‘Major Port Traffic & Capacity’

(using IBM Cognos Analytics)

A PROJECT REPORT

Submitted by

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at

Vellore Institute of Technology, Vellore

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TRAINING

in

‘Data Analytics’

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Under the guidance of

Mrs. Uma Rani

PROJECT DESCRIPTION:

The Indian Railways has a capital base of about Rs. 100000 crores and is often referred to as the lifeline of the Indian economy because of its predominance in transportation of bulk freight and long distance passenger traffic. The network criss-crosses the nation, binding it together by ferrying freight and passengers across the length and breadth of the country. As the Indian economy moves into a high growth trajectory the Railways have also stepped-up developmental efforts and are preparing themselves for an even bigger role in the future.

Goal of the Project:

- To regain some of the market, it has lost over past decades and regain market share in some commodities and overcome the challenges and to maintain sustainable growth in all its commodities.
- Reducing the congestion on rail corridors and improving port connectivity.
- The development of two Dedicated Freight Corridors across key ports

Solution Requirements:

Services Used: IBM Cognos Analytics

TECHNOLOGY & CONCEPTS involved :

Data Analytics :

Data analytics (DA) is the process of examining data sets in order to find trends and draw conclusions about the information they contain. Increasingly, data analytics is done with the aid of specialized systems and software. Data analytics technologies and techniques are widely used in commercial industries to enable organizations to make more-informed business decisions. Scientists and researchers also use analytics tools to verify or disprove scientific models, theories and hypotheses. As a term, data analytics predominantly refers to an assortment of applications, from basic business intelligence (BI), reporting and online analytical processing (OLAP) to various forms of advanced analytics. Data analytics initiatives can help businesses increase revenue, improve operational efficiency, optimize marketing campaigns and bolster customer service efforts. Analytics also enable organizations to respond quickly to emerging market trends and gain a competitive edge over business rivals. The ultimate goal of data analytics, however, is boosting business performance.

Four main types of data analytics

1. Predictive data analytics

Predictive analytics may be the most commonly used category of data analytics. Businesses use predictive analytics to identify trends, correlations, and causation. The category can be further broken down into predictive modeling and statistical modelling.

2. Prescriptive data analytics

Prescriptive analytics is where AI and big data combine to help predict outcomes and identify what actions to take. This category of analytics can be further broken down into optimization and random testing. Using advancements in ML, prescriptive analytics can help answer questions such as “What if we try this?” and “What is the best action?” We can test the correct variables and even suggest new variables that offer a higher chance of generating a positive outcome.

3. Diagnostic data analytics

Diagnostic data analytics is the process of examining data to understand cause and event or why something happened. Techniques such as drill down, data discovery, data mining, and correlations are often employed. Diagnostic data analytics help answer why something occurred.

Like the other categories, it too is broken down into two more specific categories:

- ➔ discover and alerts ,

➔ query and drill downs

Query and drill downs : used to get more detail from a report ,

Discover and alerts : notify of a potential issue before it occurs

4. Descriptive data analytics

Descriptive analytics are the backbone of reporting—it's impossible to have business intelligence (BI) tools and dashboards without it. It addresses basic questions of "how many, when, where, and what."

Project Flow:

· Users create multiple analysis graphs/charts/Visualizations.

· Using the analyzed chart creation of Dashboard is done.

· Saving and visualizing the final dashboard in the IBM Cognos Analytics.

To accomplish this, we have to complete all the activities and tasks listed below:

· IBM Cloud Account

· Login to Cognos Analytics

· Working with the Dataset

➔ Understanding the Dataset

➔ Loading the Dataset

PROBLEM STATEMENT:

Because of its dominance in the transportation of bulk freight and long-distance passenger traffic, the Indian Railways is sometimes referred to as the lifeline of the Indian economy, with a capital base of almost Rs. 100000 crores. The network crisscrosses the country, connecting it by ferrying freight and passengers across the country's length and width. As the Indian economy continues to grow at a rapid pace, the railways have increased their development efforts and are preparing for a larger role in the future.

As a data analyst we need to :

• To regain some of the market, it has lost over past decades and regain market share in some commoditiesand overcome the challenges and to maintain sustainable growth in all its commodities.

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

• The development of two Dedicated Freight Corridors across key ports

PROCEDURE :

To accomplish the objective, we have to follow the activities and tasks listed below:

- creating IBM Cloud Account
- Login to Cognos Analytics
- Working with the Dataset
- Understanding the Dataset
- Loading the Dataset
- Data Prep - Conversion of Data and Calculations
- Do required calculations in Dataset
- Finally , create Data Visualizations Charts
- Port-wise Traffic Distribution, Port wise Capacity Distribution
- Port-wise Traffic vs Capacity by Line Chart
- Port-wise Traffic Projected vs Achieved by Column Chart
- Port-wise Traffic Projected vs Achieve by Stacked Column Chart
- Port-wise Total Capacity Projects vs Total Capacity Achieve by Line and Bar Chart
- Port-wise Traffic Projects vs Total Projected by Area Chart
- Port-wise Total Capacity Achieve, Traffic Achieved using Stacked Bar
- Filters

- Port-wise Total Capacity Achieved using Map
- Summary Cards and Visual using Total Capacity vs Actual Capacity Column Chart

So we all know the first 2 steps and can do them easily. So we shall move on and continue from 3rd step.

Working with the Dataset

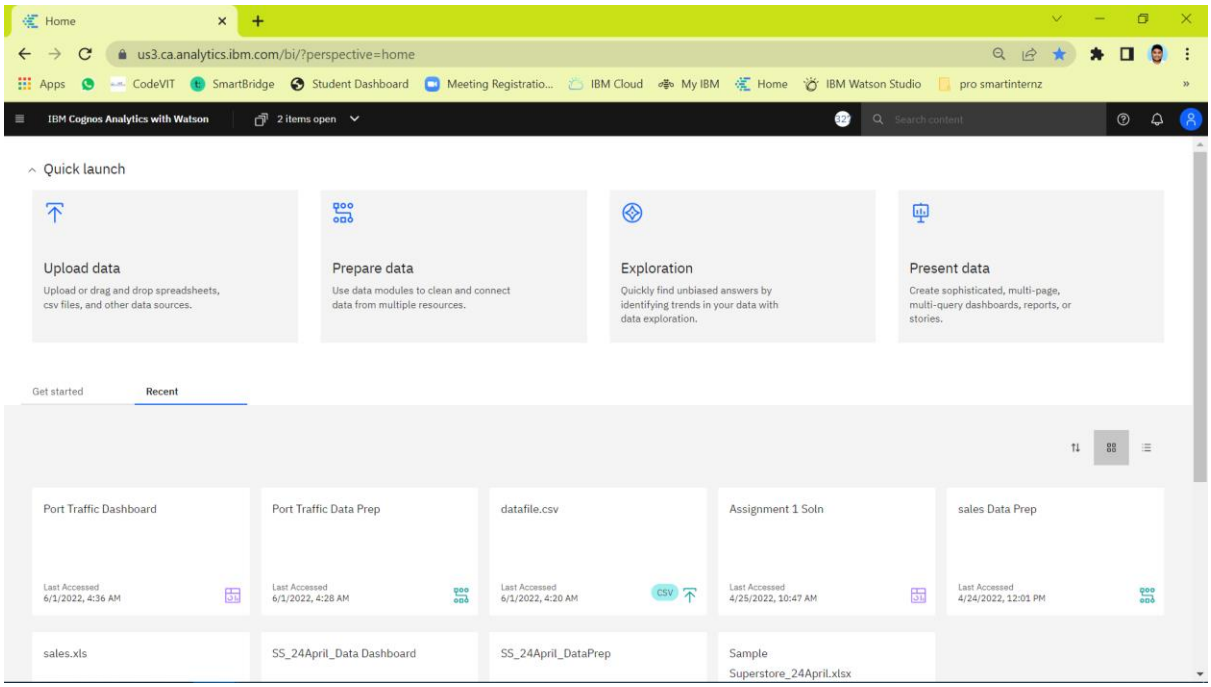
Before we build a view and do analysis of our data, we must first connect the data to IBM Cognos. Cognos supports connecting to a wide variety of data, stored in a variety of places. The data can be stored on our computer in a spreadsheet or a text file, or in a big data, relational, or cube (multidimensional) database on a server in our enterprise.

Understanding the Dataset

This dataset consists information about used 'Major Port : Traffic and its Capacity'

It has 7 columns each columns consists information about 'Major Port : Traffic and its Capacity' like Traffic in Eleventh Plan (MT) (2011-12)Proj. : traffic projected in 11th plan of project , i.e; 2011-12 session , Traffic in Eleventh Plan (MT) (2011-12) Ach. : traffic achieved in 11th plan of project , i.e; 2011-12 session , Traffic in Eleventh Plan (MT) (2011-12) % : traffic percentage in 11th plan of project , i.e; 2011-12 session , Total Capacity in Eleventh Plan (MT) (2011-12) Proj. : total capacity projected in 11th plan of project , i.e; 2011- 12 session, Total Capacity in Eleventh Plan (MT) (2011-12) Ach. : total capacity achieved in 11th plan of project , i.e; 2011-12 session Total Capacity in Eleventh Plan (MT) (2011-12) % : total capacity percentage in 11th plan of project , i.e; 2011-12 session & Port : name of the ports.

Loading the dataset:



Data Prep – Conversion of Data and Calculations:

Now, we need prepare dataset, we need to rename the ‘existing column name’ to ‘simple column name’, as :

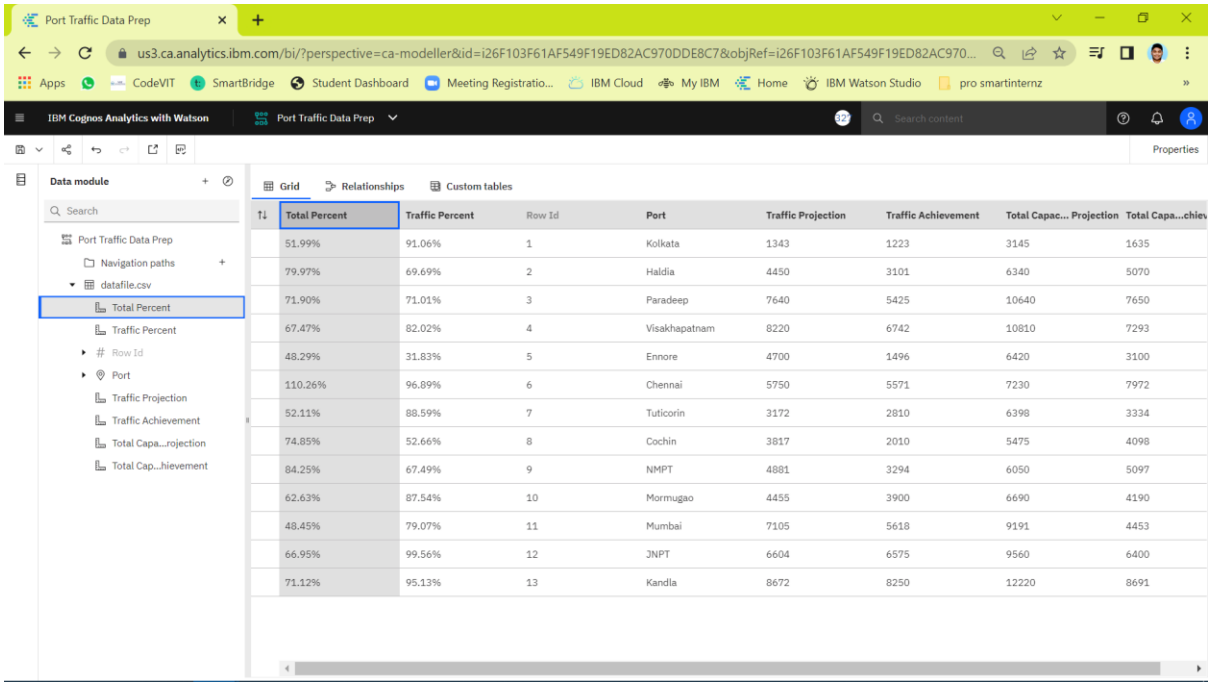
Existing Column Name	Rename to
Traffic in Eleventh Plan (MT) (2011-12)Proj.	Traffic Projection
Traffic in Eleventh Plan (MT) (2011-12) Ach.	Traffic Achievement
Traffic in Eleventh Plan (MT) (2011-12) %	Traffic Percentage
Total Capacity in Eleventh Plan (MT) (2011-12) Proj.	Total Capacity Projection
Total Capacity in Eleventh Plan (MT) (2011-12) Ach.	Total Capacity Achievement
Total Capacity in Eleventh Plan (MT) (2011-12) %	Total Capacity Percentage

i. Traffic Percentage as

Traffic Achievement / Traffic Projection

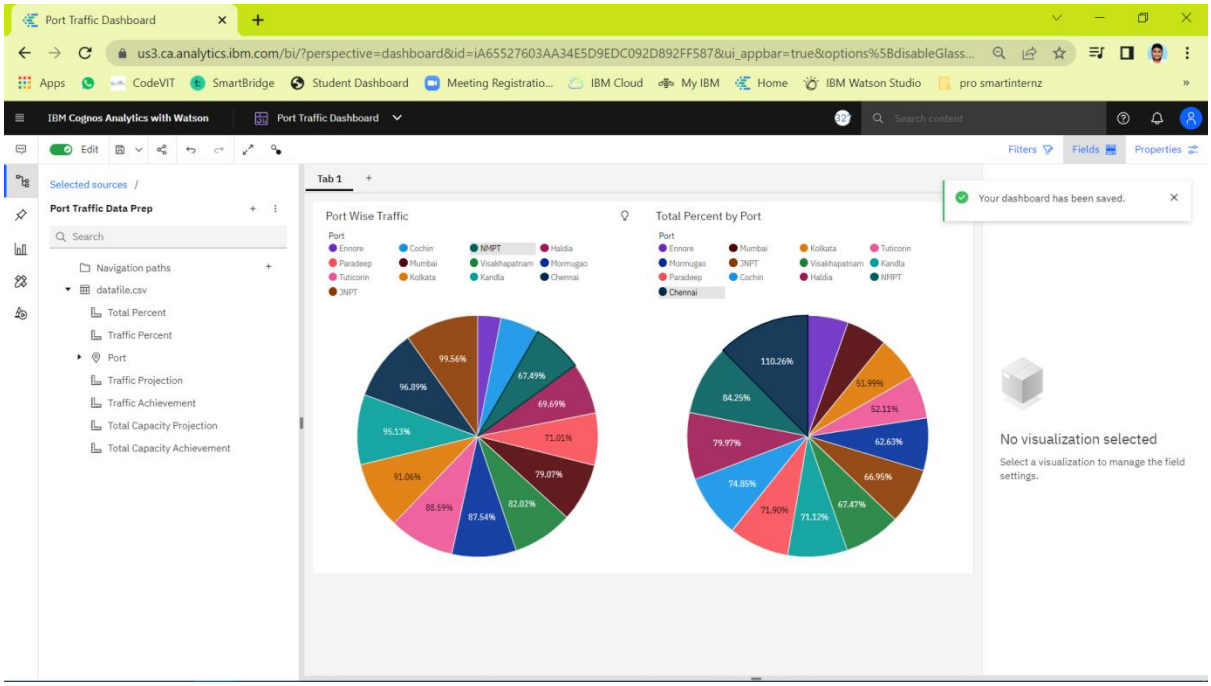
ii. Total Capacity Percentage as

Total Capacity Achievement / Total Capacity Projection

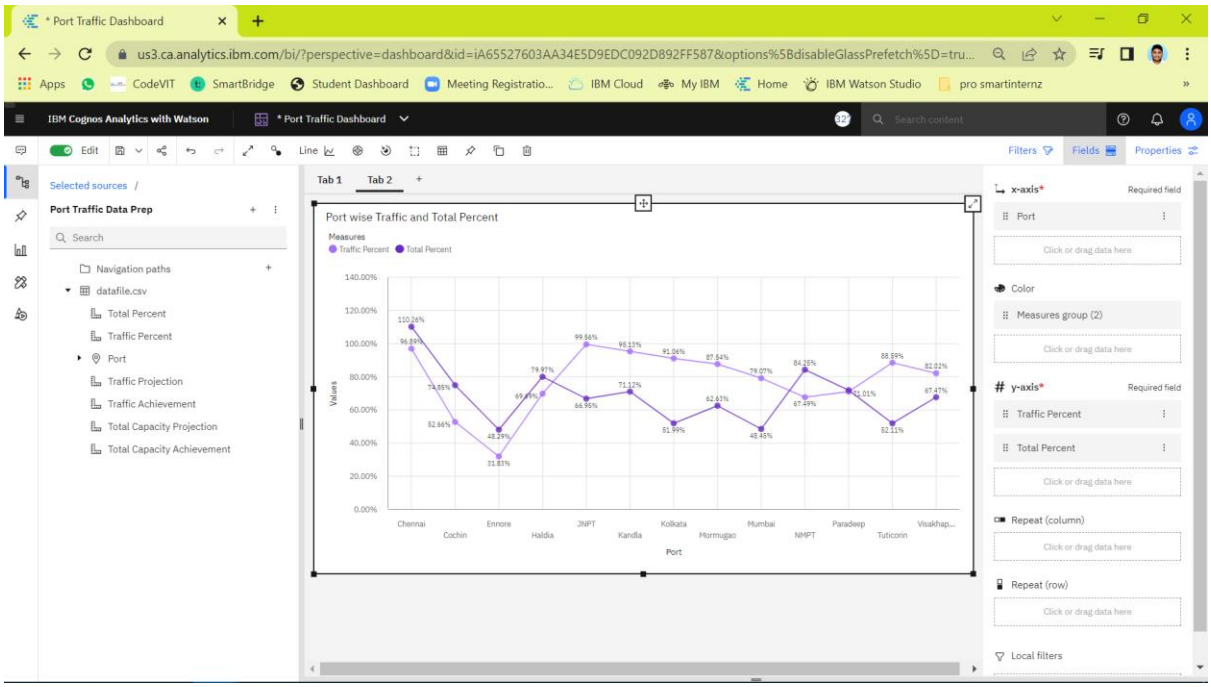


Now save these and come back to home.

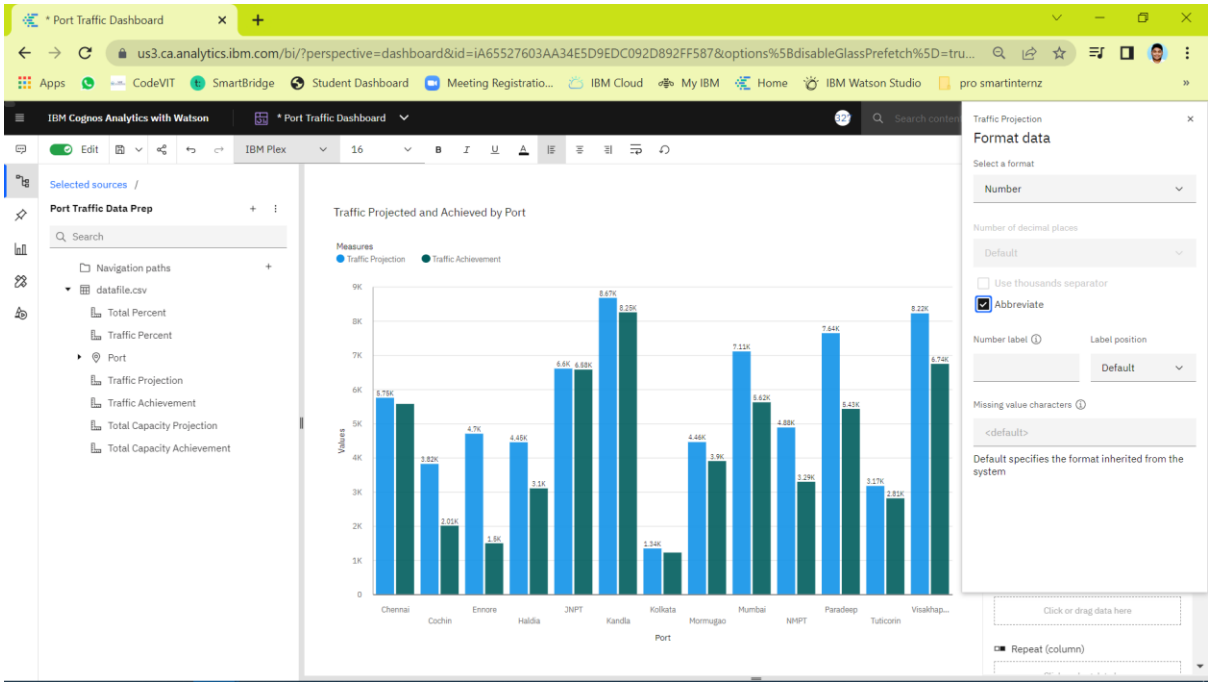
Port-wise Traffic Distribution, Port wise Capacity Distribution:



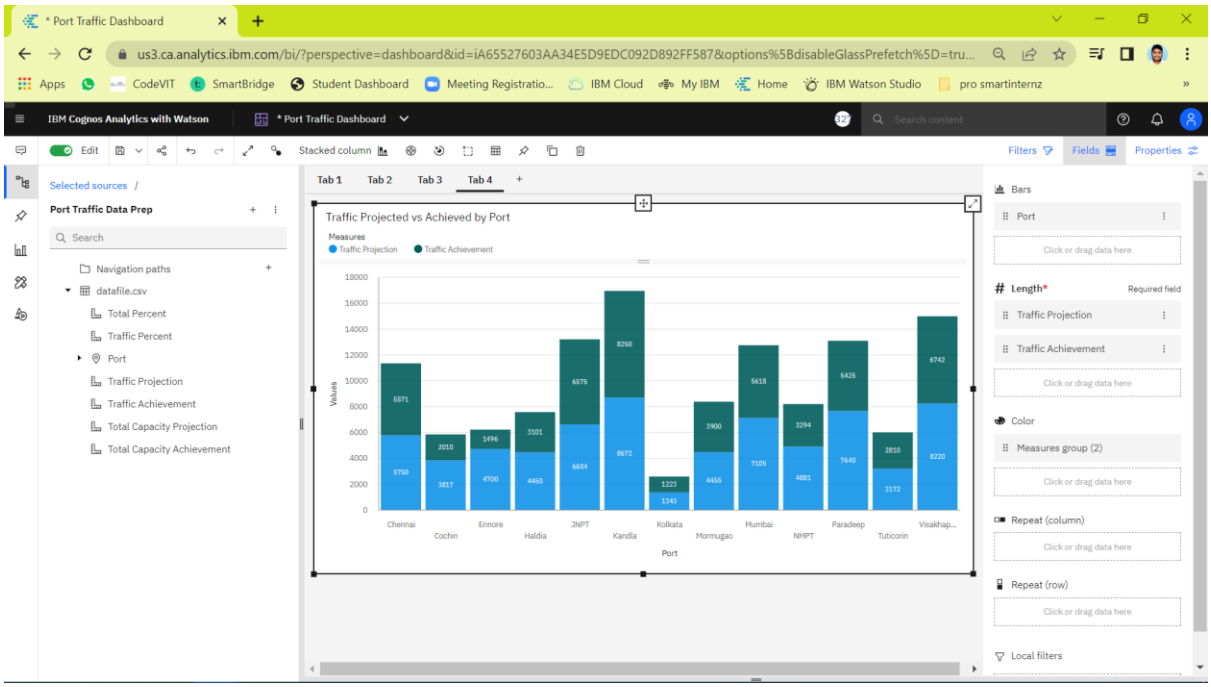
Port-wise Traffic vs Capacity by Line Chart:



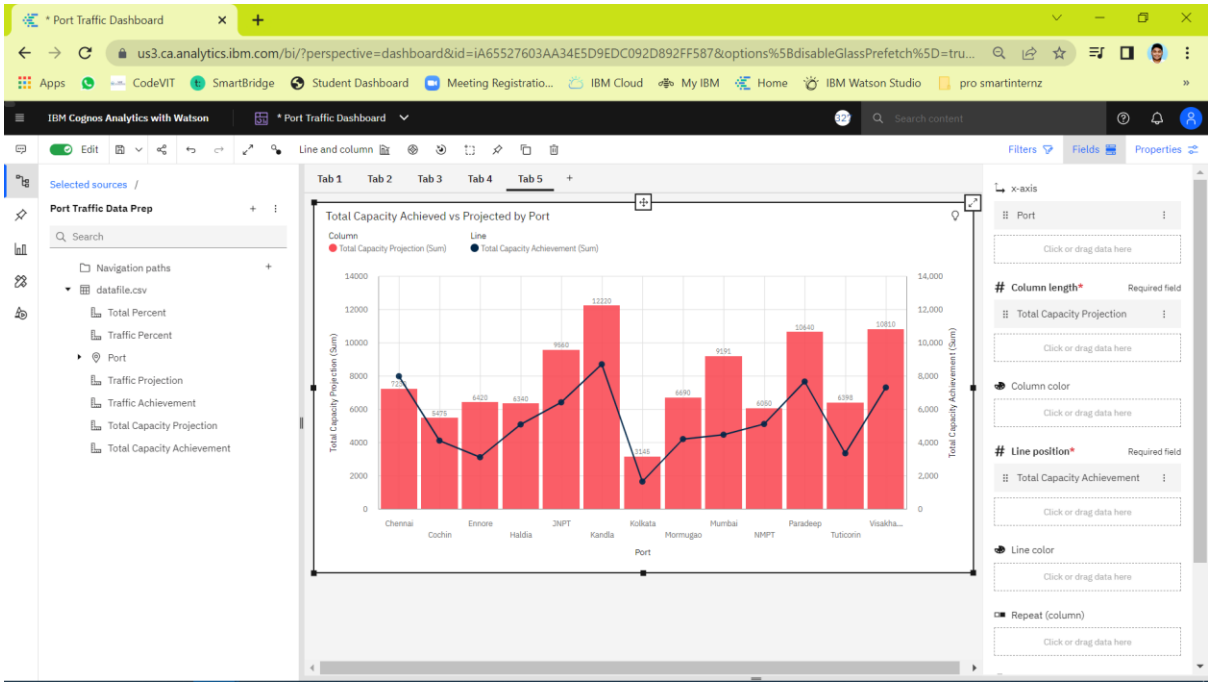
Port-wise Traffic Projected vs Achieved by Column Chart:



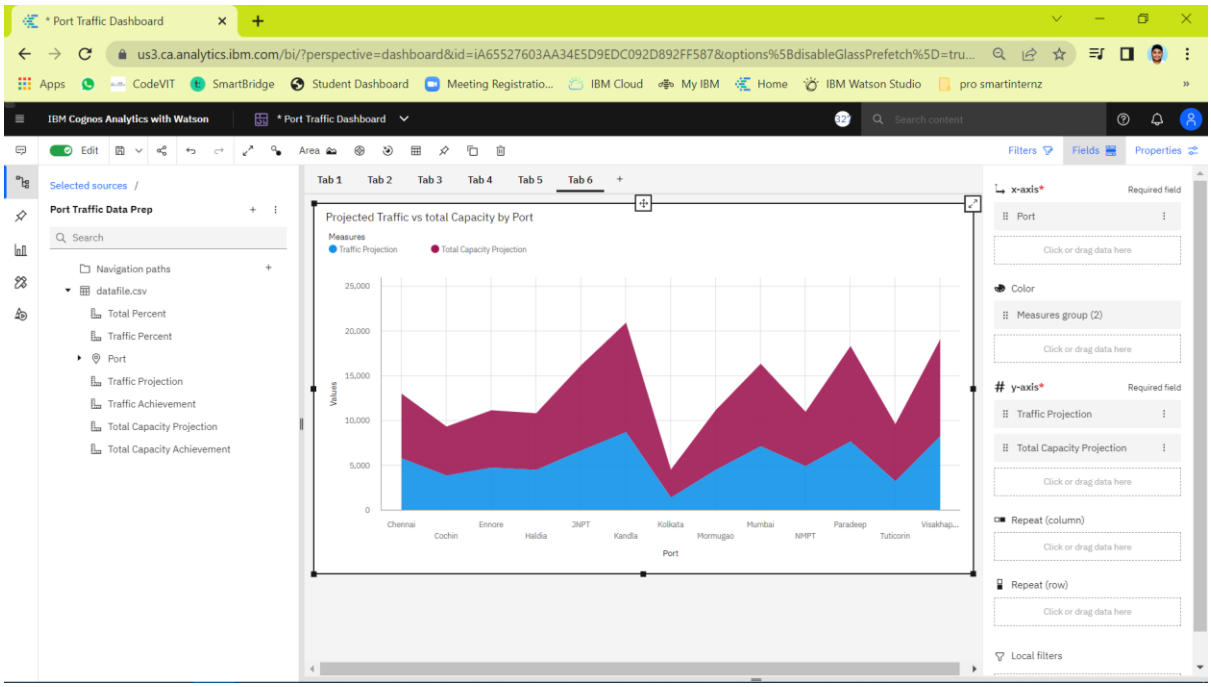
Port-wise Traffic Projected vs Achieve by Stacked Column Chart:



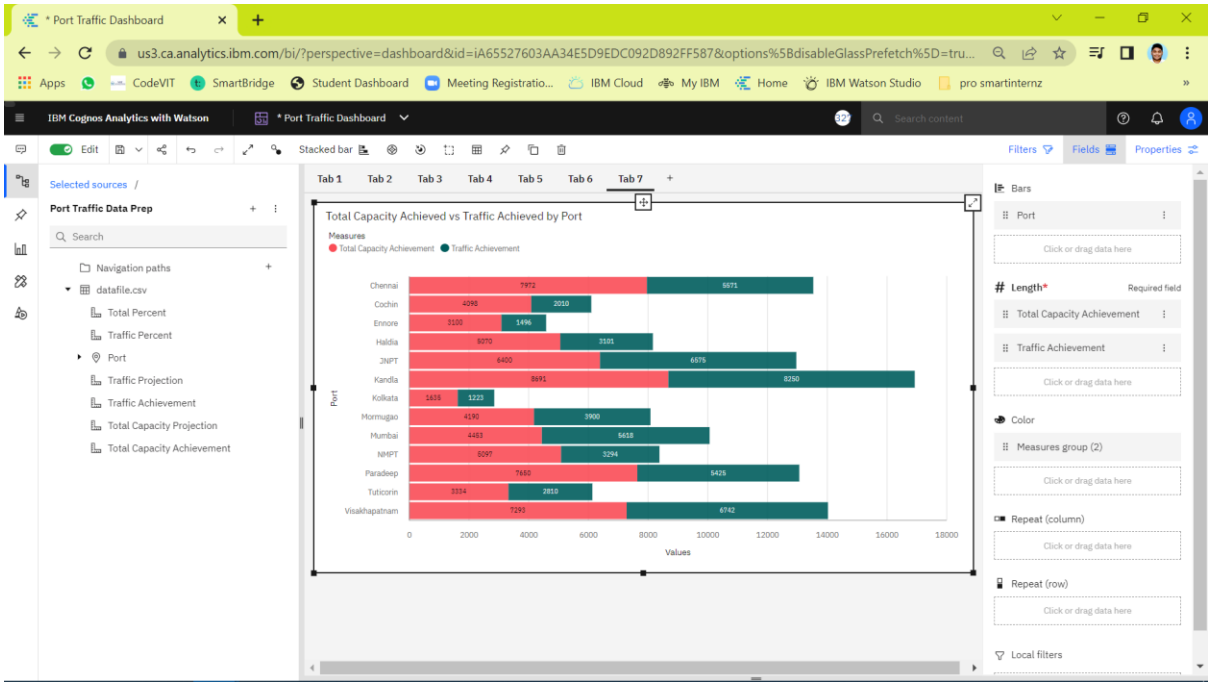
Port-wise Total Capacity Projects vs Total Capacity Achieve by Line and Bar Chart:



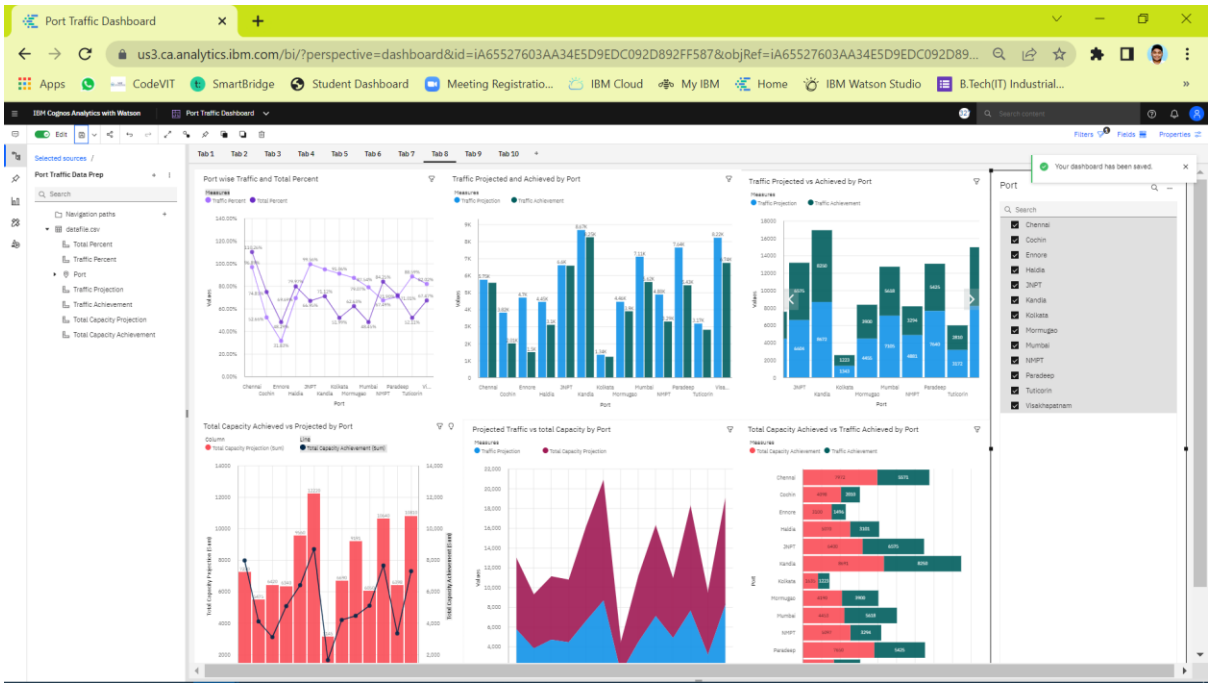
Port-wise Traffic Projects vs Total Projected by Area Chart:

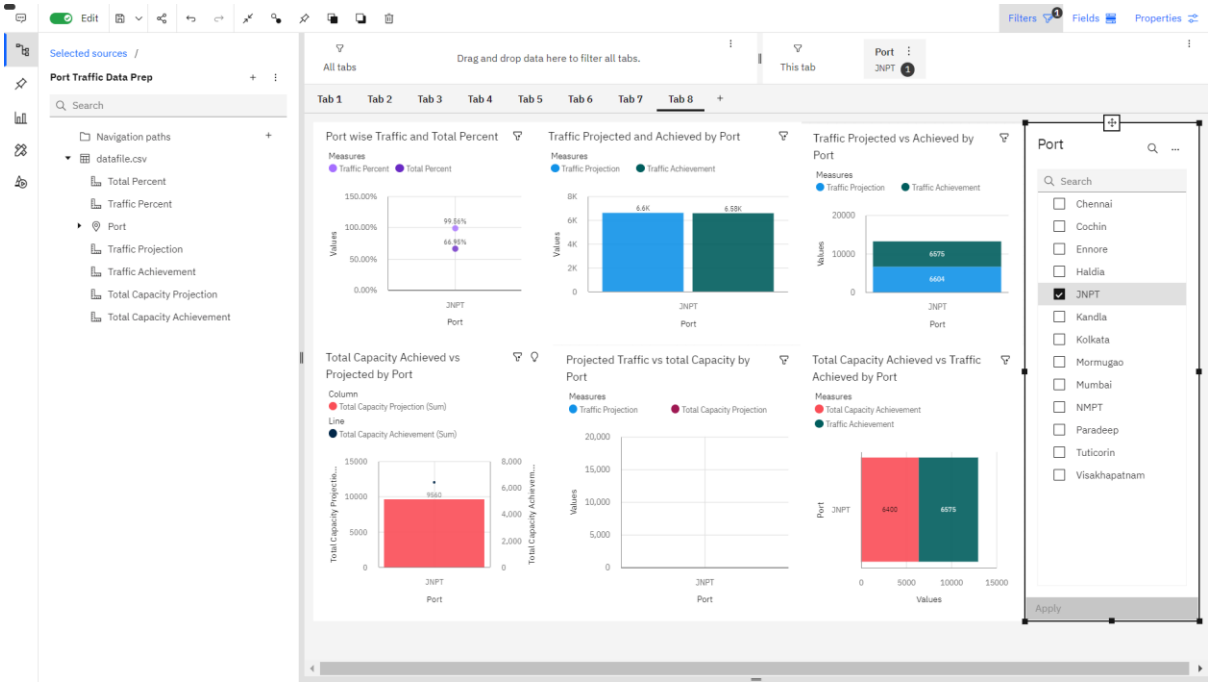


Port-wise Total Capacity Achieve, Traffic Achieved using Stacked Bar:



Filters:


Port Traffic Dashboard
Port wise Traffic and Total Percent
Traffic Projected and Achieved by Port
Traffic Projected vs Achieved by Port
Total Capacity Achieved vs Projected by Port
Projected Traffic vs total Capacity by Port
Total Capacity Achieved vs Traffic Achieved by Port
Port


Edit
Filters
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Selected sources
Port Traffic Data Prep
All tabs
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This tab
Port
JNPT
Tab 1
Tab 2
Tab 3
Tab 4
Tab 5
Tab 6
Tab 7
Tab 8
Port wise Traffic and Total Percent
Traffic Projected and Achieved by Port
Traffic Projected vs Achieved by Port
Total Capacity Achieved vs Projected by Port
Projected Traffic vs total Capacity by Port
Total Capacity Achieved vs Traffic Achieved by Port
Chennai
Cochin
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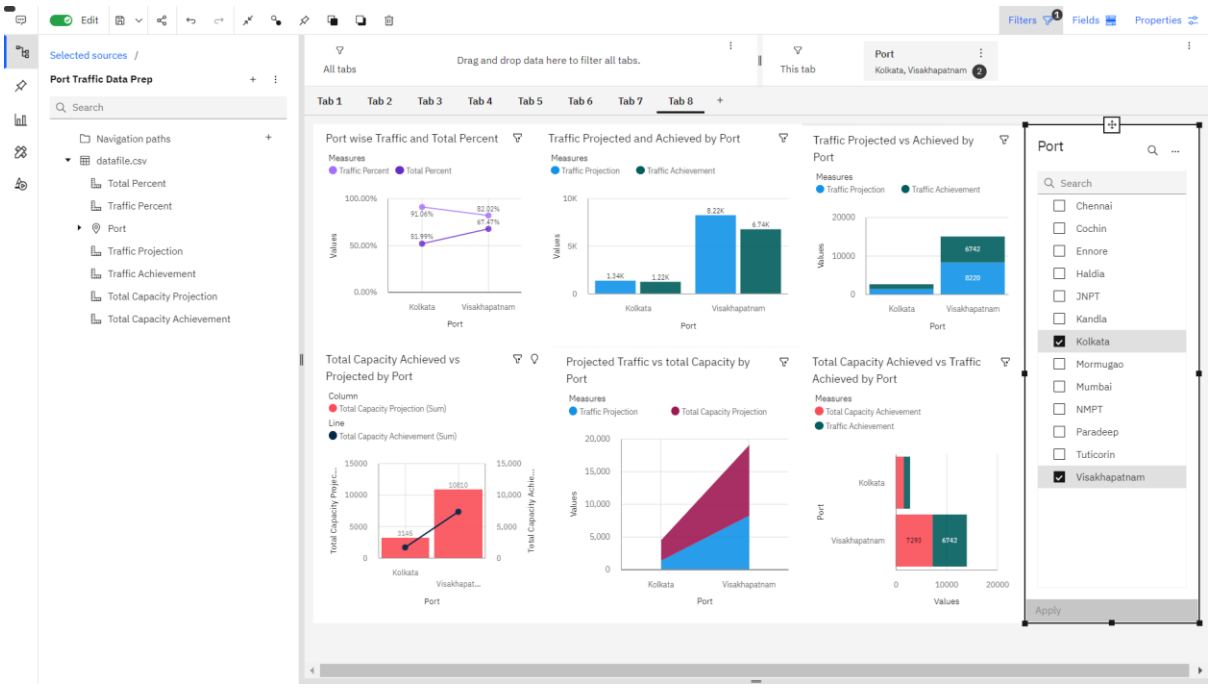
Mormugao
Mumbai
NMPT
Paradeep
Tuticorin
Visakhapatnam
Apply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Total Percent
Traffic Percent
Port
Traffic Projection
Traffic Achievement
Total Capacity Projection
Total Capacity Achievement
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Port
Kolkata, Visakhapatnam 2
Tab 1
Tab 2
Tab 3
Tab 4
Tab 5
Tab 6
Tab 7
Tab 8
Port wise Traffic and Total Percent
Traffic Projected and Achieved by Port
Traffic Projected vs Achieved by Port
Total Capacity Achieved vs Projected by Port
Projected Traffic vs total Capacity by Port
Total Capacity Achieved vs Traffic Achieved by Port
Chennai
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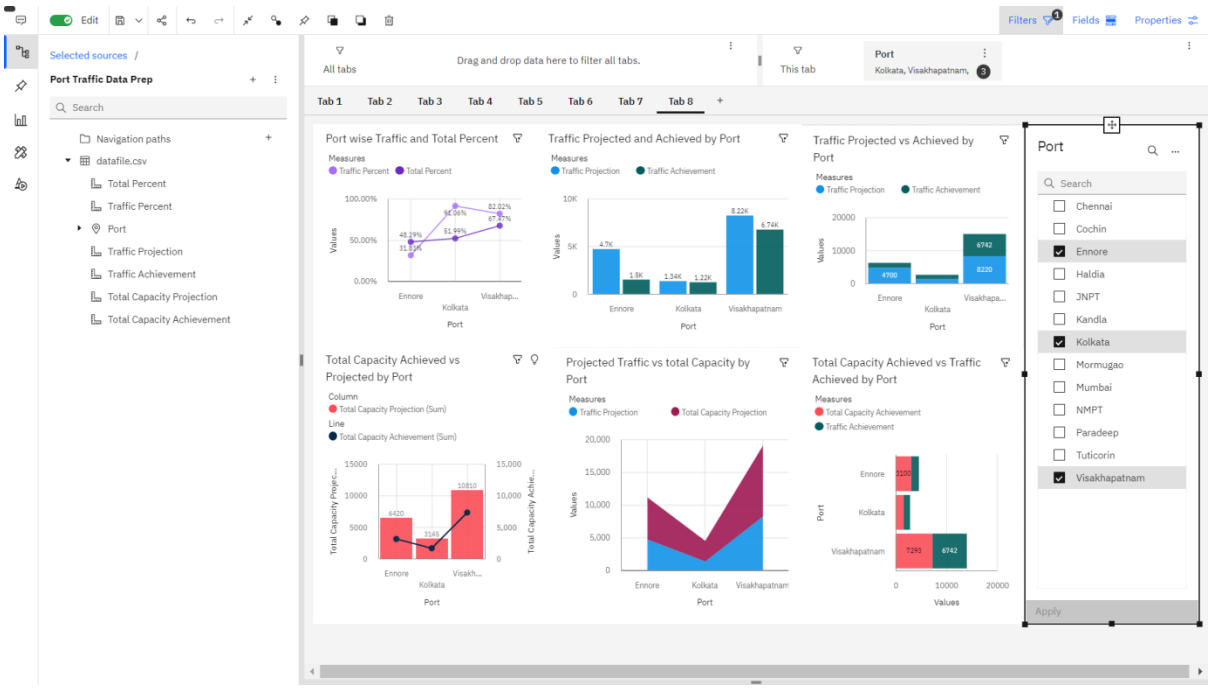
Kolkata
Mormugao
Mumbai
NMPT
Paradeep
Tuticorin
Visakhapatnam
Apply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Port Traffic Data Prep
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Navigation paths
datafile.csv
Total Percent
Traffic Percent
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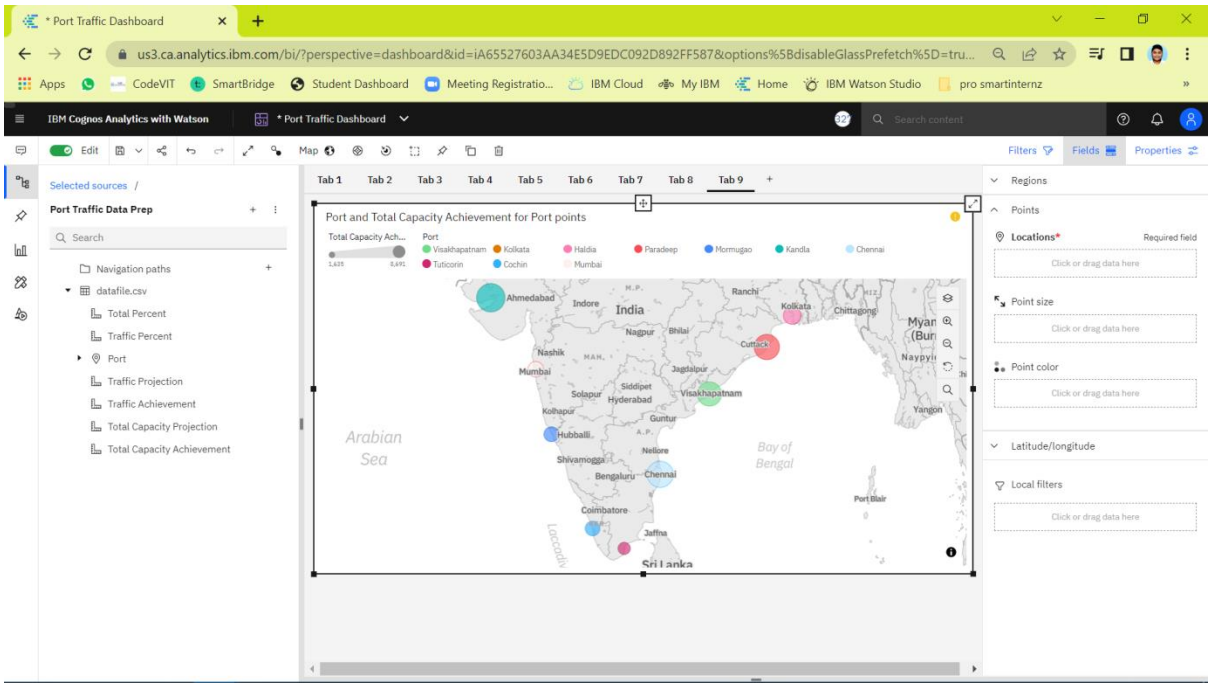
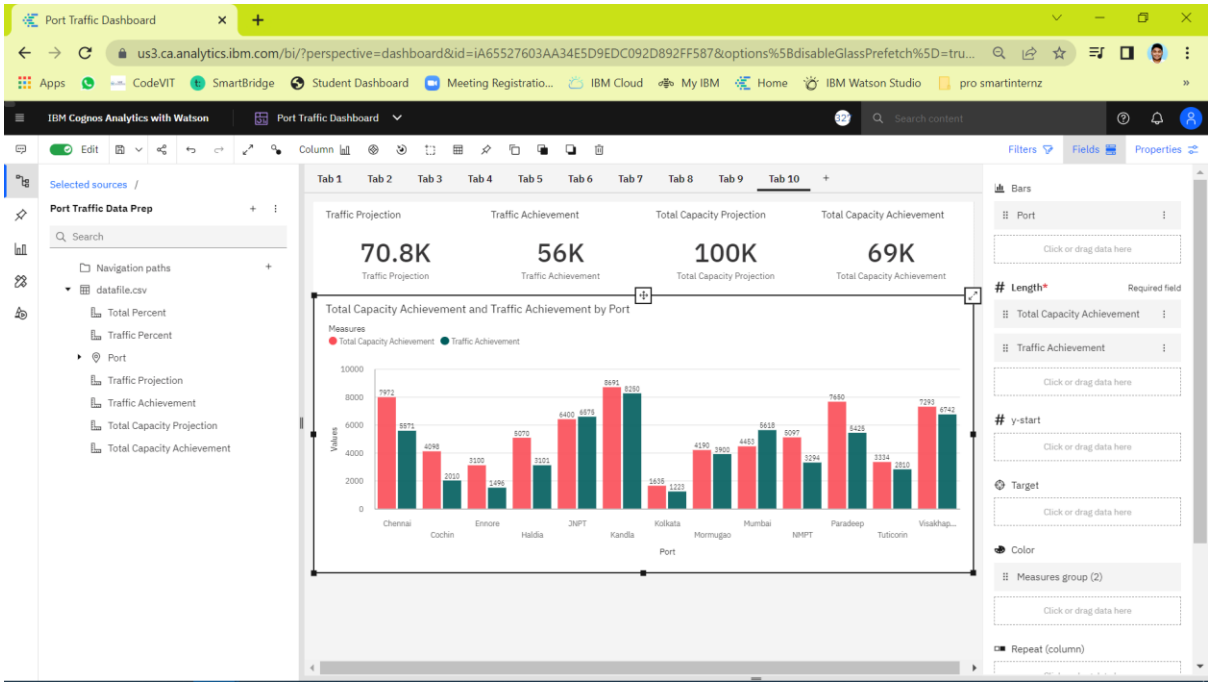
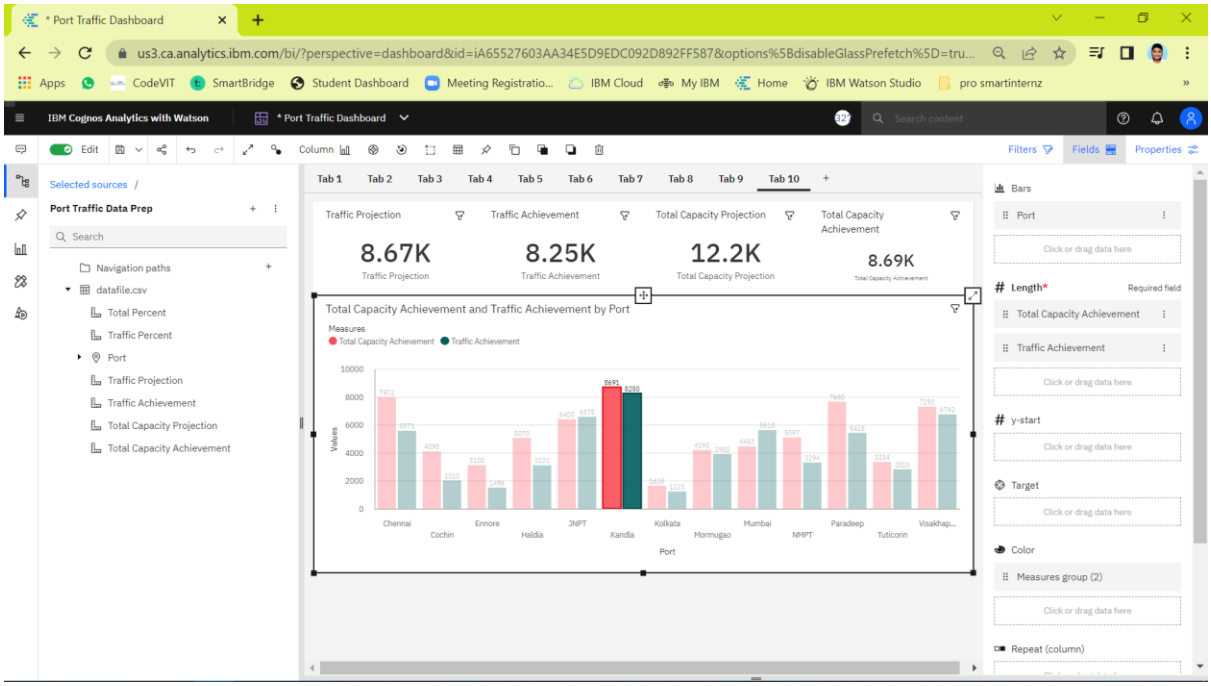
Traffic Projection
Traffic Achievement
Total Capacity Projection
Total Capacity Achievement
All tabs
Drag and drop data here to filter all tabs.
This tab
Port
Kolkata, Visakhapatnam, 3
Tab 1
Tab 2
Tab 3
Tab 4
Tab 5
Tab 6
Tab 7
Tab 8
Port wise Traffic and Total Percent
Traffic Projected and Achieved by Port
Traffic Projected vs Achieved by Port
Total Capacity Achieved vs Projected by Port
Projected Traffic vs total Capacity by Port
Total Capacity Achieved vs Traffic Achieved by Port
Chennai
Cochin
Ennore
Haldia
JNPT
Kandla
Kolkata
Mormugao
Mumbai
NMPT
Paradeep
Tuticorin
Visakhapatnam
Apply

Port-wise Total Capacity Achieved using Map:



Summary Cards and Visual using Total Capacity vs Actual Capacity Column Chart:





CONCLUSION

As learning / outcome from (training + project) :

I have learned fundamental concepts and I can work on IBM Cognos Analytics , also :

- Understanding big/small industrial dataset ,
- Making data preparation report of real dataset(s) ,
- Calculations in dataset for getting meaningful insights & visuals for appropriate predictive result for data(s) ,
- Have learned a broad understanding of plotting different graphs ,
- Learned to create meaningful dashboard

Thank You