

Project On Tata Power Stock Analysis



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Data Analytics
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Project Guide :- Srikanth

Team ID : Team-591245

Project Name : Project On Tata Power Stock Analysis

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Project Overview: -

Overview of Tata Power Stock Dataset:

An Indian electric utility firm, Tata Power firm Limited is a division of the Tata Group conglomerate. It is one of India's biggest integrated power corporations, producing, transferring, and distributing electricity throughout different areas. The Tata Power stock dataset offers information and historical statistics about the performance of the company's stock on the financial markets.

Key Features of the Dataset:

1. **Stock Price Data:** Usually displayed as daily closing prices, the dataset contains historical Tata Power stock price information. It makes it possible to track and analyze changes in the stock's price over a given period of time.
2. **Time Frame:** Depending on the source and accessibility of the data, the dataset's coverage may differ within the specified time frame. It may contain information covering a few years or a shorter time frame, enabling users to examine both long- and short-term patterns.
3. **Stock Metrics:** The dataset may also contain information on trade volume, market capitalization, dividend history, and other pertinent financial indicators in addition to stock prices. These indicators shed light on the company's financial standing and investor attitude.
4. **Data Granularity:** The dataset has the potential to offer data at multiple levels of detail, including daily, weekly, monthly, and even intraday periods. The ability to access data at several time periods gives consumers the flexibility to examine the performance of the stock from various angles.
5. **Adjacent Market Data:** To offer a baseline for comparison, the dataset may also contain pertinent sector or market indices in addition to the stock-specific data. This enables users to evaluate Tata Power's stock performance in comparison to more general market trends.
6. **Data Sources:** A variety of sources, such as reliable financial websites, stock exchanges, and providers of financial data, may have contributed to the compilation of the dataset. To preserve data integrity, it is crucial to guarantee the dependability and correctness of the data sources.

Potential Use Cases:

1. **Stock Performance Analysis:** Using the dataset, users can examine the past performance of Tata Power's stock, spot trends, and investigate how different factors affect price movement. Financial analysts, traders, and investors can all benefit from this analysis.
2. **Technical Analysis:** Using a variety of indicators, chart patterns, and statistical tools, traders can use the dataset for technical analysis to forecast future price movements and make well-informed trading decisions.
3. **Financial Research:** Using the dataset, researchers can carry out empirical investigations into the dynamics of the stock market, correlations with macroeconomic variables, or relationships with

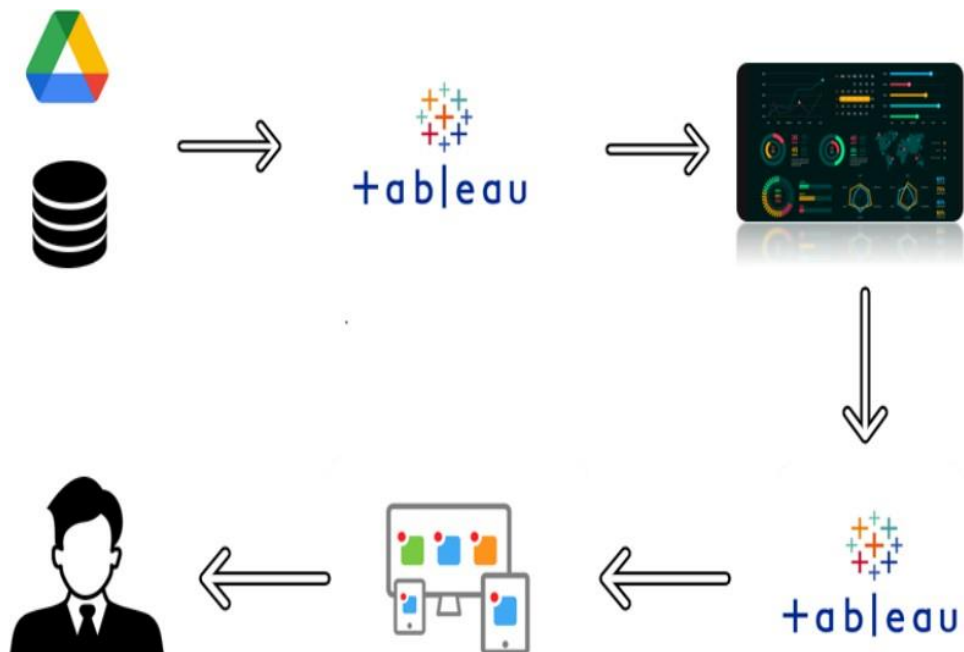
other businesses or industries.

4. Algorithmic Trading: By utilizing historical price patterns and associated metrics, algorithmic traders and quantitative analysts can create and test trading strategies using the dataset.

5. Machine Learning Models: Using historical patterns and other factors, data scientists can use the dataset to create machine learning models that forecast future stock prices or identify trading signals.

It is important to note that the dataset's usefulness and relevance depend on its quality, completeness, and timeliness. Users should exercise due diligence in understanding the dataset's limitations and verifying its accuracy when using it for analysis or decision-making.

Technical Architecture:-



Project Flow

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

Define Problem / Problem Understanding

- Social or Business Impact.
- Specify the business problem
- Literature Survey
- Business requirements
- Data Collection & Extraction from Database
 - Connect dataset with Tableau
 - Collect the dataset,
- Data Preparation
 - Prepare the Data for Visualization
- Data Visualizations
 - No of Unique Visualizations
- Dashboard
 - Responsive and Design of Dashboard
- Story
 - No of Scenes of Story
- Performance Testing
 - Amount of Data Rendered to DB ‘
 - Utilization of Data Filters
 - No of Calculation Fields
 - No of Visualizations/ Graphs
- Web Integration
 - Dashboard and Story embed with UI With Flask
- Project Demonstration & Documentation
 - Record explanation Video for project end to end solution.
 - Project Documentation-Step by step project development procedure

Milestone 1: Define Problem / Problem Understanding

Activity 1: Specify the business problem

Refer Project Description

Activity 2: Business requirements

The business requirements for this project would likely include

Data collection: Gathering information from a data source relevant to artificial intelligence is the first prerequisite.

Data preparation and cleaning: In order to make sure the gathered data is appropriate for analysis, it needs to be processed and cleaned. This could entail purging unneeded information, fixing errors and missing values, and formatting the data so that it works with the analysis software.

Data analysis: In order to find important insights, the data must be analyzed. To better understand the data, this may entail applying methods like regression analysis, data visualization, and descriptive statistics.

Report creation: A thorough report with data tables and visualizations must be created based on the insights and conclusions drawn from the data analysis. The report needs to be clearly and concisely organized, with explanations of the results that are easy to understand.

Activity 3: Literature Survey :-

Literature Review on Tata Power Stock Dataset:

1. Gurung and Ghimire's "Stock Market Prediction using Machine Learning Techniques: A Review" (2020): This paper offers a thorough analysis of machine learning methods used in stock market forecasting. It talks about different stock price forecasting models and algorithms, including ones that are used with Tata Power stock. The authors stress how crucial it is to train and assess machine learning models using accurate and trustworthy datasets, like the Tata Power stock dataset.
2. "Predicting Stock Prices using Technical Analysis and Machine Learning Techniques" by P. Gupta and R. Rastogi (2020): This paper investigates the prediction of stock prices through the use of machine learning techniques in conjunction with technical analysis indicators. It contrasts how well various machine learning algorithms perform in forecasting future stock prices and analyzes Tata Power stock data. The study highlights how important complete and accurate datasets are to producing trustworthy predictions.
3. "An Empirical Study on Factors Affecting Stock Returns in Indian Power Sector" by S. Prasad and S. Swarup (2019): The factors affecting stock returns in the Indian power industry, which includes Tata Power, are the main subject of this study. It examines numerous fundamental and market-related elements and how they affect the performance of stocks. The study conducts a thorough empirical analysis using historical stock price data from Tata Power and other companies.
4. "Efficiency of Indian Stock Market: A Study of Power Sector" by P. Singh and S. Gupta (2018): The effectiveness of the Indian stock market is examined in this paper, with a focus on the power industry. To ascertain market efficiency and the existence of any anomalies, it examines the Tata Power stock data as well as stock data from other power sector companies. The study assesses stock market efficiency using econometric models and statistical measures.
5. "Volatility Spillovers and Stock Market Linkages: Evidence from India's Power Sector" by S. Patnaik and R. Jain (2017): This study looks into the relationships between stock markets and India's power sector's volatility spillovers. In order to comprehend the transmission of market volatility, the study looks at the relationships between Tata Power and other stocks in the power sector. It analyzes the co-movement of sector stock prices using time series analysis techniques.
6. "A Comparative Analysis of Stock Market Prediction using Data Mining Techniques" by S. Bhatia and V. Sethi (2016): The study offers a comparison of different data mining methods for predicting the stock market, including those used with Tata Power shares. It investigates how predictive models can be created using historical stock price data in conjunction with other financial and market indicators. The study addresses the significance of precise and complete datasets and assesses the performance of various algorithms.

These reviews of the literature emphasize the value of precise and trustworthy datasets—like the Tata Power stock dataset—for a range of purposes, such as empirical research, market efficiency analysis, and stock prediction. In order to guarantee the validity and reliability of their analyses and models, researchers stress the importance of having strong datasets.

Activity 4: Social or Business Impact.

Business Model/Impact: -

1. Investment Decision-making: For the purpose of helping financial institutions and investors make wise investment decisions, the Tata Power stock dataset offers useful information. It gives investors the ability to evaluate the Tata Power stock's past performance, volatility, and trends. The company's growth prospects, market position, and financial health are all evaluated with the help of this dataset—all important aspects of investment analysis.

2. Risk management: Risk managers and portfolio managers can examine the risk-return profile of Tata Power stock thanks to the availability of historical stock data. The dataset can be used by them to evaluate the correlations, volatility, and downside risks related to Tata Power investments. This data facilitates the creation of diversified portfolios and efficient risk management.

3. Market Analysis and Strategy: To perform market analysis and develop investment strategies, financial analysts and market researchers use the Tata Power stock dataset. Analysts can spot patterns, market cycles, and possible trading opportunities by examining historical data, market trends, and correlations with other market indicators. Using this dataset will help you create investment plans that take market dynamics into account.

4. Algorithmic Trading and Quantitative Research: The availability of the Tata Power stock dataset is valuable for quantitative analysts and algorithmic traders. They can use the historical data to develop and backtest trading strategies based on technical indicators, statistical models, and machine learning algorithms. This dataset supports the development of automated trading systems and quantitative research in the financial markets.

Social Impact:

1. Investor Education and Financial Literacy: The Tata Power stock dataset's accessibility advances financial literacy and investor education. It makes it possible for regular people, learners, and inexperienced investors to study investment strategies, comprehend the workings of stock markets, and examine actual stock data. This encourages financial literacy and gives people the power to choose wisely when making investments.

2. Transparency and Accountability: The financial markets are made more accountable and transparent by the availability of precise and thorough stock datasets, such as Tata Power. Transparency in business operations is facilitated by the availability of trustworthy information about the company's past performance to stakeholders and investors. This encourages confidence and trust among investors and the broader public.

3. Economic Analysis: Researchers, decision-makers, and economists use the Tata Power stock dataset to aid in their economic analyses. Through an analysis of the stock's performance and its correlations with macroeconomic variables, one can acquire valuable insights into the impact of the power sector on the economy at large. This dataset facilitates the analysis of policy implications,

industry trends, and the sector's growth contribution to the economy.

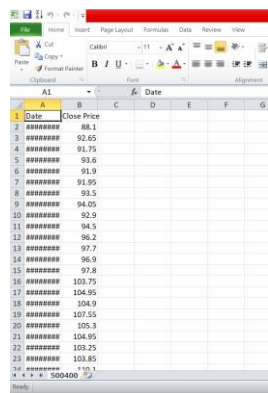
4. Socio-economic Development: Tata Power makes a major contribution to the socio-economic development of the areas it serves by working in the power industry. The company's financial performance, expansion goals, and investment activities are all revealed by the stock dataset. Policymakers, stakeholders, and communities can evaluate the company's impact on creating jobs, developing infrastructure, and advancing the economy as a whole with the use of this information.

Overall, The Tata Power stock dataset supports market analysis, quantitative research, risk management, and investment decisions. It has significant business implications. It also has a positive social impact on socioeconomic development, investor education, transparency, and economic analysis.

Milestone 2: Data Collection & Extraction from Database

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes and generate insights from the data.

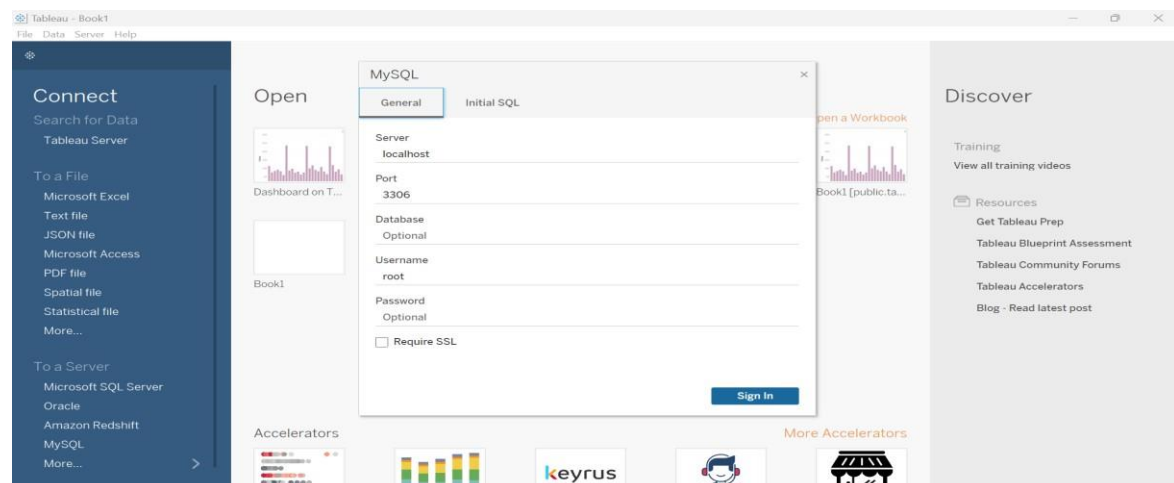
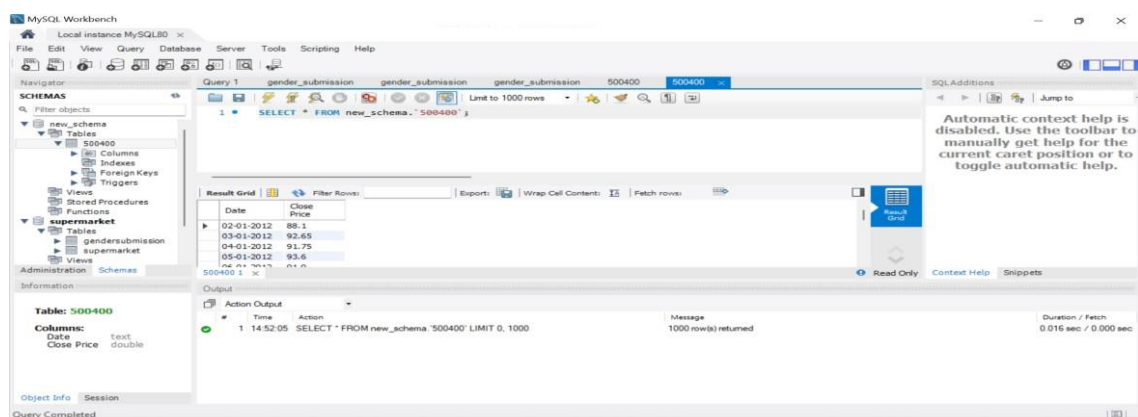
Activity 1: Collect the dataset:



A	B	C	D	E	F	G
1	Date	Close Price				
2	02-01-2012	88.1				
3	03-01-2012	92.65				
4	04-01-2012	91.75				
5	05-01-2012	93.6				
6	06-01-2012	91.9				
7	07-01-2012	91.95				
8	08-01-2012	93.5				
9	09-01-2012	94.05				
10	10-01-2012	92.9				
11	11-01-2012	94.5				
12	12-01-2012	96.2				
13	13-01-2012	97.7				
14	14-01-2012	96.9				
15	15-01-2012	97.8				
16	16-01-2012	103.75				
17	17-01-2012	104.95				
18	18-01-2012	104.9				
19	19-01-2012	107.55				
20	20-01-2012	105.3				
21	21-01-2012	104.95				
22	22-01-2012	103.25				
23	23-01-2012	103.85				
24	24-01-2012	110.1				
25	25-01-2012	100.400				

Activity 1.1: Understand the data.

Activity 2: Connect Dataset to Tableau:

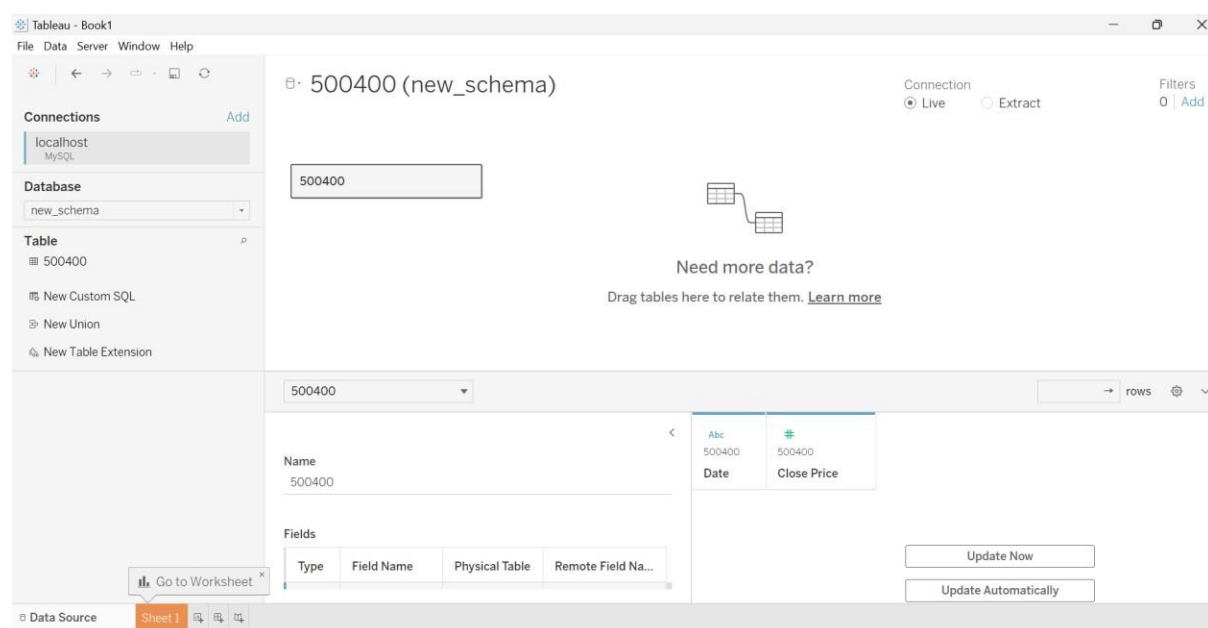


Milestone 3: Data Preparation

Activity 1: Prepare the Data for Visualization

Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the data is accurate and complete. This process helps to make the data easily understandable and ready for creating visualizations to gain insights into the performance and efficiency

Activity 1.1 : Preparing a Data Module:



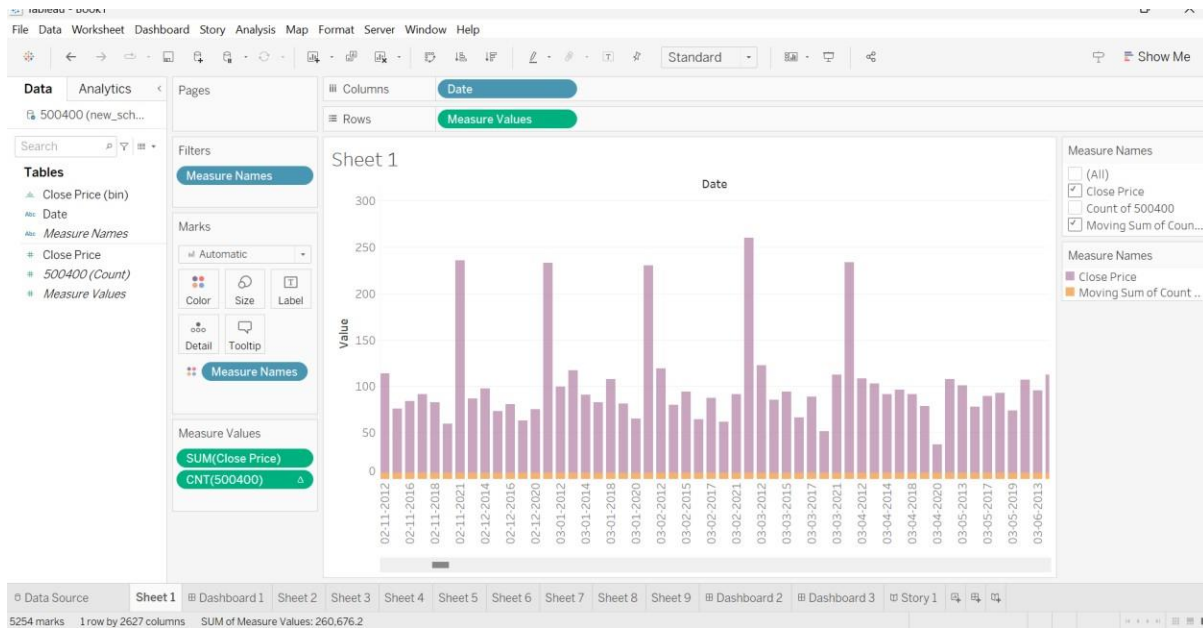
Milestone 4: Data Visualization

Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

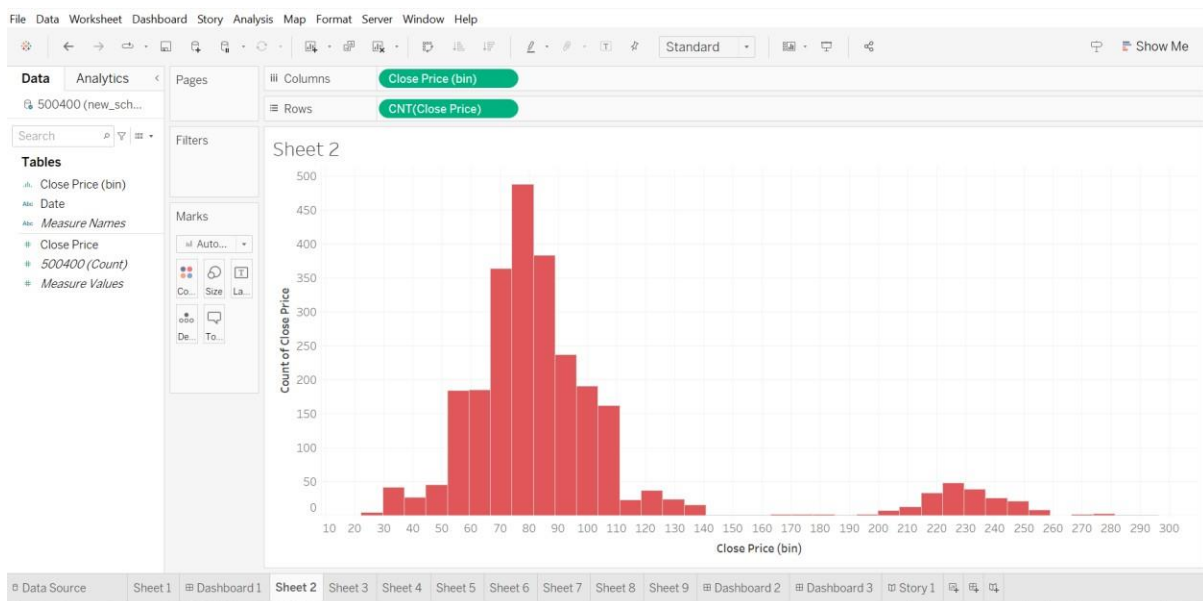
Activity 1: No of Unique Visualizations

The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyse the Rice production include bar charts, line charts, heat maps, scatter plots, pie charts, Maps etc. These visualizations can be used to compare performance, track changes over time, show distribution, and relationships between variables.

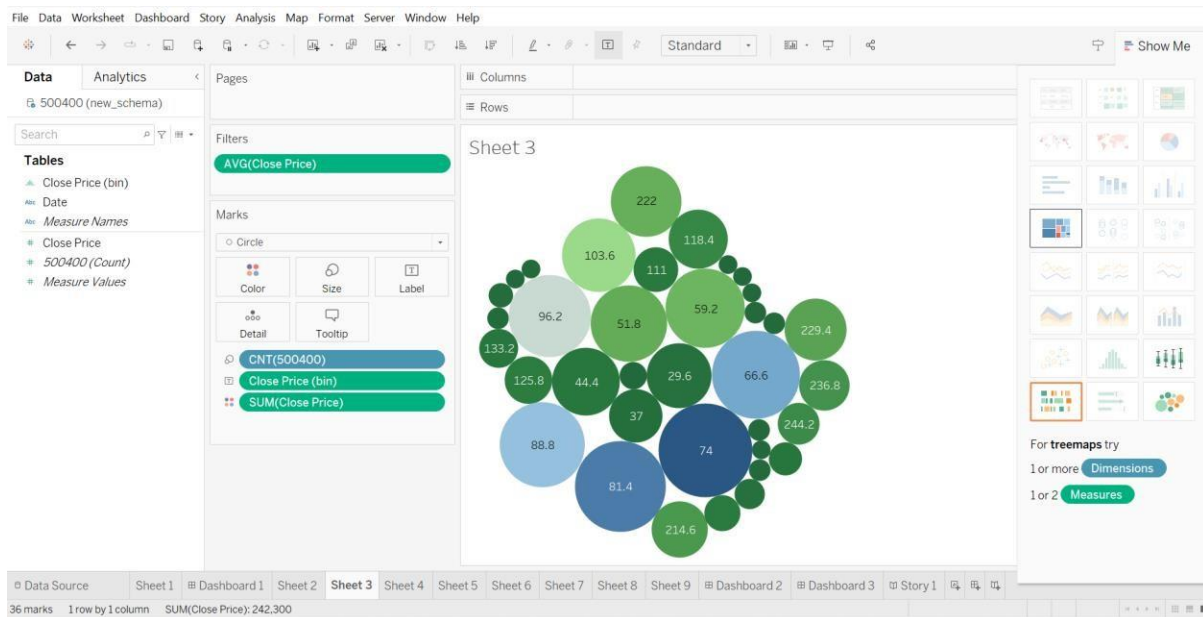
Activity 1.1: sum of close price and count of Data points



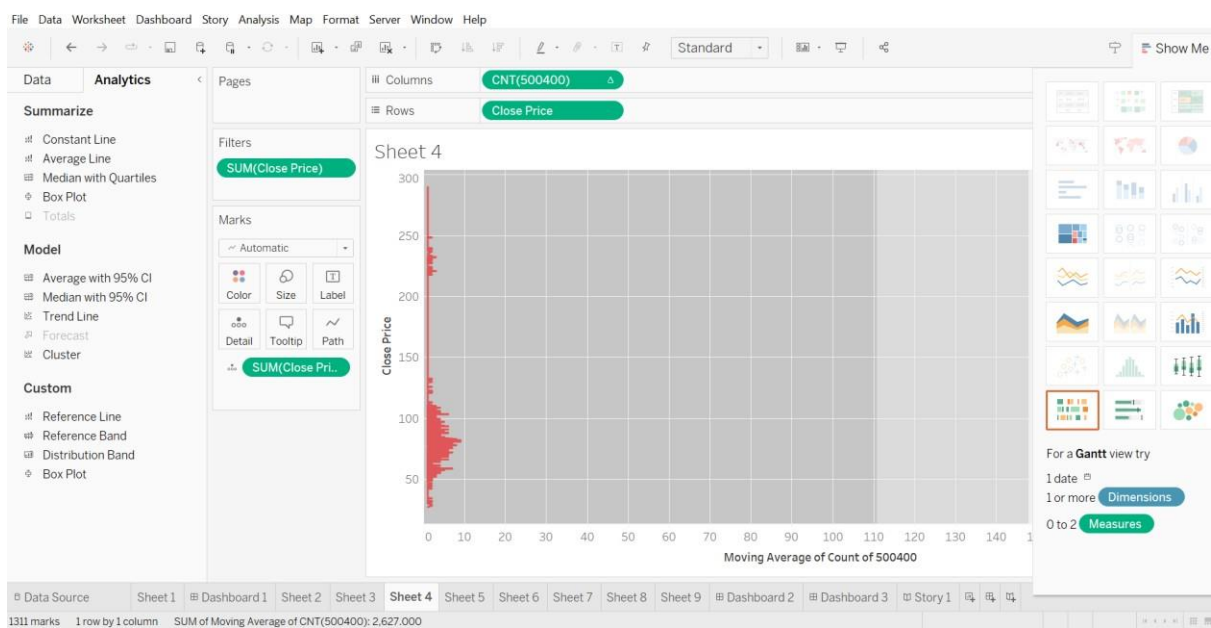
Activity 1.2: Close Price Bin and Count :



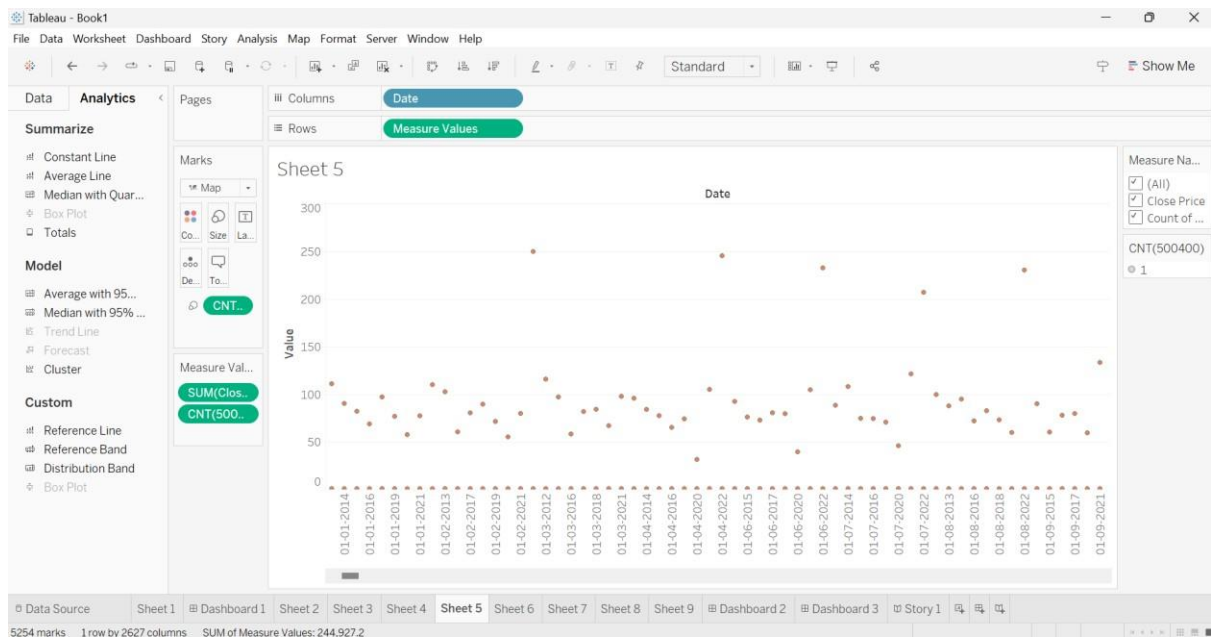
Activity 1.3 :AVG(close price) and count of (500400)



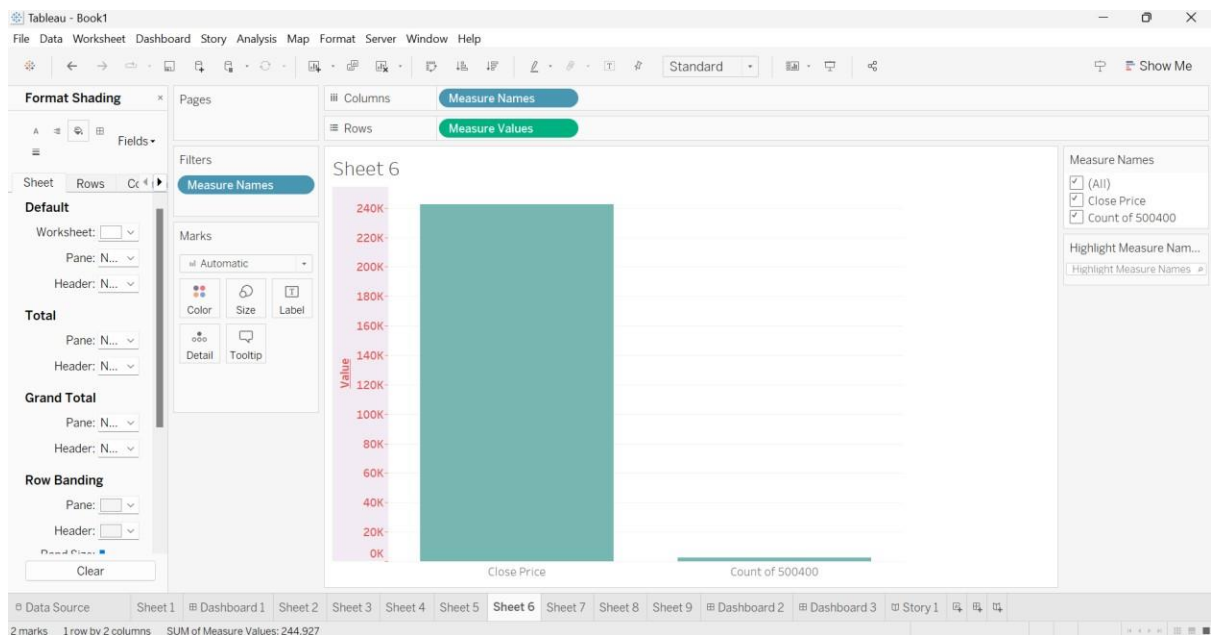
Activity 1.4: Close price and count (500400)



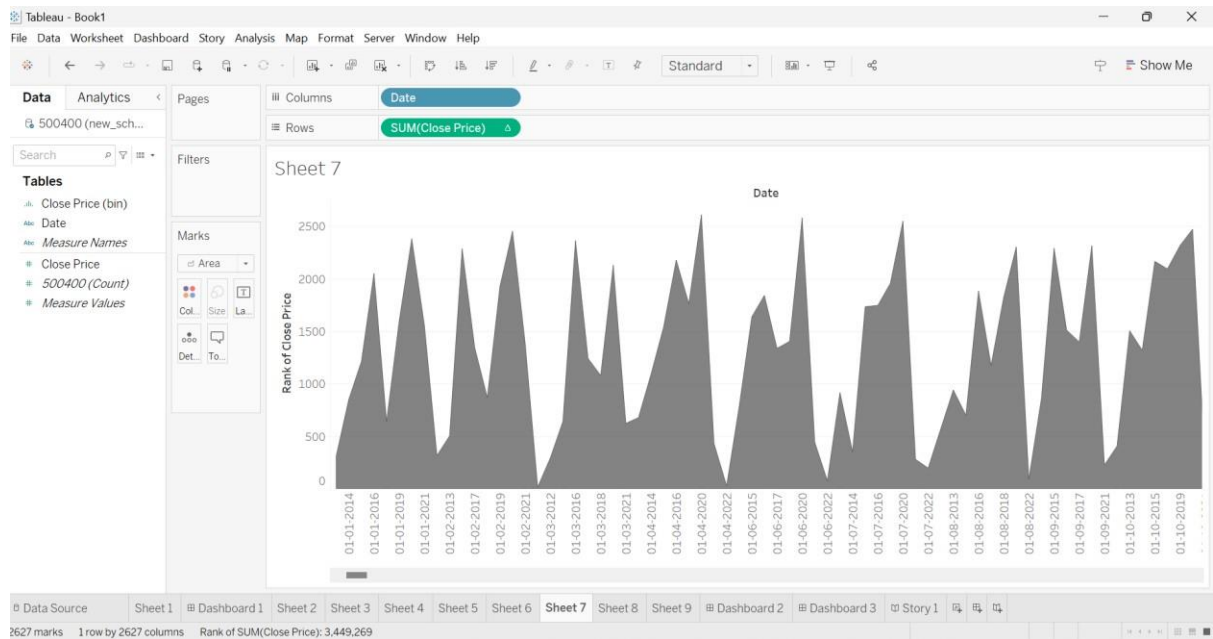
Activity 1.5: Measuring values and their dates



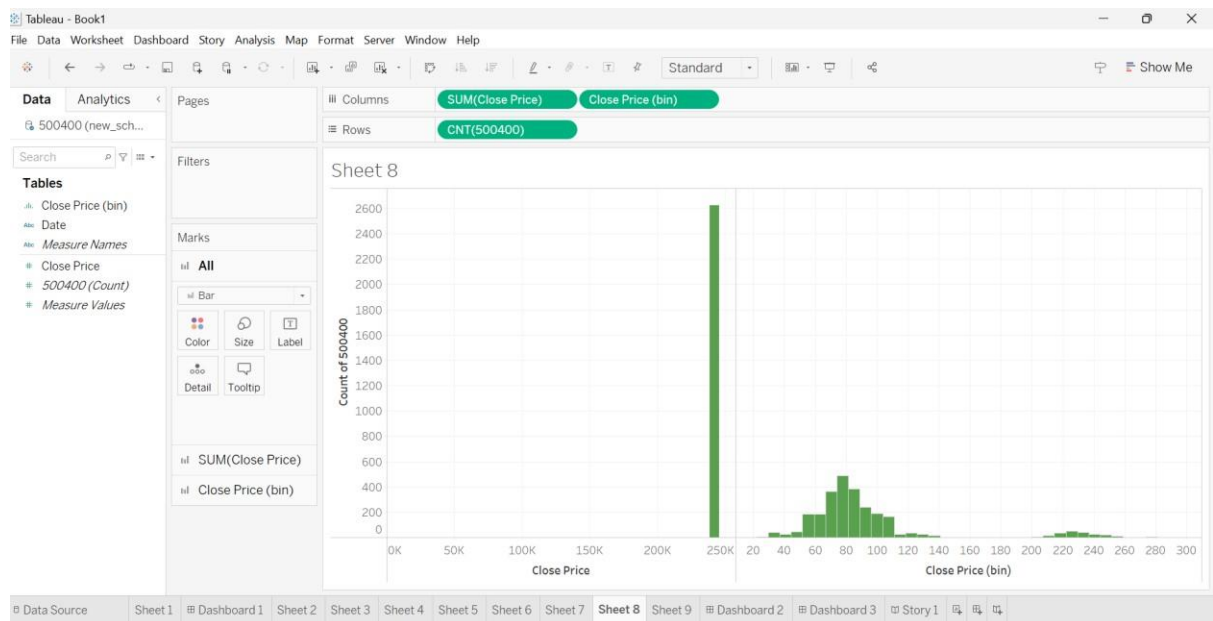
Activity 1.6:"Analysis of values , close price,and count of 500400"



Activity 1.7:"close price Ranking"and "Date Ranking"



Activity 1.8 :Sum and Bin of close price and count (500400):

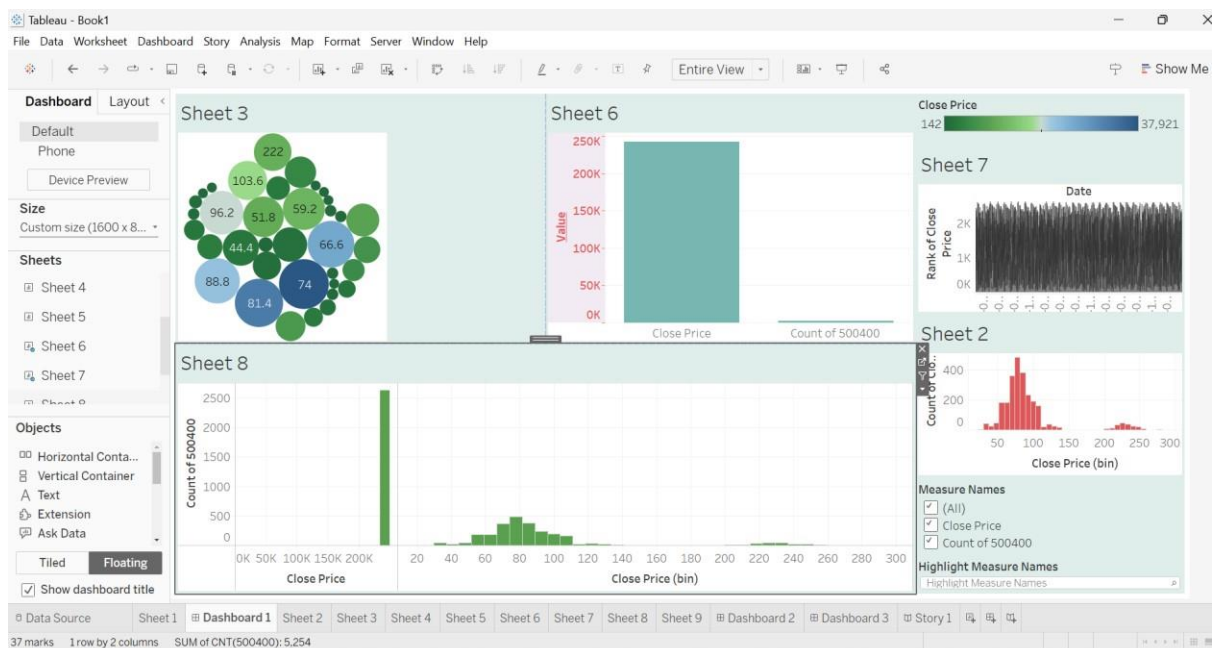


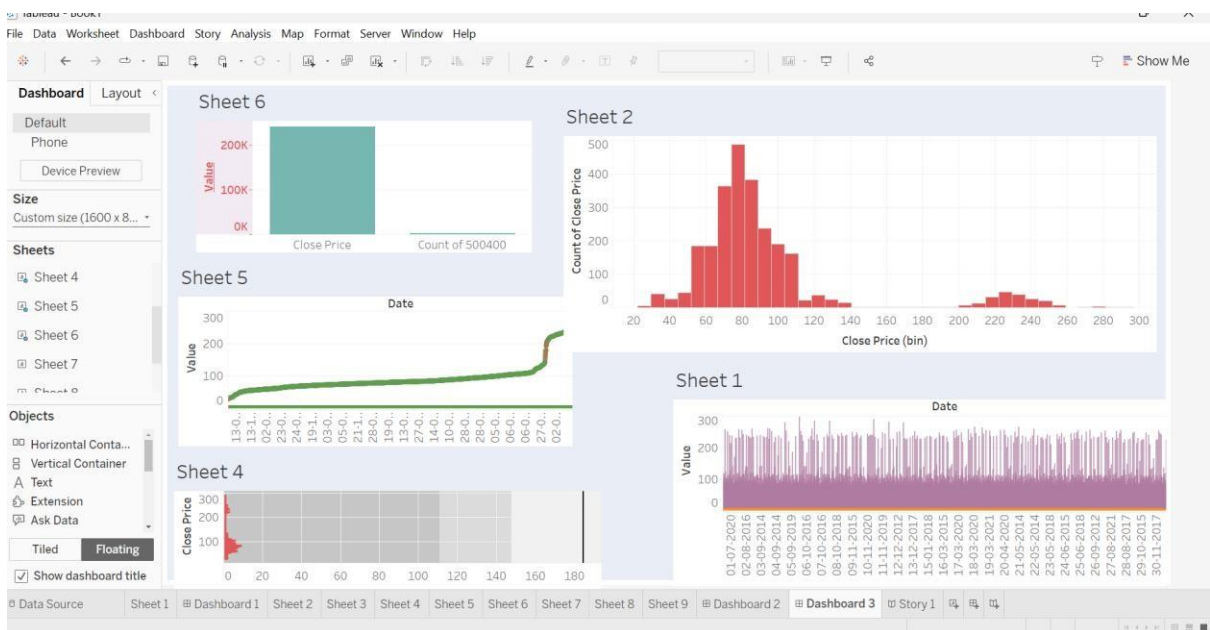
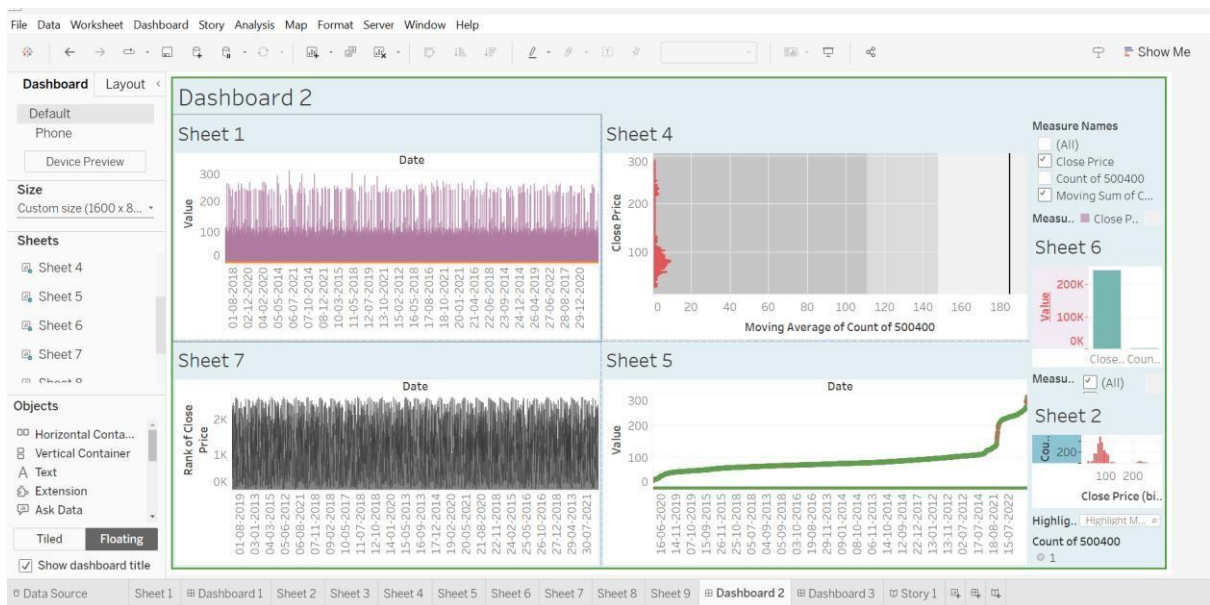
Milestone 5: Dashboard

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data, and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.

Activity :1- Responsive and Design of Dashboard

The responsiveness and design of a dashboard for analysing the factors important for Stock investors to invest in the Tata Power Stock analyzes various engagement metrics such as likes, high, Low And Open, close Of Stocks . We can also help in distributing the production across different countries



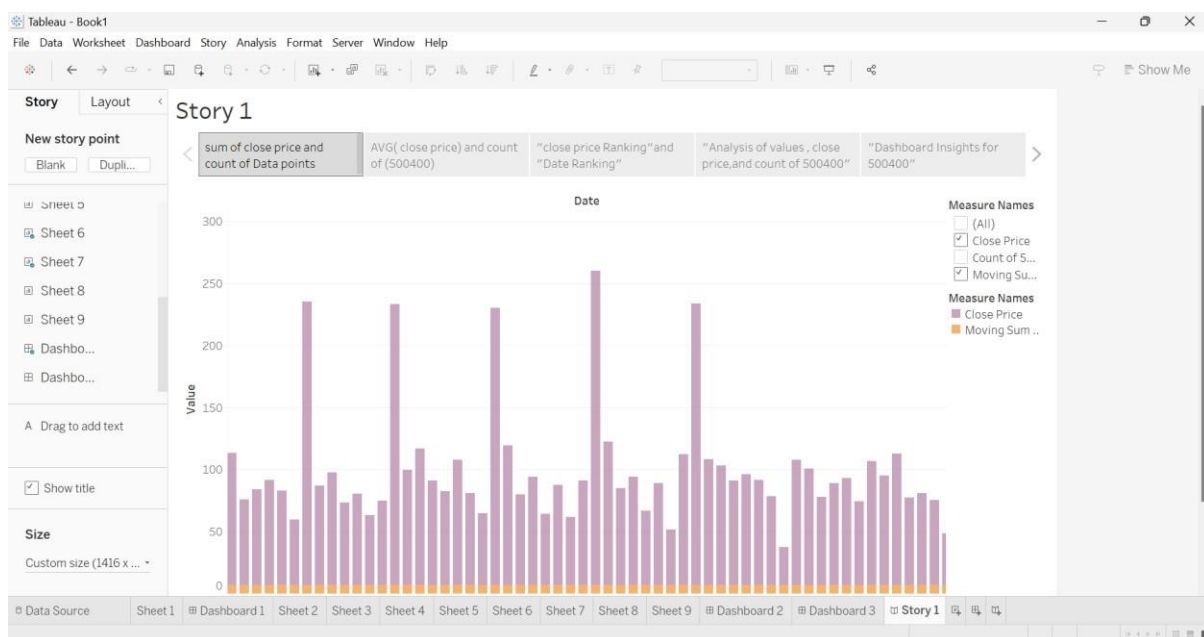


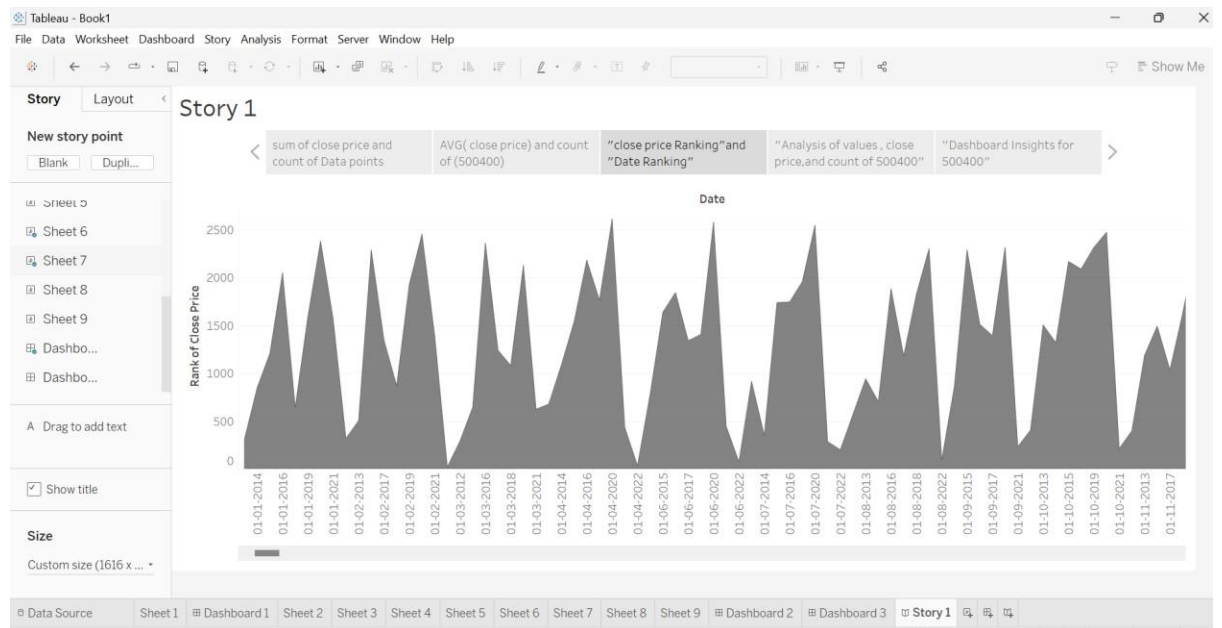
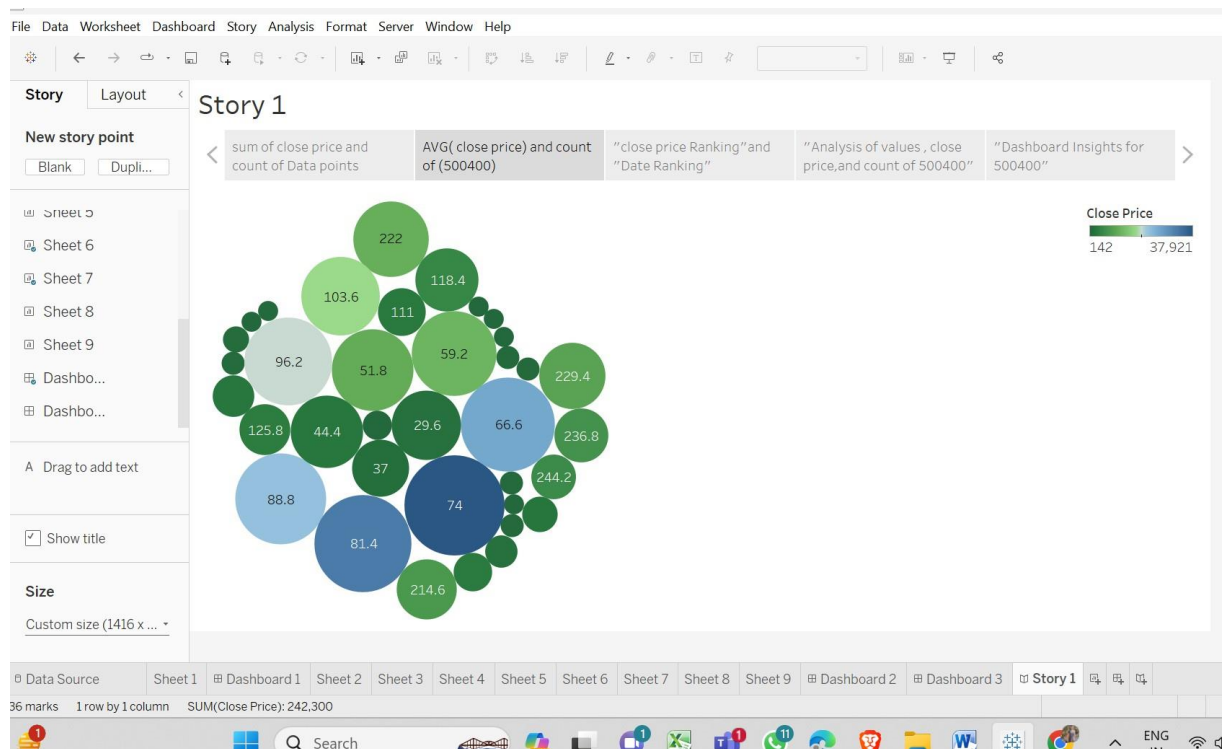
Milestone 6: Story:

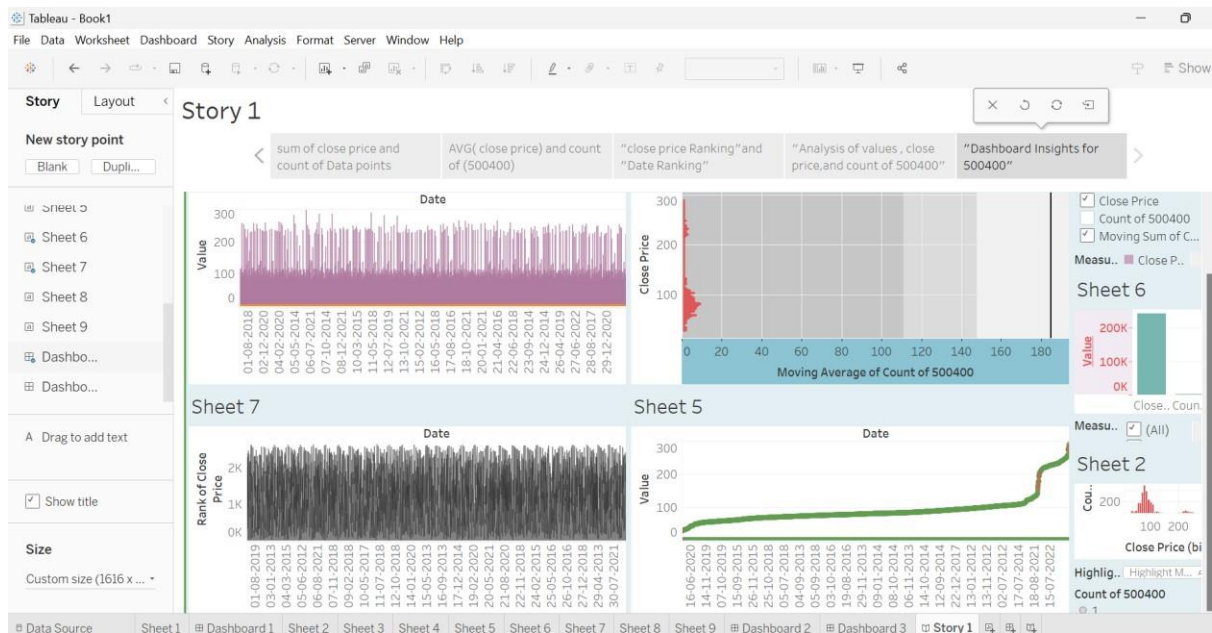
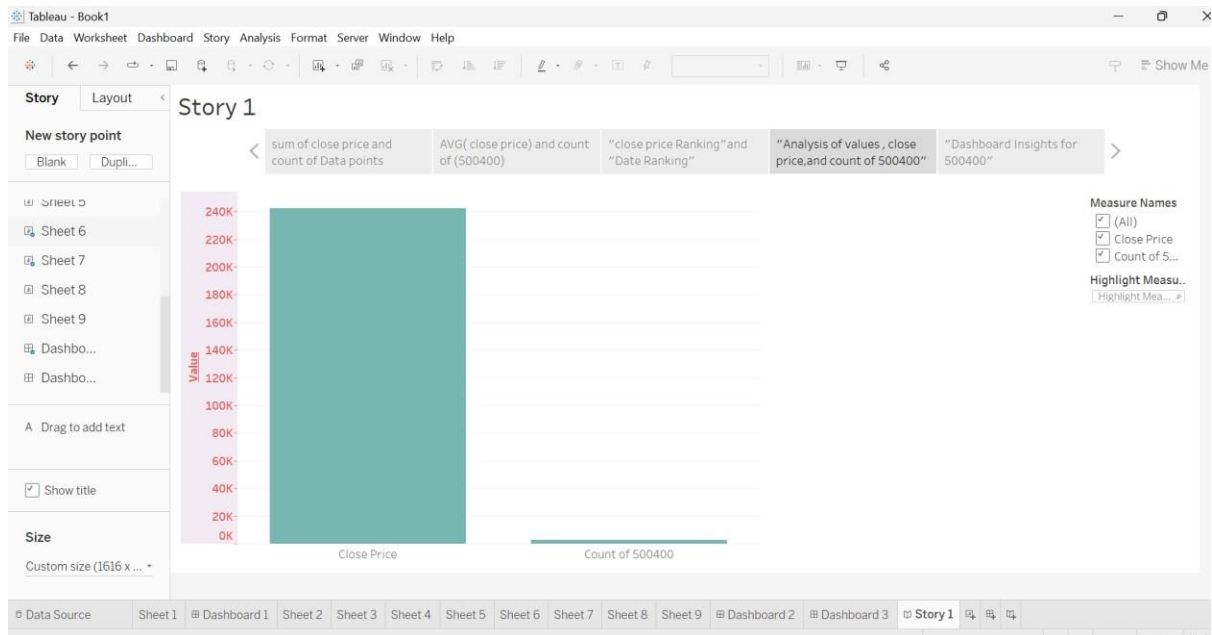
A data story is a way of presenting data and analysis in a narrative format, with the goal of making the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data, a body that presents the data and analysis in a logical and systematic way, and a conclusion that summarizes the key findings and highlights their implications. Data stories can be told using a variety of mediums, such as reports, presentations, interactive visualizations, and videos.

Activity:1- No of Scenes of Story

The number of scenes in a storyboard for a data visualization analysis of the factors affecting the insights of Tata Power Stocks, will depend on the complexity of the analysis and the specific insights that are trying to be conveyed. A storyboard is a visual representation of the data analysis process, and it breaks down the analysis into a series of steps or scenes.

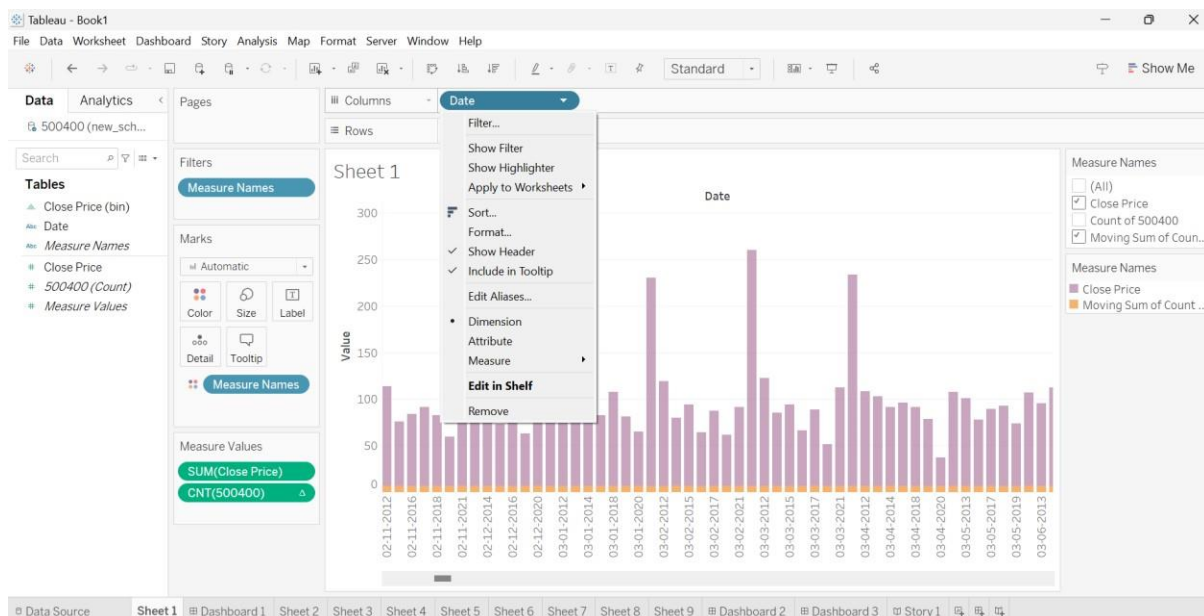
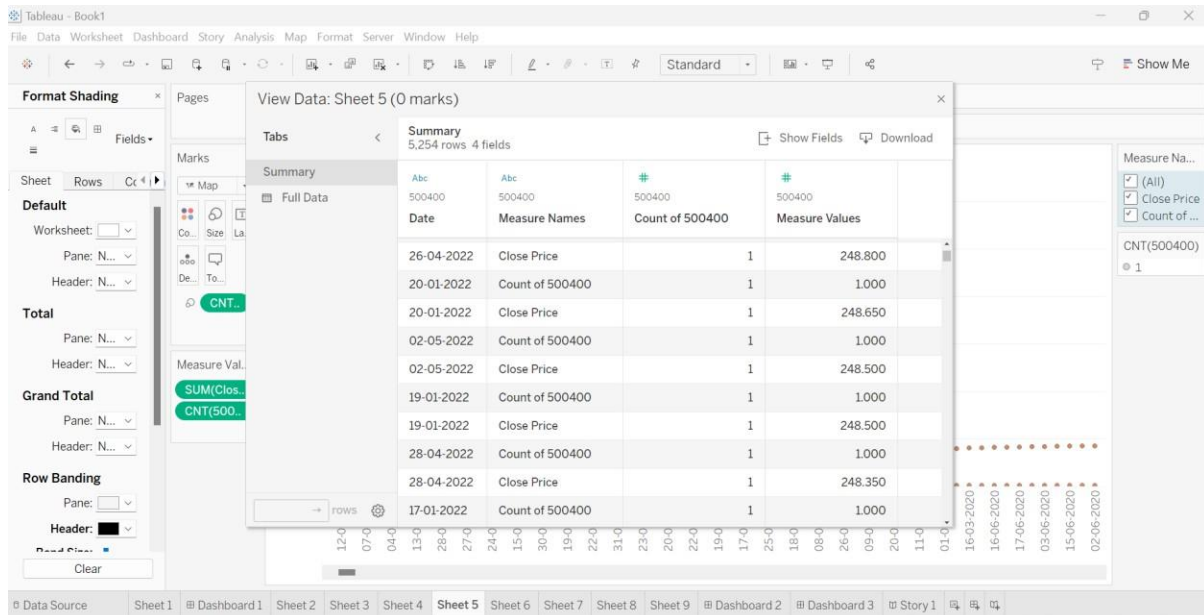


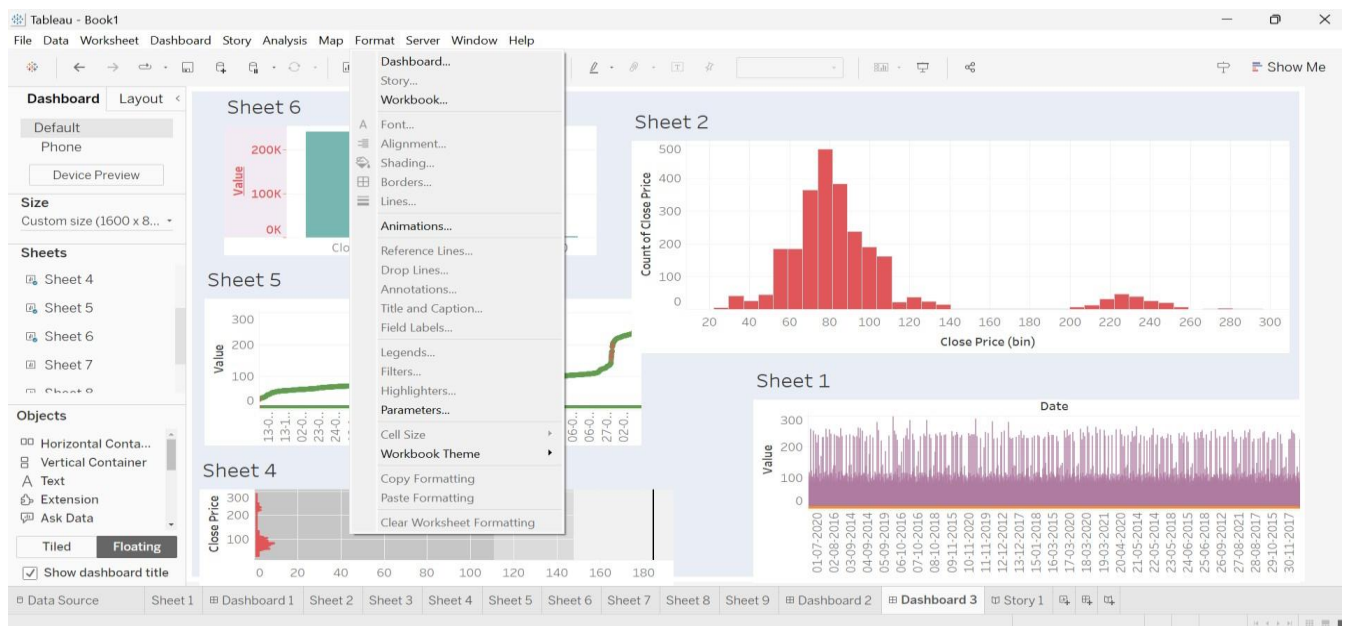
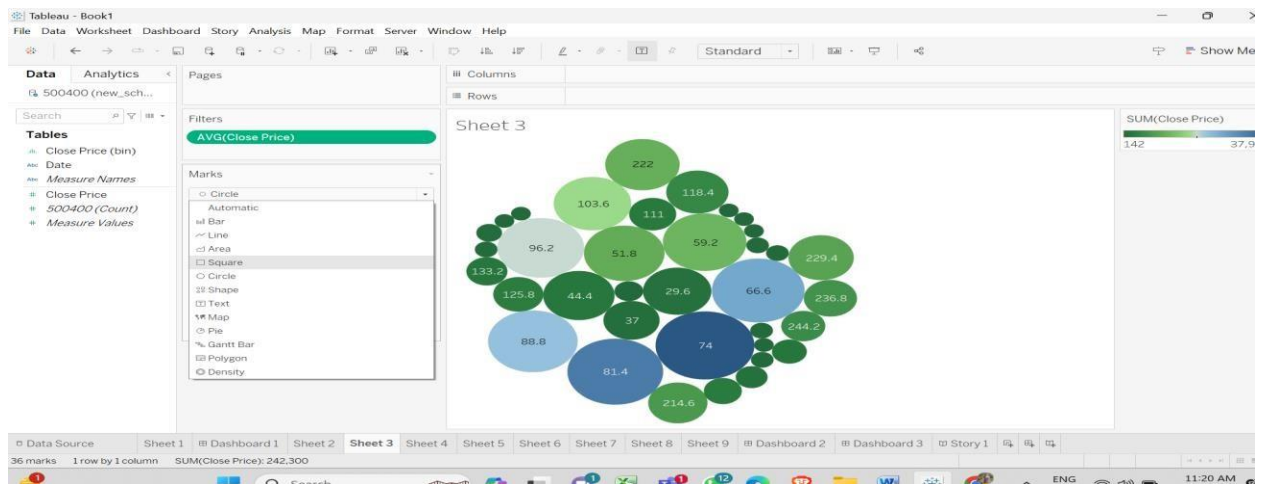
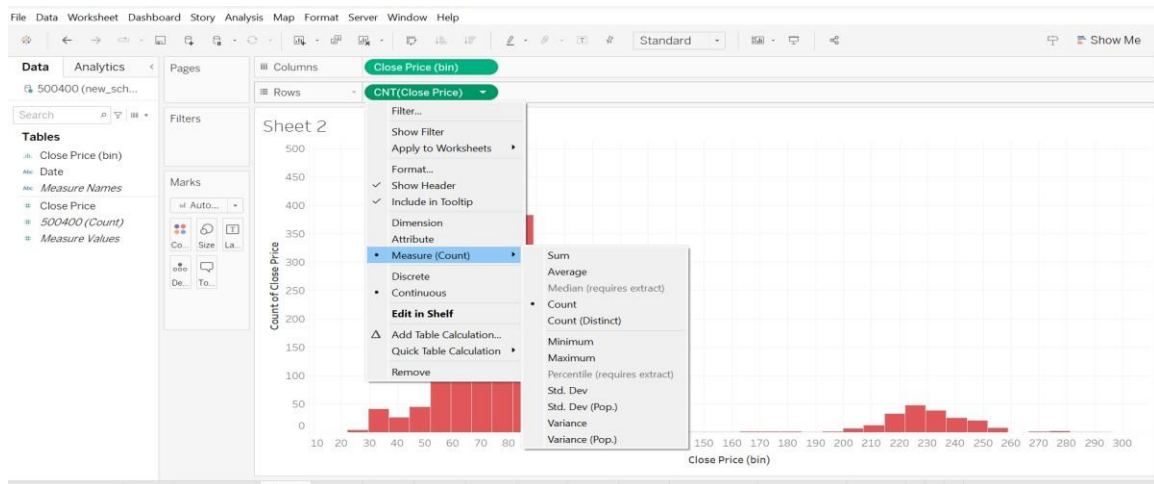


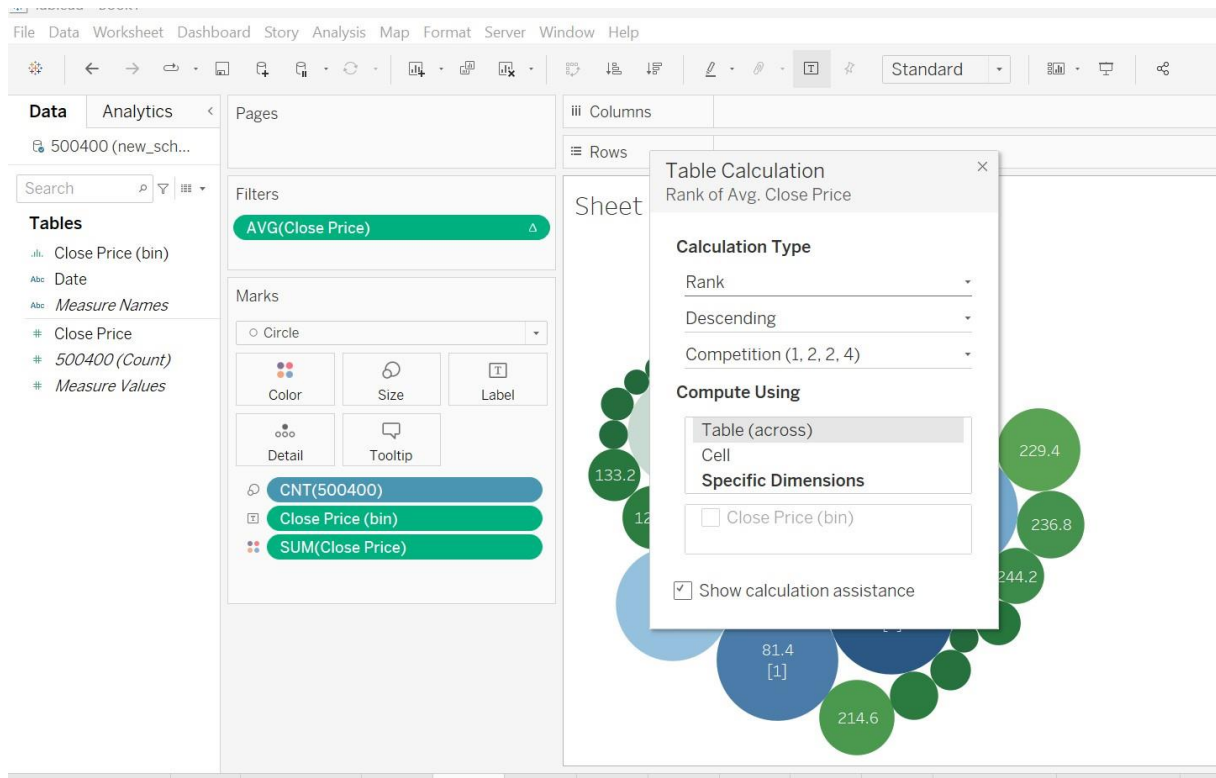


Milestone 8: Performance Testing

Activity 1: Utilization of Data Filters







Activity 4: No of Visualizations/ Graphs

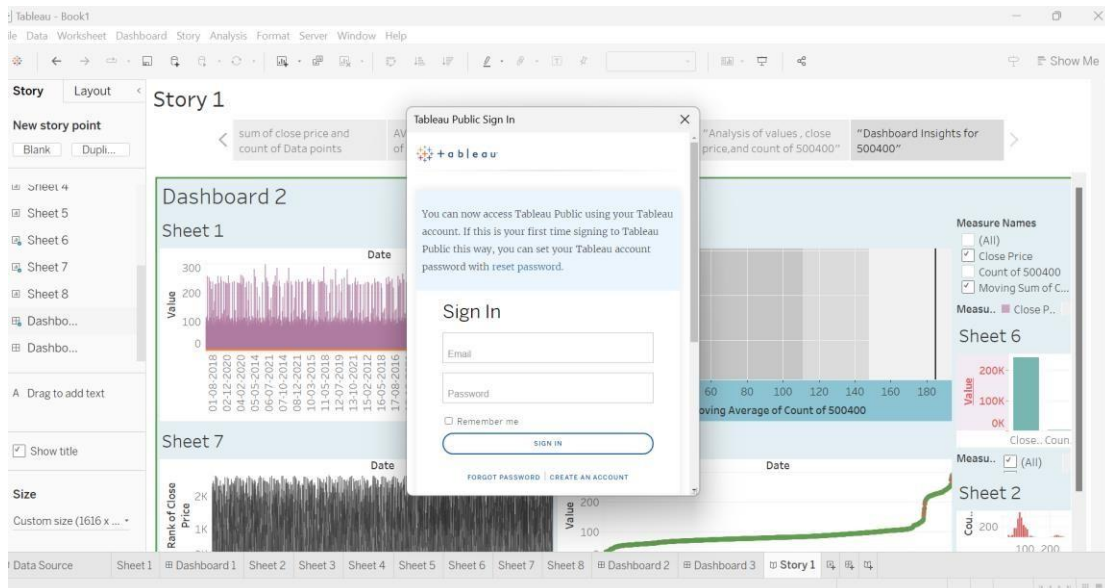
- 1) sum of close price and count of Data points?
- 2) Close Price Bin and Count ?
- 3)AVG(close price) and count of (500400)?
- 4) Close price and count (500400) ?
- 5) Measuring values and their dates ?
- 6)"Analysis of values , close price,and count of 500400"?
- 7) "close price Ranking"and "Date Ranking"?
- 8) Sum and Bin of close price and count (500400)?

Milestone 9: Web integration

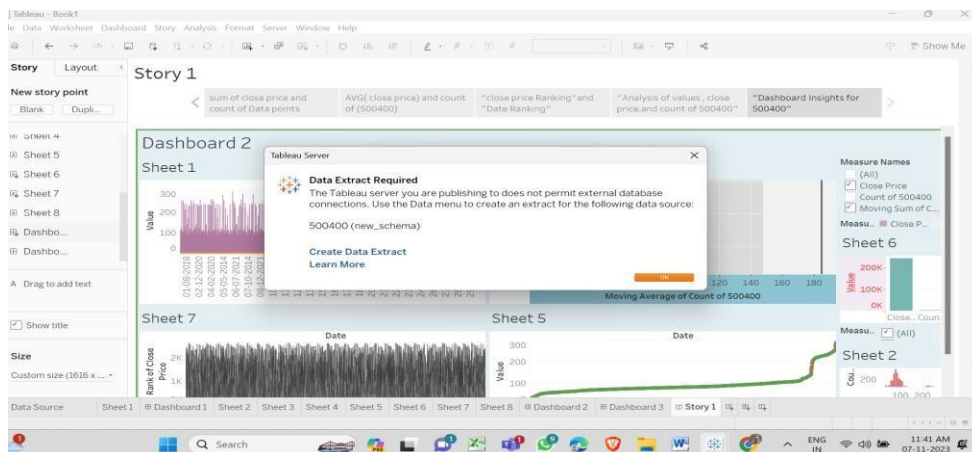
Publishing helps us to track and monitor key performance metrics, to communicate results and progress.help a publisher stay informed, make better decisions, and communicate their performance to others.

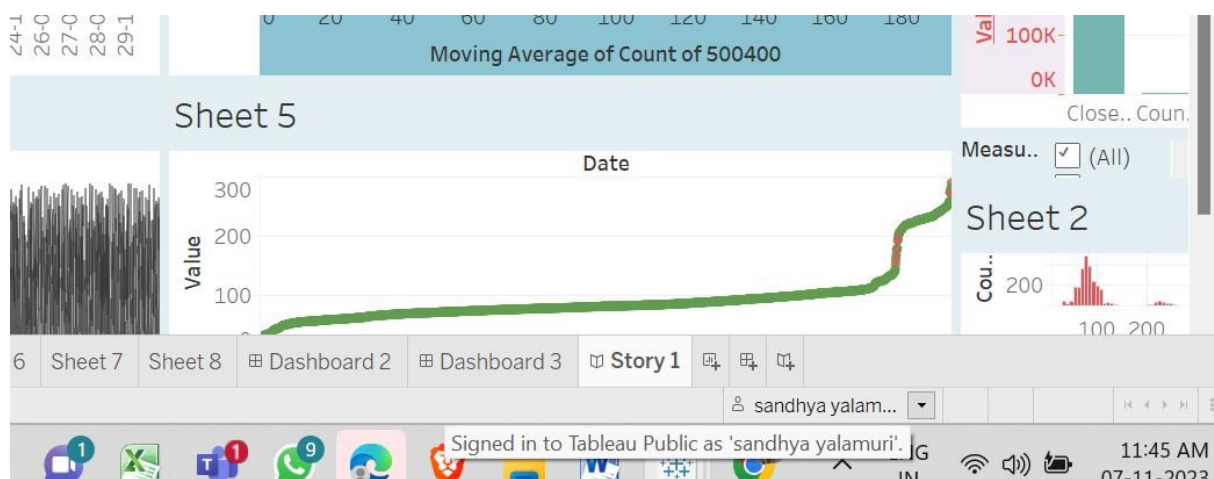
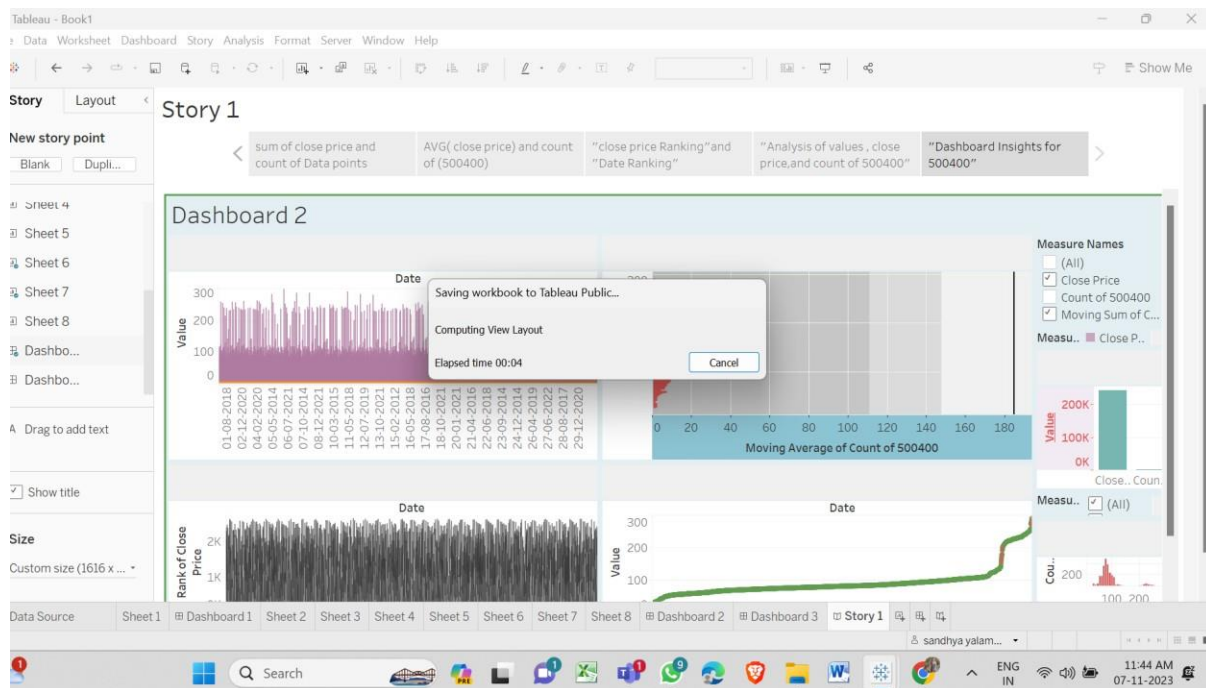
Integrating dashboard/reports/stories to web

Step 1: Go to **Tableau** and click on the server and publish your workbook .



Step 2: Then enter your tableau public credentials. The sheet will be published to your tableau public account.



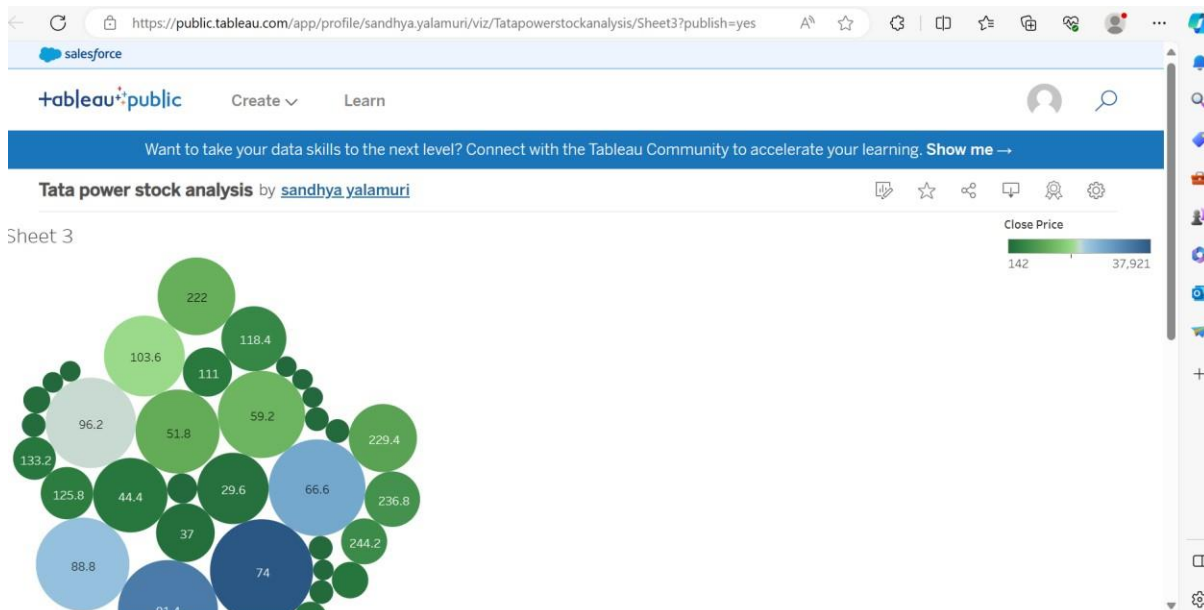
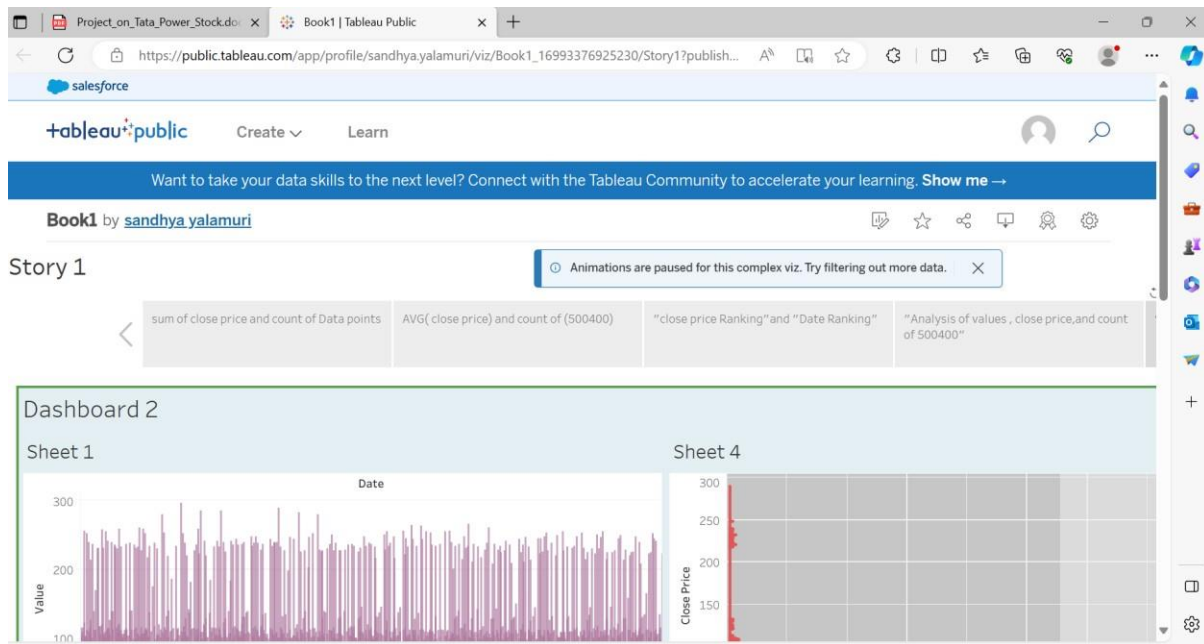


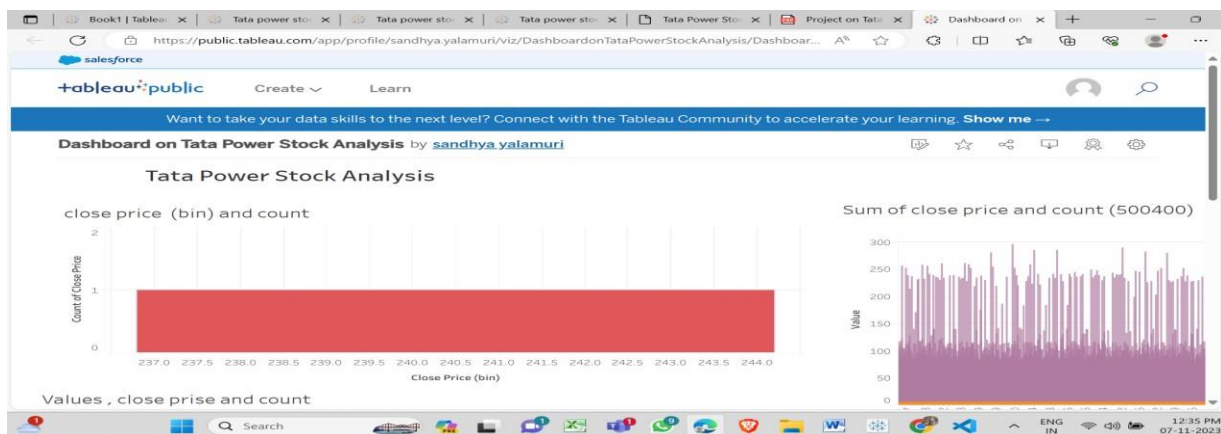
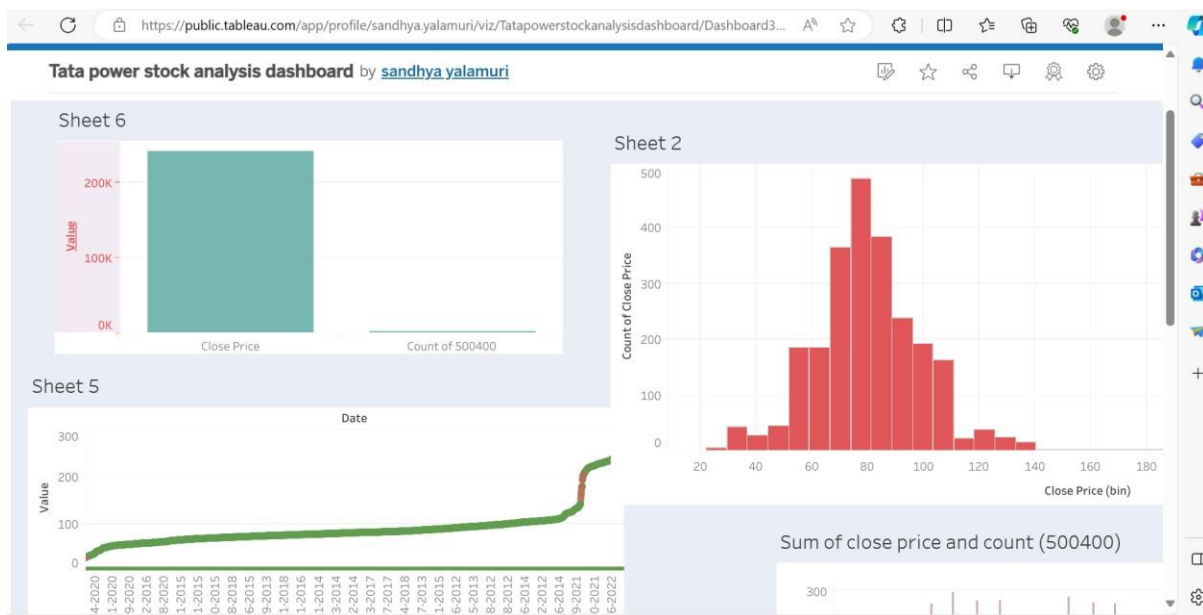
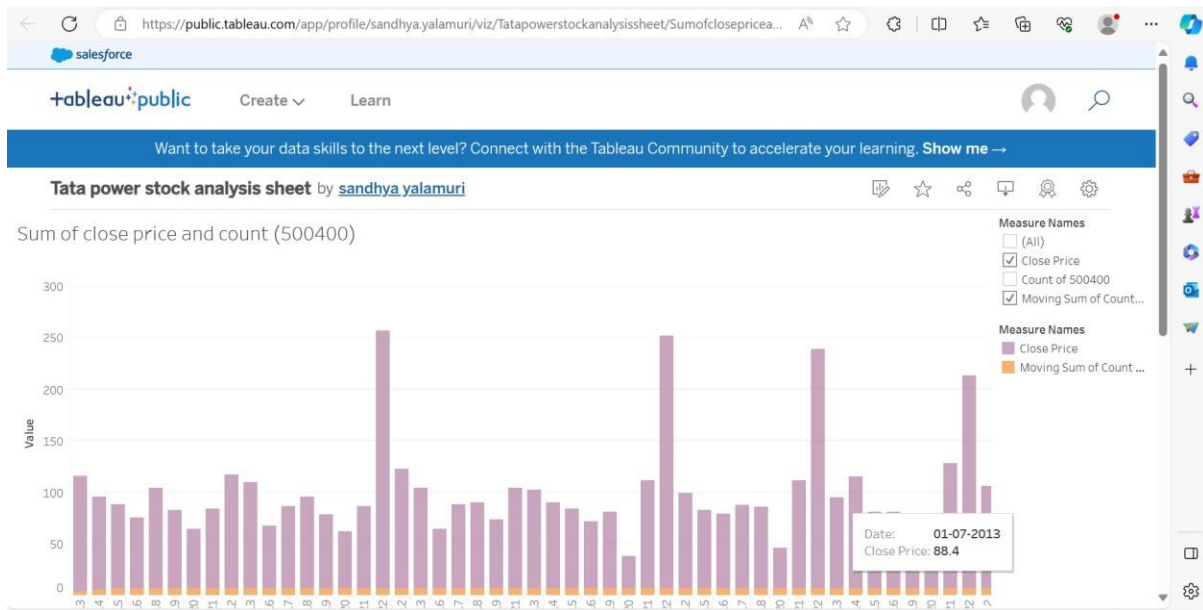
- Once you login into your tableau public using the credentials, the particular visualization will be published into the tableau public

Activity 1: Dashboard and Story embed with UI

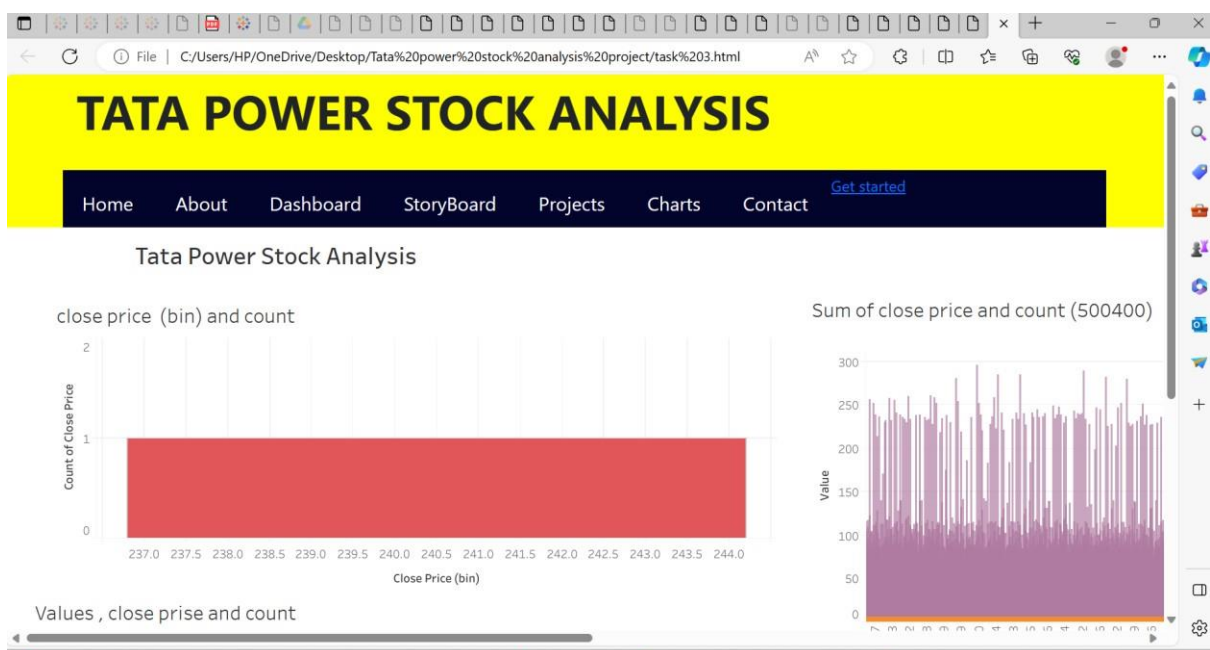
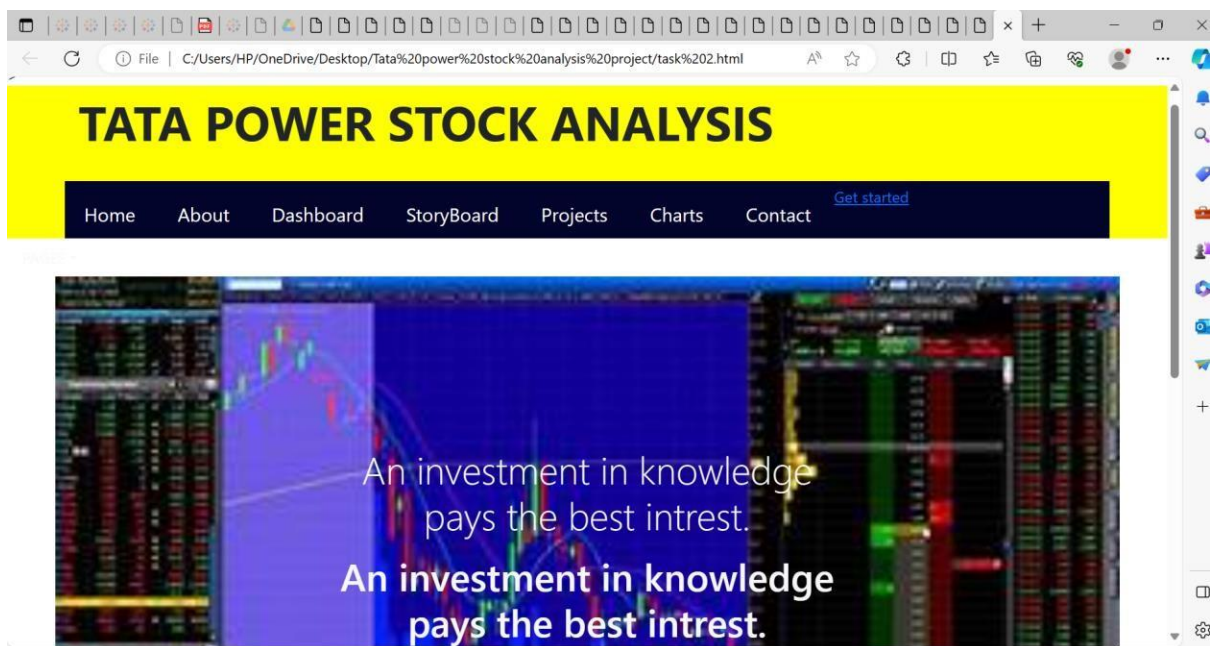
1. You have to Publish your sheet in your tableau public account.
2. Once you publish it, get the link as shown in the video below and paste it in your html code.
3. Then the sheets are displayed.

Tableau Public:-

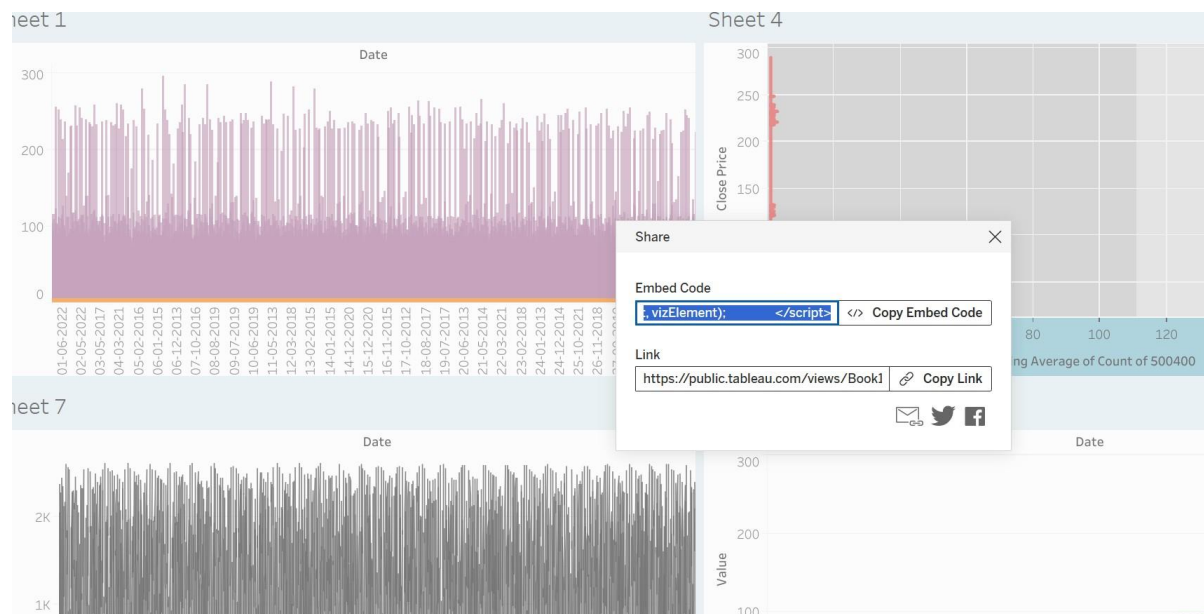




Web Integration :-Web data integration (WDI) is the process of aggregating and managing data from different websites into a single, homogeneous workflow. This process includes data access, transformation, mapping, quality assurance and fusion of data. Data that is sourced and structured from websites is referred to as "web data".



Flask Deployment:-Deploying a Flask application involves making it accessible and runnable on a web server, allowing users to access your application over the internet. Here's an overview of the steps involved in deploying a Flask application:



The image shows the Visual Studio Code editor interface. The 'EXPLORER' sidebar on the left displays a file tree for a project named 'TATA POWER STOCK ANAL...'. The main editor area shows the content of 'task 3.html', which contains CSS code for styling a web page. The code includes styles for a navigation bar, a main content area, and a button.

```

36 .timings, .callus, .emailus{
37   display: flex;
38   padding-right: 50px;
39 }
40
41 .navi{
42   background-color: yellow;
43   margin-bottom: 0px;
44 }
45
46 nav{
47   background-color: rgb(2, 4, 44);
48   margin-left: auto;
49   margin-right: auto;
50   width: 90%;
51   height: 60px;
52   align-items: center;
53   text-decoration-color: rgb(209, 18, 18);
54 }
55
56 .bordered-button-mini {
57   border: 2px solid #ffffff;
58   width: 100px;
59   height: 20px;
60   padding: 5px;
61   text-decoration: none;
62   background-color: transparent;
63   color: #ffffff;
64   font-size: 20px;
65   text-align: center;
66 }

```

The End