexure 1	Mail communication
Annexure 2	Brief profile of the speaker
Annexure 3	Attendees list
Annexure 4	Photo Gallery



dr zeb PPT

dr jahan zeb no jahanzeb@pakistan.com
to: "jahanzeb" <jahanzeb@pakistan.com>

Attachments: [unreadable]

24 October 2003, 10:14 AM

Introduction to Anatomy (1) (1).pptx

Annexure 2

Brief Profile of the Resources Person

Dr Jahan Zeb is an under graduate from Maulana Azad Medical College. Delhi, he holds a post-graduation from PES college Kuppam and has also been awarded PhD in medical anatomy from Maulana Azad Medical College. Delhi.

He is a Professor and HOD of Department of Human Anatomy at KLE Institute of Dental Sciences, Bangalore, since 2008. He is a visiting post mortem surgeon in RV college and Sanjay Gandhi Institute of Trauma and Orthopedics.

Annexure 3

Attendees list

Seminar - "A Walkthrough of Human Anatomy" - 28.10.2022					
Sl	Names	Section	UCIMS	Date Attended	Signature
1	CHAITANYA RAMATAGI B	A	P18FW21M0009	28-10-22	
2	AKASH RACHAPPA KHANAGAVI	A	P18FW21M0010	28-10-22	
3	SHETTY TRUPTI CHANDRANAS	A	P18FW21M0019	28-10-22	
4	HARSHITHA SRINIVAS	A	P18FW21M0018	-	
5	SAGI SAMPI	A	P18FW21M0019	28-10-22	
6	PAULOMEE BARUAN	A	P18FW21M0020	28-10-22	
7	NEETHA KAMATH	A	P18FW21M0021	28-10-22	
8	ADITYA UDAY HEGDE	A	P18FW21M0022	-	
9	SHREYAS G A	A	P18FW21M0023	28/10/2022	
10	SRUJANA S	A	P18FW21M0024	28/10/2022	
11	PRAJWAL S N	A	P18FW21M0025	28/10/2022	
12	SUCHITRA G	A	P18FW21M0026	-	
13	SANKET SURESH SHIRSAT	A	P18FW21M0027	Director of Acad	
14	ANIKET SANJAY REVANKAR	A	P18FW21M0028	28/10/2022	
15	M LUGHMAN NAWAZ	A	P18FW21M0030	Placement ET	
16	MADHURA A	A	P18FW21M0031	28/10/2022	
17	H V SHREELVATA	A	P18FW21M0032	-	
18	LILIMA DASH	A	P18FW21M0033	28/10/2022	
19	KUMAR ASHUTOSH	A	P18FW21M0034	28/10/2022	
20	RAHUL S SANGOLI	A	P18FW21M0035	28/10/2022	
21	GIRISH N NASHI	A	P18FW21M0036	28/10/2022	
22	ANKITA GAJANAN NAIK	A	P18FW21M0037	28/10/2022	
23	GURUBASAVARAJ K M	A	P18FW21M0038	28/10/2022	
24	LIKHITHA L	A	P18FW21M0041	28/10/2022	
25	RAHUL RAM BHAT	A	P18FW21M0042	Placement ET	
26	AMIT KAMADOLLISHETTARU	A	P18FW21M0043	-	
27	PODIARANI TALAWAR	A	P18FW21M0044	-	
28	ABHITHA K	A	P18FW21M0045	28/10/22	
29	ABHISHEK SHENOY	A	P18FW21M0047	28/10/2022	
30	DEEPAK GIRISH KALYANI	A	P18FW21M0051	-	
31	ISAAC JESSE K	A	P18FW21M0052	28/10/2022	
32	VINAYAK RAO GAIKWAD K	A	P18FW21M0054	28/10/2022	
33	SUTOPA DEB	A	P18FW21M0055	28/10/22	
34	BHASKARA PRABHU	A	P18FW21M0057	28/10/22	
35	PRAKASH SHIVAKUMAR	A	P18FW21M0058	-	
36	AKANKSH K G	A	P18FW21M0061	28/10/22	
37	BERNARD FERNANDES	A	P18FW21M0062	28/10/22	
38	VIOLA PINTO	A	P18FW21M0064	28/10/22	
39	VARSHA	A	P18FW21M0065	28/10/22	
40	GAGANDEEP V N	A	P18FW21M0067	7	
41	ANUSHA	A	P18FW21M0071	-	
42	KAVYAPRIYA J	A	P18FW21M0074	28/10/22	
43	BASAVARAJ	A	P18FW21M0077	28/10/22	
44	ANVITH KUMAR	A	P18FW21M0086	28/10/2022	
45	DESAI JATIN ARUN	A	P18FW21M0093	-	
46	NAYAN KUMAR	A	P18FW21M0104	28/10/2022	
47	DINAH NEETHA NORONHA	A	P18FW21M0116	28/10/22	
48	CHETAN SINGH M	A	P18FW21M0129	28/10/22	
49	KAUSTUBH LACHAPPANAVAR	A	P18FW21M0130	-	
50	KSHITIJ P L	A	P18FW21M0131	28/10/2022	
51	BHUVANES P	A	P18FW21M0132	-	
52	KOKILA K	A	P18FW21M0134	-	
53	M M JABEZ	A	P18FW21M0141	-	
54	KALAVALA ABHISHTA	A	P18FW21M0142	28-10-2022	
55	KAPARTHI BHAVANA	A	P18FW21M0146	28-10-2022	
56	HEMA S	A	P18FW21M0149	28/10/2022	
57	RAMANABOINA ANAND KUMAR	A	P18FW21M0154	Medical	
58	SNEHA U	A	P18FW21M0173	28-10-2022	
59	D SURIYA PRIYASREE	A	P18FW21M0176	28/10/2022	
60	TEJAS N	A	P18FW21M0182	-	

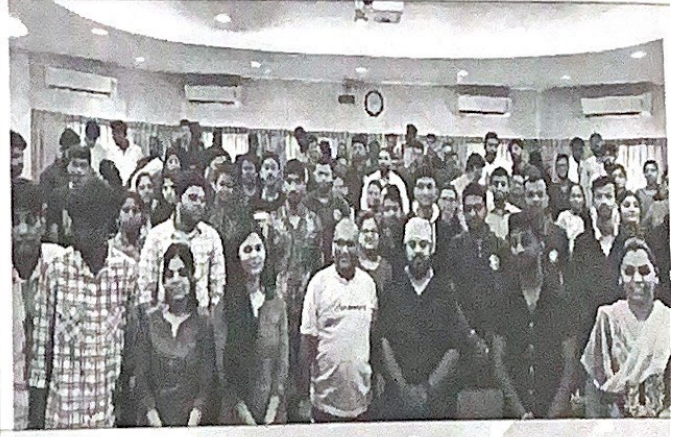
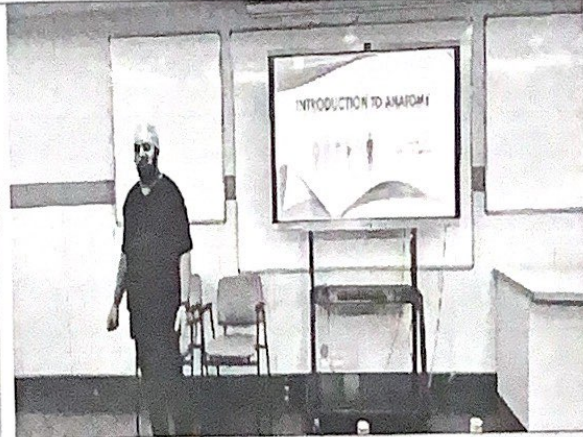
Seminar - "A Walkthrough of Human Anatomy" - 28.10.2022

Sl	Names	Section	UCIMS	Date Attended	Signature
1	AISHWARYA G	B	P18FW21M0006	28.10.22	P
2	SUPRIYA GOVIND BELSARE	B	P18FW21M0053		AB
3	AISHWARYA P	B	P18FW21M0063	28.10.22	P
4	CHIDRI BALAJI	B	P18FW21M0066	28.10.22	P
5	PRAJWALA	B	P18FW21M0068	28.10.22	P
6	POORNIMA L	B	P18FW21M0069	28.10.22	P
7	SAMEEKSHA M P	B	P18FW21M0073	28.10.22	P
8	RAKSHITH R T	B	P18FW21M0075	28.10.22	P
9	SHUBHA R	B	P18FW21M0076	28.10.22	P
10	ADITI RANI	B	P18FW21M0079	28.10.22	P
11	NELAMMA M K	B	P18FW21M0083		AB
12	NAMRATHA N	B	P18FW21M0085	29.10.22	P
13	OLETI SAI SREENITHYA	B	P18FW21M0090	28.10.22	P
14	RAMANUJAM H J	B	P18FW21M0091		AB
15	CHAVI JAGADEESH	B	P18FW21M0092		AB
16	MALLESH S	B	P18FW21M0094		AB
17	SRINIDHI K	B	P18FW21M0095	28.10.22	P
18	B SHASHANK	B	P18FW21M0096	28.10.22	P
19	NAGARAJ GAJANAN HEGDE	B	P18FW21M0099	28.10.22	P
20	YASHASWINI P	B	P18FW21M0101	1	AB
21	TANUSHREE R	B	P18FW21M0102		AB
22	CHETHAN KUMAR V A	B	P18FW21M0103	28.10.22	P
23	DEEPAK GOPALAKRISHNAN	B	P18FW21M0105	28.10.22	P
24	POORNAPRAINYA K MANGALVEDI	B	P18FW21M0106		AB
25	JENISHA MENEZES	B	P18FW21M0107	28.10.22	P
26	SRAVANI SUNIL MHALSEKAR	B	P18FW21M0108		AB
27	M RITISH	B	P18FW21M0109	28.10.22	P
28	PREETHAM D VARMA	B	P18FW21M0111	28.10.22	P
29	DHIRAJKUMAR BELAVADI	B	P18FW21M0112		AB
30	FERNANDES RICHA FLORINDA	B	P18FW21M0113		AB
31	MEGHA U JOSHI	B	P18FW21M0114		AB
32	HEGDE PAVANA GANAPATHI	B	P18FW21M0117		AB
33	LOYSTON CRASTA	B	P18FW21M0118	28.10.22	P
34	ANJANA KSHIRASAGAR	B	P18FW21M0121	1	AB
35	TEJAS H P	B	P18FW21M0124		AB
36	AMITH BHAT	B	P18FW21M0127	28.10.22	P
37	NUTHANA U	B	P18FW21M0128	28.10.22	P
38	MUCHELI SUBBARAJU	B	P18FW21M0136	28.10.22	P
39	NANDAGOPAL B R	B	P18FW21M0137	28.10.22	P
40	VISHAL SHIVARAJ	B	P18FW21M0138		AB
41	SHASHI KUMAR R	B	P18FW21M0139	28.10.22	P
42	YASHWANTR R	B	P18FW21M0140	28.10.22	P
43	NAVEEN C	B	P18FW21M0144	28.10.22	P
44	PAVAN KUMAR M	B	P18FW21M0145		AB
45	MADHUSUDAN G	B	P18FW21M0150	28.10.22	P
46	ANNASAGARAM RAGHAVENDRA	B	P18FW21M0151	28.10.22	P
47	SYED MUSSAVEERULLA	B	P18FW21M0152	28.10.22	P
48	SYED SAMEER	B	P18FW21M0153	28.10.22	P
49	GURU VARUN G	B	P18FW21M0157		AB
50	NAVEEN SETTY N A	B	P18FW21M0161	28.10.22	P
51	REHAN FAISAL QADRI	B	P18FW21M0162	28.10.22	P
52	SMITHA M	B	P18FW21M0163	28.10.22	P
53	ANIRUDH K	B	P18FW21M0164	28.10.22	P
54	SALMAN FAISAL QADRI	B	P18FW21M0165	28.10.22	P
55	RAVISH RAMACHANDRA HEGDE	B	P18FW21M0166	28.10.22	P
56	POOJA VALLUR	B	P18FW21M0167		AB
57	MAHANATH GOWDA K C	B	P18FW21M0169	28.10.22	P
58	SHAH VINIT SIDDHARTH	B	P18FW21M0174	28.10.22	P
59	NAYANA G C	B	P18FW21M0175		AB
60	NIRANJAN JANARDHAN HEGDE	B	P18FW21M0181	28.10.22	P

Seminar - "A Walkthrough of Human Anatomy" - 28.10.2022


Sl	Names	Section	UCIMS	Date Attended	Signature
1	VIPUL VILAS NAJK (A)	C	P18FW21M0001		
2	M PRANEETH KUMAR REDDY	C	P18FW21M0002	28/10/22	Praneeth
3	NIKHIL S ANJANALI (A)	C	P18FW21M0003		
4	KARTHIC P SHETTY	C	P18FW21M0004		
5	ANITH C	C	P18FW21M0005	28/10/22	Anith
6	ARANKSH P	C	P18FW21M0007	28/10/2022	Aranksh
7	SACHITH B R (A)	C	P18FW21M0008		
8	SOURAV SADANAND SWAR	C	P18FW21M0011	28/10/22	Sourav
9	NISHANTH KRISHNA	C	P18FW21M0012	28/10/2022	Nishanth
10	MEHUL V BHASKAR	C	P18FW21M0013	28/10/2022	Mehul
11	SHUBHAM RAJENDRA REVANKAR	C	P18FW21M0014		
12	SNEEBAL M S	C	P18FW21M0016	28/10/2022	Sneebal
13	VISHNU KUMAR	C	P18FW21M0017	28/10/2022	Vishnu
14	AKHILA H	C	P18FW21M0029	28/10/2022	Akhila
15	ANANYA P HEGDE	C	P18FW21M0039	28/10/2022	Ananya
16	NIVEDITHA K SWAMY	C	P18FW21M0040	28/10/2022	Niveditha
17	S SHREYAS	C	P18FW21M0046	28/10/2022	S Shreyas
18	B S SUSHEN (A)	C	P18FW21M0048		
19	PRAJWALA H	C	P18FW21M0049	28/10/22	Prajwala
20	VAISHNAVI N	C	P18FW21M0050	28/10/22	Vaishnavi
21	M S SUKRUT	C	P18FW21M0056	28/10/22	Sukrut
22	AMOGHA Y G (A)	C	P18FW21M0059		
23	BHARATH K S (A)	C	P18FW21M0060		
24	SHUBIKSHA S	C	P18FW21M0070	28/10/22	Shubiksha
25	P T KIRTI	C	P18FW21M0072	28/10/22	Pt Kirti
26	MANDI RAKSHATH B S	C	P18FW21M0078	28/10/22	Mandi
27	DIVYA SHREE M	C	P18FW21M0080	28/10/22	Divya
28	VARUN S BHARADWAJ	C	P18FW21M0081	28/10/2022	Varun
29	S KARTHIK (A)	C	P18FW21M0082		
30	PRAMOD K L	C	P18FW21M0084	28/10/2022	Pramod
31	BHOOMIKA BHAT	C	P18FW21M0087	28/10/2022	Bhoomika
32	SOUMYA GANAPATI HEGDE	C	P18FW21M0088	28/10/2022	Soumya
33	SHREEKRISHNA	C	P18FW21M0089	28/10/2022	Shreekrishna
34	YOGASHREE C N	C	P18FW21M0097	28/10/2022	Yogashree
35	CHARANA T U	C	P18FW21M0098	28/10/2022	Charana
36	NIKITHA J SHANBHOJ	C	P18FW21M0100	28/10/2022	Nikitha
37	DHANYA S SHARMA (A)	C	P18FW21M0110		
38	GANESH HEGDE	C	P18FW21M0119	28/10/22	Ganesh
39	ANUSHA PRAKASH	C	P18FW21M0120	28/10/22	Anusha
40	JAGADISH SHENOY R	C	P18FW21M0122	28/10/22	Jagadish
41	MADHAN KUMAR C S	C	P18FW21M0123	28/10/2022	Madhan
42	DHANUSH K V	C	P18FW21M0125	28/10/2022	Dhanush
43	SWAMI SAMIKSHA PUSHPARAJ	C	P18FW21M0126	28/10/2022	Swami
44	NALASANI VARSHITHA (A)	C	P18FW21M0133		
45	KOTHA KEERTHANA	C	P18FW21M0135	28/10/22	Kotha
46	SANKALP V (A)	C	P18FW21M0143		
47	MANOJ N S	C	P18FW21M0147	28/10/22	Manoj
48	SHIVAM GANAPATI ANVEKAR	C	P18FW21M0155	28/10/22	Shivam
49	SHUBHAM SINGH (A)	C	P18FW21M0156		
50	ABHUEETH MASHETTY (A)	C	P18FW21M0158		
51	PRANITH KUMAR S	C	P18FW21M0159	28/10/22	Pranith
52	LIKITHA A	C	P18FW21M0160	28/10/22	Likitha
53	BHUPALI SAURABH PRAKASH (A)	C	P18FW21M0170		
54	SYED RAIHAN	C	P18FW21M0171	28/10/22	Syed
55	SHRI HARI L	C	P18FW21M0172	28/10/22	Shri
56	SATHYA B NAYAKA	C	P18FW21M0177	28/10/22	Sathya
57	NEHA H V (A)	C	P18FW21M0178		
58	SAAHIL SRIKANT KULLOLI (A)	C	P18FW21M0179	28/10/22	Saahil
59	SIMRANJIT KAUR	C	P18FW21M0180	28/10/22	Simranjit
60	AGAMYA A KINHAL	C	P18FW21M0184	28/10/22	Agamy


Annexure 4
Photo Gallery





Seminar Organized by RVIM on Stress – De stress for (MBA Batch 2022-24) By Ms. Kriti and Ms. Shaguna Sondhi (Interns MSc. Counselling Psychology from Christ University)	
Date: 16 th Feb 2023	Venue: Seminar Hall (RV Institute of Management)
Time: 12:45 pm to 1:45 pm	Event: Stress – De stress - Seminar
No. of Participants: 170 Section: A, B and C (MBA Batch 2022-24)	Event Coordinator: Asst. Professor Ankita Shrivastava
Objectives <ul style="list-style-type: none">A Session on Stress De-stress to help understand oneself better and strategically deal with the situations that seem difficult.	
The flow of the Event <ul style="list-style-type: none">Activities to check the level of stress.Session delivery on destressing.	
Outcome Achieved: A Session on Stress De-stress to help understand oneself better and strategically deal with the situations that seem difficult.	
Feedback & Coordinator Comment: The resource person Ms. Shagun and Ms. Kriti were the interns MSc. Counselling Psychology from Christ University	

Event Coordinators 
Prof. Ankita Shrivastava


Director

Annexure 1	Mail communication
Annexure 2	Brief profile of the speaker
Annexure 3	Attendees list



Annexure 2

Brief Profile of the Resources Person

The resource person Ms. Shagun and Ms. Kriti were the interns MSc. Counselling Psychology from Christ University



RVIM MBA 2022-24

Aditi, Anita Mam , Ashok SIR, Chetan Sir RV, Deepika CR , Dilip Sir RV, Dr. Tamizharasi, Dr. Bung Sir RV Institute , Dr. Anupama Mam RV,...



Good Evening All Students 🌻

This is to inform, that we are conducting a Session on **Stress De-stress** to help you *understand yourself better and strategically deal* with the situations that seem difficult. The session will be conducted by Ms. Kriti and Ms. Shaguna Sondhi (Interns MSc. Counselling Psychology from CHRIST University, Bangalore).

Attend the same as per below details.

📅 Date: 16th February, 2023 (Thursday)

🕒 Time: 12:45 pm - 1:45 pm

📍 Venue: Seminar Hall - 3rd Floor

Kindly note that attendance is compulsory.

Thanks & Regards

10:45 ✓

Annexure 2

Brief Profile of the Resources Person

The resource person Ms. Shagun and Ms. Kriti were the interns MSc. Counselling Psychology from Christ University

Annexure 3

Attendees list

MBA - Batch 2022-24 (1st Semester)

Session Stress - Destress (Stress Management) - Attendance Sheet

Section A

Sl. No	NAME	Section	Date	Signature
1	AAPTHA SHETTY	A	16/02/23	Aa
2	ABHILASH K	A	16/02/23	Abhilash
3	ABHISHEK HEGDE	A	16/2/23	Abhishek
4	ADITI B. KHONA	A	16/2/23	Aditi
5	AJAY BHASKAR HEGDE	A	16/2/23	Ajay
6	AKSHATHA ANANTH SHET	A	16/2/23	Akshatha
7	ANUSHRUTH D	A	16/2/23	Anushruth
8	AYISHA SIDDIKHA K	A	16/02/2023	Ayisha
9	B P SHASHWATH	A	16/02/2023	B.P. Shashwath
10	BHARGAVI	A	16/02/2023	Bhargavi
11	BHAVISHYA	A	16/02/2023	Bhavishya
12	BHUVAN C WANDKAR	A	16/02/2023	Bhuvan
13	CHETHAN K N	A	16/02/2023	Chethan
14	CHILAMACHERLA VARUNESH	A	16/02/2023	Chilamacherla
15	CHINTHAN B.K	A	16/02/2023	Chinthan
16	CHIRANJEEVI RAM P	A	16/02/2023	Chiranjeevi
17	DEVIPRASAD Y	A	16/02/2023	Deviprasad
18	DINESH G	A	16/02/2023	Dinesh
19	DISHANTH	A	16/02/2023	Dishanth
20	GAURAV	A	16/02/2023	Gaurav
21	HARSHITHA S L	A	16/02/2023	Harshitha S.L.
22	K. S. RAKSHITA	A	16/02/2023	Rakshita
23	KRISTAM PREETHIKA	A	16/02/2023	Kristam
24	KUMAR RAGHAVENDRA M D	A	16/02/2023	Kumar
25	LAKSHIPRASAD KARNIK S	A	16/02/2023	Lakshiprasad
26	MOHAMMAD MUZAMEEL SAMAD	A	16/02/2023	Muzameel
27	NAGBHUSHAN SHIRALKAR	A	16/02/2023	Nagbhushan
28	NAVEEN S. KUMBAR	A	16/02/2023	Naveen
29	NAVEENAKUMARA K A	A	16/02/2023	Naveenakumara
30	NEELAPPA VALAVATI	A	16/02/2023	Neelappa
31	NIKHIL D. HEGDE	A	16/02/2023	Nikhil
32	NIKITHA RAJ N	A	16/02/2023	Nikitha
33	P PRANAY	A	16/02/2023	Pranay
34	REDDAKOTLA SHASIDHAR	A	16/02/2023	Reddakotla
35	PRARINA N BHAT	A	16/02/2023	Prarina
36	PRAMOD B NADAGERI	A	16/02/2023	Pramod
37	PRAVEEN PRABHAKAR HEGDE	A	16/02/2023	Praveen
38	PRAVEEN S RAJ	A	16/02/2023	Praveen
39	PRIYANKA M S	A	16/02/2023	Priyanka
40	PRIYANKA MALLYA J	A	16/02/2023	Priyanka
41	PUSHPATHIREGOUNDAR	A	16/02/2023	Pushpathiregoundar
42	RAHUL R	A	16/02/2023	Rahul
43	RAJESH	A	16/02/2023	Rajesh
44	RAJKUMAR	A	16/02/2023	Rajkumar
45	RAKESH A	A	16/02/2023	Rakesh
46	RASHMI M	A	16/02/2023	Rashmi
47	SACHIN V N	A	16/02/2023	Sachin
48	SADHANESH VENKATESH	A	16/02/2023	Sadhanesh
49	SADHAN S GOWDA	A	16/02/2023	Sadhan
50	SANDAN C S	A	16/02/2023	Sandan
51	SANTHOSH J	A	16/02/2023	Santhosh
52	SATYAKI ADAK	A	16/02/2023	Satyaki
53	SHARANYA	A	16/02/2023	Sharanya
54	SHASHANK KALLESH CHOWDRY K S	A	16/02/2023	Shashank
55	S SHASHWATH S SHETTY	A	16/02/2023	S Shashwath
56	SHOBHANYA INAMDAR	A	16/02/2023	Shobhanya
57	SOUJIKHA H C	A	16/02/2023	Soujikha
58	SUBHUTI PRAKASH	A	16/02/2023	Subhuti
59	TEJAS C	A	16/02/2023	Tejas
60	VISHAL S	A	16/02/2023	Vishal

MBA-Batch 2022-24 (1st Semester)

Session Stress - Destress (Stress Management) - Attendance Sheet

Section B				
Sl. No	NAME	Section	Date	Signature
1	ABHINAV PRAKASH	B	16-02-2023	Abhinav Prakash
2	ADITHYA M S	B	16/2/2023	Adithya M S
3	ADITHYA P	B	16-02-2023	Adithya P
4	ADITHYA S HIREMATH	B	16-02-2023	Adithya S H
5	AKHILA KULKARNI	B	16-02-2023	Akhila Kulkarni
6	AKSHAY S. RAIKAR	B	16-02-2023	Akshay S. Raikar
7	ANKITHA P R	B	16-02-2023	Ankitha P R
8	ANUBHAV JAGANNATHA NAIK	B	16-02-2023	Anubhav
9	ARADHANA A HEGDE	B	16/2/23	Aradhana
10	ARVIND SHRINIVAS PAWAR	B		
11	AYUSHI	B	16/02/23	Ayushi
12	CHANDANA K R	B	16-02-23	Chandana
13	CHINMAYI BALACHANDRA NAIK	B	16/2/23	Chinmayi
14	D. BHAWYA	B	16-02-2023	D. Bhawya
15	DEEPIKA S MANJALUR	B	16-02-2023	Deepika S Manjalar
16	DEEPIKA K. SHETTY	B	16/2/23	Deepika K Shetty
17	DHANUSHREE K T	B	16-02-2023	Dhanushree
18	DIBYA SAI DALAI	B	16-02-2023	Dibya Sai Dalai
19	G BASAN GOUDA	B	16-02-2023	G Basan Gouda
20	GAUTHAM SHETTY	B		
21	GIRISHA ADITYA	B	16/2/23	Girisha Aditya
22	GLINJAN RAJU CHAUDHARI	B	16/2/23	Glinsjan Raju Chaudhari
23	GURU PRASAD	B	16-02-2023	Guru Prasad
24	HRISHIKESH V. HATHISHEFFA	B	16-02-2023	Hrishikesh V. Hathisheffa
25	KARTHIK G BHARAVAJ	B	16-2-23	Karthik G Bharavaj
26	KARTHIK GAJANANA KOTEMANE	B	16-02-2023	Karthik Gajanan Kotemane
27	KAVITA HEMANT A	B	16-02-2023	Kavita Hemant A
28	KEERTHANA N. G	B	16/2/23	Keerthana N. G
29	KISHAN KUMAR R	B	16-02-2023	Kishan Kumar R
30	KOUSHIK KUMARA B	B	16-02-2023	Koushik Kumara B
31	M R S JAYASHREE	B	16-02-2023	M R S Jayashree
32	MANOJ B J	B	16-02-2023	Manoj B J
33	MANOJ D	B	16-02-2023	Manoj D
34	MAYUR D. NAIK	B	16/02/2023	Mayur D. Naik
35	MYTHRI R	B	16/02/2023	Mythri R
36	NITISH MALLANAGOWDA PATIL	B	16-02-23	Nitish Mallanagowda Patil
37	PAUL ABY	B		
38	PAVAN KUMAR J	B	16-02-23	Pavan Kumar J
39	PRAJNA RANI N R	B	16/2/23	Prajna Rani N. R
40	PRASHANTA KUMAR	B	16/2/23	Prashanta Kumar
41	PRUTHVIRAJ GOWDA P	B	16/2/23	Pruthviraj Gowda P
42	RAKESH DANDU	B	16/2/23	Rakesh Dandu
43	RANJITH K	B	16/2/23	Ranjith K
44	RISHI SAGAR B K	B	16/2/23	Rishi Sagar B K
45	RIYA BILLAVA	B	16-2-23	Riya Billava
46	SATHVEK NARASIMHA SHASTRI	B	16/2/23	Sathvek Narasimha Shastri
47	SRIKSHITE JOSHI	B	16-2-23	Srikshite Joshi
48	SUHAS K S	B	16-2-23	Suhas K S
49	SUMANTH KOUSHIK R V	B	16/2/23	Sumanth Koushik R V
50	SURYA K	B	16/2/23	Surya K
51	SUSHMITHA	B	16-2-23	Sushmitha
52	THARUN MADHAV G P	B	16-2-23	Tharun Madhav G P
53	VAMSHI J. LAKSHMAN	B	16-2-23	Vamshi J. Lakshman
54	VARUN N	B	16/2/23	Varun N
55	VENU KUMARI G M	B	16-02-2023	Venu Kumari G. M.
56	VIKRAM BORKAR	B	16-02-2023	Vikram Borkar
57	VINAYKUMAR	B	16-02-2023	Vinay Kumar
58	VINITH N SHETTY	B	16-02-2023	Vinith N Shetty
59	VISHAL VEERABHAI RANNAVAR	B	16-2-2023	Vishal Veerabhai Rannavar
60	VJGESH B	B	16/2/2023	Vjgesh B

MBA Batch 2022-24 (1st Semester) C Section

Session Stress - Destress (Stress Management) - Attendance Sheet

Section C				
Sl. No	Name	Section	Date	Signature
1	AARON GOES	C	16/2/2023	<i>[Signature]</i>
2	ABHIRAM.K V	C	16/2/2023	<i>[Signature]</i>
3	AMAL NATH P K	C	16/2/2023	<i>[Signature]</i>
4	AMISHA R MAJALIKAR	C	16/02/2023	<i>[Signature]</i>
5	ASHISH M	C	16/02/2023	<i>[Signature]</i>
6	BHARATH	C	16/2/2023	<i>[Signature]</i>
7	BHARGAVA HEBBAR M L	C	16/2/2023	<i>[Signature]</i>
8	BIRADAR ANUPAMA BASAVARAJ	C	16/02/2023	<i>[Signature]</i>
9	DEEPAK S IYER	C	16/2/2023	<i>[Signature]</i>
10	DHRUVA ADITHYA.H	C	16/02/2023	<i>[Signature]</i>
11	G UDAYA KUMAR	C	16/2/2023	<i>[Signature]</i>
12	HARI CHANDANA SRI MAREMALLA	C	16/2/2023	<i>[Signature]</i>
13	JAGPAL REDDY	C	16/2/2023	<i>[Signature]</i>
14	JAGRUTHI.S	C	16/2/2023	<i>[Signature]</i>
15	JAYRAJ S K	C	16/2/2023	<i>[Signature]</i>
16	KAPIL JAJU	C		
17	KARTHIKEYA.N.S	C	16/2/2023	<i>[Signature]</i>
18	KAVYA B KULKARNI	C	16/2/2023	<i>[Signature]</i>
19	KEERTI MANOHARA BAGEWADI	C	16/2/2023	<i>[Signature]</i>
20	MAHESH S HEGDE	C	16/2/2023	<i>[Signature]</i>
21	MANORANJAN C M	C	16/2/2023	<i>[Signature]</i>
22	MR.KIRAN.D.SHIRAHATTI	C	16/2/2023	<i>[Signature]</i>
23	NAMANA T.G	C	16/2/2023	<i>[Signature]</i>
24	NAVEEN KUMAR G	C	16/2/2023	<i>[Signature]</i>
25	NAVNEETH.S	C	16/2/23	<i>[Signature]</i>
26	PEARL JOVITA MARTIS	C	16/2/23	<i>[Signature]</i>
27	PRADYUMNA K P	C	16/02/2023	<i>[Signature]</i>
28	RAHIL M	C		
29	RAHUL RAJENDRA JAWALI	C	16-02-23	<i>[Signature]</i>
30	RAJATH K L	C	16-2-23	<i>[Signature]</i>
31	ROHAN R HUNNARAGI	C	16-02-23	<i>[Signature]</i>
32	RUDRESH H R	C	16-02-23	<i>[Signature]</i>
33	S.R. SREEVARSHA	C	16-02-23	<i>[Signature]</i>
34	SAHANA PATIL	C	16-02-23	<i>[Signature]</i>
35	SANA UR RAHMAN	C	16-02-23	<i>[Signature]</i>
36	SANJAYA M	C	16/2/23	<i>[Signature]</i>
37	SHAMANTH.U	C	16/2/23	<i>[Signature]</i>
38	SHARATH M N	C	16/2/23	<i>[Signature]</i>
39	SHREESHYLA KUNCHANOORA	C		
40	SHREYA NAGESH	C	16/02/2023	<i>[Signature]</i>
41	SRUJANRAJ G B	C	16/02/23	<i>[Signature]</i>
42	SURE SAI NITHYUSHA	C	16/02/23	<i>[Signature]</i>
43	SUSHMITHA JOIS	C	16/02/23	<i>[Signature]</i>
44	TEJASWI SURESH GAUNKAR	C	16/02/23	<i>[Signature]</i>
45	VAISHVI.N NAIDU	C	16/02/23	<i>[Signature]</i>
46	YOGESHWARI D	C	16/2/23	<i>[Signature]</i>
47	Nikhil Naitik	C	16-02-23	<i>[Signature]</i>
48	Shreyas Mulkashi	C	16-02-23	<i>[Signature]</i>
49	Jayshree G	C	16/02/23	<i>[Signature]</i>
50	Shailaja V	C	16/02/23	<i>[Signature]</i>
51	Shashank A shetye	C	16/02/23	<i>[Signature]</i>
52	Pranava Nayanak	C	16/02/23	<i>[Signature]</i>
53	Steffi F D Souza	C	16/02/23	<i>[Signature]</i>
54	Vibha Bhat	C	16/02/23	<i>[Signature]</i>
55	S.R. Sree Varsha	C	16/02/23	<i>[Signature]</i>
56	Reshma V	C	16/2/23	<i>[Signature]</i>
57	Sanjanya N.M	C	16/2/23	<i>[Signature]</i>
58	Naitik K.N	C	16/2/23	<i>[Signature]</i>



Workshop Organized by RVIM
on
Food and Nutrition for (MBA Batch 2021-23)
By
Dr. Trupti Bagul Khairnar (BAMS and PGd Clinical Nutrition)
Ojas Ayurveda and Nutrition Clinic (Bengaluru)

Date: 20 th / 21 st / 22 nd September 2022	Venue: Conference Hall
Time: 08.00 am to 09.30 am	Event : Workshop
No. of Participants: 167 Section: A, B and C (MBA Batch 2021-23)	Event Coordinator: Asst. Professor Ankita Shrivastava

Objectives

- To impart knowledge on important nutrients for body, daily requirements of nutrients.
- To make participants aware about signs of different deficiencies of nutrients.
- To discuss, impact of junk food on Health and Do's and Don'ts to follow.

The flow of the Event

- Introduction and information of various types of nutrients.
- Signs of different deficiencies of nutrients and Do's and Don'ts to follow.

Outcome Achieved:

Dr. Trupti Bagul Khairnar, a resource person and a practitioner at Ojas Ayurveda and Nutrition Clinic (Bengaluru), initially explained the different types and classification of nutrients, vitamins, minerals. She explained the importance of food in overall health & wellness, by discussing the balanced diet through five main groups of valuable foods. Further, she discussed the importance of breakfast in an individual's life by highlighting the measure of various nutrients to be maintained in the diet. The further discussion involved portion sizes and menu plan of various foods(raw) and nutrients. The resource person explained the signs that body shows if it is deficient in certain nutrients and precautions to be taken to avoid such deficiencies. The effect of junk food on body was also discussed during the session as well as the effects of sugar on body as well as brain was also discussed during the event.

In continuation to above discussion the resource person explained the importance of green vegetables and fruits by discussing the micronutrients provided by the intake of different fruits and vegetables.

The discussion further involved explaining oxidative stress causing an imbalance between free radicals and antioxidants in the body. A discussion on Free radical Anti-oxidant theory was taken up by the

resource person also including the sources of free radicals, as well as the ways to manage and prevent oxidative stress.

The resource person explained the role of various vitamins as memory boosters. The session also included a discussion on key points to be monitored and taken care of for a healthy diet and what a standard day plan for food intake should look like.

The resource person concluded the session with various do's and don't for leading a healthy life thus contributing in physical and mental fitness and overall wellbeing.

Feedback & Coordinator Comment:

The resource person had a rich expertise in diabetes reversal, weight management, CHL & hypertension, thyroid & PCOD management, etc. The workshop was excellent, and the resource person was very good and well versed in her knowledge on the topic. It was a great program, and the resource person has delivered in a very simple manner, and the participants have got a great insight on overall wellbeing through taking care of food and nutrition.

Event Coordinators

Prof. Ankita Shrivastava



Director

Annexure 1	Mail communication
Annexure 2	Brief profile of the speaker
Annexure 3	Attendees list
Annexure 4	Photo Gallery



Ankita Shrivastava <ankitashri.rvim@rvi.edu.in>

Fwd: Nutrition workshop for Students of RVIM

2 messages

15 September 2022 at 11:17

Dr. Purushottam Bung - director.rvim@rvi.edu.in
To: Ankita Shrivastava <ankitashri.rvim@rvi.edu.in>

For records & necessary preparations)

----- Forwarded message -----

From: Dr Trupti Kharmar <drtrupti@gmail.com>
Date: Wed, 14 Sept 2022 at 07:41
Subject: Nutrition workshop for Students of RVIM
To: director.rvim@rvi.edu.in; director.rvim@rvi.edu.in

Dear Sir

Good Morning

This is Dr Trupti

As discussed, I am going to cover below mentioned points in coming Nutrition Workshop

- 1) Important nutrients for body
- 2) Daily requirement of nutrients
- 3) Signs of different deficiencies of nutrients in diet
- 4) Impact of junk food on Health
- 5) Do's & Don't to follow

I will be available on 20th, 21st & 22nd September from 8am to 9:30am to take a class for the students.

Thank you

Regards,

Dr Trupti Kharmar

7678947606

Annexure 2

Brief Profile of the Resources Persons

Dr Trupti Bagul khairnar is a visiting consultant at Wellbeing Integrated Multi-speciality, Medicare multispeciality clinic and Pranav Ayurveda hospital.

The founder of Ojas Ayurveda and Nutrition Clinic (Bangalore).

She holds a rich expertise in diabetes reversal, weight management, CHL & hypertension, thyroid & PCOD management, etc.

As receipt of her work, she has received "We lead Achiever's Award", 2019, an Award of Excellence in field of Ayurveda & Nutrition from additional chief secretary of Karnataka, Dr. Kalpana Gopalan (IAS), Emerging Woman's achiever award as a professional of the year 2022 by K. Ratnaprabha Mam an IAS, Navodayan of the year 2022 Maharashtra state in medical field.

Dr. Trupti's future engagements includes an Advisor for Diet & Nutrition by RV Institute of Management for Unnat Bharat Abhiyaan & Rural Immersion Programmes 2022 and Nutrition Advisor for Indian Air force squadron Bangalore who are participating in upcoming 2024-25 Olympic games

Section - B Workshop Food & Nutrition 22/03/22

Sl no	UUCMS NO	Name	Section	Date Attended	Signature
1	P18FW21M0079	ADITHYAN	B		
2	P18FW21M0086	AISHWARYA G	B		
3	P18FW21M0081	AISHWARYA P	B		
4	P18FW21M0117	AMITHYAN	B		
5	P18FW21M0161	ANRUDH K	B		
6	P18FW21M0171	ANANA KSHI KASAGAR	B		
7	P18FW21M0151	ANJASALARAM RAGHAVENDRA	B		
8	P18FW21M0096	B SHASHANK	B		
9	P18FW21M0097	CHAVI RAJARETHI	B		
10	P18FW21M0123	CHETHAN KUMAR V A	B		
11	P18FW21M0096	CHHORI BALAK	B		
12	P18FW21M0105	DEEPAK GOPALAKR SHIVANI	B		
13	P18FW21M0117	DIRRAJ KUMAR B LAVAD	B		
14	P18FW21M0113	FERNANDES RICHIA FLORINDA	B		
15	P18FW21M0157	GURU JARUN G	B		
16	P18FW21M0117	HEGDE PAVANA GANAPATHI	B		
17	P18FW21M0107	JENISHA MENI JES	B		
18	P18FW21M0118	JYOSTIN KASTA	B		
19	P18FW21M0102	M RISHI	B		
20	P18FW21M0150	MEENAKSHUDAN G	B		
21	P18FW21M0164	MEENAKSHI SUDHAKAR	B		
22	P18FW21M0094	MALESH S	B		
23	P18FW21M0114	MEGHA D JOSHI	B		
24	P18FW21M0136	MUCHETI SUBBARAJI	B		
25	P18FW21M0093	NAGARAJ GANANAN HEGDE	B		
26	P18FW21M0085	NAMRATHA N	B		
27	P18FW21M0137	NANDALAKSHI B R	B		
28	P18FW21M0141	NAYELI L	B		
29	P18FW21M0166	NAYELI SETHYANA	B		
30	P18FW21M0175	NAYANA G C	B		
31	P18FW21M0083	NEELANMA M S	B		
32	P18FW21M0141	NIRANJAN ANARETHAN HEGDE	B		
33	P18FW21M0128	NUTHANA U	B		
34	P18FW21M0090	OJETHI SAI SREENITHYA	B		
35	P18FW21M0145	PALAN KUMAR M	B		
36	P18FW21M0167	PODIA V SUDHAR	B		
37	P18FW21M0106	PONDRANAPRAJYA K MANGALVEDE	B		
38	P18FW21M0069	POORNIMA I	B		
39	P18FW21M0064	PRANWALA	B		
40	P18FW21M0111	PREETHAM D VARMA	B		
41	P18FW21M0075	RAKSHITH R T	B		
42	P18FW21M0091	RAMANI JAMALI	B		
43	P18FW21M0100	RAJESH RAMACHANDRA HEGDE	B		
44	P18FW21M0162	REHANA SAI QADRI	B		
45	P18FW21M0165	SALMAN FAISAL QADRI	B		
46	P18FW21M0073	SAMEEKSHA M P	B		
47	P18FW21M0174	SHRIVINITH SUDHARTI	B		
48	P18FW21M0130	SHASHI KUMAR P	B		
49	P18FW21M0076	SHUBHA R	B		
50	P18FW21M0163	SMITHA M	B		
51	P18FW21M0128	SRIVAN SUHEL MIMESHVAR	B		
52	P18FW21M0076	SRIJITH K	B		
53	P18FW21M0051	SUBHIA KVINOD BISSATHI	B		
54	P18FW21M0152	SUDH MUSAFAEE RUIELA	B		
55	P18FW21M0153	SYED SAMEER	B		
56	P18FW21M0102	TANUSHREE P	B		
57	P18FW21M0174	TIJAS H T	B		
58	P18FW21M0138	VIPHAL SHIVARAJ	B		
59	P18FW21M0101	VASHASWINI P	B		
60	P18FW21M0140	VASANTANIK R	B		

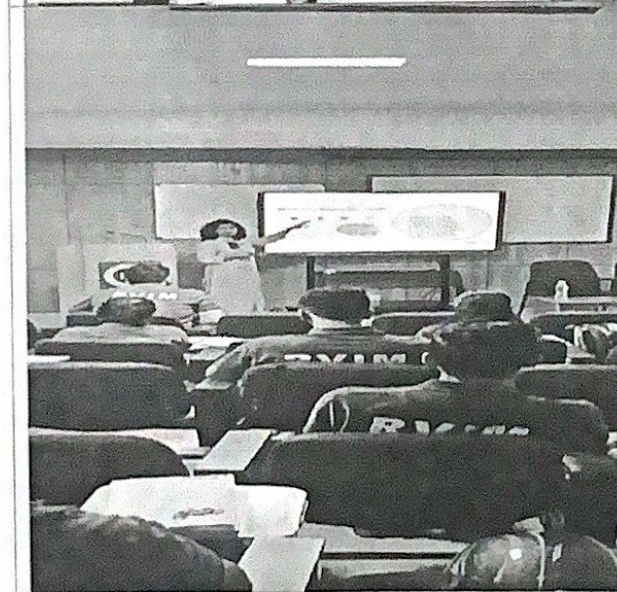
Workshop - Food & Nutrition

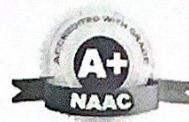
Date = 20/09/22

Sr.no	UUCMS NO	Name	Section	Date Attended	Signature
1	P18W21M00158	ADARSH THIRUMASHETTY		20/9/22	[Signature]
2	P18W21M00154	AGARWALA URBHA		20/9/22	[Signature]
3	P18W21M00157	ANANDKUMAR		20/9/22	[Signature]
4	P18W21M00159	ANURAG		20/9/22	[Signature]
5	P18W21M00155	ARJUN C		20/9/22	[Signature]
6	P18W21M00156	ARUN K S		20/9/22	[Signature]
7	P18W21M00159	GANESH K S		20/9/22	[Signature]
8	P18W21M00157	ANUSHA PRASANN		20/9/22	[Signature]
9	P18W21M00158	B S SURESH		20/9/22	[Signature]
10	P18W21M00160	BHASKAR K S		20/9/22	[Signature]
11	P18W21M00157	BIJU MIRA BHAI		20/9/22	[Signature]
12	P18W21M00159	BIJUT ANUSHA PRASANN		20/9/22	[Signature]
13	P18W21M00158	CHANDANA T S		20/9/22	[Signature]
14	P18W21M00155	CHANDAN K S		20/9/22	[Signature]
15	P18W21M00158	DANISHA S SHARMA		20/9/22	[Signature]
16	P18W21M00158	DIVYA SHREE M		20/9/22	[Signature]
17	P18W21M00159	GANI SURESH		20/9/22	[Signature]
18	P18W21M00152	MEENAKSHI SHENOY A		20/9/22	[Signature]
19	P18W21M00154	KANAKA P SURESH		20/9/22	[Signature]
20	P18W21M00155	KOJIMA VEERTHANA		20/9/22	[Signature]
21	P18W21M00160	KRISHNA		20/9/22	[Signature]
22	P18W21M00157	NI PRANEE THIRUMAR REDDY		20/9/22	[Signature]
23	P18W21M00156	N S SURESH		20/9/22	[Signature]
24	P18W21M00155	NANDHAN KUMAR E S		20/9/22	[Signature]
25	P18W21M00157	MARU N S		20/9/22	[Signature]
26	P18W21M00158	MANOJ BHASKAR P S		20/9/22	[Signature]
27	P18W21M00158	MITHRA V BHASKAR		20/9/22	[Signature]
28	P18W21M00155	NALINATHI VARDHITHA		20/9/22	[Signature]
29	P18W21M00158	NEELU S		20/9/22	[Signature]
30	P18W21M00155	RAJESH S ANJANAN		20/9/22	[Signature]
31	P18W21M00159	RAJITHA S SHARMA		20/9/22	[Signature]
32	P18W21M00152	NIKHANTH KRISHNA		20/09/22	[Signature]
33	P18W21M00154	RAVITHA L SWANTI		20/09/22	[Signature]
34	P18W21M00152	P T Jothi		20/09/22	[Signature]
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36	P18W21M00158	PRANAV K S		20/09/22	[Signature]
37	P18W21M00159	PRANAV KUMAR S		20/09/22	[Signature]
38	P18W21M00158	S KARTHIC		20/09/22	[Signature]
39	P18W21M00156	S SURESH		20/09/22	[Signature]
40	P18W21M00159	SARATHI SURESH KULLITHI		20/09/22	[Signature]
41	P18W21M00158	SARATHI SURESH		20/09/22	[Signature]
42	P18W21M00157	SARATHI SURESH		20/09/22	[Signature]
43	P18W21M00152	SATHISH RAYARA		20/09/22	[Signature]
44	P18W21M00156	SHIBBA KAS		20/09/22	[Signature]
45	P18W21M00155	SHIVANI GANAPATI ANVI KAR		20/09/22	[Signature]
46	P18W21M00159	SURESH KRISHNA		20/09/22	[Signature]
47	P18W21M00152	SURESH NARAI		20/09/22	[Signature]
48	P18W21M00154	SHRUTHI RAJESH NORA REVANBAR		20/09/22	[Signature]
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59	P18W21M00157	SURESH KANAKA		20/09/22	[Signature]
60	P18W21M00157	SURESH KANAKA		20/09/22	[Signature]

Annexure 4

Photo Gallery





Workshop Organized by RVIM
 on
General First Aid for (MBA Batch 2021-23)
 By
Team from RV College of Nursing
Bengaluru

Date: 13 th and 15 th October 2022	Venue: Seminar Hall (RV Institute of Management)
Time: 07.30 am to 10.00 am	Event : Workshop
No. of Participants: 155	Event Coordinator: Asst. Professor Ankita Shrivastava
Section: A, B and C (MBA Batch 2021-23)	

Objectives

- To impart knowledge on First Aid to Saves Lives in the early hours of requirement.
- To make participants aware about accurately assessing the situation, act appropriately, and be more conscious of safety in their own home, workplace, or community.
- To impart enough knowledge on health and safety to make students aware of their lifestyle habits and choices to avoid the risk of developing problems.

The flow of the Event

- Introduction and information on necessity of having knowledge of Basic care and Life support.
- Different types of emergencies and dos and don'ts to be taken care on such situations.

Outcome Achieved:

The team started with a quick overview of what is constituted as medical emergency, what is meant by cardiac resuscitation, including safe use of defibrillator and how to save a patient with an obstructed airway.

Following were the learning objectives as dealt by the team in their presentation:

- To know what is medical emergency.
- Learn to apply critical thinking in an emergency situation.
- Learn problem solving and communication skills.
- To work as a team and also to be a team leader.

The workshop was comprised of four sessions including, common emergencies, ensuring scene safety and primary assessment, cardiac arrest and relieving airway obstruction due to choking.

The team described the spectrum of emergency care as on-site care, care during transit and care in the hospital.

The team demonstrated how to recognize common emergencies, manage COVID – 19 safeties in community and how to understand simple interventions that can stabilize the patient.

The workshop included imparting of knowledge on various common emergencies including heart attack, snake

te, stroke, infections e.g., COVID – 19, diabetic collapse, fits and fractures, wounds, burns and life threatening bleeding.

The team further explained the importance of personal and scene safety in an emergency, steps to be taken to prevent further damage including infection control, using others in ensuring scene safety and performing primary assessment.

The workshop included thorough discussion on understanding what is Cardiac Arrest, the importance of calling for help and learning the correct steps to follow in such situation.

The session also included imparting knowledge on being able to recognize a choking victim, be able to demonstrate proper technique to relieve choking in all age groups and know how to help yourself if you choke and have airway obstruction.

Feedback & Coordinator Comment:

The resource team had a rich expertise in teaching and imparting knowledge on Basic care and Life support. The workshop was excellent, and the resource team was very good and well versed in their knowledge on the topic. It was a great program including demonstration of the scenarios using props and the resource team has delivered in a very simple manner, the participants have got a great insight on overall wellbeing.

Event Coordinators

Prof. Ankita Shrivastava



Director

Annexure 1	Mail communication
Annexure 2	Brief profile of the speaker
Annexure 3	Attendees list
Annexure 4	Photo Gallery



Ankita Shrivastava <ankitashri.rvm@rve.edu.in>

Fwd: Delivering 2 hours workshop on general first aid to 1st year students

Dr Purushottam Bung <director.rvm@rve.edu.in>
To: Ankita Shrivastava <ankitashri.rvm@rve.edu.in>

1 October 2022 at 15:23

----- Forwarded message -----

From: R V College of Nursing <nurs@rve.edu.in>
Date: Wed, 28 Sept 2022 at 12:35
Subject: Re: Delivering 2 hours workshop on general first aid to 1st year students
To: Dr Purushottam Bung <director.rvm@rve.edu.in>
Cc: Prof S R GAJENDRA SINGH <srn@rve.edu.in>

Sir,

We confirm the dates of the workshop session on First aid for 1st year students from 13.10.2022, 14.10.2022 and 15.10.2022.

Thanks & Regards
Bharati BS
RVON

On Sat, 24 Sept 2022 at 14:27, Dr. Purushottam Bung <director.rvm@rve.edu.in> wrote
Respected Sir, GA!

With reference to the above subject, we kindly request to postpone the workshop session on First aid for 1st year students earlier scheduled at 27.09.2022, 28.09.2022, 29.09.2022 to 13.10.2022, 14.10.2022, 15.10.2022 respectively due to engagement of students with programme on "Environment, Social & Governance (ESG)" on September 27th and 28th 2022.

Kindly acknowledge the same!

Thanks & Regards,

Brief Profile of the Resources Team

The Resource Team included:

- Mrs. Mamata N (HOD – Dept. of Medical Surgical Nursing).
- Mrs. Sheela (HOD – Dept. of Obstetrics and Gynaecology).
- Mr. Chethan Kumar (HOD – Dept. of community Health Nursing).
- Mrs. Navitha (HOD – Dept. Psychiatry Nursing).
- Mrs. Gauthami (HOD – Dept. of Child Health Nursing).

Annexure 3

Attendees list

Workshop - General First Aid					
Sl	Names	Section	UCIMS	Date Attended	Signature
1	CHAITANYA KAMATAGI B	A	P18FW21M0009	15/10/2022	[Signature]
2	AKASH RACHAPPA KHANAGAVI	A	P18FW21M0010	15/10/2022	[Signature]
3	SHETTY TRUPTHI CHANDRAHAS	A	P18FW21M0015	15/10/2022	[Signature]
4	HARSHITHA SRINIVAS	A	P18FW21M0018	15/10/2022	[Signature]
5	SAGI SAMPI	A	P18FW21M0019	15/10/2022	[Signature]
6	PAULOMEE BARUAH	A	P18FW21M0020	15/10/2022	[Signature]
7	NEETHA KAMATH	A	P18FW21M0021	15/10/2022	[Signature]
8	ADITYA UDAY HEGDE	A	P18FW21M0022	15/10/2022	[Signature]
9	SHREYAS G A	A	P18FW21M0023	15/10/2022	[Signature]
10	SRUJANA S	A	P18FW21M0024	15/10/2022	[Signature]
11	PRAJWAL S N	A	P18FW21M0025	15/10/2022	[Signature]
12	SUCHITRA G	A	P18FW21M0026	15/10/2022	[Signature]
13	SANKET SURESH SHIRSAT	A	P18FW21M0027	15/10/2022	[Signature]
14	ANIKET SANJAY REVANKAR	A	P18FW21M0028	15/10/2022	[Signature]
15	M LUQMAN NAWAZ	A	P18FW21M0030	15/10/2022	[Signature]
16	MADHURA A	A	P18FW21M0031	15/10/2022	[Signature]
17	H V SHREEVATSA	A	P18FW21M0032	15/10/2022	[Signature]
18	LILIMA DASH	A	P18FW21M0033	15/10/2022	[Signature]
19	KUMAR ASHUTOSH	A	P18FW21M0034	15/10/2022	[Signature]
20	RAHUL S SANGOLLI	A	P18FW21M0035	15/10/2022	[Signature]
21	GIRISH N NASHI	A	P18FW21M0036	15/10/2022	[Signature]
22	ANKITA GAJANAN NAIK	A	P18FW21M0037	15/10/2022	[Signature]
23	GURUBASAVARAJ K M	A	P18FW21M0038	15/10/2022	[Signature]
24	LIKHITHA L	A	P18FW21M0041	15-10-2022	[Signature]
25	RAHUL RAM BHAT	A	P18FW21M0042	15-10-2022	[Signature]
26	AMIT KAMADOLLISHETTARU	A	P18FW21M0043	15-10-2022	[Signature]
27	POOJARANI TALAWAR	A	P18FW21M0044	15-10-2022	[Signature]
28	ABHITHA K	A	P18FW21M0045	15-10-2022	[Signature]
29	ABHISHEK SHENOY	A	P18FW21M0047	15-10-2022	[Signature]
30	DEEPAK GIRISH KALYANI	A	P18FW21M0051	15-10-2022	[Signature]
31	ISAAC JESSE K	A	P18FW21M0052	15/10/22	[Signature]
32	VINAYAK RAO GAIKWAD K	A	P18FW21M0054	15/10/22	[Signature]
33	SUTOPA DEB	A	P18FW21M0055	15/10/22	[Signature]
34	BHASKARA PRABHU	A	P18FW21M0057	15/10/22	[Signature]
35	PRAKASH SHIVAKUMAR	A	P18FW21M0058	15/10/22	[Signature]
36	AKANKSH K G	A	P18FW21M0061	15-10-22	[Signature]
37	BERNARD FERNANDES	A	P18FW21M0062	15-10-22	[Signature]
38	VIOLA PINTO	A	P18FW21M0064	15-10-22	[Signature]
39	VARSHA	A	P18FW21M0065	15-10-22	[Signature]
40	GAGANDEEP V N	A	P18FW21M0067	15-10-22	[Signature]
41	ANUSHA	A	P18FW21M0071	15-10-22	[Signature]
42	KAVYAPRIYA J	A	P18FW21M0074	15/10/22	[Signature]
43	BASAVARAJ	A	P18FW21M0077	15/10/22	[Signature]
44	ANVITH KUMAR	A	P18FW21M0086	15/10/22	[Signature]
45	DESAI JATIN ARUN	A	P18FW21M0093	15-10-22	[Signature]
46	NAYAN KUMAR	A	P18FW21M0104	15/10/2022	[Signature]
47	DINAH NEETHA NORONHA	A	P18FW21M0116	15/10/2022	[Signature]
48	CHETAN SINGH M	A	P18FW21M0129	15/10/22	[Signature]
49	KAUSTUBH LACHAPPANAVAR	A	P18FW21M0130	15/10/2022	[Signature]
50	KSHITIJ P L	A	P18FW21M0131	- Permitted	for attendance
51	BHUVANES P	A	P18FW21M0132	15/10/22	[Signature]
52	KOKILA K	A	P18FW21M0134	15/10/22	[Signature]
53	M M JABEZ	A	P18FW21M0141	15/10/22	[Signature]
54	KALAVALA ABHISHTA	A	P18FW21M0142	15/10/22	[Signature]
55	KAPARTHI BHAVANA	A	P18FW21M0146	15/10/22	[Signature]
56	HEMA S	A	P18FW21M0149	15/10/22	[Signature]
57	RAMANABOINA ANAND KUMAR	A	P18FW21M0154	15/10/22	[Signature]
58	SNEHA U	A	P18FW21M0173	15/10/22	[Signature]
59	D SURIYA PRIYASREE	A	P18FW21M0176	15/10/22	[Signature]
60	TEJAS N	A	P18FW21M0182	15/10/22	[Signature]

13/10/2022

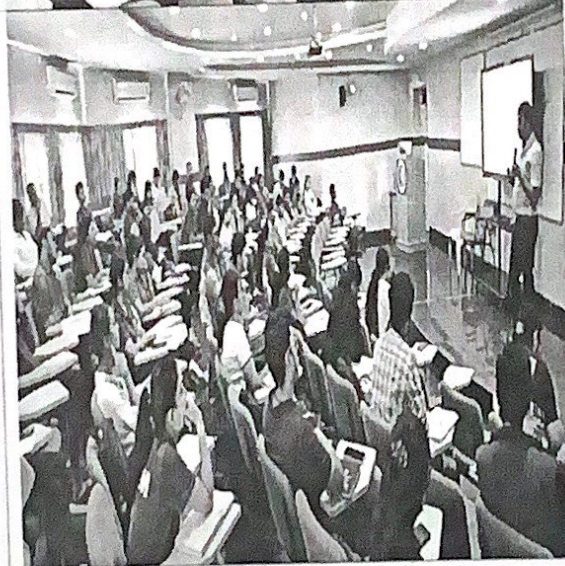
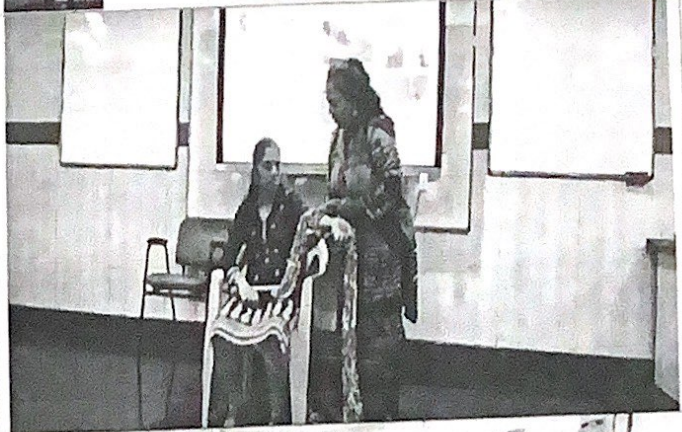
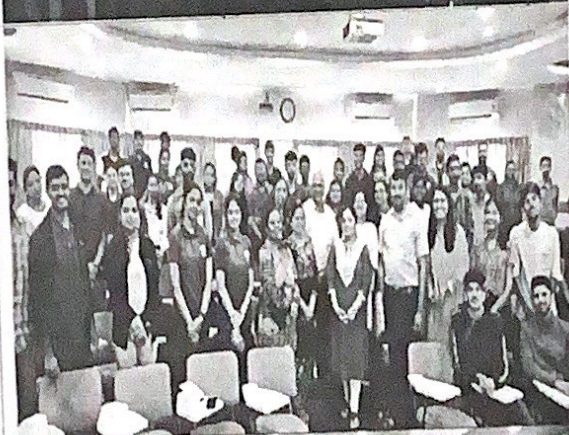
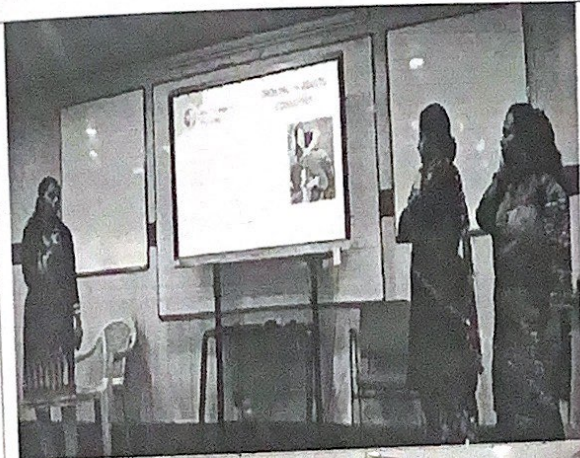
Workshop - General First Aid

Sl	Names	Section	UCIMS	Date Attended	Signature
1	AISHWARYA G	B	P18FW21M0006		AB
2	SUPRIYA GOVIND BELSARE	B	P18FW21M0053		AB
3	AISHWARYA P	B	P18FW21M0063		AB
4	CHIDRI BALAJI	B	P18FW21M0066		AB
5	PRAJWALA	B	P18FW21M0068		AB
6	POORNIMA L	B	P18FW21M0069		AB
7	SAMEEKSHA M P	B	P18FW21M0073		AB
8	RAKSHITH R T	B	P18FW21M0075		AB
9	SHUBHA R	B	P18FW21M0076		AB
10	ADITI RANI	B	P18FW21M0079		AB
11	NEELAMMA M K	B	P18FW21M0083		AB
12	NAMRATHA N	B	P18FW21M0085		AB
13	OLETI SAI SREENITHYA	B	P18FW21M0090		AB
14	RAMANUJAM H J	B	P18FW21M0091		AB
15	CHAVI JAGADEESH	B	P18FW21M0092		AB
16	MALLESH S	B	P18FW21M0094		AB
17	SRINIDHI K	B	P18FW21M0095		AB
18	B SHASHANK	B	P18FW21M0096		AB
19	NAGARAJ GAJANAN HEGDE	B	P18FW21M0099		AB
20	YASHASWINI P	B	P18FW21M0101		AB
21	TANUSHREE R	B	P18FW21M0102		AB
22	CHETHAN KUMAR V A	B	P18FW21M0103		AB
23	DEEPAK GOPALAKRISHNAN	B	P18FW21M0105		AB
24	POORNAPRAJNYA K MANGALVEDI	B	P18FW21M0106		AB
25	JENISHA MENEZES	B	P18FW21M0107		AB
26	SRAVANI SUNIL MHALSEKAR	B	P18FW21M0108		AB
27	M RITISH	B	P18FW21M0109		AB
28	PREETHAM D VARMA	B	P18FW21M0111		AB
29	DHIRAJKUMAR BELAVADI	B	P18FW21M0112		AB
30	FERNANDES RICHA FLORINDA	B	P18FW21M0113		AB
31	MEGHA U JOSHI	B	P18FW21M0114		AB
32	HEGDE PAVANA GANAPATHI	B	P18FW21M0117		AB
33	LOYSTON CRASTA	B	P18FW21M0118		AB
34	ANJANA KSHIRASAGAR	B	P18FW21M0121		AB
35	TEJAS H P	B	P18FW21M0124		AB
36	AMITH BHAT	B	P18FW21M0127		AB
37	NUTHANA U	B	P18FW21M0128		AB
38	MUCHELI SUBBARAJU	B	P18FW21M0136		AB
39	NANDAGOPAL B R	B	P18FW21M0137		AB
40	VISHAL SHIVARAJ	B	P18FW21M0138		AB
41	SHASHI KUMAR R	B	P18FW21M0139		AB
42	YASHWANTH R	B	P18FW21M0140		AB
43	NAVEEN C	B	P18FW21M0144		AB
44	PAVAN KUMAR M	B	P18FW21M0145		AB
45	MADHUSUDAN G	B	P18FW21M0150		AB
46	ANNASAGARAM RAGHAVENDRA	B	P18FW21M0151		AB
47	SYED MUSSAVEERULLA	B	P18FW21M0152		AB
48	SYED SAMEER	B	P18FW21M0153		AB
49	GURU VARUN G	B	P18FW21M0157		AB
50	NAVEEN SETTY N A	B	P18FW21M0161		AB
51	REHAN FAISAL QADRI	B	P18FW21M0162		AB
52	SMITHA M	B	P18FW21M0163		AB
53	ANIRUDH K	B	P18FW21M0164		AB
54	SALMAN FAISAL QADRI	B	P18FW21M0165		AB
55	RAVISH RAMACHANDRA HEGDE	B	P18FW21M0166		AB
56	POOJA VALLUR	B	P18FW21M0167		AB
57	MAHANTH GOWDA K C	B	P18FW21M0169		AB
58	SHAH VINIT SIDDHARTH	B	P18FW21M0174		AB
59	NAYANA G C	B	P18FW21M0175		AB
60	NIRANJAN JANARDHAN HEGDE	B	P18FW21M0181		AB

Workshop - General First Aid

Sl	Names	Section	UCIMS	Date Attended	Signature
1	VIPUL VILAS NAIK	C	P18FW21M0001	13/10/22	Vipul Naik
2	M PRANEETH KUMAR REDDY	C	P18FW21M0002	13/10/2022	Praneeth
3	NIKHIL S ANIANALLI	C	P18FW21M0003	13/10/2022	Nikhil
4	KARTHIK P SHETTY	C	P18FW21M0004	13/10/22	Karthik
5	AMITH C	C	P18FW21M0005	13/10/2022	Amith
6	AKANKSH P	C	P18FW21M0007	13/10/22	Akanksh
7	SACHITH B K	C	P18FW21M0008		Sachith
8	SOURAV SADANAND SWAR	C	P18FW21M0011	13/10/22	Sourav
9	NISHANTH KRISHNA	C	P18FW21M0012	13/10/22	Nishanth
10	MIHUL V BHASKAR	C	P18FW21M0013	13/10/22	Mihul
11	SHUBHAM RAJENDRA REVANKAR	C	P18FW21M0014	13/10/2022	Shubham
12	SHEEBAL M S	C	P18FW21M0016	13/10/2022	Sheebal
13	VISHNU KUMAR	C	P18FW21M0017	13/10/2022	Vishnu
14	AKHILA H	C	P18FW21M0029	13/10/2022	Akhila
15	ANANYA P HEGDE	C	P18FW21M0039	13/10/22	Ananya
16	NIVEDITHA K SWAMY	C	P18FW21M0040	13/10/22	Niveditha
17	S SHREYAS	C	P18FW21M0046	13/10/22	S Shreyas
18	B S SUSHEN	C	P18FW21M0048	13/10/22	B S Sushen
19	PRAJWALA H	C	P18FW21M0049	13/10/22	Prajwala
20	VAISHNAVI N	C	P18FW21M0050	13/10/22	Vaishnavi
21	M S SUKRUT	C	P18FW21M0056		M S Sukrut
22	AMOGHA Y G	C	P18FW21M0059	13/10/22	Amogha
23	BHARATH K S	C	P18FW21M0060	13/10/22	Bharath
24	SHUBIKSHA S	C	P18FW21M0070	13/10/22	Shubiksha
25	P T KIRTI	C	P18FW21M0072		P T Kirti
26	MANOJ RAKSHATH B S	C	P18FW21M0078	13/10/22	Manoj
27	DIVYA SHREE M	C	P18FW21M0080	13/10/22	Divya
28	VARUN S BHARADWAJ	C	P18FW21M0081	13/10/22	Varun
29	S KARTHIK	C	P18FW21M0082	13/10/22	S Karthik
30	PRAMOD K L	C	P18FW21M0084	13/10/22	Pramod
31	BHOOMIKA BHAT	C	P18FW21M0087	13/10/22	Bhoomika
32	SOURMYA GANAPATI HEGDE	C	P18FW21M0088	13/10/22	Sourmya
33	SHREEKRISHNA	C	P18FW21M0089	13/10/22	Shreekrishna
34	YOGASHREE C N	C	P18FW21M0097		Yogashree
35	CHARANA T U	C	P18FW21M0098	13/10/22	Charana
36	NIKITHA J SHANBHOJ	C	P18FW21M0100	13/10/2022	Nikitha
37	DHANYA S SHARMA	C	P18FW21M0110	13/10/22	Dhanya
38	GANESH HEGDE	C	P18FW21M0119	13/10/22	Ganesh
39	ANUSHA PRAKASH	C	P18FW21M0120	13/10/22	Anusha
40	JAGADISH SHENOY R	C	P18FW21M0122	13/10/22	Jagadish
41	MADHAN KUMAR C S	C	P18FW21M0123	13/10/22	Madhan
42	DHANUSH K V	C	P18FW21M0125	13/10/22	Dhanush
43	SWAMI SAMIKSHA PUSHPARAJ	C	P18FW21M0126	13/10/22	Swami
44	NALASANI VARSHITHA	C	P18FW21M0133	13/10/22	Nalasan
45	KOTHA KEERTHANA	C	P18FW21M0135	13/10/22	Kotha
46	SANKALP V	C	P18FW21M0143		Sankalp
47	MANOJ N S	C	P18FW21M0147	13/10/22	Manoj
48	SHIVAM GANAPATI ANVEKAR	C	P18FW21M0155	13/10/22	Shivam
49	SHUBHAM SINGH	C	P18FW21M0156	13/10/22	Shubham
50	ABHINEETH MASHETTY	C	P18FW21M0158	13/10/22	Abhineeth
51	PRANITH KUMAR S	C	P18FW21M0159		Pranith
52	LIKITHA A	C	P18FW21M0160		Likitha
53	BHUPALI SAURABH PRAKASH	C	P18FW21M0170	13/10/22	Bhupali
54	SYED RAHSAN	C	P18FW21M0171	13/10/22	Syed
55	SHRI HARI L	C	P18FW21M0172	13/10/22	Shri Hari
56	SATHYA B NAYAKA	C	P18FW21M0177	13/10/22	Sathya
57	NEHA H V	C	P18FW21M0178		Neha
58	SAANIL SRIKANT KULLOLI	C	P18FW21M0179	13/10/22	Saanil
59	SIMRANJIT KAUR	C	P18FW21M0180	13/10/22	Simranjit
60	AGAMYA A KINHAL	C	P18FW21M0184	13/10/22	Agamya

Annexure 4
Photo Gallery





Seminar Organized by RVIM

on

Surya Namaskar Challenge for (MBA Batch 2022-24)

Date: April 12, 2023 to April 17, 2023	Venue: Quadrangle (RV Institute of Management)
Time: 07:30 am to 09:30 am	Event: Surya Namaskar Challenge for (MBA Batch 2022-24)
No. of Participants: 180	Event Coordinator: Asst. Professor Ankita Shrivastava
Section: A, B and C (MBA Batch 2022-24)	

Objectives

In order to enhance the appeal of yoga practice and instil a sense of enthusiasm among students to incorporate yoga into their daily routines, we organized the "Surya Namaskar Challenge - MBA (2022-24)" for our first-year students. The challenge took place from April 12, 2023, to April 17, 2023, and involved the students performing 11 rounds of Surya Namaskar within 11 minutes, encompassing 12 asanas within the Surya Namaskar sequence.

The flow of the Event

- A total of 42 participants registered for the challenge, undergoing a section-wise Surya Namaskar challenge. Among them, 6 girls and 6 boys were chosen to compete against each other in the final round.
- The winners from the three distinct sections, were awarded thrilling cash prizes, in addition to the opportunity to compete against each other in the final round.

Outcome Achieved:

In order to enhance the appeal of yoga practice and instill a sense of enthusiasm among students to incorporate yoga into their daily routines, we organized the "Surya Namaskar Challenge - MBA (2022-24)" for our first-year students. The challenge took place from April 12, 2023, to April 17, 2023, and involved the students performing 11 rounds of Surya Namaskar within 11 minutes, encompassing 12 asanas within the Surya Namaskar sequence.

The participants underwent evaluation based on various criteria, including rhythm, style, final posture in each asana, overall stamina, and time management.


A total of 42 participants registered for the challenge, undergoing a section-wise Surya Namaskar challenge. Among them, 6 girls and 6 boys were chosen to compete against each other in the final round.

The winners from the three distinct sections, were awarded thrilling cash prizes, in addition to the opportunity to compete against each other in the final round.

The winners of the Finale round, comprising one boy and one girl, were honored with the prestigious titles of Mr. Yogi and Ms. Yogi of RVIM, accompanied by enticing cash prizes.

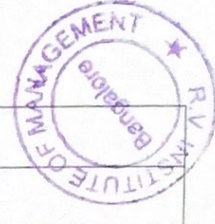
Feedback & Coordinator Comment:

The activity was designed to enhance the appeal of yoga practice and instil a sense of enthusiasm among students to incorporate yoga into their daily routines


Event Coordinators

Prof. Ankita Shrivastava



Director




Annexure 1	Mail communication
Annexure 2	Photo Gallery

Annexure 1

Mail communications

 **RVIM MBA 2022-24**
Aditi, Anita Mam , Ashok SIR, Chetan Sir RV, Deepika CR , Dilip Sir RV, Dr. Tamizharasi, Dr. Bung Sir RV Institute , Dr. Anupama Mam RV, Dr. Jahnvi, Dr. Padmali...

 Surya Namaskar Challenge.pdf
62 KB, Adobe Acrobat Document

"Surya Namaskar" CHALLENGE 2023-24 (Let's Stretch & Relax).

Register yourself and participate to give yourself a chance to win exciting prizes while attending class. - Use below link to register your name for competition.

Google Form Link- https://docs.google.com/forms/d/e/1FAIpQLSeu8Wv5_gDYbNG4D4_A8MMYlTHVtBdcmg9xTbVS8xb0u_s9fA/viewform?usp=sf_link

FIRST ROUND - Dates : Section A (12.04.2023), Wednesday
Section B (13.04.2023), Thursday
Section C (15.04.2023), Saturday

FINALE ROUND - Dates : All Three Sections (A+B+C) - 17.04.2023

For any query related to challenge, Please Contact:
Student Co-ordinator : Hema 9071684021
Manoj 8618320379
Faculty Co-ordinator : Ankita Shrivastava 7045354073.


Thanks & Regards 14:15 ✓

Section A - Kind Attention Section A students.

This is to inform that Yoga Session is scheduled tomorrow for your section at usual timing i.e. 07:30 am to 09:30am.

All the participants of Surya Namaskar Challenge from Section A. Kindly be in readiness for the event tomorrow and perform your best to win exciting cash prize .

Regards 14:18 ✓

 **RVIM MBA 2022-24**
Aditi, Anita Mam , Ashok SIR, Chetan Sir RV, Deepika CR , Dilip Sir RV, Dr. Tamizharasi, Dr. Bung Sir RV Institute , Dr. Anupama Mam RV, Dr. Jahnvi, Dr. Padmali...

+91 90089 60025 added +91 6375 414 422

Section B - Kind Attention Section B students.

This is to inform that Yoga Session is scheduled tomorrow for your section at usual timing i.e. 07:30 am to 09:30am.

All the participants of Surya Namaskar Challenge from Section B Kindly be in readiness for the event tomorrow and perform your best to win exciting cash prize .

Further to this message.

This is to inform that tomorrow's yoga session is the usual yoga class and has to be attended by all students of Section B.

Thanks and Regards 16:04 ✓



RVIM MBA 2022-24

Aditi, Anita Mam , Ashok SIR, Chetan Sir RV, Deepika CR , Dilip Sir RV, Dr Tamizharasi, Dr. Bung Sir RV Institute , Dr. Anupama Mam RV, Dr. Jahnavi, Dr. Padmali...



Section C - Kind Attention Section C students.

This is to inform that Yoga Session is scheduled on Saturday i.e. 15.04.2023 for your section at usual timing i.e. 07:30 am to 09:30am.

All the participants of Surya Namaskar Challenge from Section C, kindly be in readiness for the event on Saturday and perform your best to win exciting cash prize .

Further to this message.

This is to inform that Saturday's yoga session is the usual yoga class and has to be attended by all students of Section C

Thanks and Regards

16:15 ✓



RVIM MBA 2022-24

Aditi, Anita Mam , Ashok SIR, Chetan Sir RV, Deepika CR , Dilip Sir RV, Dr Tamizharasi, Dr. Bung Sir RV Institute , Dr. Anupama Mam RV, Dr. Jahnavi, Dr. Padmali...



Kind Attention All students – Sec (A + B + C).

This is to inform that Yoga Session for all Sections (A + B + C) is scheduled on Monday i.e., 17.04.2023 at usual timing i.e., 07:30 am to 09:30 am for next week.

All the finalists of Surya Namaskar Challenge from All Sections, kindly be in readiness for the event and perform your best to win exciting cash prize.

Further to this message.

This is to inform that Monday's (17.04.2023), yoga session is the usual yoga class (combined on one day for all sections) and has to be attended by all students of all Sections (A + B + C).

Kindly be present in yoga attire (received from college), carry your yoga mats and water bottles.

Instructions for Final Round of Surya Namaskar Challenge on Monday (17.04.2023):

For BOY Participants: 11 Rounds in 11 minutes

CONDITION: BOY Participants should stay for 30 seconds in each asana only for the FIRST ROUND and then maintain the flow from 2nd ROUND till 11th ROUND.

For GIRL Participants: 11 Rounds in 11 minutes

CONDITION: GIRL Participants should stay for 20 seconds in each asana only for the FIRST ROUND and then maintain the flow from 2nd ROUND till 11th ROUND.

Kindly take a note.

Thanks and Regards

14:23 ✓

Annexure 2

Photo Gallery







Seminar Organized by RVIM

on

Har Ghar Dhyan - Seminar for (MBA Batch 2021-23)

By

Under Aegis Azadi ka Mahotsav (AKAM), Ministry of culture, Govt. of India in collaboration with Art of living foundation, Bengaluru.

Date: 4 th Feb 2023	Venue: Seminar Hall (RV Institute of Management)
Time: 09:00 am to 10:00 am	Event: Har Ghar Dhyan - Seminar
No. of Participants: 130	Event Coordinator: Asst. Professor Ankita Shrivastava
Section: A, B and C (MBA Batch 2021-23)	

Objectives

- To impart knowledge on guided meditation.
- To brief about all importance of meditation in life.
- To understand ways through yoga and meditation towards holistic development.

The flow of the Event

- Session on guided meditation.

Outcome Achieved:

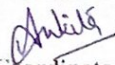
The event was organized under the Aegis Azadi ka Mahotsav (AKAM), Ministry of culture, Govt. of India in collaboration with Art of living foundation, Bengaluru.

The resource person commenced with explanation of why it is important to include mediation in day to day life. The session included discovering the transformative power of guided meditation, an immersive practice that gently directs the mind towards tranquility. Through soothing narration, practitioners are led on a journey of self-exploration, cultivating mindfulness and relaxation. The resource person talked about how focusing on breath and visualization, guided meditation fosters a profound sense of presence, reducing stress and anxiety. This accessible technique is ideal for both beginners and experienced meditators, offering a structured and supportive approach to attaining inner peace. Embrace the countless benefits of guided meditation and embark on a path of inner serenity today.

Feedback & Coordinator Comment:

The resource person had a rich expertise in teaching and imparting knowledge guided mediation. Mr. Mohit Sanjeev. He is currently working with Salesforce as a Network Security engineer. Mind Management & Meditation Trainer @ Art of living. He is associated with the Art of Living for more than 10 years and has taught courses for age groups of all sections. Apart from that he plays flute.

Ms. Manisha Soneja. Computer Science & Engineering. Graduate from PESIT. Software Developer @ Oracle with 3.5 years of experience. Mind Management & Meditation. Trainer @ Art of Living. Associated with Art of living for 4.5 years


Event Coordinators

Prof. Ankita Shrivastava


Director


Annexure 1	Mail communication
Annexure 2	Brief profile of the speaker
Annexure 3	Attendees list
Annexure 4	Photo Gallery



Phone : 011-26131577 - 76, 80
011-29581009
Website : www.aicte-india.org



सत्यमेव जयते

अखिल भारतीय तकनीकी शिक्षा परिषद्

(भारत सरकार का एक सचिवालय विभाग)

(शिक्षा विभाग, भारत सरकार)

नेल्सन मंडेला मार्ग, वसंत कुंज, नई दिल्ली-110070

ALL INDIA COUNCIL FOR TECHNICAL EDUCATION

(A Statutory Body of the Govt. of India)

(Ministry of Education, Govt. of India)

Nelson Mandela Marg, Vasant Kunj, New Delhi-110070

F. No. AICTE/P&AP/Misc/2022/

Dated: 23.12.2022

CIRCULAR

To

All Vice Chancellors of Technical Universities and
All Directors/ Principals of AICTE Approved Institutions,

Subject: "Har Ghar Dhyam" (HGD) as a part of Azadi ka Amrit Mahotsav- Reg.

Sir/Madam,

Under the Aegis Azadi Ka Amrit Mahotsav (AKAM), Ministry of Culture, Govt. of India has collaborated with the Art of Living Foundation, Bengaluru and launched a campaign "Har Ghar Dhyam" (HGD). One hour introductory sessions on meditation and mental health for people from all walks of life would be conducted in this regard. The modules have been developed by the founder of Art of living Sri Ravi Shankar Ji and trained faculty from Art of Living shall conduct these sessions free of cost for the interested organizations.

You are therefore, requested to disseminate the information to students, staff and faculty members about HGD and take up the following activities:

- Introduce students and faculty members to meditation as a solution for positive mental health.
- Students should be facilitated to conduct one-hour introductory session on meditation and health for people from all walks of life.

All the technical universities/institutions may fill up the request form on tiny.cc/hgd-college and nominate a senior faculty member /staff member as "Meditation Ambassador" for this program.

The photos of the activities relating to the programme undertaken may be uploaded on the institute's website.

Regards

(Dr. Ramesh Unnikrishnan)

Advisor-II

Policy & Academic Planning Bureau



शिक्षा का
विभाग

Annexure 2

Brief Profile of the Resources Person

The resource person had a rich expertise in teaching and imparting knowledge guided mediation. Mr. Mohit Sanjeev. He is currently working with Salesforce as a Network Security engineer. Mind Management & Meditation Trainer @ Art of living. He is associated with the Art of Living for more than 10 years and has taught courses for age groups of all sections. Apart from that he plays flute.

Ms. Manisha Soneja. Computer Science & Engineering. Graduate from PESIT. Software Developer @ Oracle with 3.5 years of experience. Mind Management & Meditation. Trainer @ Art of Living. Associated with Art of living for 4.5 years

Annexure 3
Attendees list

Section-A
Har Ghar Dhyam - One Hour Session "04th Feb. 2023" (09:00 am to 10:00 am)

Attendance Sheet

Sl.No.	USN	STUDENT FULL NAME	Section	Date	Signature
1	P18FW21M0003	NIKHIL S ANJANALLI	A	4-2-2023	<i>[Signature]</i>
2	P18FW21M0007	AKANKSH P	A		
3	P18FW21M0012	NISHANTH KRISHNA	A	04/02/2023	<i>[Signature]</i>
4	P18FW21M0016	SHEEBAL MS	A	4-2-23	<i>[Signature]</i>
5	P18FW21M0017	VISHNU KUMAR	A	4-2-23	<i>[Signature]</i>
6	P18FW21M0020	PAULOMEE BARUAH	A	4-2-23	<i>[Signature]</i>
7	P18FW21M0021	NEETHA KAMATH	A		
8	P18FW21M0024	SRUJANA S	A	4-2-23	<i>[Signature]</i>
9	P18FW21M0033	LILIMA DASH	A	4-2-23	<i>[Signature]</i>
10	P18FW21M0037	ANKITA GAJANAN NAIK	A	4-2-23	<i>[Signature]</i>
11	P18FW21M0038	GURUBASAVARAJ K M	A	4-2-23	<i>[Signature]</i>
12	P18FW21M0039	ANANYA P HEGDE	A	4-2-23	<i>[Signature]</i>
13	P18FW21M0040	NIVEDITHA K SWAMY	A	4/2/23	<i>[Signature]</i>
14	P18FW21M0045	ABHITHA K	A	4/2/23	<i>[Signature]</i>
15	P18FW21M0046	S SHREYAS	A		
16	P18FW21M0051	DEEPAK GIRISH KALYANI	A	04/02/2023	<i>[Signature]</i>
17	P18FW21M0052	ISAAC JESSE K	A		
18	P18FW21M0054	VINAYAK RAO GAIKWAD K	A	4/2/23	<i>[Signature]</i>
19	P18FW21M0055	SUTOPIA DEB	A	4-2-23	<i>[Signature]</i>
20	P18FW21M0059	AMOGHA Y G	A	4-2-2023	<i>[Signature]</i>
21	P18FW21M0061	AKANKSH K G	A		
22	P18FW21M0062	BERNARD FERNANDES	A	4-2-2023	<i>[Signature]</i>
23	P18FW21M0067	GAGANDEEP V N	A	04/02/2023	<i>[Signature]</i>
24	P18FW21M0073	SAMEEKSHA M P	A		
25	P18FW21M0075	RAKSHITH R T	A	4/2/23	<i>[Signature]</i>
26	P18FW21M0076	SHUBHA R	A	4/2/23	<i>[Signature]</i>
27	P18FW21M0078	MANOJ RAKSHATH B S	A		
28	P18FW21M0080	DIVYA SHREE M	A	4/2/23	<i>[Signature]</i>
29	P18FW21M0081	VARUN S BHARADWAJ	A	4/2/23	<i>[Signature]</i>
30	P18FW21M0082	S KARTHAK	A		
31	P18FW21M0083	NEELAMMA M K	A		
32	P18FW21M0086	ANVITH KUMAR	A	4/2/23	<i>[Signature]</i>
33	P18FW21M0088	SOUMYA GANAPATI HEGDE	A	4-02-2023	<i>[Signature]</i>
34	P18FW21M0090	OLETTI SAI SREENITHYA	A	4-02-23	<i>[Signature]</i>
35	P18FW21M0091	RAMANUJAM H J	A	4-02-2023	<i>[Signature]</i>
36	P18FW21M0092	CHAVI JAGADEESH	A	4-2-2023	<i>[Signature]</i>
37	P18FW21M0093	DESAI JATIN ARUN	A		
38	P18FW21M0097	YOGASHREE C N	A	4/02/23	<i>[Signature]</i>
39	P18FW21M0099	NAGARAJ GAJANAN HEGDE	A	4/2/2023	<i>[Signature]</i>
40	P18FW21M0101	YASHASVINI P	A		
41	P18FW21M0105	DEEPAK GOPALAKRISHNAN	A	4/2/2023	<i>[Signature]</i>
42	P18FW21M0106	POORNAPRAJNYA K MANGALVEDI	A		
43	P18FW21M0108	SRAVANI SUNIL MHALSEKAR	A	4/2/2023	<i>[Signature]</i>
44	P18FW21M0111	PREETHAM D VARMA	A		
45	P18FW21M0113	FERNANDES RICHA FLORINDA	A		
46	P18FW21M0122	JAGADISH SHENDY R	A		
47	P18FW21M0128	NUTHANA U	A	4/2/2023	<i>[Signature]</i>
48	P18FW21M0136	MUCHELI SUBRAHAJU	A	4/2/23	<i>[Signature]</i>
49	P18FW21M0137	NANDAGOPAL B R	A	4/2/23	<i>[Signature]</i>
50	P18FW21M0139	SHASHI KUMAR R	A	4-02-2023	<i>[Signature]</i>
51	P18FW21M0140	YASHWANTH K	A		
52	P18FW21M0146	KAPANTHI BHAVANA	A	4-02-2023	<i>[Signature]</i>
53	P18FW21M0157	GURU VARUN G	A		
54	P18FW21M0159	PRANITH KUMAR S	A	4-2-2023	<i>[Signature]</i>
55	P18FW21M0160	LIKITHA A	A	4/2/2023	<i>[Signature]</i>
56	P18FW21M0172	SHRI HARI L	A	4/2/2023	<i>[Signature]</i>
57	P18FW21M0174	SHAH VINIT SIDDHARTH	A	4/2/2023	<i>[Signature]</i>
58	P18FW21M0180	SIBRANBIT KAUR	A	4/2/23	<i>[Signature]</i>
59	P18FW21M0182	ELIAS N	A		
60	P18FW21M0184	AGAMYA A KINHAL	A		

Section - B

Har Ghar Dhyam - One Hour Session "04th Feb. 2023" (09:00 am to 10:00 am)

Attendance Sheet

Sl No.	USN	STUDENT FULL NAME	Section	Date	Signature
1	P18FW21M0001	VIPUL VILAS MAIK	B		
2	P18FW21M0004	KARTHIK P SHETTY	B		
3	P18FW21M0006	AISHWARYA G	B		
4	P18FW21M0011	SOURAV SADANAND SWAR	B	04/02/23	<i>[Signature]</i>
5	P18FW21M0013	MEHUL V BHASKAR	B	04/02/23	Mehul
6	P18FW21M0014	SHUBHAM RAJENDRA REVANKAR	B		
7	P18FW21M0015	SHETTY TRUPTHI CHANDRAHAS	B		
8	P18FW21M0022	ADITYA UDAY HEGDE	B	4/02/2023	<i>[Signature]</i>
9	P18FW21M0029	AKHILA H	B	4/02/23	<i>[Signature]</i>
10	P18FW21M0031	MADHURA A	B	4/02/23	<i>[Signature]</i>
11	P18FW21M0032	H V SHREEVATSA	B	4/02/2023	<i>[Signature]</i>
12	P18FW21M0043	AMIT KAMADOLLISHETTARU	B	4/02/2023	<i>[Signature]</i>
13	P18FW21M0044	POOJARAN TALAWAR	B	4/2/2023	<i>[Signature]</i>
14	P18FW21M0050	VAISHNAVI N	B	4/2/2023	<i>[Signature]</i>
15	P18FW21M0053	SUPRIYA GOVIND BELSARE	B		
16	P18FW21M0057	BHASKARA PRABHU	B	04/2/2023	<i>[Signature]</i>
17	P18FW21M0063	AISHWARYA P	B	4/2/23	<i>[Signature]</i>
18	P18FW21M0066	CHIDRI BALAJI	B	4/2/2023	<i>[Signature]</i>
19	P18FW21M0070	SHUBIKSHA S	B	4/2/2023	<i>[Signature]</i>
20	P18FW21M0071	ANUSHA	B		
21	P18FW21M0072	P T KIRTI	B	4/2/2023	<i>[Signature]</i>
22	P18FW21M0077	DASAVARUJ	B	04/2/2023	<i>[Signature]</i>
23	P18FW21M0085	NAMRATHA N	B	04/02/23	<i>[Signature]</i>
24	P18FW21M0096	B SHASHANK	B	4/2/2023	<i>[Signature]</i>
25	P18FW21M0100	NIKITHA J SHANDHOG	B	4/2/23	<i>[Signature]</i>
26	P18FW21M0103	CHE THAN KUMAR V A	B	04/02/23	<i>[Signature]</i>
27	P18FW21M0104	NAYAN KUMAR	B	04/02/23	<i>[Signature]</i>
28	P18FW21M0107	JENISHA MENZIES	B		
29	P18FW21M0109	N RITISH	B		
30	P18FW21M0112	DHIRAJKUMAR BELAVADI	B		
31	P18FW21M0114	MEGHA U JOSHI	B		
32	P18FW21M0116	DINAH NEETHA NORDINHA	B		
33	P18FW21M0119	GANESH HEGDE	B	4/2/23	<i>[Signature]</i>
34	P18FW21M0120	ANUSHA PRAKASH	B	4/2/23	<i>[Signature]</i>
35	P18FW21M0123	MADHAN KUMAR C S	B	4/2/2023	<i>[Signature]</i>
36	P18FW21M0124	TEJAS H P	B		
37	P18FW21M0126	SWAMI SAMIKSHA PUSHPARAJ	B	4/2/2023	<i>[Signature]</i>
38	P18FW21M0129	CHE TAN SINGH M	B	4/2/2023	<i>[Signature]</i>
39	P18FW21M0130	KAUSTUBH LACHAPPANAVAR	B	4/2/2023	<i>[Signature]</i>
40	P18FW21M0133	NALASANI VARSHITHA	B	4-2-2023	<i>[Signature]</i>
41	P18FW21M0138	VISHAL SHIVARAJ	B	4/2/23	<i>[Signature]</i>
42	P18FW21M0142	KALAVALLA ABHISHTA	B	4/2/23	<i>[Signature]</i>
43	P18FW21M0145	PAVAN KUMAR M	B	4-2-23	<i>[Signature]</i>
44	P18FW21M0147	MANOJ N S	B	4/2/2023	<i>[Signature]</i>
45	P18FW21M0149	HEMA S	B	4/02/2023	<i>[Signature]</i>
46	P18FW21M0150	MADHUSUDAN G	B	4/2/23	<i>[Signature]</i>
47	P18FW21M0153	SYED SAMIR	B		
48	P18FW21M0156	SHUBHAM SINGH	B		
49	P18FW21M0158	ABHJEETI MASHETTY	B		
50	P18FW21M0161	NAVEEN SETTY N A	B	4-2-2023	<i>[Signature]</i>
51	P18FW21M0163	SMITRA M	B		
52	P18FW21M0164	ANIRUDEH K	B		
53	P18FW21M0165	SALMAN FAISAL QADRI	B		
54	P18FW21M0170	BHUPALI SAURABH PRAKASH	B		
55	P18FW21M0176	D SURIYA PRIYASREE	B	4/2/23	<i>[Signature]</i>
56	P18FW21M0177	SATHYA B NAYAKA	B		
57	P18FW21M0178	NEHA H V	B	4/2/23	<i>[Signature]</i>
58	P18FW21M0179	SAAHIL SRIKANT KULLOLI	B		
59	P18FW21M0181	NIRANJAN JANARDHAN HEGDE	B	4/2/2023	<i>[Signature]</i>

Section - c.

Har Ghar Dhyan - One Hour Session "04th Feb. 2023" (09:00 am to 10:00 am)

Attendance Sheet

Sl No.	USN	STUDENT FULL NAME	Section	Date	Signature
1	P18FW21M0002	M PRANEETH KUMAR REDDY	C	4-2-2023	<i>Praneeth</i>
2	P18FW21M0005	AMITH C	C	4-2-2023	<i>Amith</i>
3	P18FW21M0008	SACHITH B K	C		
4	P18FW21M0009	CHAITANYA KAMATAGI B	C	4-2-2023	<i>Chaitanya</i>
5	P18FW21M0010	AKASH RACHAPPA KHANAGAVI	C	4-2-2023	<i>Akash</i>
6	P18FW21M0018	HARSHITHA SRINIVAS	C	4-2-2023	<i>Harshitha</i>
7	P18FW21M0019	SAGI SAMPI	C	4-2-2023	<i>Sagi</i>
8	P18FW21M0023	SHREYAS G A	C	4-2-2023	<i>Shreyas G.A.</i>
9	P18FW21M0025	PRAJWAL S N	C		
10	P18FW21M0026	SUCHITRA G	C		
11	P18FW21M0027	SANKET SURESH SHIRSAT	C	4-2-2023	<i>Sanket</i>
12	P18FW21M0028	ANIKET SANJAY REVANKAR	C		
13	P18FW21M0030	M LUQMAN NAWAZ	C		
14	P18FW21M0034	KUMAR ASHUTOSH	C		
15	P18FW21M0035	RAHUL S SANGOLLI	C		
16	P18FW21M0036	GIRISH N NASIH	C	4/2/2023	<i>Girish</i>
17	P18FW21M0041	LIKHITHA L	C	4/2/2023	<i>Likhitha</i>
18	P18FW21M0042	RAHUL RAM BHAT	C	4/2/2023	<i>Rahul</i>
19	P18FW21M0047	ABHISHEK SHENDY	C		
20	P18FW21M0048	B S SUSHEN	C	4/2/2023	<i>Sushen</i>
21	P18FW21M0049	PRAJWALA H	C	4.02.2023	<i>Prajwala.H</i>
22	P18FW21M0056	M S SUKRLIT	C		
23	P18FW21M0058	PRAKASH SHIVAKUMAR	C		
24	P18FW21M0060	BHARATH K S	C		
25	P18FW21M0064	VIOLA PINTO	C		
26	P18FW21M0065	VARSHA	C		
27	P18FW21M0068	PRAJWALA	C	4/2/2023	<i>Prajwala</i>
28	P18FW21M0069	POORNIMA L	C	4/2/2023	<i>Poornima</i>
29	P18FW21M0074	KAVYAPRIYA J	C		
30	P18FW21M0079	ADITI RANI	C	4/2/2023	<i>Aditi</i>
31	P18FW21M0084	PRAMOD K L	C		
32	P18FW21M0087	BHOOMIKA BHAT	C		
33	P18FW21M0089	SHREE KRISHNA	C	4/2/2023	<i>Shree</i>
34	P18FW21M0094	MALLESH S	C	4/2/2023	<i>Mallesha</i>
35	P18FW21M0095	SRINIDHI K	C	4/2/2023	<i>Srinidhi</i>
36	P18FW21M0098	CHARANA T U	C	4/2/2023	<i>Charana</i>
37	P18FW21M0102	TANUSHREE R	C		
38	P18FW21M0110	DHANYA S SHARMA	C		
39	P18FW21M0117	HEGDE PAVANA GANAPATHI	C	4/2/2023	<i>Pavana</i>
40	P18FW21M0118	LOYSTON CRASTA	C		
41	P18FW21M0121	ANJANA KSHIRASAGAR	C	4/2/2023	<i>Anjana</i>
42	P18FW21M0125	DHANUSH K V	C		
43	P18FW21M0127	AMITH BHAT	C		
44	P18FW21M0131	KSHITIJ PL	C	4/2/2023	<i>Kshitij</i>
45	P18FW21M0132	BHRUVANES P	C		
46	P18FW21M0134	KOKILA K	C	4/2/2023	<i>Kokila</i>
47	P18FW21M0135	KOTHA KEERTHANA	C	4-2-2023	<i>Keertana</i>
48	P18FW21M0141	M M JABEZ	C		
49	P18FW21M0143	SANKALP V	C		
50	P18FW21M0144	NAVEEN C	C	4/02/23	<i>Naveen</i>
51	P18FW21M0151	ANNASAGARAM RAGHAVENDRA	C	4-2-23	<i>Annasa</i>
52	P18FW21M0152	SYED MUSSAVEERULLA	C		
53	P18FW21M0154	RAMANABOINA ANAND KUMAR	C	4-2-23	<i>Raman</i>
54	P18FW21M0155	SHIVAM GANAPATI ANVEKAR	C	4-2-23	<i>Shivam</i>
55	P18FW21M0162	BEHAN FAISAL QADRI	C		
56	P18FW21M0166	RAVISH RAMACHANDRA HEGDE	C	4-2-2023	<i>Ravish</i>
57	P18FW21M0167	POOJA VALLUR	C	4-2-2023	<i>Pooja</i>
58	P18FW21M0169	MAHANATH GOWDA K C	C	4/02/23	<i>Maha</i>
59	P18FW21M0171	SYED RAHMAN	C	4/02/23	<i>Syed</i>
60	P18FW21M0178	SNEHA U	C	4/02/23	<i>Sneha</i>
61	P18FW21M0175	NAYANA G C	C		

Annexure 4
Photo Gallery

