HOUSE PRICE PREDICTION IN METROPOLITAN AREAS OF INDIA

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TEAM MEMBER : **GONDELA RAJESWARI**

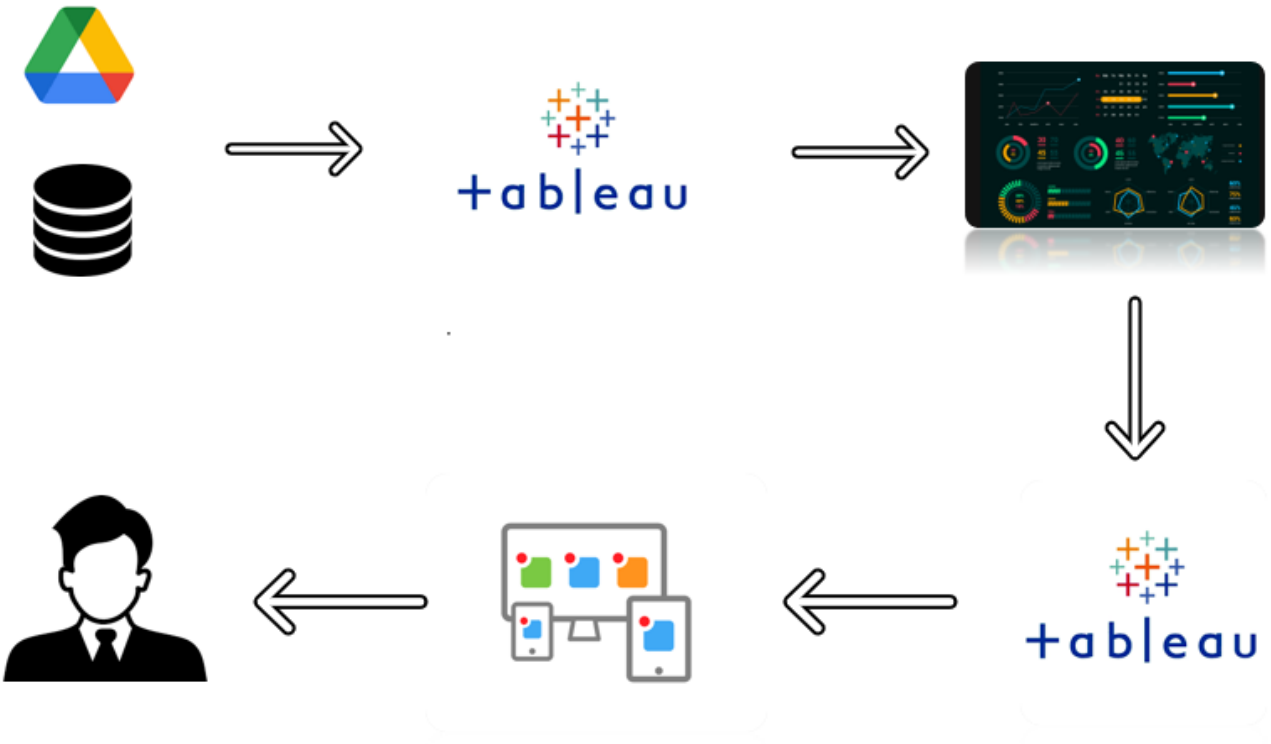
TEAM MEMBER : **GORIPILLI VAMSI KRISHNA**

House Price Prediction In Metropolitan

Areas Of India :

House price prediction in a metropolitan city in India is a valuable solution for potential home buyers, real estate agents, and investors. By leveraging historical sales data, property details, and location-specific information, a predictive model can accurately estimate house prices. The model's scalability, real-time updates, user-friendly interface, and transparency ensure it meets the needs of stakeholders. Integration capability, data privacy, and cost-effectiveness are also important considerations. By addressing these requirements, the prediction model provides reliable insights, empowering stakeholders to make informed decisions in the fast-paced real estate market.

Technical Architecture :



Pre-Requisites

For Completing this project these are some of the prerequisites needed

- A system with a minimum 4GB RAM and 128GB Hard Disk
- Good Internet Connection
- Google Drive / Any of the Database Server with Management Studio
- MySQL:
- **SQL Server Management Studio:**
- **Tableau Desktop:**

- Tableau Public Account: https://public.tableau.com/app/discover
- Html, CSS or Bootstrap

Prior-Knowledge

To Complete this project, one must understand the below concepts and able to work with the tools

- **Data Visualization:**
-
- **Univariate, Bi- Variate and Multi-Variate Analysis**
- **Chart Types:**
- **Tableau:**
- **Business Intelligence**:

Project Objectives

By the end of this project, you will:

- Able to Connect Tableau with different data sources
- Know fundamental concepts and techniques used for Data Visualization.
- Gain a broad understanding about data and different types of charts.
- Have knowledge of developing Visualizations, Dashboards and Story.
- Able to Integrate the developed dashboard and story with the web application

Project Flow

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

- Data collection
  - Collect the dataset or create the dataset
- Database /Spreadsheet Connection
  - Understand the dataset
  - Import Dataset into the database
  - Connect Tableau Desktop to Database server.
- Visualizing and analyzing data
- Understand the Data and the Business Questions
- Based on the Business questions develop the different visualizations
- Dashboard
  - Develop the Dashboard
- Story
  - Develop the Storyboard
- Publishing to the Tableau Public & Web Application Integration
  - Developed Visualizations, Dashboard and story will be published to Tableau Public Account.
  - Once it is published, we will get the shareable links
  - Develop a web application using HTML, CSS or Using Bootstrap
  - Integrate the Visualizations, Dashboard and Story with the Web Application

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, evaluate outcomes and generate insights from the data.

Collect The Dataset

Please use the link to download the dataset:
https://www.kaggle.com/datasets/ruchi798/housing-prices-in-metropolitan-areas-of-india

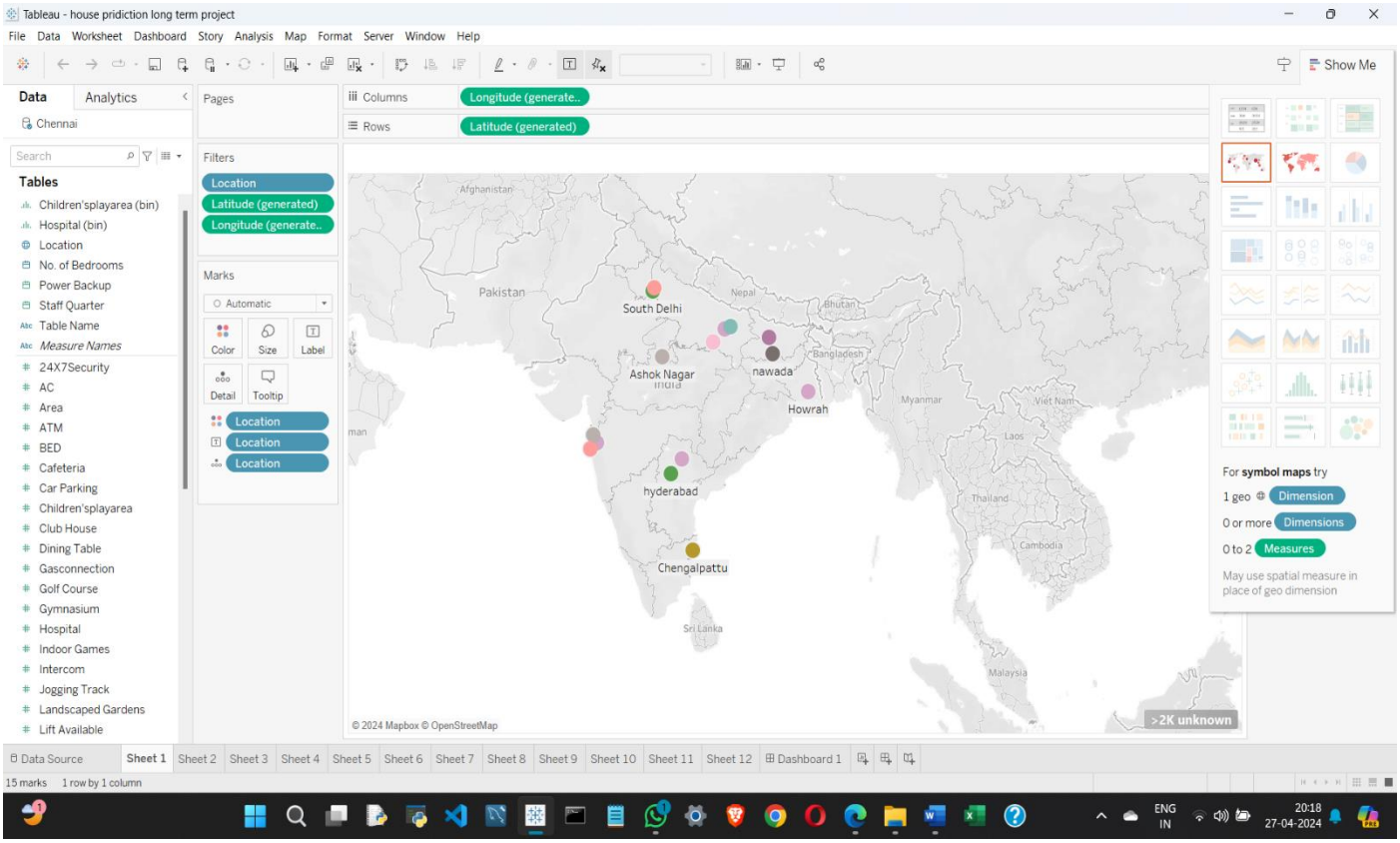
Understand the data

Data contains all the meta information regarding the columns described in the CSV files

Data Visualization

Data visualization is the process of creating graphical representations of data 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.

They are some visualizations we created using tableau :-



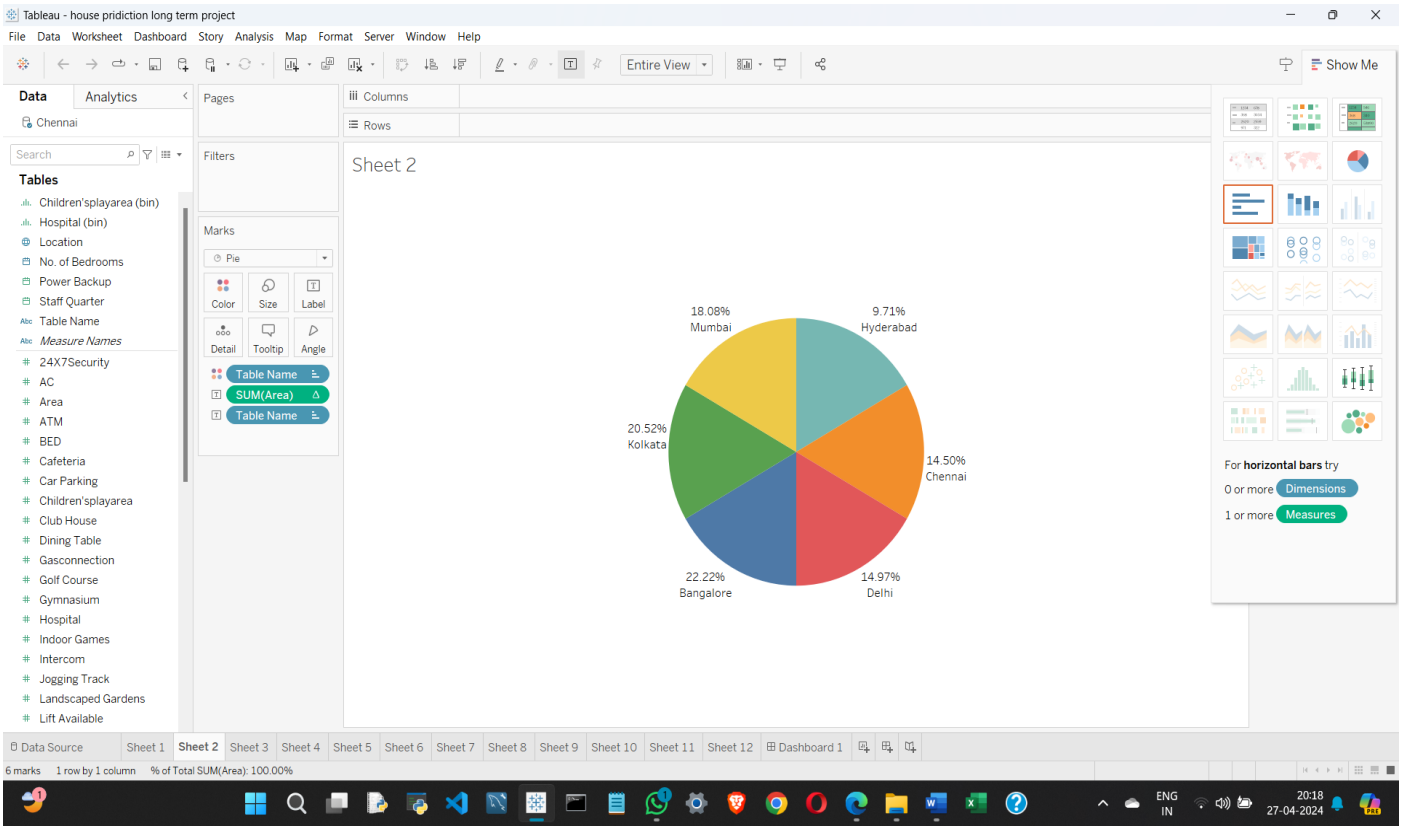


Tableau - house pridiction long term project
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Entire View
Show Me
Data
Analytics
Chennai
Search
Tables
Children'splayarea (bin)
Hospital (bin)
Location
No. of Bedrooms
Power Backup
Staff Quarter
Table Name
Measure Names
24X7Security
AC
Area
ATM
BED
Cafeteria
Car Parking
Children'splayarea
Club House
Dining Table
Gasconnection
Golf Course
Gymnasium
Hospital
Indoor Games
Intercom
Jogging Track
Landscaped Gardens
Lift Available
Pages
Filters
Marks
Pie
Color
Size
Label
Detail
Tooltip
Angle
Table Name
SUM(Area)
Table Name
Columns
Rows
Sheet 2
18.08%
Mumbai
9.71%
Hyderabad
20.52%
Kolkata
14.50%
Chennai
22.22%
Bangalore
14.97%
Delhi
For horizontal bars try
0 or more Dimensions
1 or more Measures
Data Source
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Sheet 8
Sheet 9
Sheet 10
Sheet 11
Sheet 12
Dashboard 1
6 marks
1 row by 1 column
% of Total SUM(Area): 100.00%
ENG
IN
20:18
27-04-2024

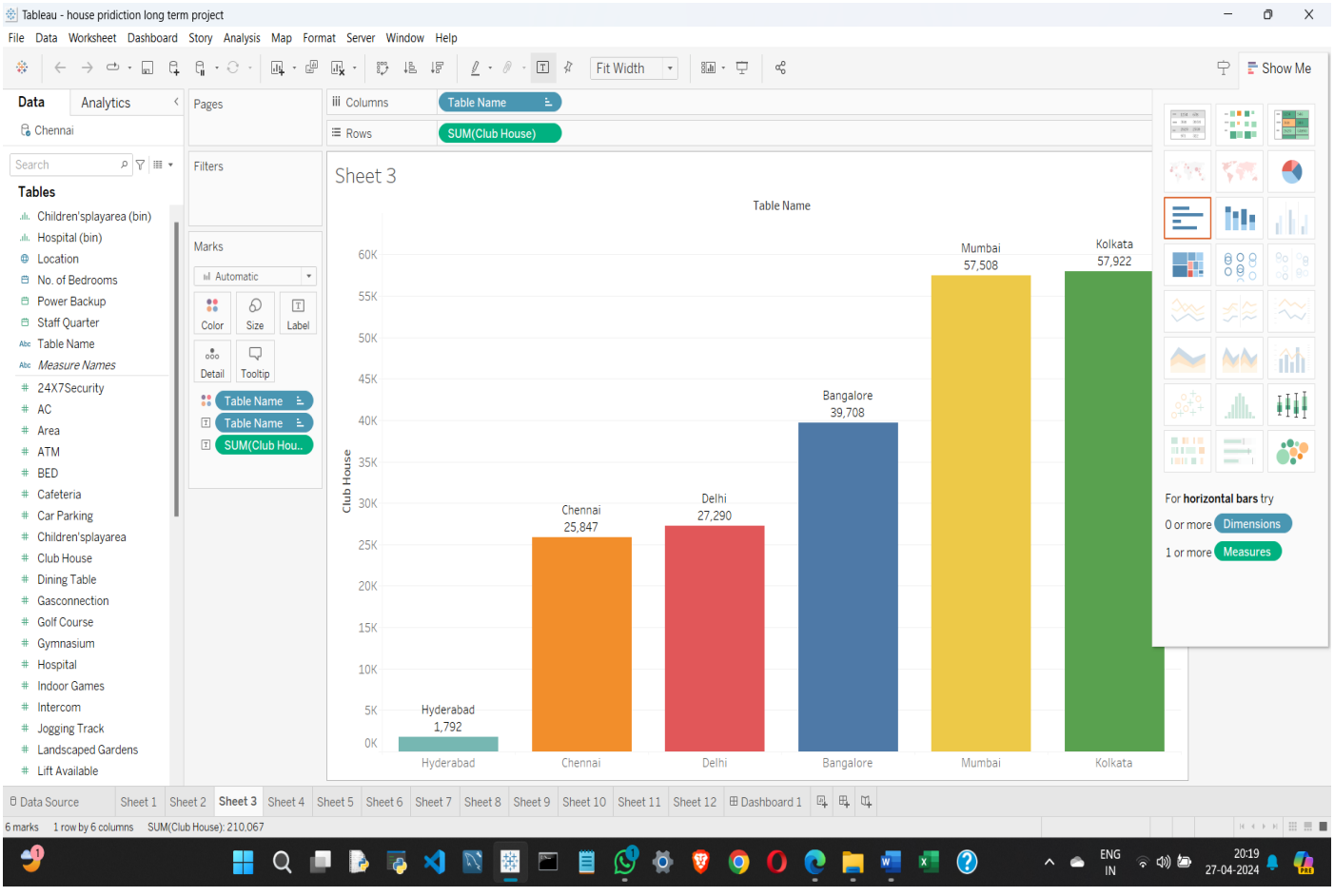


Tableau - house pridiction long term project
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
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Tables
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Hospital (bin)
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Power Backup
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Car Parking
Children'splayarea
Club House
Dining Table
Gasconnection
Golf Course
Gymnasium
Hospital
Indoor Games
Intercom
Jogging Track
Landscaped Gardens
Lift Available
Pages
Filters
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Table Name
Table Name
SUM(Club Hou..
Columns
Table Name
Rows
SUM(Club House)
Sheet 3
Table Name
Club House
60K
55K
50K
45K
40K
35K
30K
25K
20K
15K
10K
5K
0K
Hyderabad
1,792
Chennai
25,847
Delhi
27,290
Bangalore
39,708
Mumbai
57,508
Kolkata
57,922
Hyderabad
Chennai
Delhi
Bangalore
Mumbai
Kolkata
For horizontal bars try
0 or more Dimensions
1 or more Measures
Data Source
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Sheet 8
Sheet 9
Sheet 10
Sheet 11
Sheet 12
Dashboard 1
6 marks
1 row by 6 columns
SUM(Club House): 210.067
ENG
IN
20:19
27-04-2024

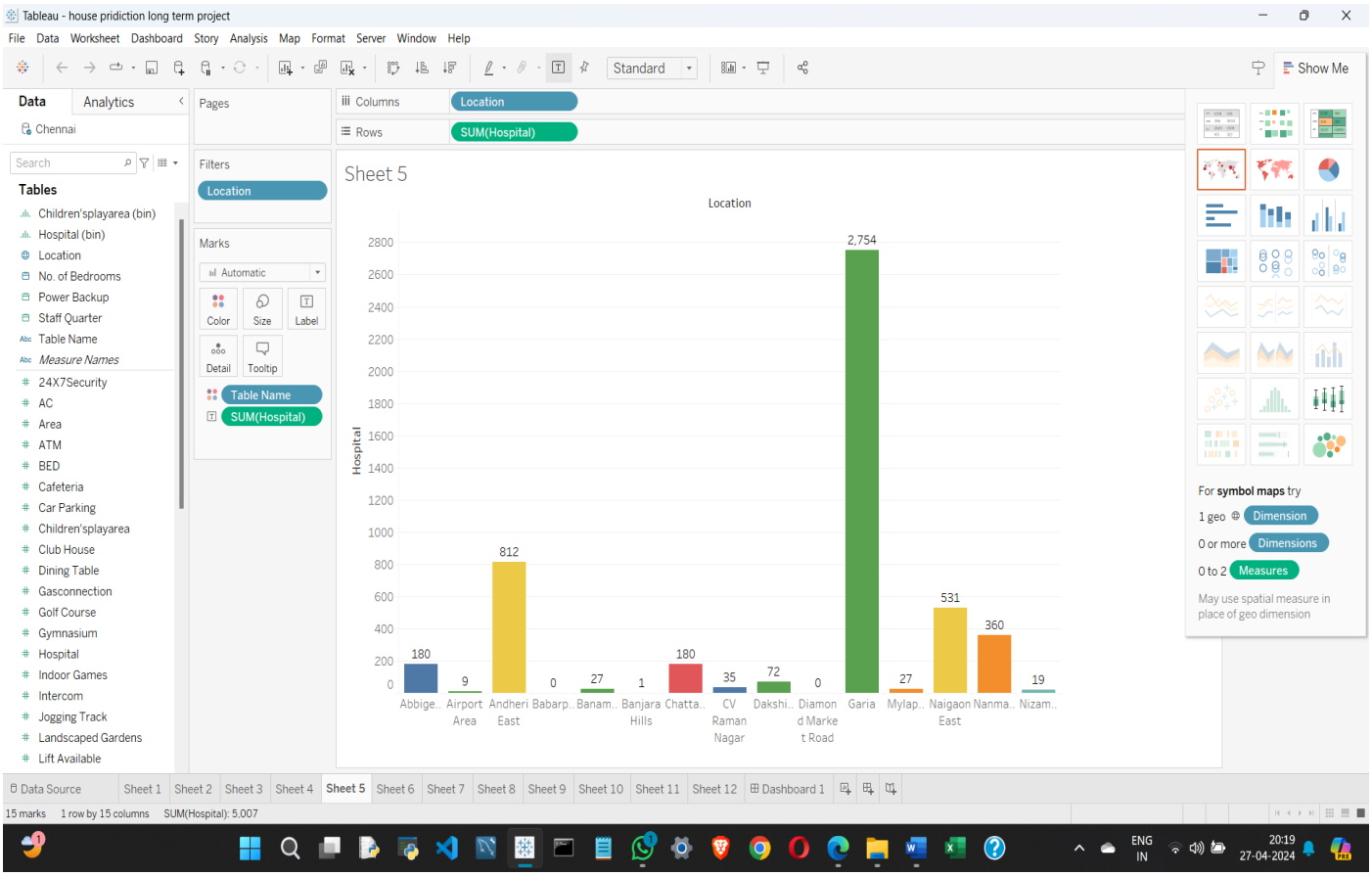
Tableau - house pridiction long term project
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Data Analytics
Chennai
Pages
Columns Location
Rows SUM(Hospital)
Filters
Location
Marks
Automatic
Color Size Label
Detail Tooltip
Table Name
SUM(Hospital)
Tables
Children'splayarea (bin)
Hospital (bin)
Location
No. of Bedrooms
Power Backup
Staff Quarter
Table Name
Measure Names
24X7Security
AC
Area
ATM
BED
Cafeteria
Car Parking
Children'splayarea
Club House
Dining Table
Gasconnection
Golf Course
Gymnasium
Hospital
Indoor Games
Intercom
Jogging Track
Landscaped Gardens
Lift Available
Sheet 5
Location
Hospital
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
180
9
812
0
27
1
180
35
72
0
2,754
27
531
360
19
Abbige..
Airport Area
Andheri East
Babarp..
Banam..
Banjara Hills
Chatta..
CV Raman Nagar
Dakshi..
Diamond Market Road
Garia
Mylap..
Naigaon East
Nanma..
Nizam..
Show Me
For symbol maps try
1 geo Dimension
0 or more Dimensions
0 to 2 Measures
May use spatial measure in place of geo dimension
Data Source Sheet 1 Sheet 2 Sheet 3 Sheet 4 Sheet 5 Sheet 6 Sheet 7 Sheet 8 Sheet 9 Sheet 10 Sheet 11 Sheet 12 Dashboard 1
15 marks 1 row by 15 columns SUM(Hospital): 5,007
ENG IN 20:19 27-04-2024

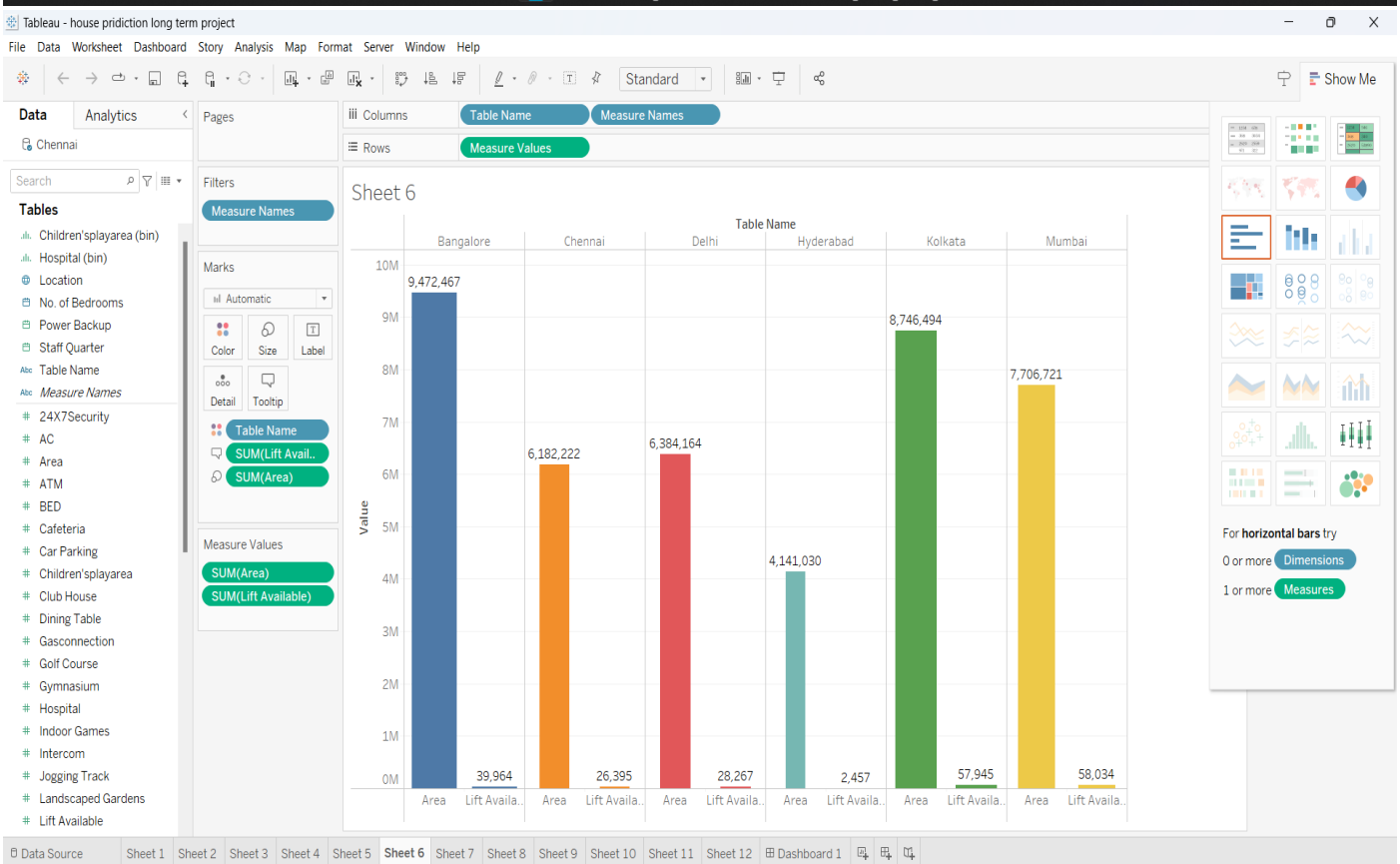
Tableau - house pridiction long term project
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Data Analytics
Chennai
Pages
Columns Table Name Measure Names
Rows Measure Values
Filters
Measure Names
Marks
Automatic
Color Size Label
Detail Tooltip
Table Name
SUM(Lift Avail..
SUM(Area)
Measure Values
SUM(Area)
SUM(Lift Available)
Tables
Children'splayarea (bin)
Hospital (bin)
Location
No. of Bedrooms
Power Backup
Staff Quarter
Table Name
Measure Names
24X7Security
AC
Area
ATM
BED
Cafeteria
Car Parking
Children'splayarea
Club House
Dining Table
Gasconnection
Golf Course
Gymnasium
Hospital
Indoor Games
Intercom
Jogging Track
Landscaped Gardens
Lift Available
Sheet 6
Table Name
Bangalore
Chennai
Delhi
Hyderabad
Kolkata
Mumbai
Value
10M
9M
8M
7M
6M
5M
4M
3M
2M
1M
0M
9,472,467
39,964
6,182,222
26,395
6,384,164
28,267
4,141,030
2,457
8,746,494
57,945
7,706,721
58,034
Area
Lift Availa..
Show Me
For horizontal bars try
0 or more Dimensions
1 or more Measures
Data Source Sheet 1 Sheet 2 Sheet 3 Sheet 4 Sheet 5 Sheet 6 Sheet 7 Sheet 8 Sheet 9 Sheet 10 Sheet 11 Sheet 12 Dashboard 1
12 marks 1 row by 12 columns SUM of Measure Values: 42,846,160
ENG IN 20:20 27-04-2024

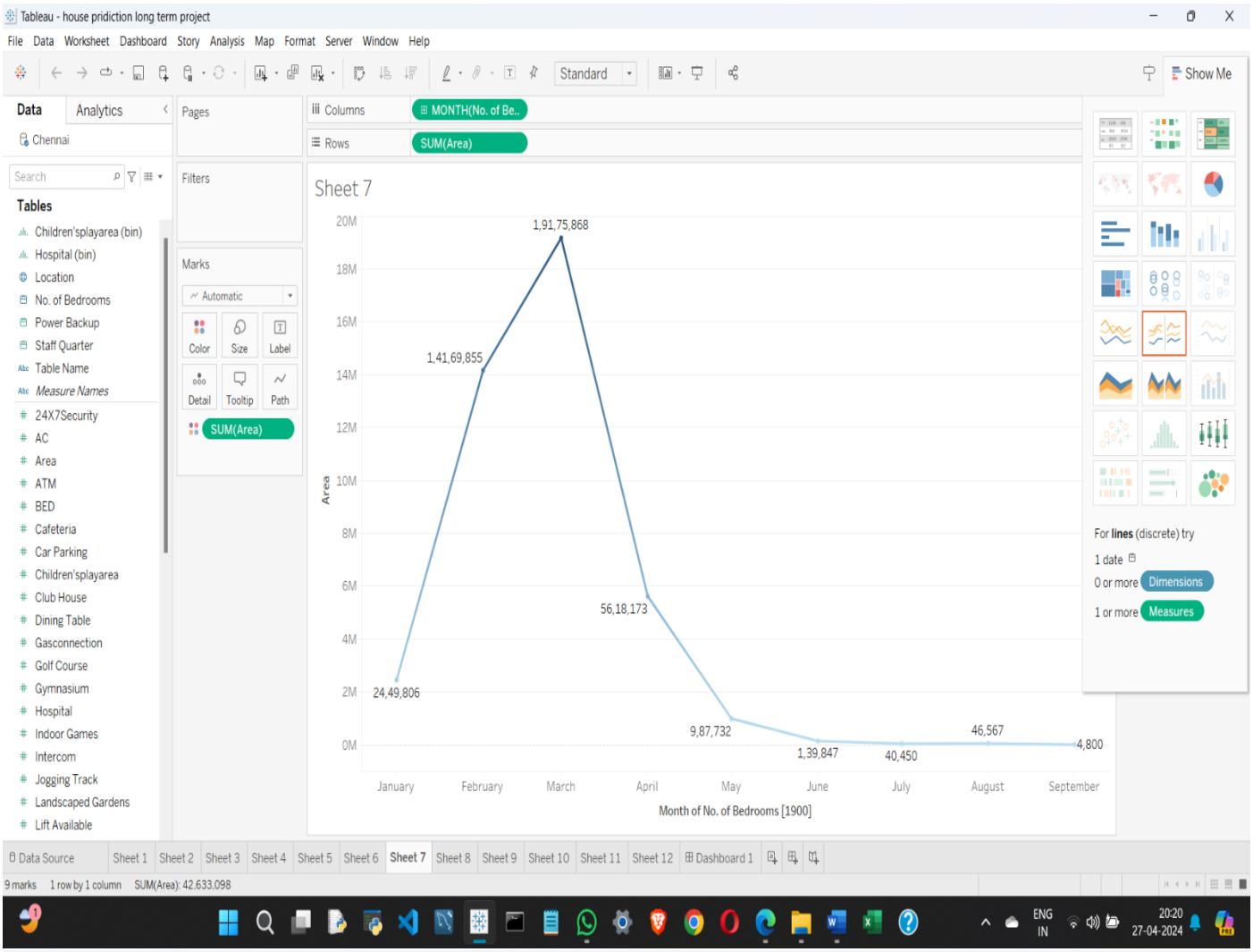
Tableau - house pridiction long term project
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Data Analytics
Chennai
Pages
Filters
Marks
Automatic
Color Size Label
Detail Tooltip Path
SUM(Area)
Columns MONTH(No. of Be..
Rows SUM(Area)
Sheet 7
Area
Month of No. of Bedrooms [1900]
January February March April May June July August September
1,91,75,868
1,41,69,855
56,18,173
24,49,806
9,87,732
1,39,847
40,450
46,567
4,800
Tables
Children'splayarea (bin)
Hospital (bin)
Location
No. of Bedrooms
Power Backup
Staff Quarter
Table Name
Measure Names
24X7Security
AC
Area
ATM
BED
Cafeteria
Car Parking
Children'splayarea
Club House
Dining Table
Gasconnection
Golf Course
Gymnasium
Hospital
Indoor Games
Intercom
Jogging Track
Landscaped Gardens
Lift Available
For lines (discrete) try
1 date
0 or more Dimensions
1 or more Measures
Data Source Sheet 1 Sheet 2 Sheet 3 Sheet 4 Sheet 5 Sheet 6 Sheet 7 Sheet 8 Sheet 9 Sheet 10 Sheet 11 Sheet 12 Dashboard 1
9 marks 1 row by 1 column SUM(Area): 42,633,098

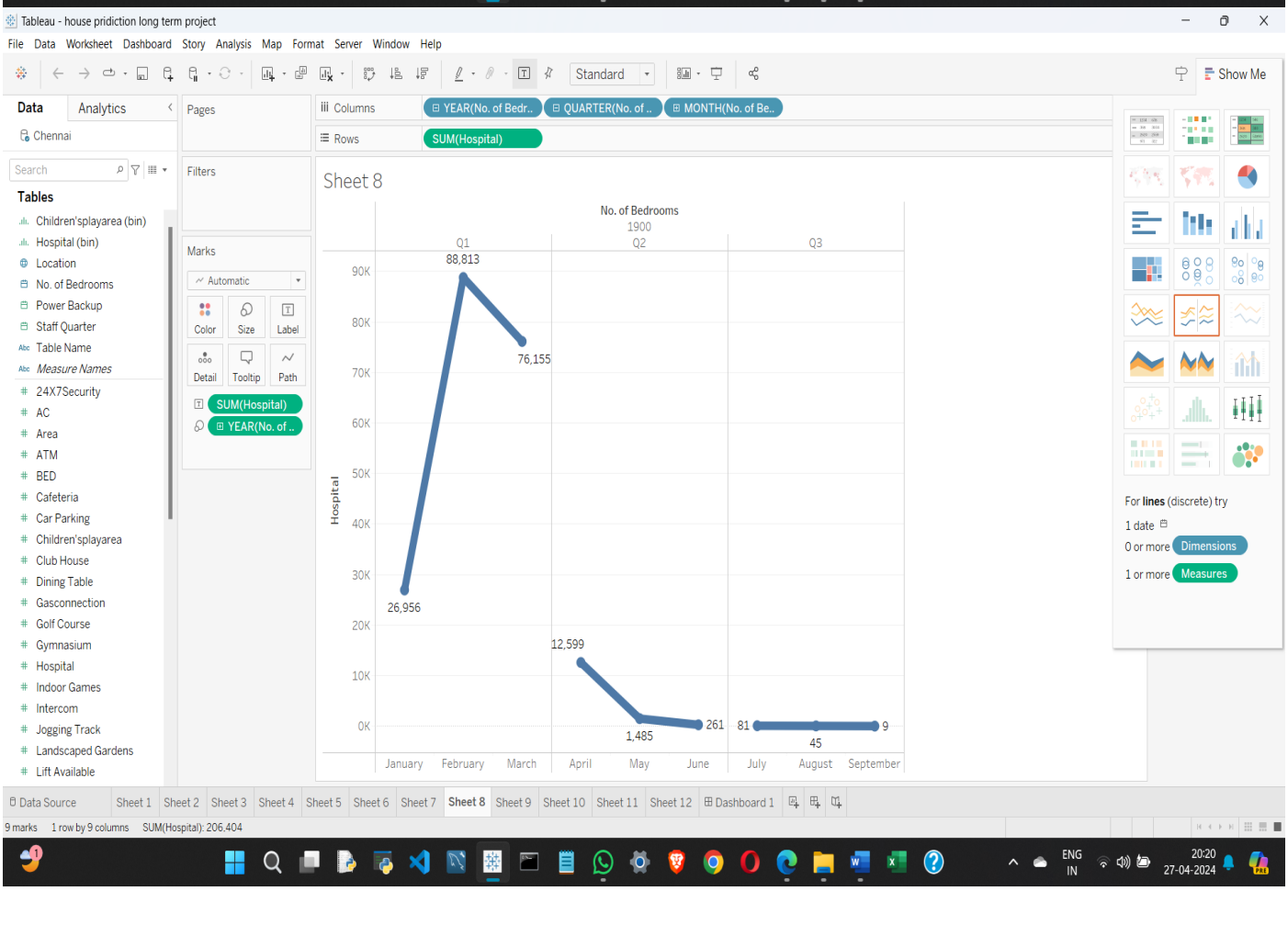
Tableau - house pridiction long term project
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Data Analytics
Chennai
Pages
Filters
Marks
Automatic
Color Size Label
Detail Tooltip Path
SUM(Hospital)
YEAR(No. of ..
Columns YEAR(No. of Bedr.. QUARTER(No. of .. MONTH(No. of Be..
Rows SUM(Hospital)
Sheet 8
No. of Bedrooms
1900
Q1 Q2 Q3
Hospital
January February March April May June July August September
88,813
76,155
26,956
12,599
1,485
261
81
45
9
Tables
Children'splayarea (bin)
Hospital (bin)
Location
No. of Bedrooms
Power Backup
Staff Quarter
Table Name
Measure Names
24X7Security
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Area
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Cafeteria
Car Parking
Children'splayarea
Club House
Dining Table
Gasconnection
Golf Course
Gymnasium
Hospital
Indoor Games
Intercom
Jogging Track
Landscaped Gardens
Lift Available
For lines (discrete) try
1 date
0 or more Dimensions
1 or more Measures
Data Source Sheet 1 Sheet 2 Sheet 3 Sheet 4 Sheet 5 Sheet 6 Sheet 7 Sheet 8 Sheet 9 Sheet 10 Sheet 11 Sheet 12 Dashboard 1
9 marks 1 row by 9 columns SUM(Hospital): 206,404

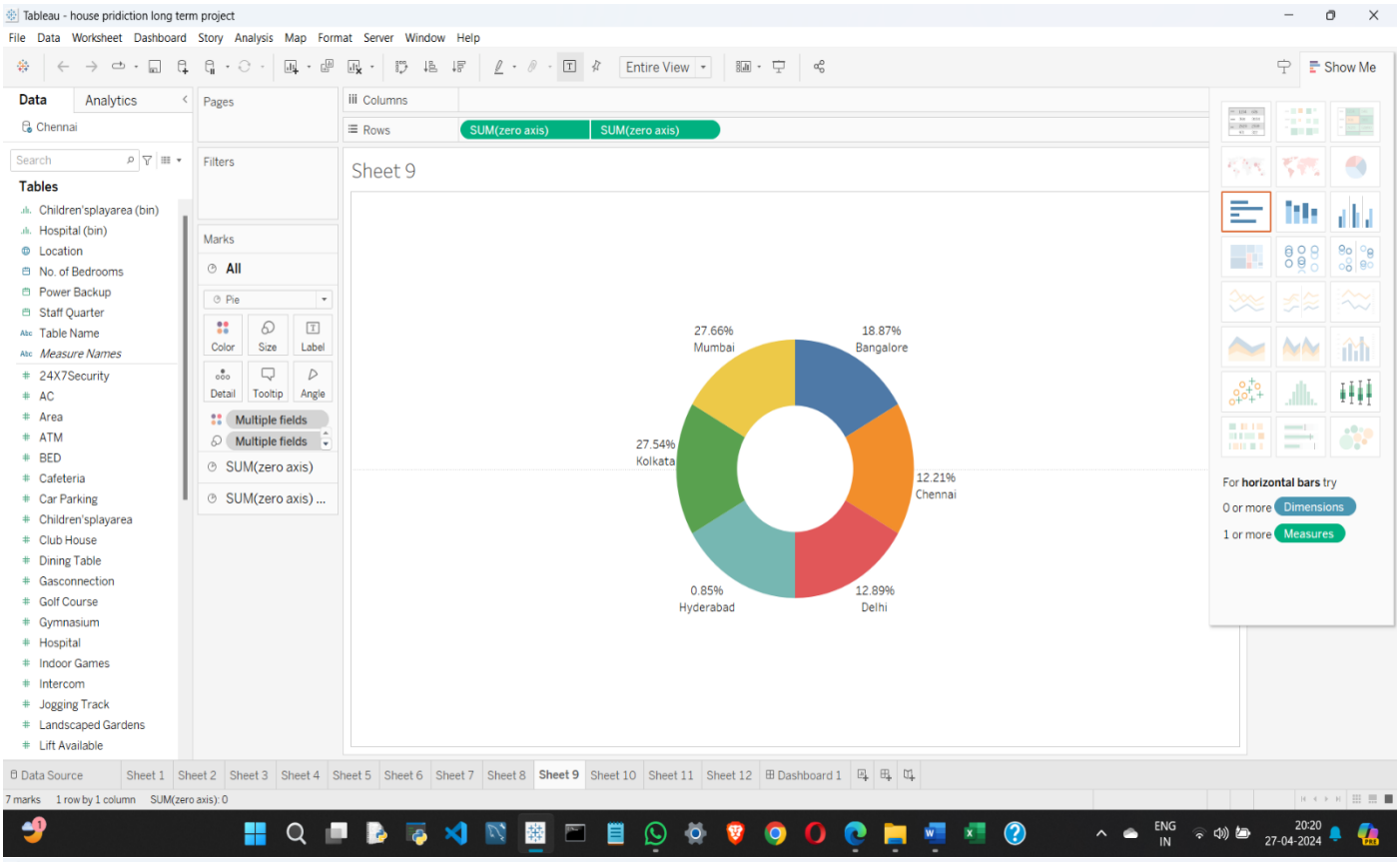
Tableau - house pridiction long term project
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Entire View
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Children'splayarea (bin)
Hospital (bin)
Location
No. of Bedrooms
Power Backup
Staff Quarter
Table Name
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Club House
Dining Table
Gasconnection
Golf Course
Gymnasium
Hospital
Indoor Games
Intercom
Jogging Track
Landscaped Gardens
Lift Available
Pages
Filters
Marks
All
Pie
Color
Size
Label
Detail
Tooltip
Angle
Multiple fields
Multiple fields
SUM(zero axis)
SUM(zero axis) ...
Columns
Rows
SUM(zero axis)
SUM(zero axis)
Sheet 9
27.66%
Mumbai
18.87%
Bangalore
27.54%
Kolkata
12.21%
Chennai
0.85%
Hyderabad
12.89%
Delhi
For horizontal bars try
0 or more Dimensions
1 or more Measures
Data Source
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Sheet 8
Sheet 9
Sheet 10
Sheet 11
Sheet 12
Dashboard 1
7 marks
1 row by 1 column
SUM(zero axis): 0
ENG
IN
20:20
27-04-2024

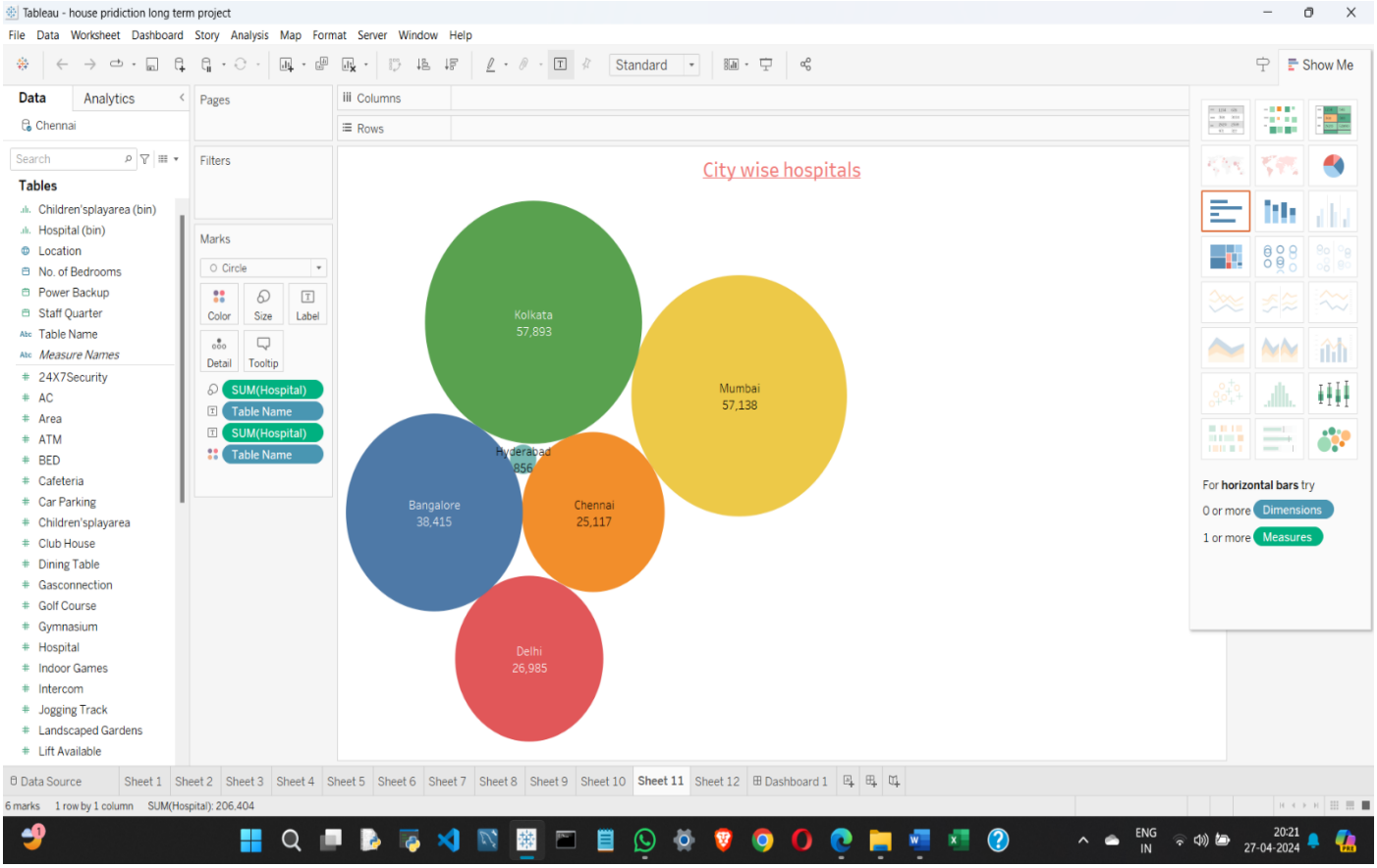
Tableau - house pridiction long term project
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Standard
Show Me
Data
Analytics
Chennai
Search
Tables
Children'splayarea (bin)
Hospital (bin)
Location
No. of Bedrooms
Power Backup
Staff Quarter
Table Name
Measure Names
24X7Security
AC
Area
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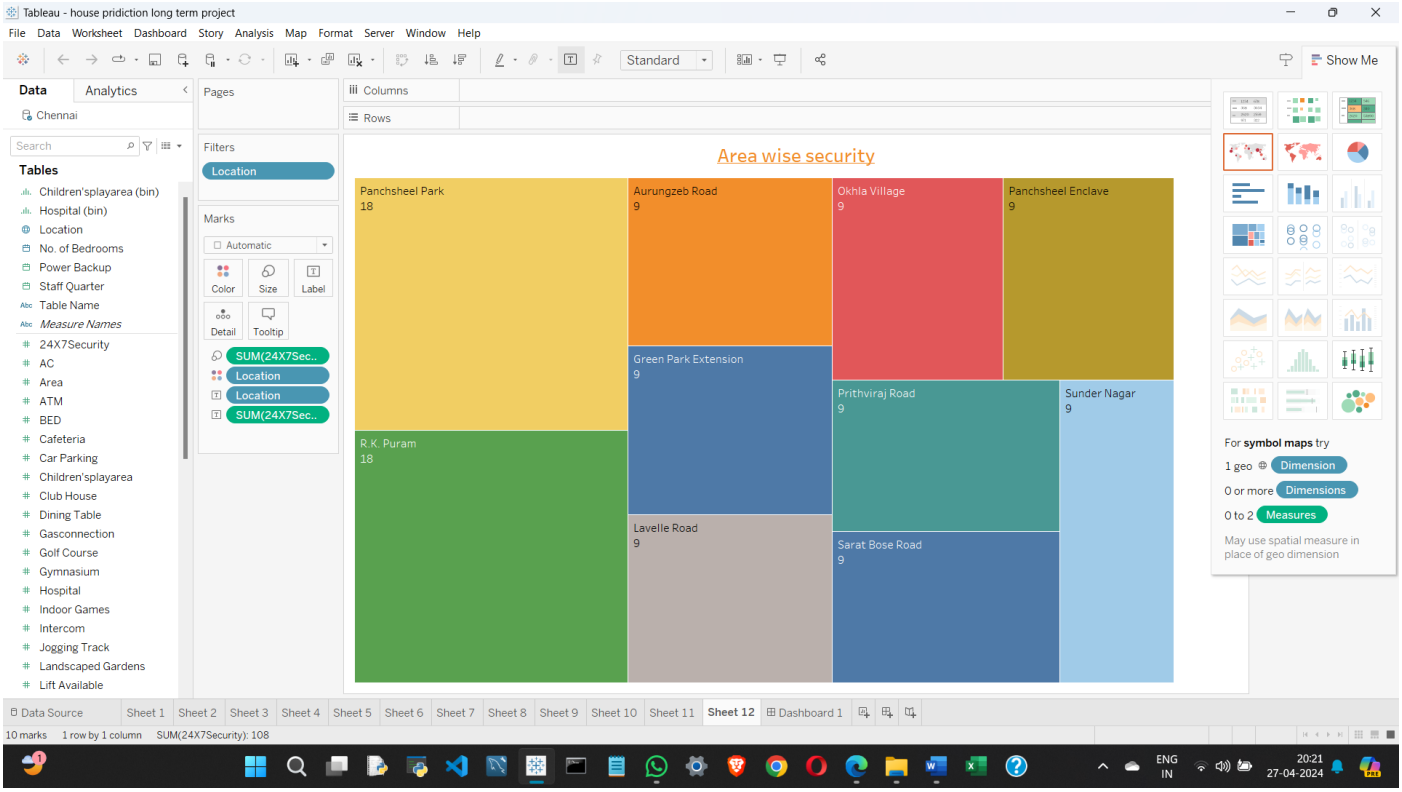
BED
Cafeteria
Car Parking
Children'splayarea
Club House
Dining Table
Gasconnection
Golf Course
Gymnasium
Hospital
Indoor Games
Intercom
Jogging Track
Landscaped Gardens
Lift Available
Pages
Filters
Marks
Circle
Color
Size
Label
Detail
Tooltip
SUM(Hospital)
Table Name
SUM(Hospital)
Table Name
Columns
Rows
City wise hospitals
Kolkata
57,893
Mumbai
57,138
Hyderabad
856
Bangalore
38,415
Chennai
25,117
Delhi
26,985
For horizontal bars try
0 or more Dimensions
1 or more Measures
Data Source
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Sheet 8
Sheet 9
Sheet 10
Sheet 11
Sheet 12
Dashboard 1
6 marks
1 row by 1 column
SUM(Hospital): 206,404
ENG
IN
20:21
27-04-2024



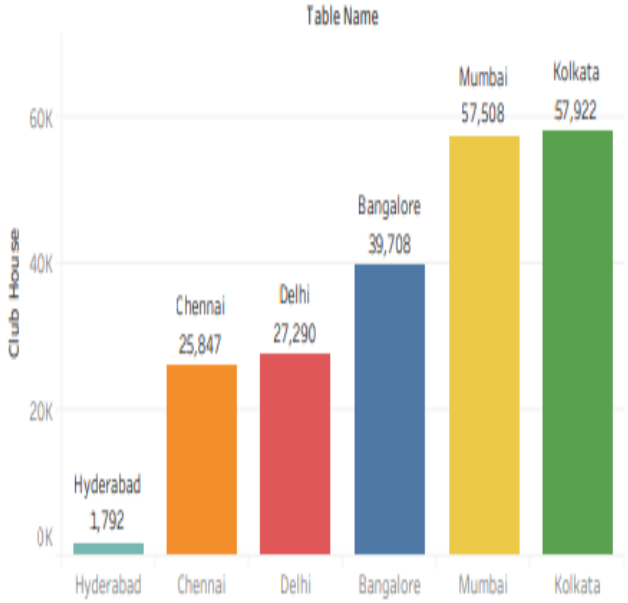
Dashboard

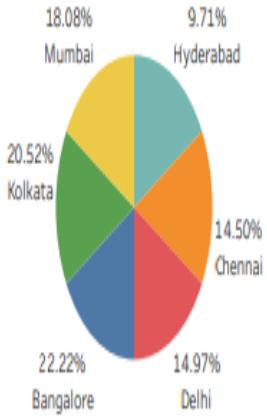
A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of 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.

No of club houses in different cities

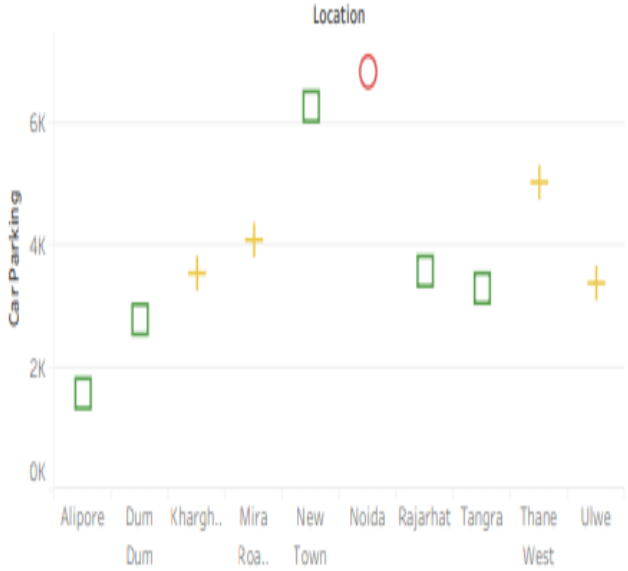
Dashboard - 2

Highest area in different cities

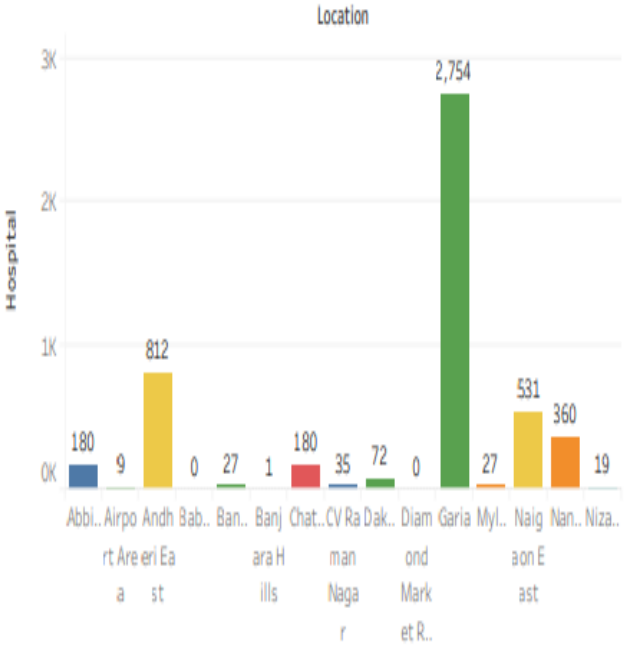




Car parking in different locations

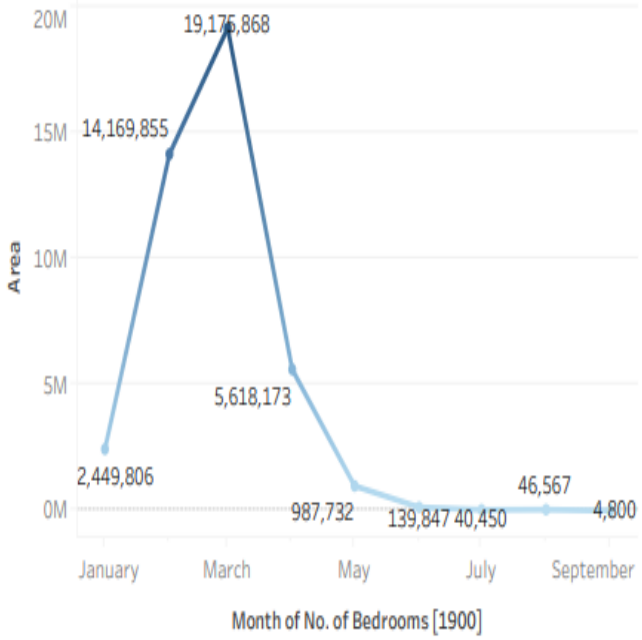


No of hospitals in different locations

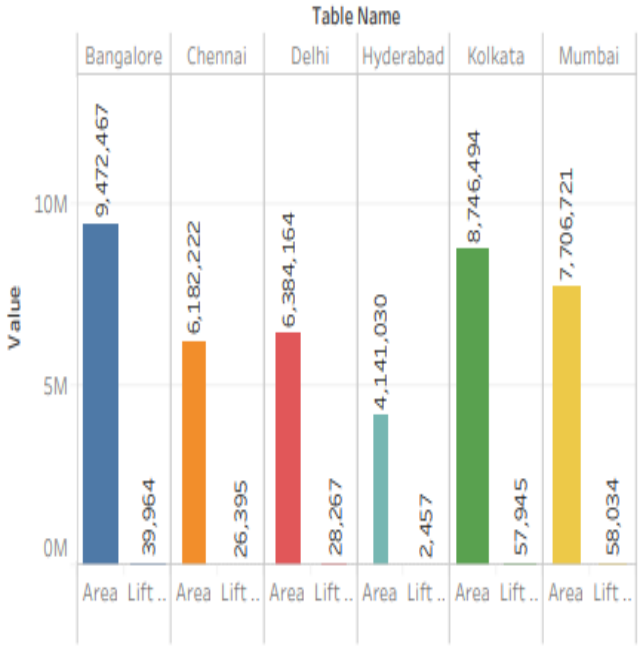


Dashboard -3

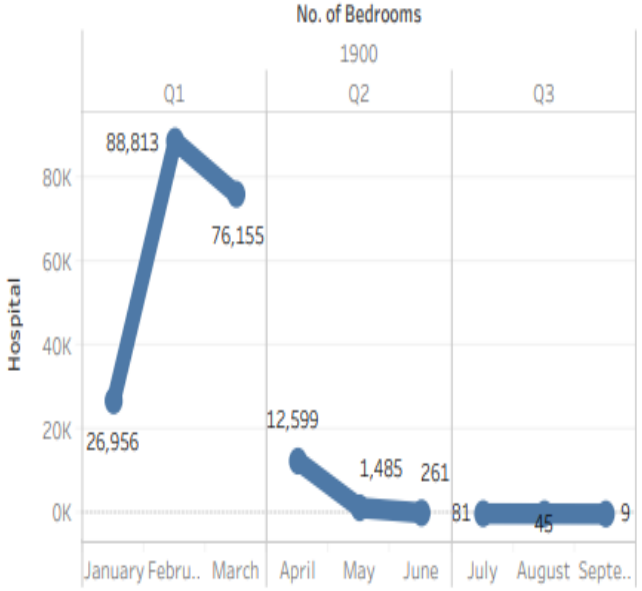
Area wise bed rooms in different months



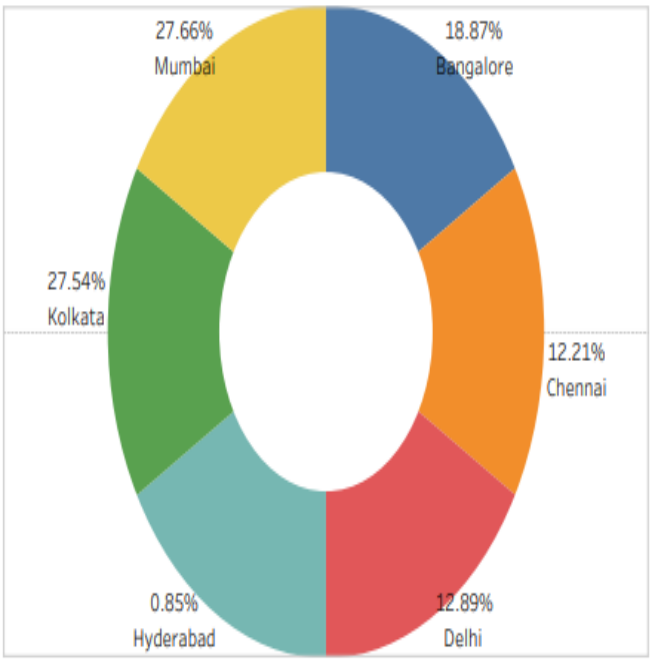
area price in different cities



Hospitals in different months and different bed rooms



Security percentage in different cities



Story

A data story is a way of presenting data and analysis in a narrative format, intending to make 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 logically and systematically, 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.

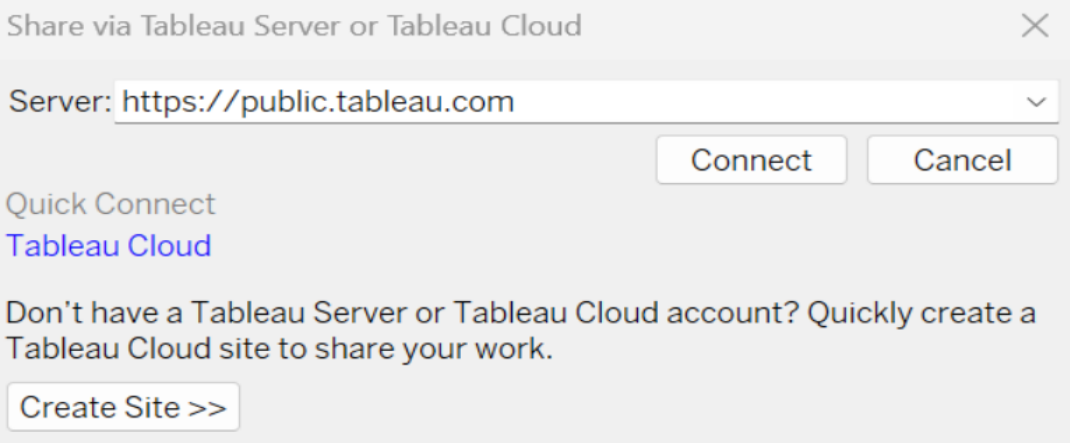
Here is the link to see the story :C:\Users\gandi\OneDrive\Desktop\housing long term\Story 1 (1).pdf

Web Integration

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

Publishing dashboard and reports to tableau public

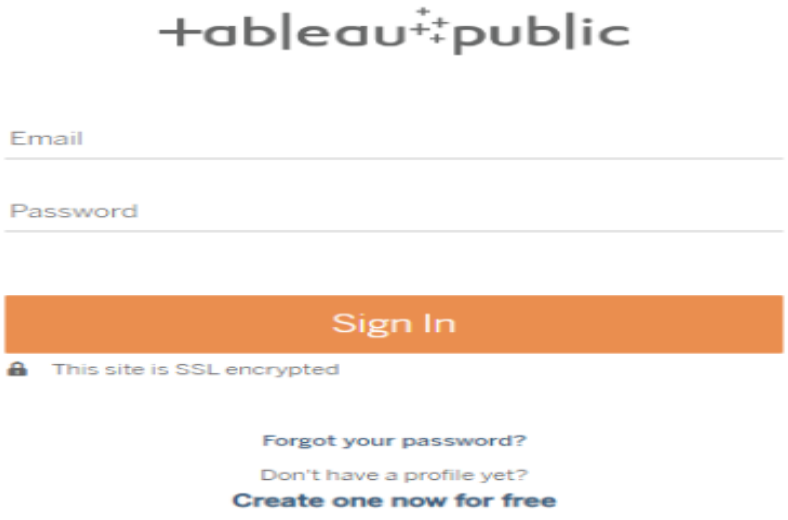
Step 1: Go to Dashboard/story, click on the share button on the top ribbon



Give the server address of your tableau public account and click on connect.

Explanation Video:- https://drive.google.com/drive/folders/15EVIuoprk6mAO55PHrXa5CvzrQl2T4Br?usp=sharing

Step 2: Once you click on connect it will ask you for the tableau public username and password




```python
from flask import Flask, render_template

app = Flask(__name__)

@app.route('/')
@app.route('/index')
def index():
    return render_template('index.html')

@app.route('/board')
def board():
    return render_template('dashboard.html')
@app.route('/story')
def story():
    return render_template('story.html')

if __name__=='__main__':
    app.run(debug=True)
```

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

Note: While publishing the visualization to the public, the respective sheet will get published when you click on the share option.

Click to see web integration code :
C:\Users\gandi\OneDrive\Desktop\gowtham\templates\index.html

Thank you