

TRAFFIC AND CAPACITY ANALYTICS FOR MAJOR PORTS

A PROJECT REPORT

Submitted by

A. VARSHA (192071107)

M. SIVA SARASWATHI(192071088)

A. SOUNDARYA LAKSHMI(192071089)

R.K. VISHALI(192071115)

In partial fulfilment for the award of the degree of

BACHELOR OF TECHNOLOGY

in

INFORMATION TECHNOLOGY

DEPARTMENT of INFORMATION TECHNOLOGY

MAHENDRA ENGINEERING COLLEGE (AUTONOMOUS)

Mahendhirapuri, Mallasamudram, Namakkal-637 503.

NOVEMBER - 2022

CHAPTER 1

INTRODUCTION

1.1 PROJECT OVERVIEW:

In recent years, the transport in line with communication, liberalization, and international standardization shaped the four pillars of globalisation. Maritime transport known as the backbone of the global trade as more than 90 percent of world cargo, in volume, is carried by sea. Among all transport modes, shipping is the most cost-effective way of cargo transport.

1.2 PURPOSE:

The goal of this project is to employ analytical improvements to enhance port services and operations. The goal is to provide a comprehensive study of the limited research on ports with a focus on the role of Cognos Analytics. A few of the port

services that are optimised by smart port management include delays, weather, procedures, and applications, port loading. It has been suggested to use Data Analytics platforms to build a networked and collaborative platform that enables information sharing among various hardware and infrastructures in order to install smart applications.

CHAPTER 2

LITERATURE SURVEY

2.1 EXISTING SYSTEM

The accuracy of traffic flow forecasting plays an important role in the field of

modern Intelligent Transportation Systems (ITS). Summarizing the existing forecasting models and considering the characteristics of the traffic itself such as nonlinearity, complexity and uncertainty, the prediction accuracy for traffic flow by the traditional method is often lower. In this paper, a combined forecasting method (Grey Model and Least Squares Support Vector Machine, GM-LSSVM) based on grey model (GM) and least squares support vector machine (LSSVM) algorithm was proposed. In the proposed forecasting model the advantages of grey model such as less raw data to be required, simple to model and convenient to calculate are fully utilized and the features of LSSVM such as strong generalization ability, good nonlinear fitting ability and less samples to be required are combined, thus the forecasting accuracy can be improved. The combined model was validated on real traffic data and simulation results show that the proposed combination forecasting method is effective and practicable. The prototype model provides a digital traffic wall. The virtual wall includes led light which makes up a red coloured virtual wall just before the zebra crossing on the road. The led are arranged on a bar joining the poles on the two sides of the road. This model, majorly designed for use in Indian subcontinent also includes a simple conventional timer for red light on top of the left pole. The virtual wall in the prototype model is novel in design and full in humanization, can separate pedestrians from vehicles, and provides more eye-catching reminding or warning to the pedestrians and drivers, thereby enabling people to pay more attention to traffic marks ahead, and reducing probability of occurrence of traffic accident.

2.2 REFERENCES

1. Anindita-Mandal: January 2016 ,Performance Analysis of Major Ports in India: A Quantity Approach. 10-year period (from 2003 to 2013).
2. Chandrasekhar Iyer.K, V.P.S.N.Nanyam: July 2021, Concentration Analysis of Container Terminals in India, Since 2015.
3. Davis, Gary A., and Nancy L. Niha: 1998, Nonparametric regression and short-term freeway traffic forecasting. Journal of Transportation Engineering 117.2 (1991): 178188.
4. Fleming, Douglas K., and Yehuda Hayuth: 1994, Spatial characteristics of transportation hubs: centrality and intermediacy. Journal of transport geography 2.1 ,3-18 .
5. Jasem Al-Hammadi and Ali Diabat: August 2015, Integrated Berth Allocation and Yard Assignment problem for Bulk Ports: Formulation and Case Study.
6. Okutani, Iwao, and Yorgos J. Stephanedes: July (1984),Dynamic prediction of traffic volume through Kalman filtering theory.Transportation Research Part B: Methodological 18.1.
7. Shuhong Peng, Junaid Quair: April 2020, Enhancing Port Activities Using Information and Communication Technology using IoT.

8. Smith, Brian Lee, Billy M. Williams, and R. Keith Oswald: 2000 Jan, Parametric and nonparametric traffic volume forecasting. Transportation Research Board 79th Annual Meeting.
9. Virginia Fernandez Argudas, Giuliana Pallota, Michele Vespe: May 2017, From Historical Positioning Data to Unsupervised Maritime Traffic Monitoring.

2.3 Problem Statement definition

A well-articulated customer problem statement allows you and your team to find the ideal solution for the challenges your customers face. Throughout the process, you'll also be able to empathize with your customers, which helps you better understand how they perceive your product or service.

Table 2.3 Problem Statement

Problem Statement (PS)	I am (customer)	i'm trying to	But	Because	Which makes feel
PS 1	Business	Track and auto	It is difficult to	Congesiton may	Tensed and

	People	Capture Real time shipment	track	cause delay in arrival of goods	frustated
PS 2	Government sector people	To avoid congestion in future	There is lack of sufficient data to predict the congestion	It is difficult to handle port connectivity to identify the congestion	Unpredictable and confused

CHAPTER 3

IDEATION AND PROPOSED SOLUTION

3.1 Empathy Map Canvas

Build empathy and keep your focus on the user by putting yourself in their shoes.

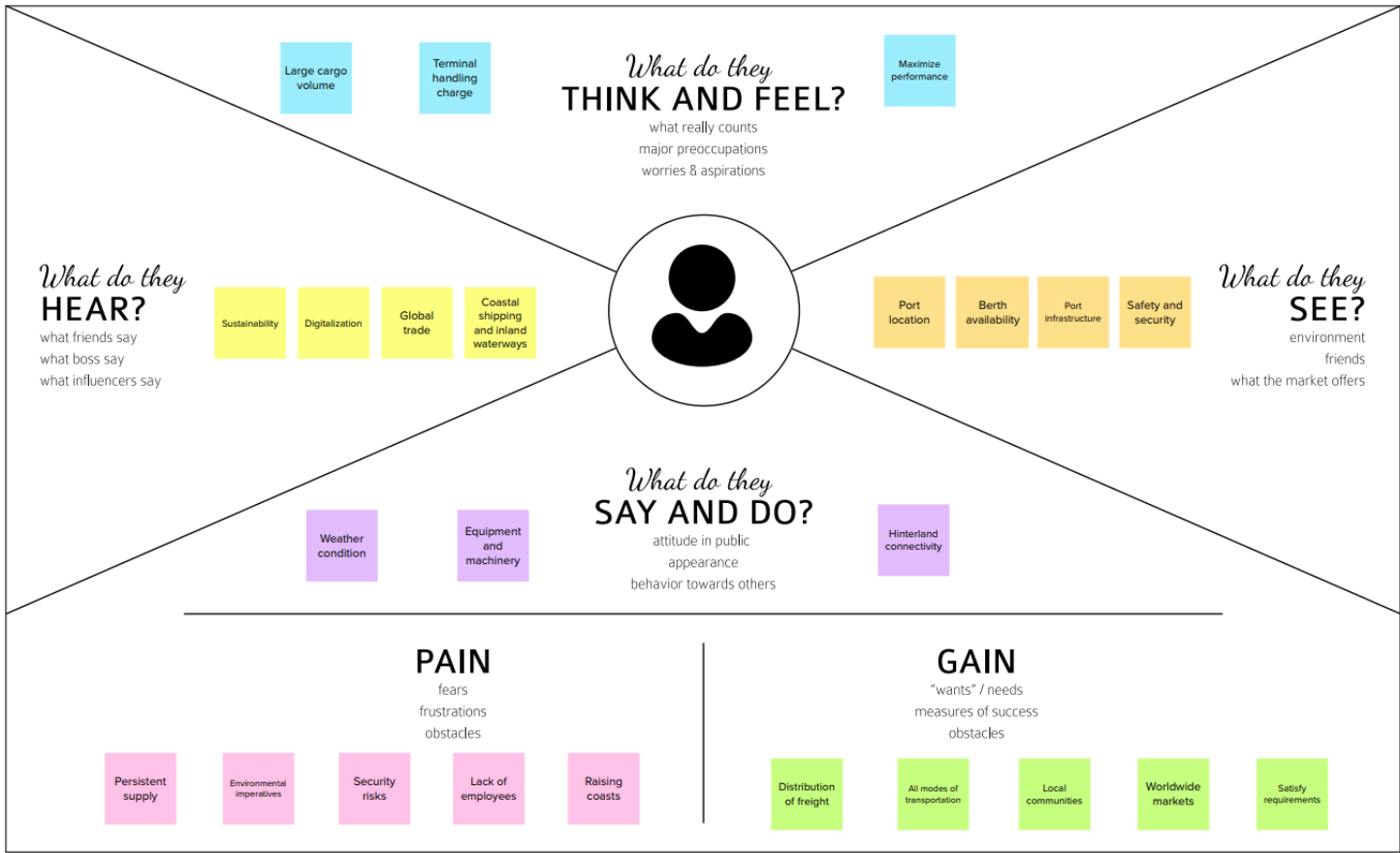


Fig.3.1 Empathy map

3.2 Ideation and Brainstorming




Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions. Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room. Brainstorm & Idea Prioritization for “Traffic and Capacity Analytics for Major Ports”:

3.3 Proposed Solution

S.No.	Parameter	Parameter
1.	Problem Statement (Problem to be solved)	The Indian railways has a capital base of about 1 lakh crores and is often referred to as the lifeline of the Indian economy. As it includes transportation of bulk freight and long-distance passengers, traffic and congestion on rail corridors becomes a major challenge
2.	Idea / Solution description	Data analytics can be applied to visualize freight Transportation and congestion on rail corridors across major railway ports to get better insight of the working of port network and to improve the port connectivity

3.	Novelty / Uniqueness	Can also predict the time at which the particular Train will arrive and depart.
4.	Social Impact / Customer Satisfaction	Adequate resources will be provided for the customers regarding the arrival, departure and delay of the trains
5.	Business Model (Revenue Model)	Businesses using railway ports can easily track the trains. Government can use data analytics dashboard to ensure less traffic on the ports.
6.	Scalability of the Solution	The solution can be used almost for all modes of transportation including the ships and so on. Thus it is scalable for almost all modes of transportation

3.4 Proposed Solution Fit

Define CS, fit into CC	<p>1. CUSTOMER SEGMENT(S) </p> <ul style="list-style-type: none"> Business people Government sector people Rail passengers 	<p>6. CUSTOMER CONSTRAINTS </p> <ul style="list-style-type: none"> Failed to track their goods Not able to predict the arrival/ departure time of train Passengers do not know the correct arrival time. 	<p>5. AVAILABLE SOLUTIONS </p> <ul style="list-style-type: none"> Dashboard is created to visualize the good status Predictive Analytics is done. 	Explore AS, differentiate

Focus on J&P, tap into BE, understand RC	<p>2. JOBS-TO-BE-DONE / PROBLEMS J&P</p> <ul style="list-style-type: none"> Port status is monitored regularly via dashboard 	<p>9. PROBLEM ROOT CAUSE RC</p> <ul style="list-style-type: none"> The departure/arrival delay may causes congestion in ports. 	<p>7. BEHAVIOUR BE</p> <ul style="list-style-type: none"> Should monitor the dashboard on regular basis. 	Focus on J&P, tap into BE, understand RC
Identify strong TR & EM	<p>3. TRIGGERS TR</p> <ul style="list-style-type: none"> Government needs to prevent congestion in future. For business people to track their needs For passengers to catch the train on time. 	<p>10. YOUR SOLUTION SL</p> <ul style="list-style-type: none"> Dashboard is created to visualize the goods and port status. Predictive Analytics is done. 	<p>8. CHANNELS of BEHAVIOUR CH</p> <p>8.1ONLINE Updating the arrival and departure time of train</p> <p>8.2OFFLINE Reducing the congestion in ports</p>	
	<p>4. EMOTIONS: BEFORE / AFTER EM</p> <p>BEFORE</p> <ul style="list-style-type: none"> Business people could not be able to track their goods. Passengers may not be able to catch the train on time. <p>AFTER</p> <ul style="list-style-type: none"> Business people can be able to track their goods. Passengers can able to catch the train on time. 			

CHAPTER 4

REQUIREMENT ANALYSIS

4.1 Functional Requirement

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Location Tracking	Location of Ships and Trains are monitored via GPS
FR-4	Historical Data	The information of past record is necessary
FR-5	Reporting Requirements	The requirements of the project should be met
FR-6		Applying algorithms on the test data set

4.2 Non Functional Requirement

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
--------	----------------------------	-------------

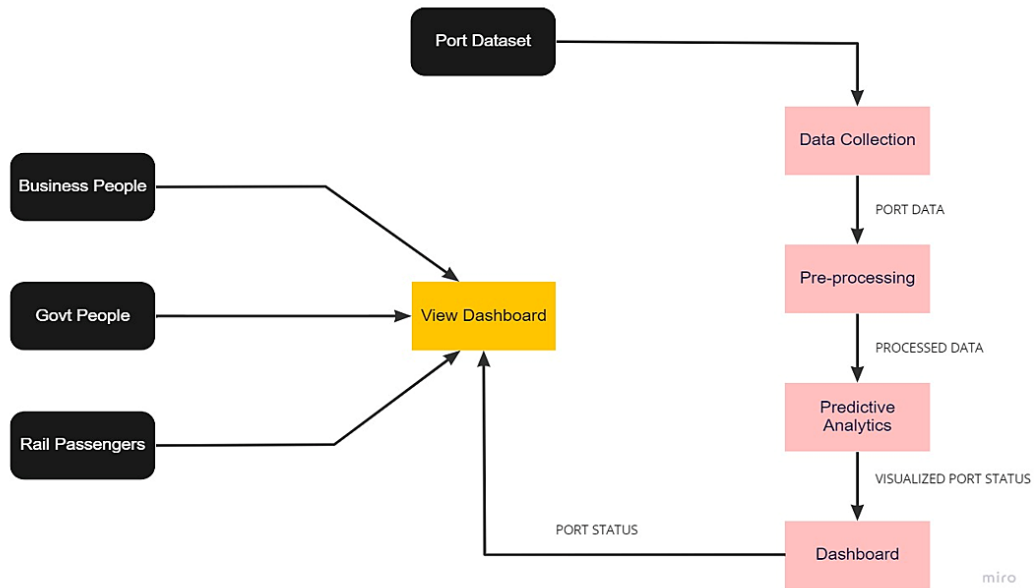
NFR-1	Usability	The traffic rate is analyzed using graphs and a record is maintained clearly for future use.
NFR-2	Security	No other persons can access this application except the team allotted for it.
NFR-3	Reliability	It is easy to access and control traffic.
NFR-4	Performance	The performance is fast and robust. Automatically schedules time for trains.
NFR-5	Availability	These projects are available for any authorized port that needs to reduce traffic.

CHAPTER 5

PROJECT DESIGN

5.1 Data Flow Diagram

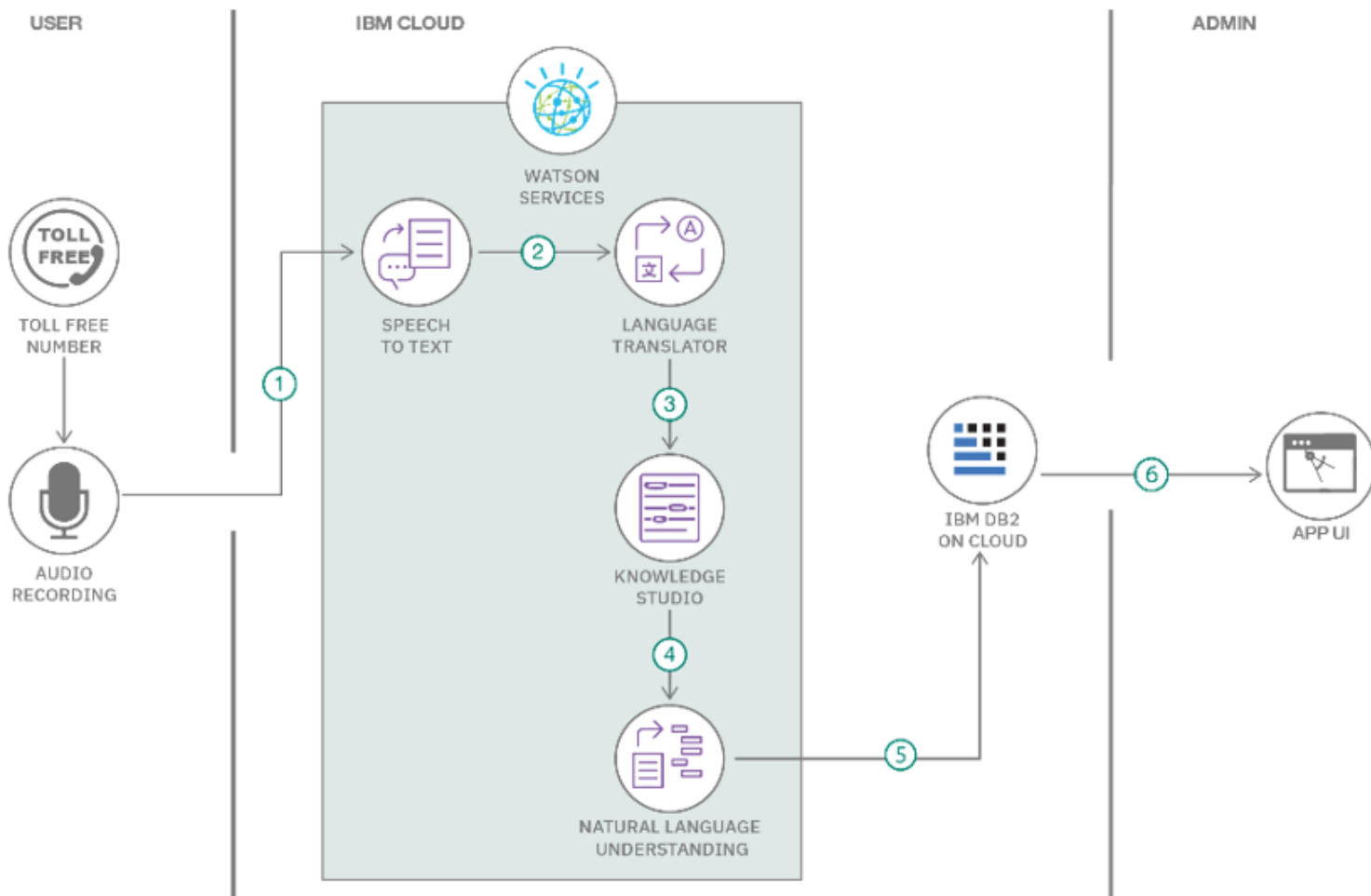
DATA FLOW DIAGRAM



5.2 Solution and Technical Architecture

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2 **Example: Order processing during pandemics for offline mode**



<https://developer.ibm.com/patterns/aipowered-backend-system-for-orderprocessing-during-pandemics/>

Table-1 : Components & Technologies:

S. No	Component	Description	Technology

1. .	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript
2. .	Application Logic-1	Logic for a process in the application	Python
3. .	Application Logic-2	Logic for a process in the application	IBM Watson STT service

4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Django
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	3 – tier, Micro-services
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	number of requests per sec, use of Cache

Table-2: Application Characteristics:

5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority

Business People	Monitoring	USN-1	As a user, I can view the dashboard to see the port status.	I can visualize the port status in dashboard	High
	Tracking	USN-2	As a user, I can track the goods	I can track the goods by its arrival/departure time.	High
Govt Sector People	Viewing	USN-1	As a user, I can view the port status regularly.	I can able to know the port status.	Low
	Predicting	USN-2	As a user, I will reduce the congestion ports by predicting the port congestion through dashboard.	I can able to predict the congestion in future.	High
Passengers	Tracing	USN-1	As a user, I can trace the arrival/departure time of rail in ports.	I can able to track the correct time of rail.	High

CHAPTER 6

PROJECT PLANNING AND SCHEDULING

6.1 Sprint Planning and Estimation

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	18 Days	1 Nov 2022	19 Nov 2022	20	19 Nov 2022
Sprint-2	20	15 Days	4 Nov 2022	19 Nov 2022	20	19 Nov 2022
Sprint-3	20	12 Days	07 Nov 2022	19 Nov 2022	20	19 Nov 2022
Sprint-4	20	5 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = \text{Sprint duration} / \text{velocity} = 20 / 10 = 2$$

6.2 Sprint Delivery Schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High
Sprint-2		USN-3	As a user, I can register for the application through	2	Low

			Facebook		
Sprint-1		USN-4	As a user, I can register for the application through Gmail	2	Medium
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	1	High
	Dashboard				

Project Tracker, Velocity & Burndown Chart:

Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint).
 Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

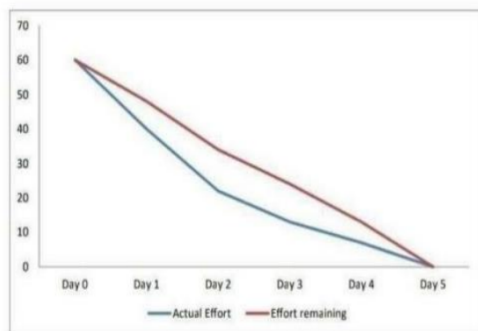
$$AV = \text{Sprint Duration} / \text{Velocity}$$

$$= 20 / 6$$

$$= 3.33$$

Burndown Chart:

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.



6.3 Reports from JIRA

IBM(T1) WhatsAppgithub.comRandom Words, OnlinProjects - Jiraiframe tag in html - G+--X

←→↻https://soundarya20.atlassian.net/jira/projects?selectedProjectType=software

Google+StarBookmarksHistory

JiraYour workProjectsFiltersDashboardsPeopleAppsCreate

Search

Help?SettingsUser

Projects

Create project

Q

Jira SoftwareX

★

Name*

Key:-

Type

Lead:-

☆

Traffic and capacity analytics for major ports

TCAFMF

Team-managed software

089 Soundarya Lakshmi IV- IT B

...

Successfully added

X

We sent an email to everyone confirming you added them.

Add more people

Activate Windows

Go to Settings to activate Windows.

Type here to search

ENG23:3919-11-2022

CHAPTER 7

CODING AND SOLUTIONS

7.1 Feature 1

```
import numpy as np
import pandas as pd
```

```
from google.colab import files
uploaded=files.upload()
```

Choose Files datafile_02.csv **datafile_02.csv**(text/csv) - 806 bytes, last modified: 11/15/2022 - 100% done Saving datafile_02.csv to datafile_02.csv

```
import io
df = pd.read_csv(io.BytesIO(uploaded['datafile_02.csv']))
print(df)
```

1. 9100
2. 7000
3. 7100
4. 8200
5. 3200
6. 9700
7. 8900
8. 5300
9. 6800
10. 8800
11. 7900
12. 10000
13. 9500

Total Capacity in Eleventh Plan (MT) (2011-12) Proj. \

1. 3145
2. 6340
3. 10640
4. 10810
5. 6420
6. 7230
7. 6398
8. 5475
9. 6050
10. 6690
11. 9191
7. 9560
8. 12220

Total Capacity in Eleventh Plan (MT) (2011-12) Ach. \

1. 1635
2. 5070
3. 7650
4. 7293
5. 3100
6. 7972
7. 3334
8. 4098
9. 5097
10. 4190
11. 4453
12. 6400
13. 8691
14. 8691

Total Capacity in Eleventh Plan (MT) (2011-12) %

- 1. 5100
- 2. 7900
- 3. 7100
- 4. 6700
- 5. 4800
- 6. 11000
- 7. 5200
- 8. 7400
- 9. 8400
- 10. 6200
- 11. 4800
- 12. 6600
- 13. 7100

```
#Loading the dataset
df = pd.read_csv('/content/datafile_02.csv') print(df.columns) df.head()
```

```
Index(['Port', 'Traffic in Eleventh Plan (MT) (2011-12)Proj.',
      'Traffic in Eleventh Plan (MT) (2011-12) Ach.',
      'Traffic in Eleventh Plan (MT) (2011-12) %',
      'Total Capacity in Eleventh Plan (MT) (2011-12) Proj.',
      'Total Capacity in Eleventh Plan (MT) (2011-12) Ach.',
      'Total Capacity in Eleventh Plan (MT) (2011-12) %'],
      dtype='object')
```

		Traffic in Eleventh Plan (MT) (201112)Proj.	Traffic in Eleventh Plan (MT) (201112) Ach.	Traffic in Eleventh Plan (MT) (2011- 12) %	Total Capacity in Eleventh Plan (MT) (2011-12) Proj.	Total Capacity in Eleventh Plan (MT) (2011-12) Ach.	Total Capacity in Eleventh Plan (MT) (2011-12) %
0	Kolkata	1343	1223	9100	3145	1635	5100

1	Haldia	4450	3101	7000	6340	5070	7900
2	Paradeep	7640	5425	7100	10640	7650	7100
3	Visakhapatnam	8220	6742	8200	10810	7293	6700
4	Ennore	4700	1496	3200	6420	3100	4800

Preprocessing the dataset

Renaming the columns df.rename(columns = {'Traffic in Eleventh Plan (MT) (2011-12)Proj.': 'Traffic_Projected', 'T df
Traffic in

		Eleventh		Plan Total_Capacity_Proj (MT) (2011-12) %
Port		Traffic_Projected	Traffic_Achieved	
0	Kolkata	1343	1223	9100
1	Haldia	4450	3101	7000
2	Paradeep	7640	5425	7100
3	Visakhapatnam	8220	6742	8200
4	Ennore	4700	1496	3200
5	Chennai	5750	5571	9700
6	Tuticorin	3172	2810	8900
7	Cochin	3817	2010	5300
8	NMPT	4881	3294	6800
9	Mormugao	4455	3900	8800

Perparing the Calculations:

Traffic_Percent = round((df.Traffic_Achieved/df.Traffic_Projected)*100,2)

```
Total_Percent = round( (df.Total_Capacity_Achieved/df.Total_Capacity_Projected)*100,2)
Total_Percent
```

- 1. 51.99
- 2. 79.97
- 3. 71.90
- 4. 67.47
- 5. 48.29
- 6. 110.26
- 7. 52.11
- 8. 74.85
- 9. 84.25
- 10. 62.63
- 11. 48.45
- 12. 66.95 12 71.12 dtype: float64

```
# Replacing the existing columns with newly created columns df.rename(columns = {'Traffic in Eleventh Plan (MT) (2011-12)
%':'Traffic_Percent%','Total df.iloc[:,3:4] = Traffic_Percent df.iloc[:,6:] = Total_Percent df
```

	Port	Traffic_Projected	Traffic_Achieved	Traffic_Percent%	Total_Capac
0	Kolkata	1343	1223	91.06	
1	Haldia	4450	3101	69.69	
2	Paradeep	7640	5425	71.01	
3	Visakhapatnam	8220	6742	82.02	
4	Ennore	4700	1496	31.83	
5	Chennai	5750	5571	96.89	


```

-----
1. Port                13 non-null  object
2. Traffic_Project    13 non-null  int64
3. Traffic_Achieved   13 non-null  int64
4. Traffic_Percent%    13 non-null  float64
5. Total_Capacity_Projected 13 non-null  int64
6. Total_Capacity_Achieved 13 non-null  int64 6 Total_Percent%    13 non-null  float64 dtypes: float64(2),
int64(4), object(1) memory usage: 856.0+ bytes

```

df.describe()

	Traffic_Project	Traffic_Achieved	Traffic_Percent%	Total_Capacity_Project
count	13.000000	13.000000	13.000000	13.0000
mean	5446.846154	4308.846154	77.887692	7705.3076
std	2133.280019	2212.894855	19.382398	2570.2426
min	1343.000000	1223.000000	31.830000	3145.0000
25%	4450.000000	2810.000000	69.690000	6340.0000
50%	4881.000000	3900.000000	82.020000	6690.0000
75%	7105.000000	5618.000000	91.060000	9560.0000
max	8672.000000	8250.000000	99.560000	12220.0000

#Finding Outliers anr replacing the outliers import seaborn as sns

sns.boxplot(x='Port',y='Traffic_Project',data=df)

<matplotlib.axes._subplots.AxesSubplot at 0x7fed8252a9d0>

Kolkata	1
Haldia	1
Paradeep	1
Visakhapatnam	1
Ennore	1
Chennai	1
Tuticorin	1
Cochin	1
NMPT	1
Mormugao	1
Mumbai	1
JNPT	1
Kandla	1

Name: Port, dtype: int64

6	1
3	1
10	1
12	1
2	1
0	1
11	1
1	1

9. 1
1. 1
2. 1
1. 1
2. 1

Name: Port, dtype: int64

7.2 Feature 2

```
import numpy as np
import pandas as pd

from google.colab import files
uploaded=files.upload()

<IPython.core.display.HTML object> Saving datafile_02.csv to
datafile_02.csv

import io
df = pd.read_csv(io.BytesIO(uploaded['datafile_02.csv']))
print(df)
```

	Port	Traffic in Eleventh Plan (MT) (2011-12)	Proj.	\ 0
	Kolkata			
1.	Haldia	4450		
2.	Paradeep	7640		
3.	Visakhapatnam	8220		
4.	Ennore	4700		
5.	Chennai	5750		
6.	Tuticorin	3172		
7.	Cochin	3817		
8.	NMPT	4881		
9.	Mormugao	4455		
10.	Mumbai	7105		

11	JNPT	6604
12	Kandla	8672

Traffic in Eleventh Plan (MT) (2011-12) Ach. \

1.	1223
2.	3101
3.	5425
4.	6742
5.	1496
6.	5571
7.	2810
8.	2010
9.	3294
10.	3900
11.	5618
12.	6575
13.	8250

Traffic in Eleventh Plan (MT) (2011-12) % \

1.	9100
2.	7000
3.	7100
4.	8200
5.	3200
6.	9700
7.	8900
8.	5300
9.	6800
10.	8800
11.	7900

12.9500

Total Capacity in Eleventh Plan (MT) (2011-12) Proj. \ 0		
3145		
1	6340	2
10640		
3	10810	4
6420		
1. 7230		
2. 6398		
3. 5475		
4. 6050		
5. 6690		
6. 9191		
7. 9560	12	12220

Total Capacity in Eleventh Plan (MT) (2011-12) Ach. \ 0		
1635		
1. 5070		
2. 7650		
3. 7293		
4. 3100		
5. 7972		
6. 3334		
7. 4098		
8. 5097		
9. 4190		
10.4453		
11.6400		
12.8691		

Total Capacity in Eleventh Plan (MT) (2011-12) % 0		
5100		

```

1. 7900
2. 7100
3. 6700
4. 4800 5          11000 6          5200
1. 7400
2. 8400
3. 6200
4. 4800
5. 6600
6. 7100

# Loading the dataset
df = pd.read_csv('/content/datafile_02.csv') print(df.columns)
df.head()

Index(['Port', 'Traffic in Eleventh Plan (MT) (2011-12)Proj.',
      'Traffic in Eleventh Plan (MT) (2011-12) Ach.',
      'Traffic in Eleventh Plan (MT) (2011-12) %',
      'Total Capacity in Eleventh Plan (MT) (2011-12) Proj.',
      'Total Capacity in Eleventh Plan (MT) (2011-12) Ach.', 'Total Capacity
in Eleventh Plan (MT) (2011-12) %'],
      dtype='object')

      Port  Traffic in Eleventh Plan (MT) (2011-12)Proj.  \ 0      Kolkata
1343
1. Haldia          4450
2. Paradeep        7640
3. Visakhapatnam      8220
4. Ennore          4700

      Traffic in Eleventh Plan (MT) (2011-12) Ach.  \ 0
1223
1. 3101
2. 5425
3. 6742

```

4. 1496

Traffic in Eleventh Plan (MT) (2011-12) % \ 0
9100

1. 7000

2. 7100

3. 8200

4. 3200

Total Capacity in Eleventh Plan (MT) (2011-12) Proj. \ 0
3145

1. 6340

2. 10640

3. 10810

4. 6420

Total Capacity in Eleventh Plan (MT) (2011-12) Ach. \ 0
1635

1. 5070

2. 7650

3. 7293

4. 3100

Total Capacity in Eleventh Plan (MT) (2011-12) % 0
5100

1. 7900

2. 7100

3. 6700

4. 4800

Preprocessing the dataset

Renaming the columns

df.rename(columns = {'Traffic in Eleventh Plan (MT) (2011-

```

12)Proj.': 'Traffic_Projected', 'Traffic in Eleventh Plan (MT) (2011-12)
Ach.': 'Traffic_Achieved', 'Total Capacity in Eleventh Plan (MT) (2011-12)
Proj.': 'Total_Capacity_Projected', 'Total Capacity in
Eleventh Plan (MT) (2011-12) Ach.': 'Total_Capacity_Achieved'}, inplace
=True) df

```

	Port	Traffic_Projected	Traffic_Achieved	\
1. Kolkata		1343		
2. 1223				
3. Haldia		4450	3101	
4. Paradeep		7640	5425	
5. Visakhapatnam		8220	6742	
6. Ennore		4700	1496	
7. Chennai		5750	5571	
8. Tuticorin		3172	2810	
9. Cochin		3817	2010	8 NMPT 4881 3294
10. Mormugao		4455	3900	
10	Mumbai		7105	5618 11
JNPT		6604	6575	12 Kandla
8672		8250		

```

Traffic in Eleventh Plan (MT) (2011-12) %
Total_Capacity_Projected \
1. 9100
3145
2. 7000
6340
3. 7100
10640
4. 8200
10810
5. 3200
6420

```

6. 9700
7230
7. 8900
6398
8. 5300
5475
9. 6800
6050
10. 8800
6690
11. 7900
9191
12. 10000 9560
13. 9500 12220

Total_Capacity_Achieved Total Capacity in Eleventh Plan (MT) (2011-12) %
1. 1635
5100
2. 5070
7900
3. 7650
7100
4. 7293
6700
5. 3100
4800
6. 7972
11000
7. 3334
5200
8. 4098
7400
9. 5097

8400
10.4190
6200
11.4453
4800
12.6400
6600
13.8691
7100

#Perparing the Calculations:

```
Traffic_Percent =  
round((df.Traffic_Achieved/df.Traffic_Projected)*100,2)
```

Traffic_Percent

```
1. 91.06  
2. 69.69  
3. 71.01  
4. 82.02  
5. 31.83  
6. 96.89  
7. 88.59  
8. 52.66  
9. 67.49  
10. 87.54  
11. 79.07  
12. 99.56 12 95.13 dtype: float64
```

```
Total_Percent =  
round((df.Total_Capacity_Achieved/df.Total_Capacity_Projected)*100,2) Total_Percent
```

```
1. 51.99
```

```
2. 79.97
3. 71.90
4. 67.47
5. 48.29
6. 110.26
7. 52.11
8. 74.85
9. 84.25
10. 62.63
11. 48.45
12. 66.95 12 71.12 dtype: float64
```

```
# Replacing the existing columns with newly created columns df.rename(columns = {'Traffic
in Eleventh Plan (MT) (2011-12) %':'Traffic_Percent', 'Total Capacity in Eleventh Plan (MT)
(2011-12)
%':'Total_Percent'}, inplace =True) df.iloc[:,3:4] =
Traffic_Percent df.iloc[:,6:] = Total_Percent df
```

	Port	Traffic_Projected	Traffic_Achieved
Traffic_Percent \			
1. Kolkata		1343	1223
2. Haldia		4450	3101
3. Paradeep		7640	5425
4. Visakhapatnam		8220	6742
5. Ennore		4700	1496
6. Chennai		5750	5571
7. Tuticorin		3172	2810

88.59

8. Cochin 3817 2010

52.66

9. NMPT 4881 3294

67.49

10. Mormugao 4455 3900

87.54

11. Mumbai 7105 5618

79.07

12. JNPT 6604 6575

99.56

13. Kandla 8672 8250

95.13

	Total_Capacity_Projected	Total_Capacity_Achieved	Total_Percent	0
3145	1635	51.99		

1.	6340	5070	79.97
----	------	------	-------

2.	10640	7650	71.90
----	-------	------	-------

3.	10810	7293	67.47
----	-------	------	-------

4.	6420	3100	48.29
----	------	------	-------

5.	7230	7972	110.26
----	------	------	--------

6.	6398	3334	52.11
----	------	------	-------

7.	5475	4098	74.85
----	------	------	-------

8.	6050	5097	84.25
----	------	------	-------

9.	6690	4190	62.63
----	------	------	-------

10.	9191	4453	48.45
-----	------	------	-------

11.	9560	6400	66.95
-----	------	------	-------

12.	12220	8691	71.12
-----	-------	------	-------

(13, 7)

Checking for null values df.isnull().sum()

Port

0

```

Traffic_Projected          0
Traffic_Achieved           0
Traffic_Percent            0
Total_Capacity_Projected    0
Total_Capacity_Achieved     0
Total_Percent              0
dtype: int64
# Summary of Dataset df.info()

<class 'pandas.core.frame.DataFrame'> RangeIndex: 13
entries, 0 to 12 Data columns (total 7 columns):
#   Column                                     Non-Null Count  Dtype  ---  ---
-----  -
0   Port                                     13 non-null   object
1   Traffic_Projected      13 non-null   int64
   Traffic_Achieved      13 non-null   int64  3
   Traffic_Percent       13 non-null   float64 4
   TotalCapacity_Projected 13 non-null   int64  5
   TotalCapacity_Achieved 13 non-null   int64  6
   Total_Percent         13 non-null   float64 dtypes: float64(2), int64(4), object(1) memory usage: 856.0+ bytes

df.describe()

   Traffic_Projected  Traffic_Achieved  Traffic_Percent  \  count
13.000000          13.000000          13.000000  mean      5446.846154
4308.846154          77.887692          std              2133.280019      2212.894855
19.382398   min          1343.000000          1223.000000      31.830000      25%
4450.000000          2810.000000          69.690000
50%          4881.000000          3900.000000          82.020000      75%
7105.000000          5618.000000          91.060000   max          8672.000000
8250.000000          99.560000

   Total_Capacity_Projected  Total_Capacity_Achieved  Total_Percent
count          13.000000          13.000000
mean          7705.307692          5306.384615

```

```

68.480000
std                2570.242673                2140.254796
17.252637
min                3145.000000                1635.000000
48.290000
25%               6340.000000                4098.000000
52.110000
50%               6690.000000                5070.000000
67.470000
75%               9560.000000                7293.000000
74.850000
max               12220.000000                8691.000000

110.260000

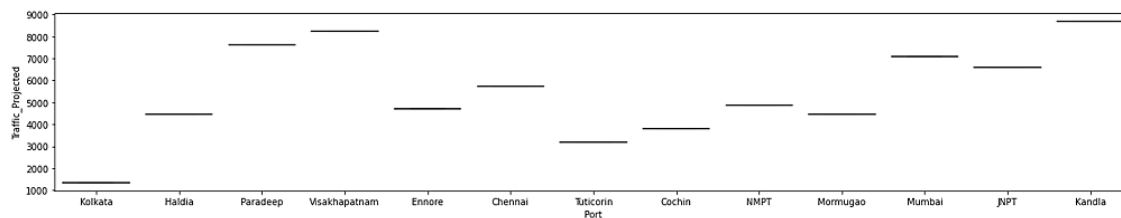
```

```

#Finding Outliers anr replacing the outliers
import seaborn as sns import matplotlib.pyplot as plt
plt.rcParams["figure.figsize"] = [17.50, 3.50]
plt.rcParams["figure.autolayout"] =True
sns.boxplot(x='Port',y='Traffic_Projected',data=df)

<matplotlib.axes._subplots.AxesSubplot at 0x7fc39b116690>

```



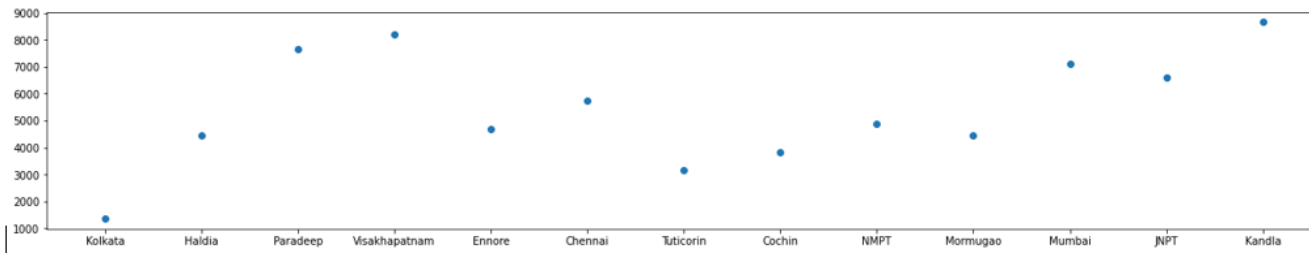
```

# Visualization using various plots import
matplotlib.pyplot as plt import seaborn as sns

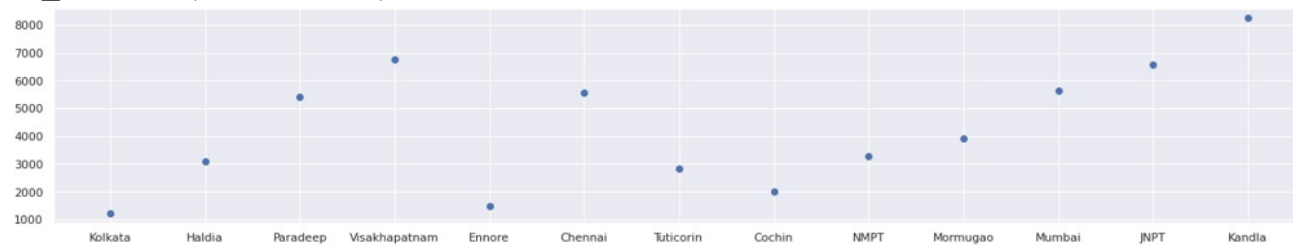
```

```
import matplotlib.pyplot as plt
import seaborn as sns
```

```
plt.scatter(df.Port,df.Traffic_Projected)
sns.set()
```

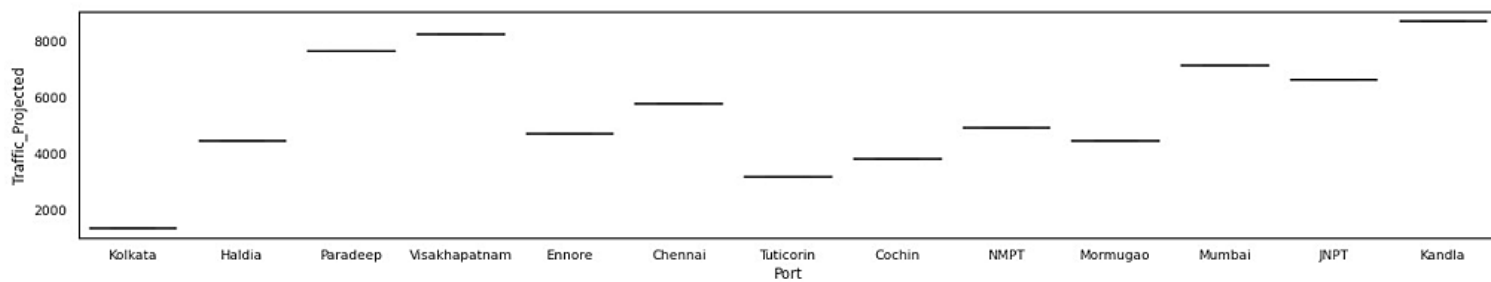


```
plt.scatter(df.Port,df.Traffic_Achieved)
sns.set_style('white')
sns.set_context('notebook')
```



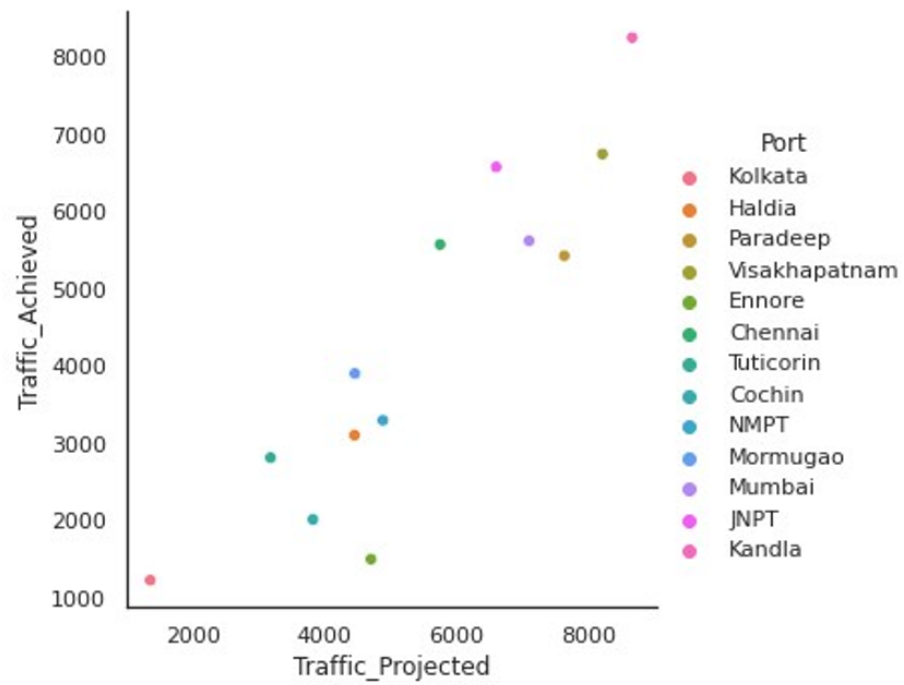
```
sns.boxplot(x='Port', y='Traffic_Projected', data=df)
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7fc3981d5490>
```



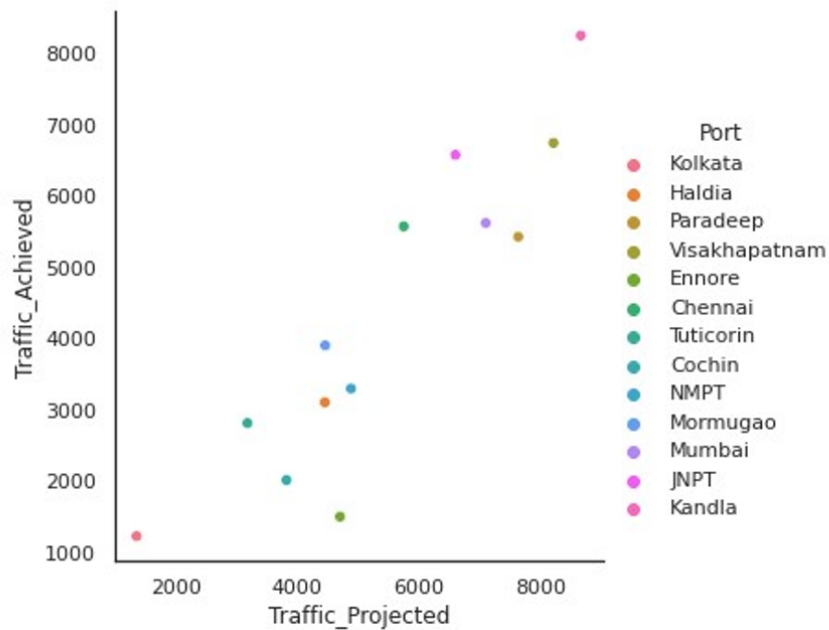
```
sns.relplot(data=df, x="Traffic_Projected", y='Traffic_Achieved', hue='Port')
```

```
<seaborn.axisgrid.FacetGrid at 0x7fc39b09a310>
```



```
sns.relplot(data=df, x="Traffic_Projected", y='Traffic_Achieved', hue='Port')
```

```
<seaborn.axisgrid.FacetGrid at 0x7fc39804a710>
```



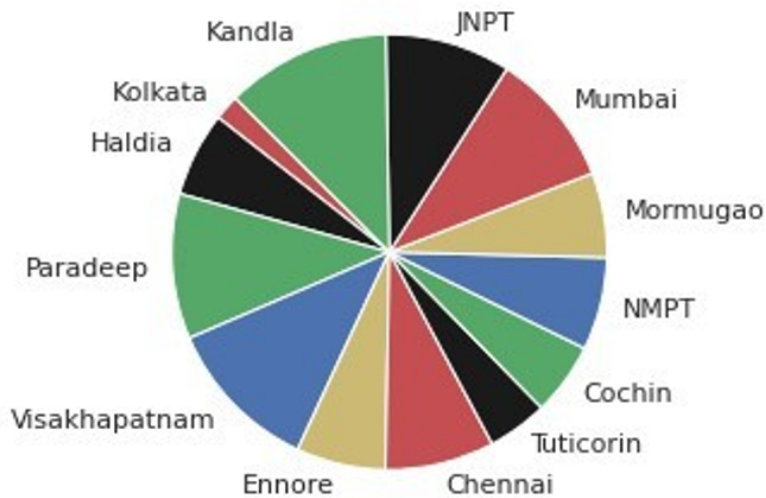
```
colors=['r','k','g','b','y']
plt.pie(df.Traffic_Projected, labels=df.Port, colors=colors, startangle=1 35)
```

```
([<matplotlib.patches.Wedge at 0x7fc397dfdb50>,
<matplotlib.patches.Wedge at 0x7fc397dfdfd0>,
<matplotlib.patches.Wedge at 0x7fc397e075d0>,
<matplotlib.patches.Wedge at 0x7fc397e07690>,
<matplotlib.patches.Wedge at 0x7fc397e12350>,
<matplotlib.patches.Wedge at 0x7fc397dfd990>,
<matplotlib.patches.Wedge at 0x7fc397e12790>,
<matplotlib.patches.Wedge at 0x7fc397e1d290>,
<matplotlib.patches.Wedge at 0x7fc397e1d2d0>,
<matplotlib.patches.Wedge at 0x7fc397e127d0>,
<matplotlib.patches.Wedge at 0x7fc397dab190>,
<matplotlib.patches.Wedge at 0x7fc397dab1d0>,
<matplotlib.patches.Wedge at 0x7fc397dab710>],
[Text(-0.8227559810574577, 0.7301182066173808, 'Kolkata'),
Text(-0.9813250715975654, 0.49699205612769437, 'Haldia'),
```

```

Text(-1.0974872598930092, -0.07430823892769065, 'Paradeep'),
Text(-0.7887307236408752, -0.7667488803936667, 'Visakhapatnam'),
Text(-0.24681684658019215, -1.0719521650914328, 'Ennore'),
Text(0.2586200998460918, -1.0691658636318304, 'Chennai'),
Text(0.6508775584042567, -0.8867685176897709, 'Tuticorin'),
Text(0.8904218552781084, -0.6458706678918711, 'Cochin'),    Text(1.068042956118005, -
0.2632190036580062, 'NMPT'),
Text(1.083660055487473, 0.18889384357592884, 'Mormugao'),
Text(0.8515399364034199, 0.6963330644957625, 'Mumbai'),
Text(0.3009306210259454, 1.058036275998578, 'JNPT'),    Text(-0.4290148932653011,
1.0128900341876024, 'Kandla'))

```



```

plt.pie(df.Traffic_Achieved, labels=df.Port, colors=colors, startangle=13 5)

```

```

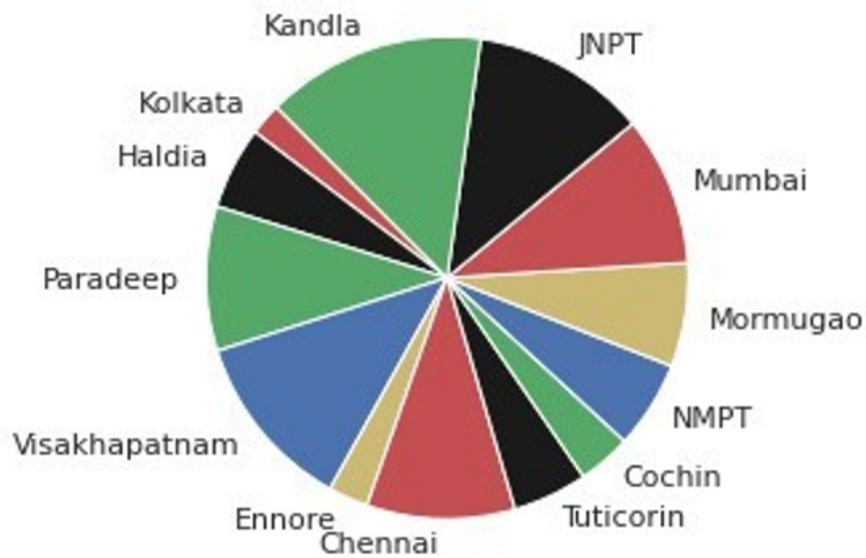
([<matplotlib.patches.Wedge at 0x7fc39818f350>,
<matplotlib.patches.Wedge at 0x7fc39813a7d0>,
<matplotlib.patches.Wedge at 0x7fc39813a2d0>,
<matplotlib.patches.Wedge at 0x7fc3980f4cd0>,
<matplotlib.patches.Wedge at 0x7fc398061b50>,
<matplotlib.patches.Wedge at 0x7fc39818f110>,
<matplotlib.patches.Wedge at 0x7fc3980668d0>,
<matplotlib.patches.Wedge at 0x7fc397fe9790>,

```

```

<matplotlib.patches.Wedge at 0x7fc397fe94d0>,
<matplotlib.patches.Wedge at 0x7fc3980614d0>,
<matplotlib.patches.Wedge at 0x7fc3980546d0>,
<matplotlib.patches.Wedge at 0x7fc398009890>,
<matplotlib.patches.Wedge at 0x7fc3980093d0>],
[Text(-0.8292984732192152, 0.7226783809664425, 'Kolkata'),
Text(-0.9785761523202932, 0.5023830352529937, 'Haldia'),
Text(-1.0999917035067, -0.004272261278115301, 'Paradeep'),
Text(-0.8509776584186843, -0.6970201036356506, 'Visakhapatnam'),
Text(-0.4510472262335761, -1.0032728440992495, 'Ennore'),
Text(-0.02876119418292548, -1.0996239328557615, 'Chennai'),
Text(0.472408825560159, -0.9933931253702492, 'Tuticorin'),
Text(0.720536507722156, -0.831160117570351, 'Cochin'),
Text(0.932508592180857, -0.5834618458038848, 'NMPT'),    Text(1.086706953339725, -
0.1704933944852213, 'Mormugao'),
Text(1.022266221308968, 0.406167173428238, 'Mumbai'),
Text(0.535803745383295, 0.9606843115369551, 'JNPT'),    Text(-0.3488393338981779,
1.0432215100952797, 'Kandla')])

```

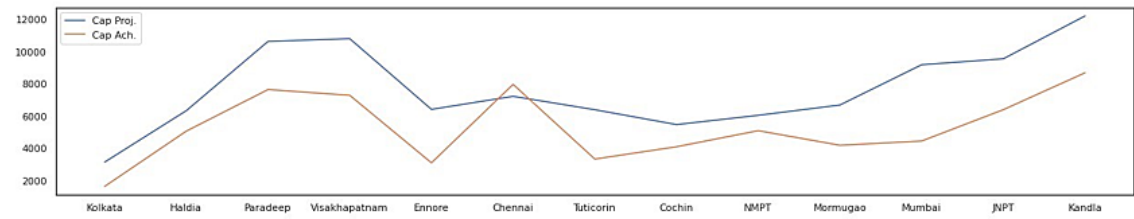



```
plt.plot(df.Port,df.Total_Capacity_Projected,label='Cap Proj.')
```

```
plt.plot(df.Port,df.Total_Capacity_Achieved,label='Cap Ach.')
```

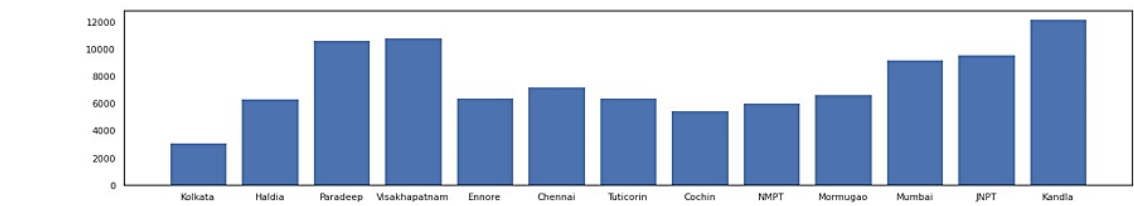
```
plt.legend()
```

<matplotlib.legend.Legend at 0x7fc397fd62d0>



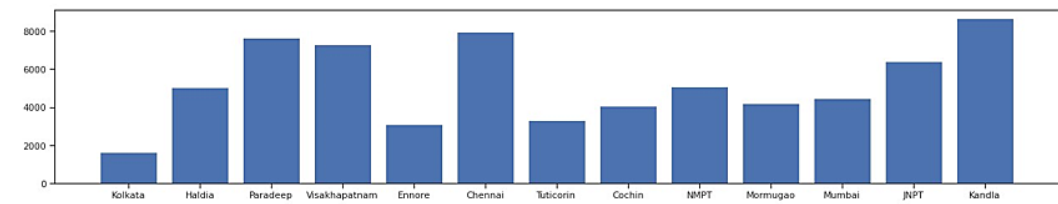
```
plt.bar(df.Port,df.Total_Capacity_Projected)
```

```
sns.set_style('ticks')
```



```
plt.bar(df.Port,df.Total_Capacity_Achieved)
```

```
sns.set_style('ticks')
```

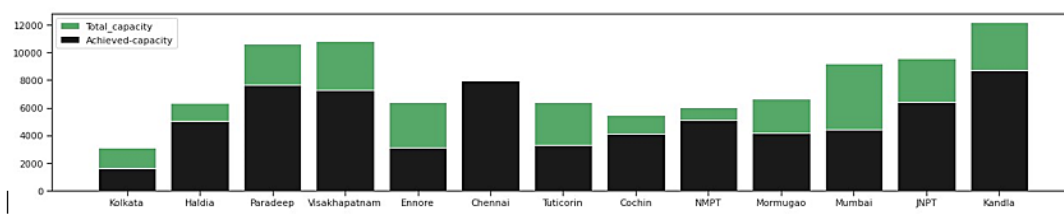


```
plt.bar(df.Port,df.Total_Capacity_Projected,label='Total_capacity',col or='g')
```

```
plt.bar(df.Port,df.Total_Capacity_Achieved,label='Achievedcapacity',color='k')
```

```
plt.legend()
```

<matplotlib.legend.Legend at 0x7fc397c76f50>



7.3 Database Schema

CHAPTER 8

TESTING

8.1 Test Cases

LoginPage_TC_001	Functional	Home Page	Verify user is able to see the Login/Signup popup when user clicked on My account		1.Click Sign in 2.Verify login/Signup popup displayed or not	Home.php	Login/Signup popup should display	Working as expected	Pass	none	N		Neerajj
LoginPage_TC_002	UI	Home Page	Verify the UI elements in Login/Signup popup		1.Click sign in/Login 2.Verify login/Signup popup with below UI elements: a.username text box b.password text box c.Login button d.Don't have an account? Sign up now link	Home.php	Application should show below UI elements: a.username text box b.password text box c.Login button with Blue colour d.Don't have an account? Sign up now link	Working as expected	Pass	none	N		Neerajj
LoginPage_TC_003	Functional	Home page	Verify user is able to log into application with Valid credentials		1.Enter URL(http://localhost/Demo/home.php) and click go 2.Click on Sign in button 3.Enter Valid username/email in Username text box 4.Enter valid password in password text box 5.Click on login button	Username: User password: 12341234	User should navigate to user account	Working as expected	Pass	none	N		Neerajj
LoginPage_TC_004	Functional	Login page	Verify user is not able to log into application with Invalid credentials		1.Enter URL(http://localhost/Demo/home.php) and click go 2.Click on Sign in button 3.Enter Invalid username/email in Email text box 4.Enter valid password in password text box 5.Click on login button	Username: chalam@gmail password: 12341234	Application should show 'Invalid username or password ' validation message.	Working as expected	Pass	none	N		Neerajj
LoginPage_TC_004	Functional	Login page	Verify user is not able to log into application with Invalid credentials		1.Enter URL(http://localhost/Demo/home.php) and click go 2.Click on Sign in button 3.Enter Valid username in Username text box 4.Enter Invalid password in password text box 5.Click on login button	Username: User password: Testing1236786867 86876876	Application should show 'Invalid username or password ' validation message.	Working as expected	Pass	none	N		Neerajj
LoginPage_TC_005	Functional	Login page	Verify user is able to log into application with Invalid credentials		1.Enter URL(http://localhost/Demo/home.php) and click go 2.Click on Sign in button 3.Enter Valid username in Username text box 4.Enter Invalid password in password text box 5.Click on login button	Username: chalam password: Testing1236786867 86876876	Application should show 'Invalid username or password ' validation message.	Working as expected	Pass	none	N		Neerajj

8.2 User Acceptance Testing

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the Traffic and Capacity Analytics for Major Ports project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	10	4	2	0	16
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	2	2	0	0	4
Not Reproduced	0	0	1	0	1
Skipped	0	0	0	0	0
Won't Fix	0	5	2	1	8
Totals	15	14	8	5	39

CHAPTER 9

RESULTS

9.1 Performance Metrics

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Screenshot / Values
1.	Dashboard design	No of Visualizations / Graphs - 19
2.	Data Responsiveness	Positive
3.	Amount Data to Rendered (DB2 Metrics)	Two data were rendered: Traffic Percentage and Total Capacity Percentage
4.	Utilization of Data Filters	1 filter was used in Dashboard for Collage tab
5.	Effective User Story	No of Scene Added – 4 Scenes
6.	Descriptive Reports	No of Visulizations / Graphs - 5 graphs

CHAPTER 9

ADVANTAGES

We do a new method using the self-placed learning course to understand the current Business Scenario, Data Analytics, and Data Visualization. Using the Cognos Analytics with Watson we can measure, analyse and categorize the profit and sales by category. Cognos Analytics provides the environment and tools to solve the traffic of major ports by collaboratively working with data. Using python we will capture every movement of delays, weather, port loading. We are revolutionising the logistics space by reducing manual workloads, eliminating miscommunication and leveraging data. We deliver efficiency and transparency in the freight procurement process. Gain unique insights through our auto-generated reports for fast, data-driven decision-making. Free your auditing department from time-consuming manual review and documentation. It will be useful to enterprises across industries, combining the power of data analytics with progressive machine intelligence to maximize savings and make logistics management efficient and fast. We can get port to port shipping schedule for all shipping lines on a single platform. Optimize your logistics operations on multiple parameters along with the cost.

- We can easily predict the port congestion
- Improvement of customer relationship
- High stability

- Explorations of data using Data visualization
- Advanced real-time shipment tracking.

CONCLUSION

Traffic in major ports are often seen in modern world due to immense usage of goods to travel. Traffic and capacity analytics for ports idea spend considerable enforce the port analysis and control of movements. Next the extracted features are taken into consideration to make easy operations from entering to communicating every other ports travellers. The Indian maritime sector still faces several issues, which have led to repeated failures in meeting growth targets for various ports. Besides, more budgetary support will be required to initiate the remaining projects under Sagarmala as the private sector may not have the risk appetite to take up these risky ventures. While new bills (such as the Major Port Authorities Bill, 2016 and the Indian Port Bills, 2018) have been introduced in order to revamp the functioning of the port sector, there have been delays in passing the bills, which calls for urgent attention,” adds Ravichandran. Going forward, the redressal of these issues is essential if the targets are to be met.

FUTURE SCOPE

In future we can easily calculate delays and non delays analysis and can explore the Port Loading. We can calculate the traffic projected and traffic achieved using data visuals in the dashboard. In future with this report the application of predicting analytics, identify patterns, relationships and connections using data visualization can be implemented. Analysing data using Cognos Watson from inside and outside the Ports. This

implementation is suitable to both users and government sectors to easily control Traffic through ports.

APPENDIX

Source Code

DASHBOARD

```
<!DOCTYPE
html>

    <html lang="en">
    <head>
    <style>
    body{
        font: 14px sans-serif;
        background-color: #333;
    }

    #apDiv1 {
    position: absolute;
    width: 1645px;
    height: 75px;
    z-index: 1;
    color: #39F;
    background-color: #660066;
    top: 1px;
```

```
left: 1px;
border: 3px solid gray;
padding: 10px;
}
#apDiv2 {
position: absolute;
width: 134px;
height: 54px;
z-index: 2;
left: 1224px;
top: 7px;
color: #F00;
text-align: center;
border: 3px;
padding: 10px;
}
#apDiv3 {
position: absolute;
width: 138px;
height: 54px;
z-index: 2;
left: 1385px;
top: 7px;
color: #000;
text-align: center;
font-weight: bold;
border: 3px solid black;
padding: 10px;
}

#apDiv1 #apDiv2 h3 a {
color: #0F0;
}
```

```
#apDiv1 #apDiv3 h3 a {  
color: #F00;  
}  
.justified {  
    text-align: justify;  
}
```

```
#apDiv4 {  
    position: absolute;  
    left: 281px;  
    top: 28px;  
    width: 631px;  
    height: 36px;  
    z-index: 2;
```

```
}
```

```
</style>
```

```
<link href="SpryAssets/SpryMenuBarHorizontal.css" rel="stylesheet" type="text/css">
```

```
<style type="text/css">
```

```
#apDiv5 {  
    position: absolute;  
    left: 63px;  
    top: 112px;  
    width: 1323px;  
    height: 731px;  
    z-index: 3;
```

```
}
```

```
</style>
```

```
<script src="SpryAssets/SpryMenuBar.js" type="text/javascript"></script>
```

```
<meta charset="utf-8">
```

```
</head>
```

```
<body>
<div id="apDiv4">
  <ul id="MenuBar1" class="MenuBarHorizontal">
    <li><a href="Dashboard.php">Dashboard</a></li>
    <li><a href="Report.php">Report</a></li>
    <li><a href="Story.php">Story</a></li>
  </ul>
</div>
<div id="apDiv5">
<iframe src="https://us3.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders&media" allowfullscreen=""></iframe></div>
<a href="home.php"></a>
<div id="apDiv1">
<h1><a href="home.php"><span style="width: 100px; height: 100px; font-size: 36px; color: #F0F;
  background-color: #F0F; border: 1px solid #F0F; border-radius: 50%; display: flex; align-items: center; justify-content: center; text-align: center; line-height: 1; padding: 5px 10px;">HOME</span></a></h1>
</div>
<div id="apDiv2">
<h3><a href="Login.php">Sign in</a></h3></div>
<div id="apDiv3">
<h3> <a href="Register.php">Sign up</a></h3>
</div>
</div><br><br><br><br><br><br>
</body>
</html>
```

HOME

```
<!DOCTYPE
html>
```

```
<html lang="en">
<head>
<style>
body{
    font: 14px sans-serif;
    background-color: #333;
}
```

```
#apDiv1 {
position: absolute;
width: 1645px;
height: 75px;
z-index: 1;
color: #39F;
background-color: #660066;
top: 1px;
left: 1px;
border: 3px solid gray;
padding: 10px;
}
```

```
#apDiv2 {
position: absolute;
width: 134px;
height: 54px;
z-index: 2;
left: 1224px;
top: 7px;
color: #F00;
text-align: center;
border: 3px;
padding: 10px;
}
```

```
#apDiv3 {
```

```
position: absolute;
width: 138px;
height: 54px;
z-index: 2;
left: 1385px;
top: 7px;
color: #000;
text-align: center;
font-weight: bold;
border: 3px solid black;
padding: 10px;
}

#apDiv1 #apDiv2 h3 a {
color: #0F0;
}
#apDiv1 #apDiv3 h3 a {
color: #F00;
}
.justified {
    text-align: justify;
}

#apDiv4 {
    position: absolute;
    left: 281px;
    top: 28px;
    width: 631px;
    height: 36px;
    z-index: 2;

}
```



```
</style>
<link href="SpryAssets/SpryMenuBarHorizontal.css" rel="stylesheet" type="text/css">
<style type="text/css">
body,td,th {
    color: #FFF;
}
.justified {
    font-size: 18px;
}
.justified .justified {
    font-size: 18px;
}
#apDiv5 {
    position: absolute;
    left: 190px;
    top: 651px;
    width: 1359px;
    height: 142px;
    z-index: 3;
}
#apDiv6 {
    position: absolute;
    left: 199px;
    top: 642px;
    width: 305px;
    height: 46px;
    z-index: 3;
    font-size: 36px;
}
#apDiv7 {
    position: absolute;
    left: 203px;
```

```

        top: 713px;
        width: 913px;
        height: 82px;
        z-index: 4;
        font-size: 24px;
        border: 3px solid black;
        padding: 10px;
    }
</style>
<script src="SpryAssets/SpryMenuBar.js" type="text/javascript"></script>
<meta charset="utf-8">
</head>

<body>

<div id="apDiv4">
    <ul id="MenuBar1" class="MenuBarHorizontal">
        <li><a href="Dashboard.php">Dashboard</a></li>
        <li><a href="Report.php">Report</a></li>
        <li><a href="Story.php">Story</a></li>
    </ul>
</div>

<div id="apDiv6">Team Members:</div>
<div id="apDiv7">
<p>Neerajj.S &nbsp; Pranav Pandy &nbsp; A.S Nanthu D.J &nbsp; Prashanth</p></div>
<a href="home.php"></a>
<div id="apDiv1">
<h1><a href="home.php"><span style="width: 100px; height: 100px; font-size: 36px; color: #F0F; 1
</div>

<div id="apDiv2">
<h3><a href="Login.php">Sign in</a></h3></div>

```

```
<div id="apDiv3">
<h3> <a href="Register.php">Sign up</a></h3>
</div>
</div><br><br><br><br><br><br>
<div style="margin-left: 10%; padding: 1px 16px; height: 1000px; font-size: 36px; font-weight: b
<p >About:</p>
<p class="justified"><span class="justified">The Indian Railways has a capital base of about Rs.
themselves for an even bigger role in the future.</span></p>
<p class="justified"><br>

Technical Architecture:<br><br><br>

• To regain some of the market, it has lost over past decades and regain market share in some

• Reducing the congestion on rail corridors and improving port connectivity.<br><br>

• The development of two Dedicated Freight Corridors a cross key ports
</p>
</p>

</div>
<script type="text/javascript">
var MenuBar1 = new Spry.Widget.MenuBar("MenuBar1", {imgDown:"SpryAssets/SpryMenuBarDownHover.gif
</script>
</body>
</html>
```

REPORT

```
<!DOCTYPE
html>
```

```
<html lang="en">
<head>
<style>
body{
    font: 14px sans-serif;
    background-color: #333;
}
```

```
#apDiv1 {
position: absolute;
width: 1645px;
height: 75px;
z-index: 1;
color: #39F;
background-color: #660066;
top: 1px;
left: 1px;
border: 3px solid gray;
padding: 10px;
}
```

```
#apDiv2 {
position: absolute;
width: 134px;
height: 54px;
z-index: 2;
left: 1224px;
top: 7px;
color: #F00;
text-align: center;
border: 3px;
padding: 10px;
}
```

```
#apDiv3 {
```

```
position: absolute;
width: 138px;
height: 54px;
z-index: 2;
left: 1385px;
top: 7px;
color: #000;
text-align: center;
font-weight: bold;
border: 3px solid black;
padding: 10px;
}

#apDiv1 #apDiv2 h3 a {
color: #0F0;
}
#apDiv1 #apDiv3 h3 a {
color: #F00;
}
.justified {
    text-align: justify;
}

#apDiv4 {
    position: absolute;
    left: 281px;
    top: 28px;
    width: 631px;
    height: 36px;
    z-index: 2;

}
```

```
</style>
<link href="SpryAssets/SpryMenuBarHorizontal.css" rel="stylesheet" type="text/css">
<style type="text/css">
#apDiv5 {
    position: absolute;
    left: 63px;
    top: 112px;
    width: 1203px;
    height: 731px;
    z-index: 3;
}
</style>
<script src="SpryAssets/SpryMenuBar.js" type="text/javascript"></script>
<meta charset="utf-8">
</head>

<body>
<div id="apDiv4">
    <ul id="MenuBar1" class="MenuBarHorizontal">
        <li><a href="Dashboard.php">Dashboard</a></li>
        <li><a href="Report.php">Report</a></li>
        <li><a href="Story.php">Story</a></li>
    </ul>
</div>
<div id="apDiv5">
<iframe src="https://us3.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2FReport&closeWindowOnExit=true"
allowfullscreen=""></iframe></div>
<a href="home.php"></a>
<div id="apDiv1">
<h1><a href="home.php"><span style="width: 100px; height: 100px; font-size: 36px; color: #F0F; text-align: center; vertical-align: middle;"></span></a>
</div>

<div id="apDiv2">
```

```
<h3><a href="Login.php">Sign in</a></h3></div>
<div id="apDiv3">
<h3> <a href="Register.php">Sign up</a></h3>
</div>
</div><br><br><br><br><br><br>
</body>
</html>
```

STORY

```
<!DOCTYPE
html>

<html lang="en">
<head>
<style>
body{
    font: 14px sans-serif;
    background-color: #333;
}

#apDiv1 {
position: absolute;
width: 1645px;
height: 75px;
z-index: 1;
color: #39F;
background-color: #660066;
top: 1px;
left: 1px;
border: 3px solid gray;
```

```
padding: 10px;
}
#apDiv2 {
position: absolute;
width: 134px;
height: 54px;
z-index: 2;
left: 1224px;
top: 7px;
color: #F00;
text-align: center;
border: 3px;
padding: 10px;
}
#apDiv3 {
position: absolute;
width: 138px;
height: 54px;
z-index: 2;
left: 1385px;
top: 7px;
color: #000;
text-align: center;
font-weight: bold;
border: 3px solid black;
padding: 10px;
}

#apDiv1 #apDiv2 h3 a {
color: #0F0;
}
#apDiv1 #apDiv3 h3 a {
color: #F00;
```



```
}  
.justified {  
    text-align: justify;  
}
```

```
#apDiv4 {  
    position: absolute;  
    left: 281px;  
    top: 28px;  
    width: 631px;  
    height: 36px;  
    z-index: 2;  
  
}
```

```
</style>
```

```
<link href="SpryAssets/SpryMenuBarHorizontal.css" rel="stylesheet" type="text/css">
```

```
<style type="text/css">
```

```
#apDiv5 {  
    position: absolute;  
    left: 63px;  
    top: 112px;  
    width: 1208px;  
    height: 731px;  
    z-index: 3;  
  
}
```

```
</style>
```

```
<script src="SpryAssets/SpryMenuBar.js" type="text/javascript"></script>
```

```
<meta charset="utf-8">
```

```
</head>
```

```
<body>
```

```

<div id="apDiv4">
  <ul id="MenuBar1" class="MenuBarHorizontal">
    <li><a href="Dashboard.php">Dashboard</a></li>
    <li><a href="Report.php">Report</a></li>
    <li><a href="Story.php">Story</a></li>
  </ul>
</div>
<div id="apDiv5">
<iframe src="https://us3.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.my_folders%2FST
allowfullscreen=""></iframe></div>
<a href="home.php"></a>
<div id="apDiv1">
<h1><a href="home.php"><span style="width: 100px; height: 100px; font-size: 36px; color: #F0F; t

<div id="apDiv2">
<h3><a href="Login.php">Sign in</a></h3></div>
<div id="apDiv3">
<h3> <a href="Register.php">Sign up</a></h3>
</div>
</div><br><br><br><br><br><br>
</body>
</html>

```

Github and Project Demo link

Github link- <https://github.com/IBM-EPBL/IBM-Project-19577-1659700911>

Project DemoLink-

https://drive.google.com/file/d/1whF74jR2xqKxN6rNd447qulVqTFBsiA6/view?usp=share_link

