Analysing Housing Prices in Metropolitan Areas of India

PROJECT REPORT

submitted to the Manonmaniam Sundaranar Univesity, Tirunelveli, in partial fulfilment of the requirements for the award of the Degree in

BACHLEOR OF SCIENCE IN PHYSICS

by

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OCTOBER – 2023.

ACKNOWLEGEMENT

Adores our heart humbly silently & gratefully reflecting the will & Blessings showed by our Lord Almighty who made us turn every challenge in to success till this day of seeing our project work in print.

With a deep sense of gratitude we express our sincere thanks to our project supervisor Dr. S. Subramanian Assistant Professor for his valuable guidance & constant encouragement in completing this project work.

I also express our gratefulness to Dr. C. Veerabahu M.Sc., Ph.D., The Principal, for giving us the permission to do the project work.

I would like to thank our H.O.D. Dr. John Prince Soundranayagam Associate Professor for his valuable advices whenever we approached him. We also express our sincere thanks to Dr. K. Amudhavalli, Dr. M. Nagarajan, Prof. A. Infantia Daphne and Prof. S. Subha, Department of Physics for their encouragement &suggestions throughout the course of study.

We would like to express our heartfelt thanks to Mr. Teles Rayer, Mr. K. Veerabahu and Mr. Rajesh, Lab Assistants for their valuable help.

I am greatly indebted to our parents & family members, friends for their moral support which helped us to complete this work.

INTRODUCTION

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.

PROJECT FLOW

- **EMPATHY MAP**
- **BRAINSTORMING AND IDEA PRIORITIZATION MAP**
- **DATA PREPARATION**

  Prepare the Data for Visualization
- **DATA VISUALIZATIONS**

  Number of Unique Visualizations
- **DASHBOARD**

  Responsive and Design of Dashboard
- **STORY**

  Number of Scenes of Story
- **PERFORMANCE TESTING**

  Utilization of Data Filters

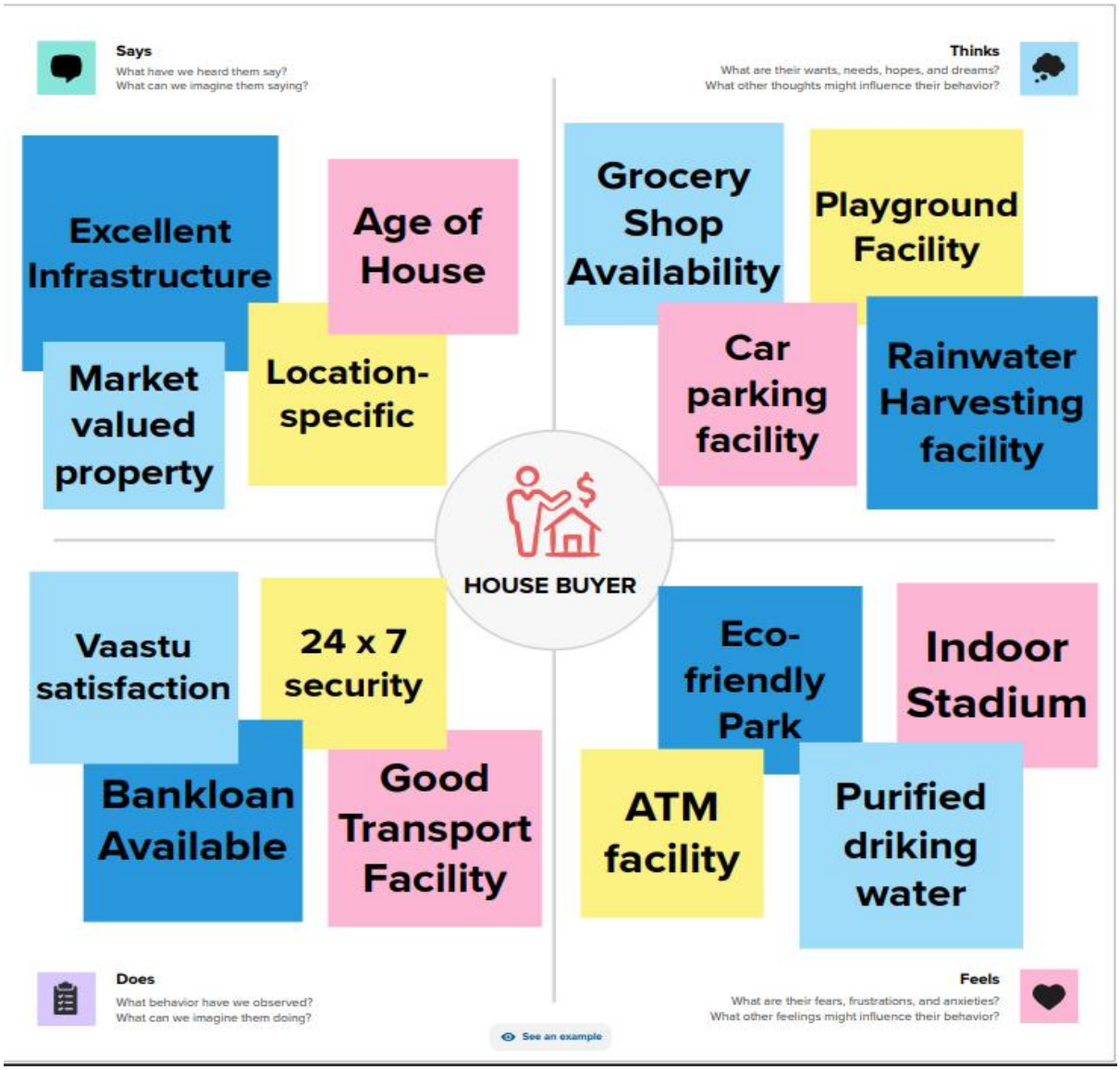
  Number of Visualizations/ Graphs
- **PUBLISHING**

  Publishing Dashboard and Story on Tableau Public
- **PROJECT DEMONSTRATION & DOCUMENTATION**

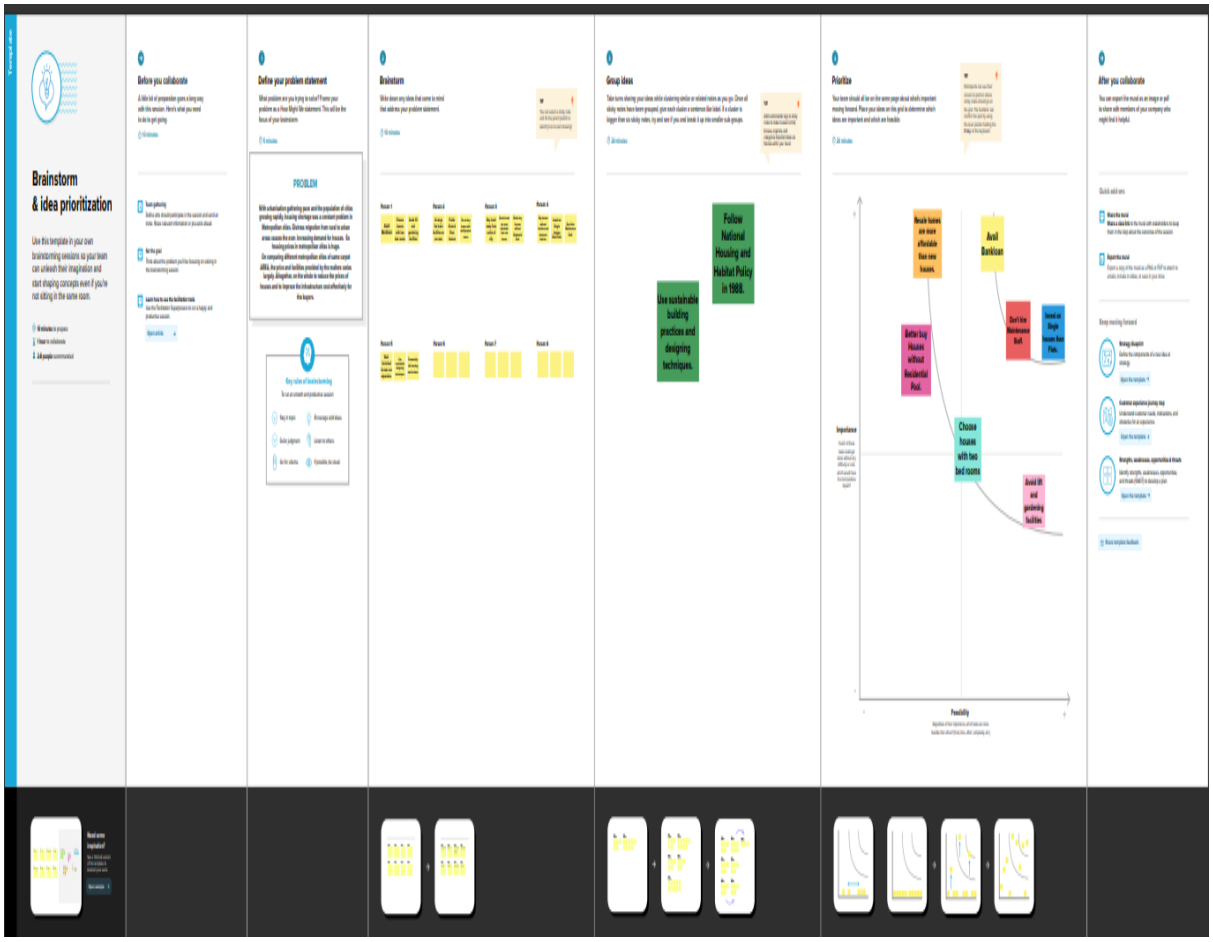
  Record explanation Video for project end to end solution

  Project Documentation-Step by step project development procedure

EMPATHY MAP


Says
What have we heard them say?
What can we imagine them saying?
Thinks
What are their wants, needs, hopes, and dreams?
What other thoughts might influence their behavior?
Excellent Infrastructure
Age of House
Grocery Shop Availability
Playground Facility
Market valued property
Location-specific
Car parking facility
Rainwater Harvesting facility
HOUSE BUYER
Vaastu satisfaction
24 x 7 security
Eco-friendly Park
Indoor Stadium
Bankloan Available
Good Transport Facility
ATM facility
Purified driking water
Does
What behavior have we observed?
What can we imagine them doing?
Feels
What are their fears, frustrations, and anxieties?
What other feelings might influence their behavior?
See an example

BRAINSTORMING AND IDEA PRIORITIZATION MAP



DATA PREPARATION

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 our analysis.

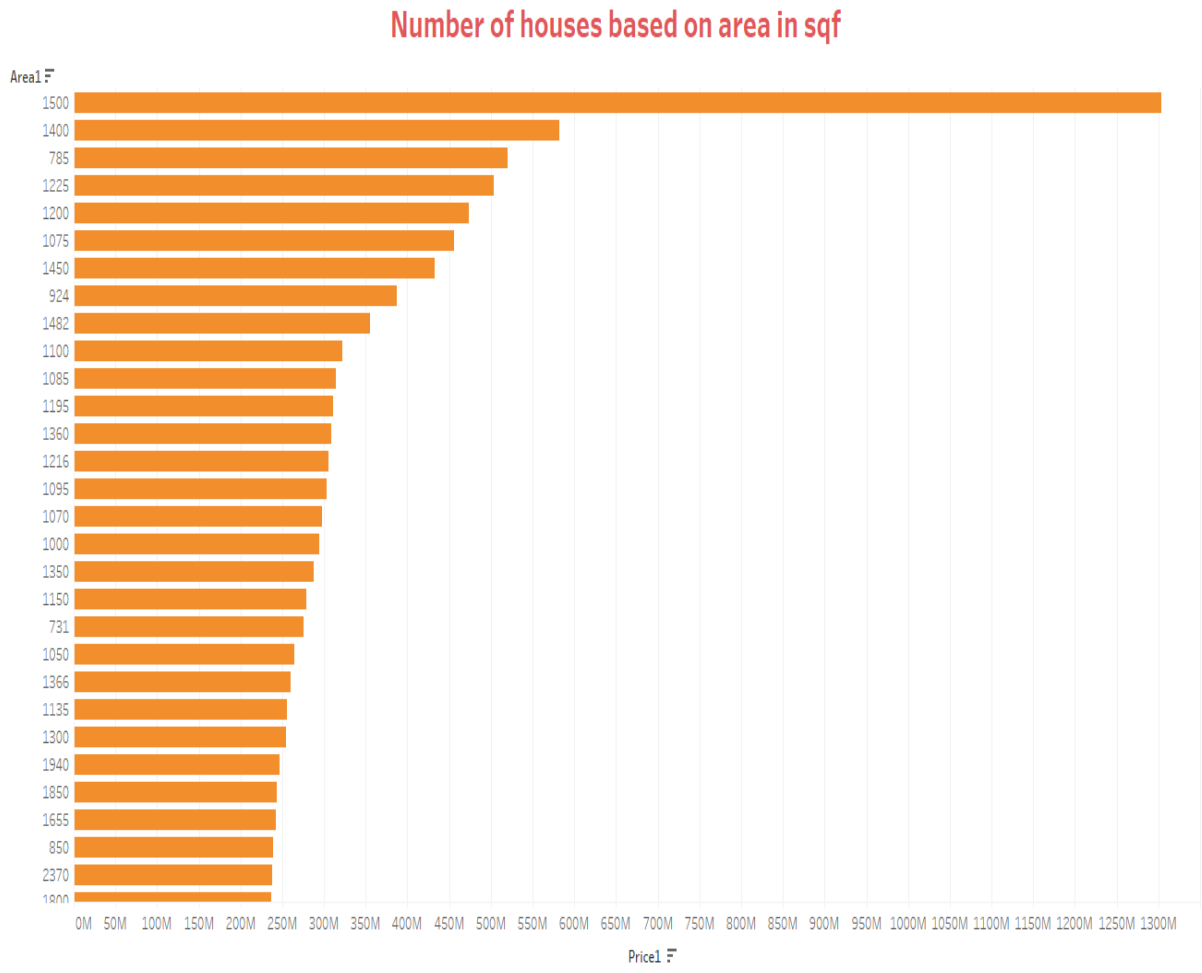
DATA VISUALIZATION

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.

SHEET 1-Latitude and Longitude based Locations

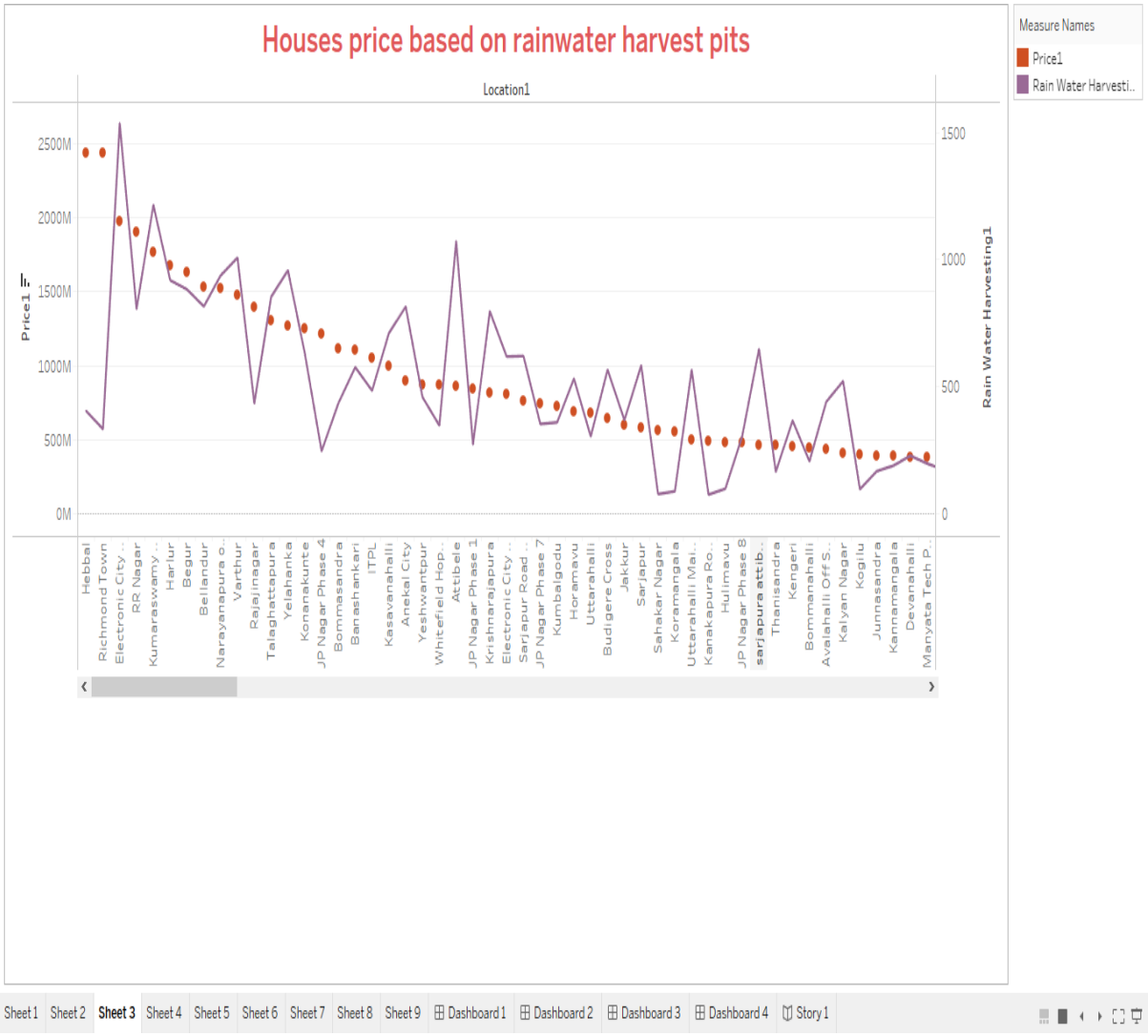
In this sheet 1 we have visualized the cities based on Latitude and Longitude.

SHEET 2- Number of houses as a function of area in sq ft.



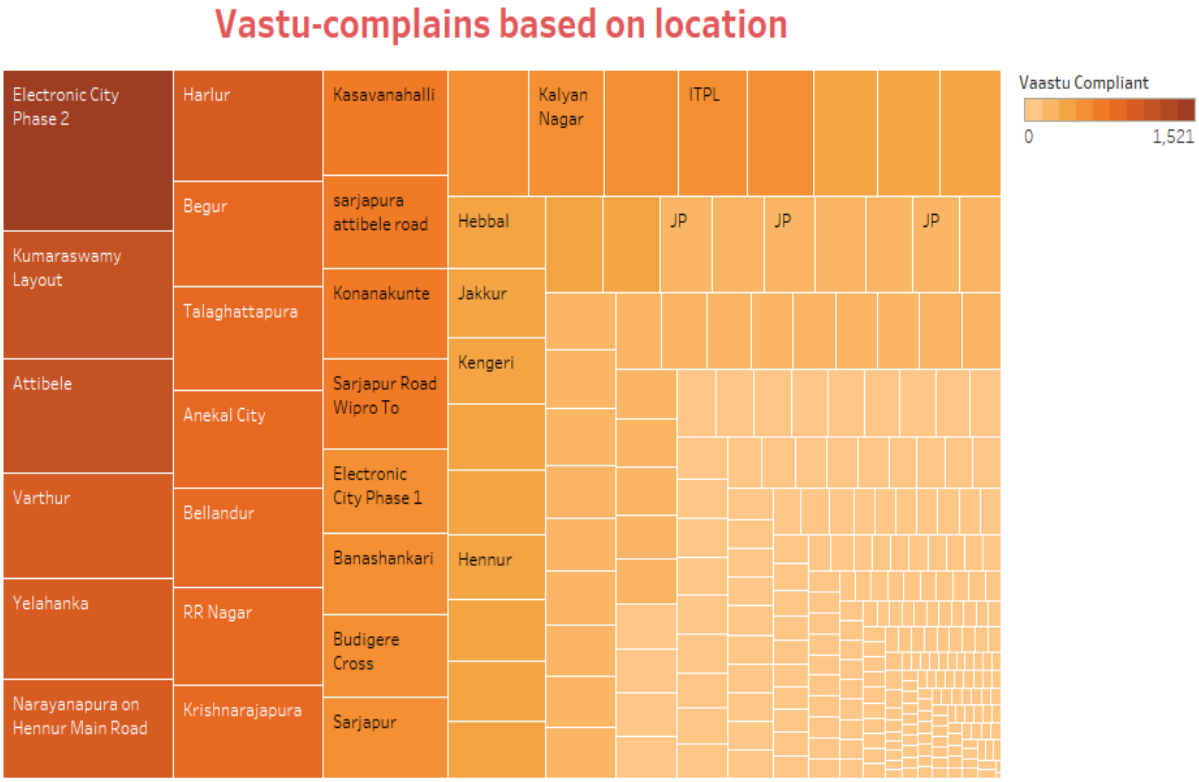
In this horizontal bar chart, we have plotted the number of houses as a function of area in sq ft.

SHEET 3- Housing Price based on Rainwater Harvesting pits



In scatterer plot we have shown how the price of houses varies with Rainwater Harvesting pits.

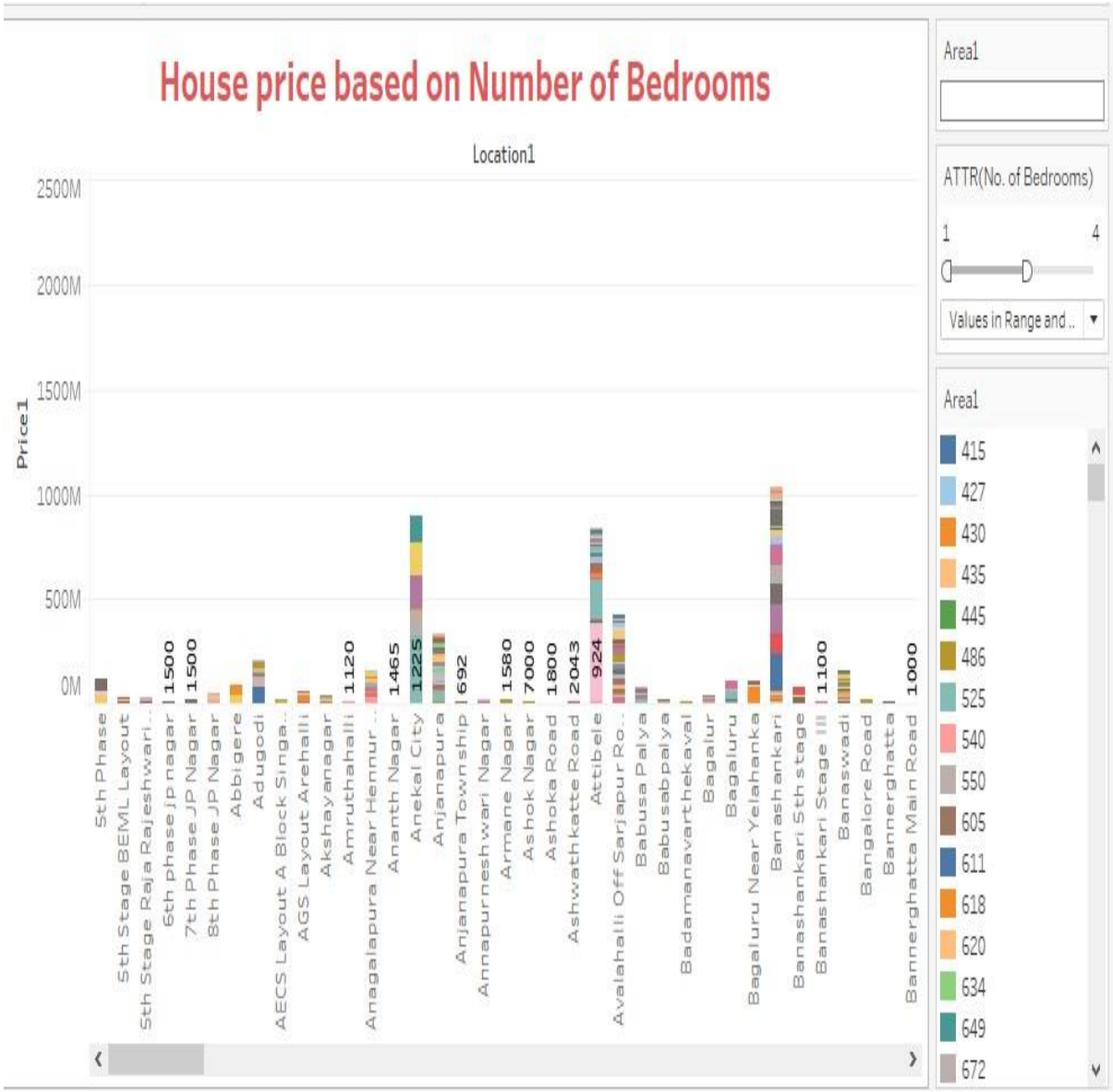
SHEET 4- Location wise Vaastu complaints



Location1. Color shows sum of Vaastu Compliant. Size shows sum of Vaastu Compliant. The marks are labeled by Location1. The view is filtered on Location1, which keeps 302 of 302 members.

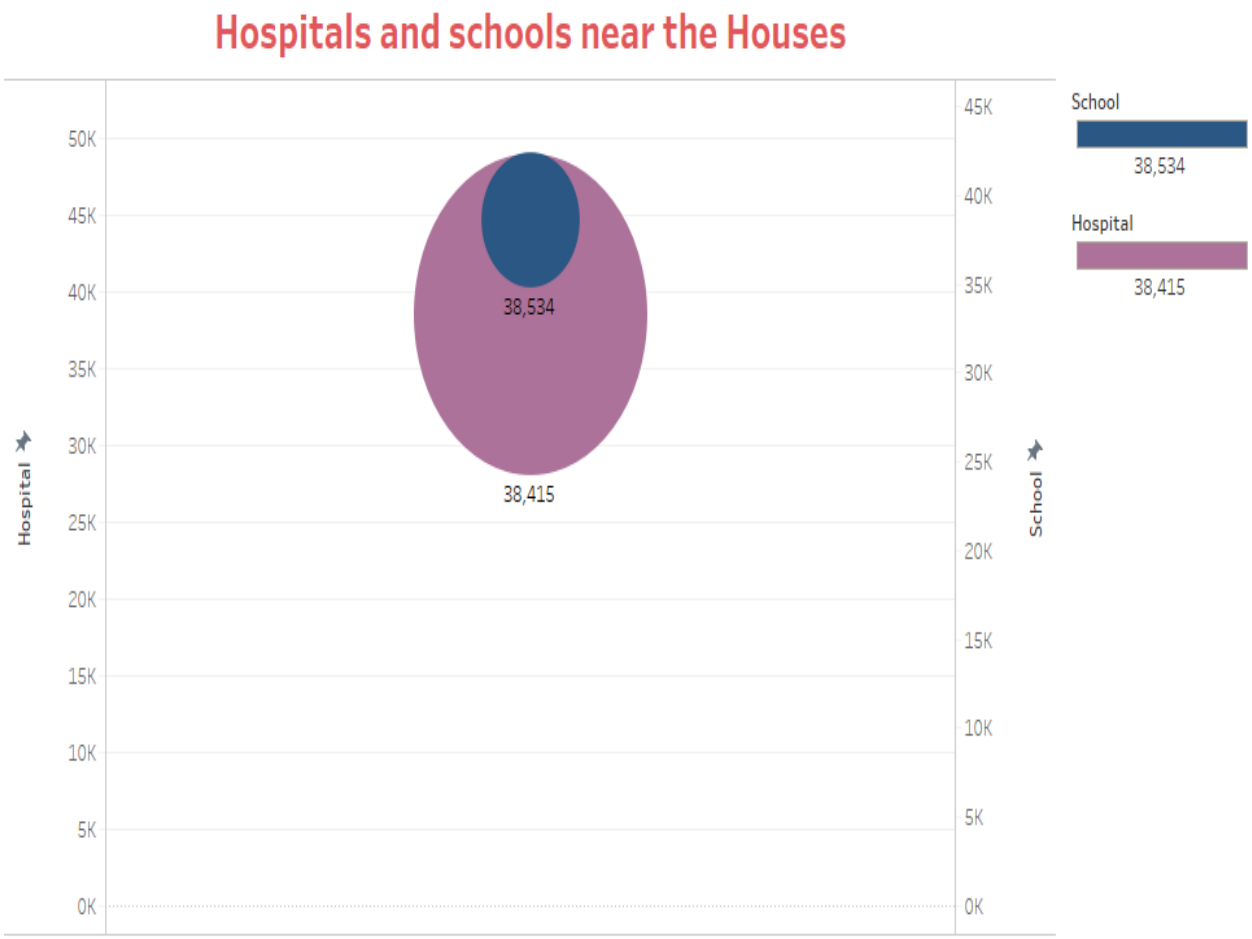
The location wise Vaastu complaints are visualised here.

SHEET 5- Housing Price as a function of Number of Bedrooms across Bangalore



We have drawn the graph between the Price and Location to visualize the Housing price based on Number of bedrooms.

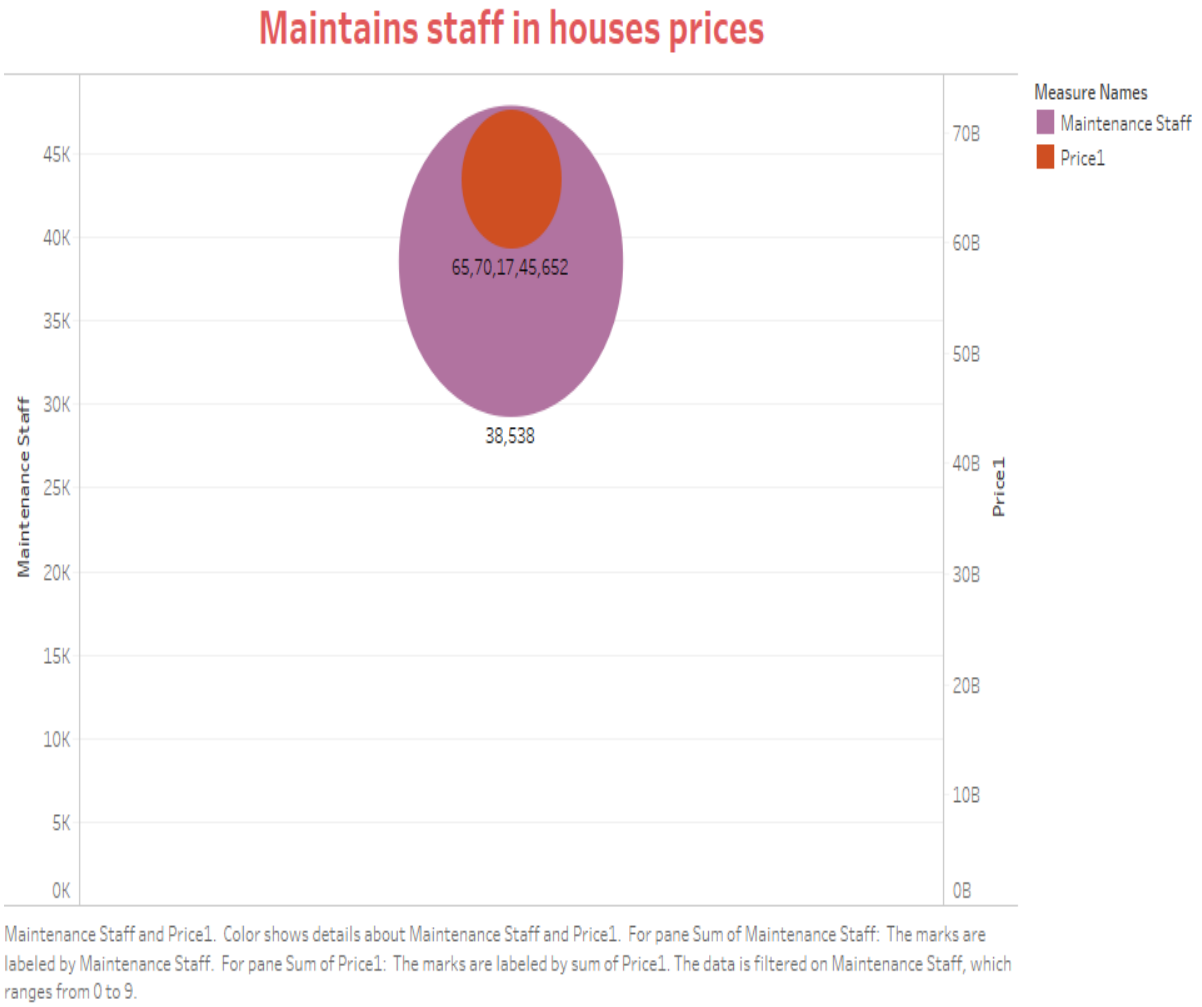
SHEET 6- Hospitals and Schools near the Houses



Sum of Hospital and sum of School. For pane Sum of School: Color shows sum of School. The marks are labeled by sum of School. For pane Sum of Hospital: Color shows sum of Hospital. The marks are labeled by sum of Hospital. The data is filtered on Price1 and Location1. The Price1 filter ranges from 2000000 to 300000000. The Location1 filter keeps 302 of 302 members.

In this bubble chart, the nearby Hospitals and Schools are represented in purple and blue colour respectively.

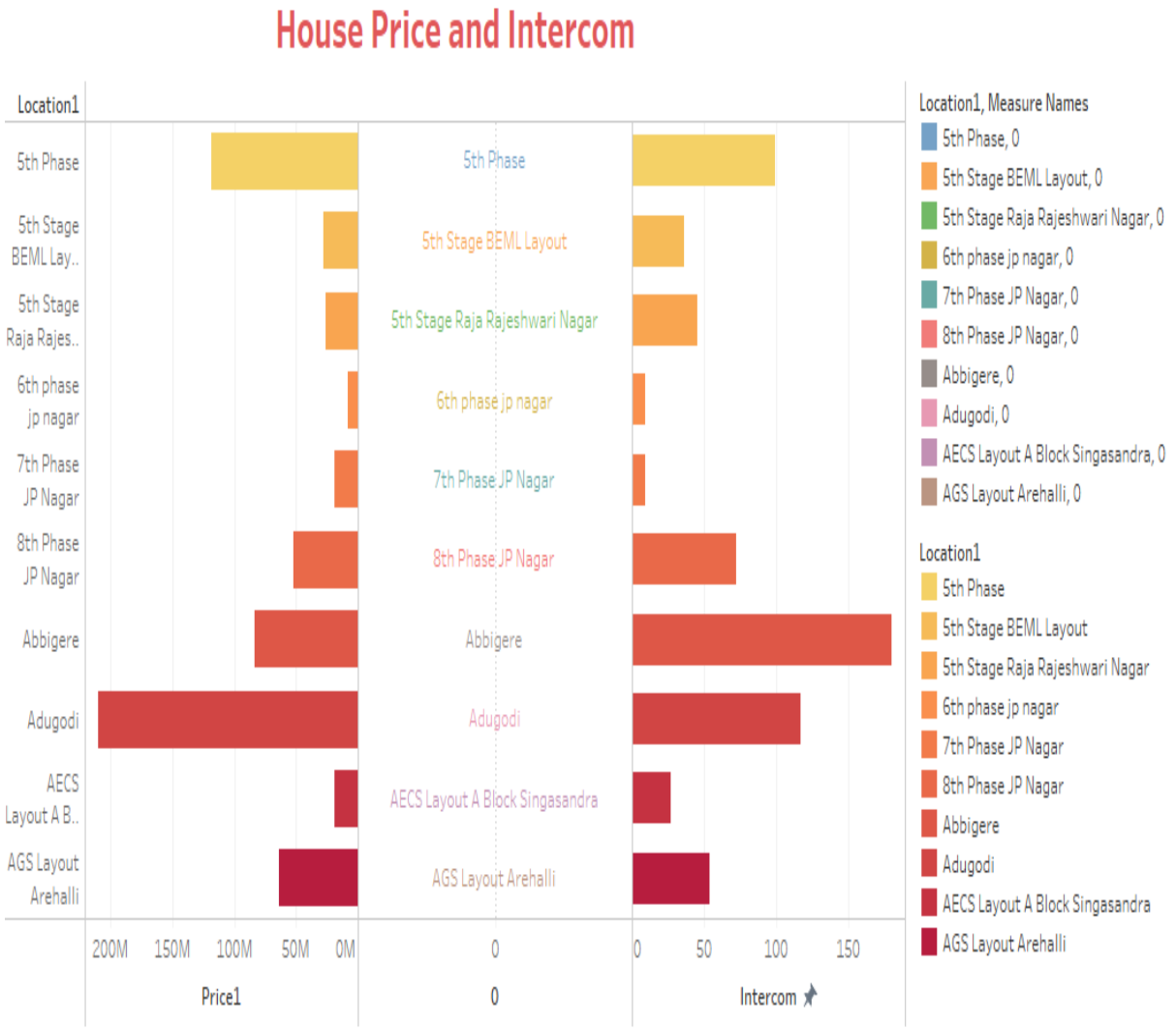
SHEET 7- Housing Price with Maintenance staff



Maintenance Staff and Price1. Color shows details about Maintenance Staff and Price1. For pane Sum of Maintenance Staff: The marks are labeled by Maintenance Staff. For pane Sum of Price1: The marks are labeled by sum of Price1. The data is filtered on Maintenance Staff, which ranges from 0 to 9.

In this chart, Red color represents the Housing prices and the Violet color represents the maintenance staff.

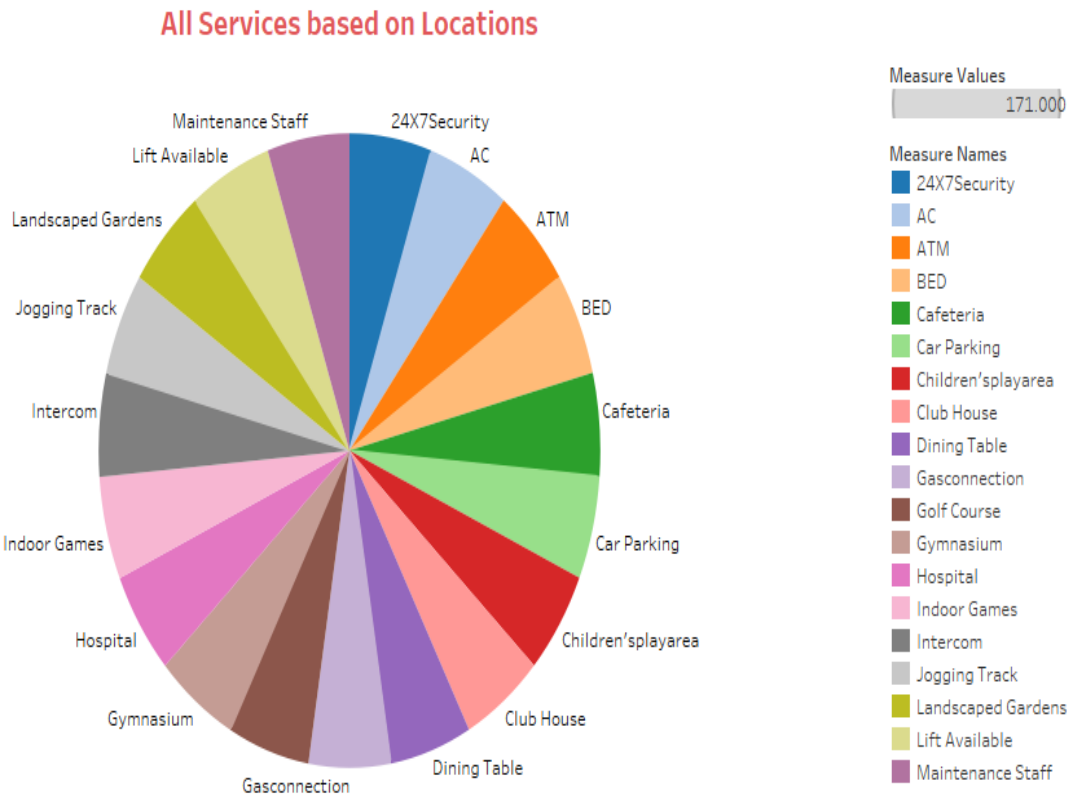
SHEET 8- House Price and Intercom



Price1, 0 and Intercom for each Location1. Color shows details about Location1. Details are shown for Price1, 0 and Intercom. For pane Sum of 0: Color shows details about Location1, Price1, 0 and Intercom. The view is filtered on Location1, which keeps 10 of 302 members.

In this Butterfly chart, the housing price is studied as a function of Intercom facility.

SHEET 9- All services based on Locations



24X7Security, AC, 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 and Maintenance Staff. Color shows details about 24X7Security, AC, 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 and Maintenance Staff. Size shows 24X7Security, AC, 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 and Maintenance Staff. The marks are labeled by 24X7Security, AC, 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 and Maintenance Staff. The data is filtered on Location1, which keeps Dwaraka Nagar.

This pie chart visualizes all the services based on location.

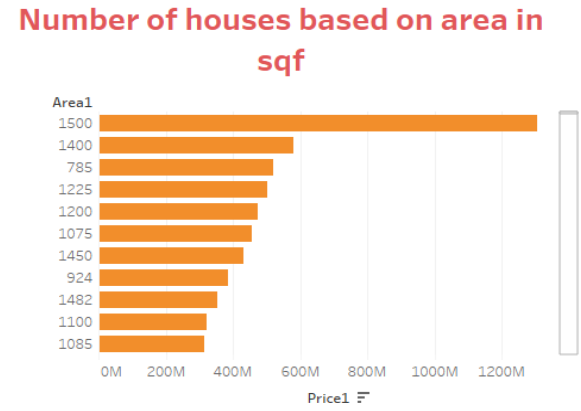
DASHBOARD

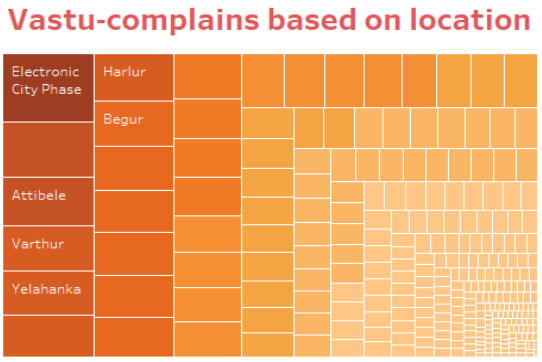
A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data, and are typically designed for a specific purpose or use case. Dashboards can be used to track key performance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

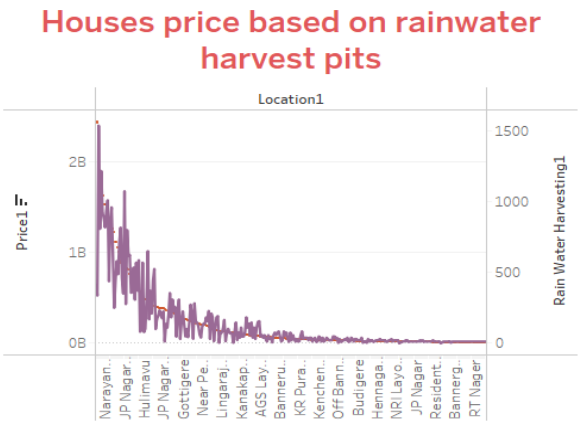
DASHBOARD 1


Latitude and Longitude based on Location
Pakistan
India
Nepal
Bhutan
Bangladesh
Sri Lanka
Myanmar
Lahore
Kandahar
Karachi
Jaipur
Agra
Delhi
Kolkata
Dhaka
Chennai
Bengaluru
Mangaluru
Kozhikode
Thiruvananthapuram
Jaffna
Trincomalee
Andaman & Nicobar Islands
Banda Aceh
© 2023 Mapbox © OpenStreetMap

DASHBOARD 2

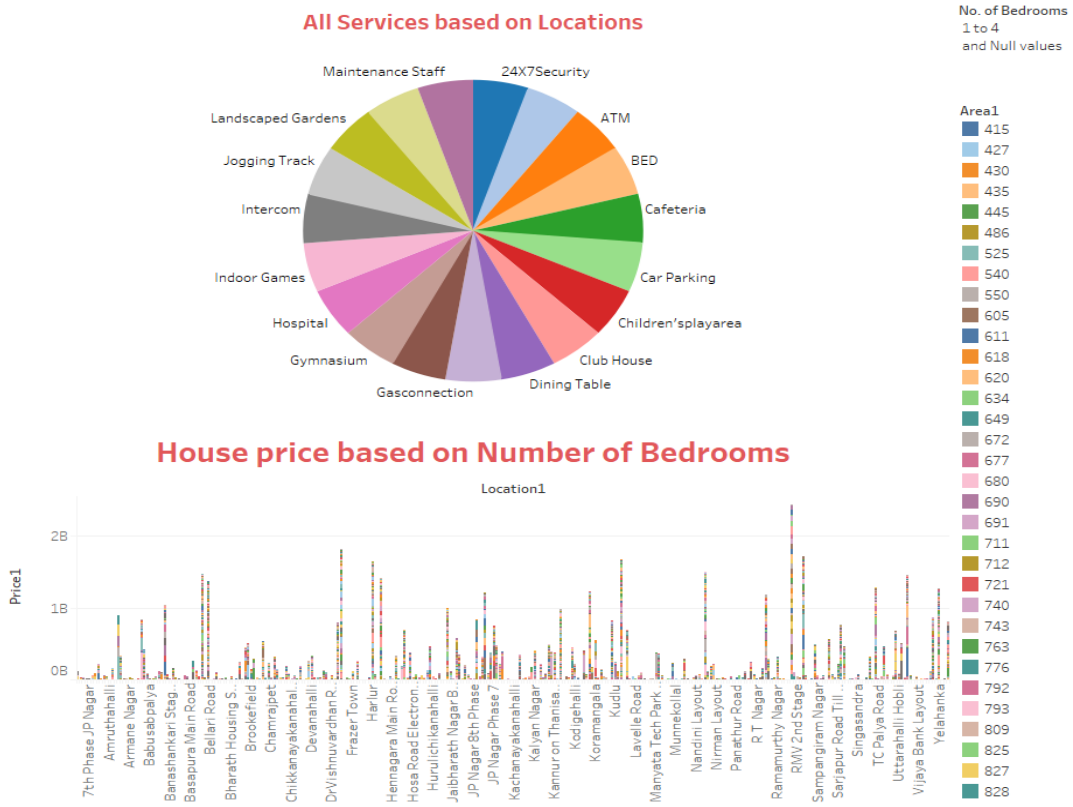

Number of houses based on area in sqf
Area1
1500
1400
785
1225
1200
1075
1450
924
1482
1100
1085
0M
200M
400M
600M
800M
1000M
1200M
Price1


Vastu-complains based on location
Electronic City Phase
Harlur
Begur
Attibele
Varthur
Yelahanka

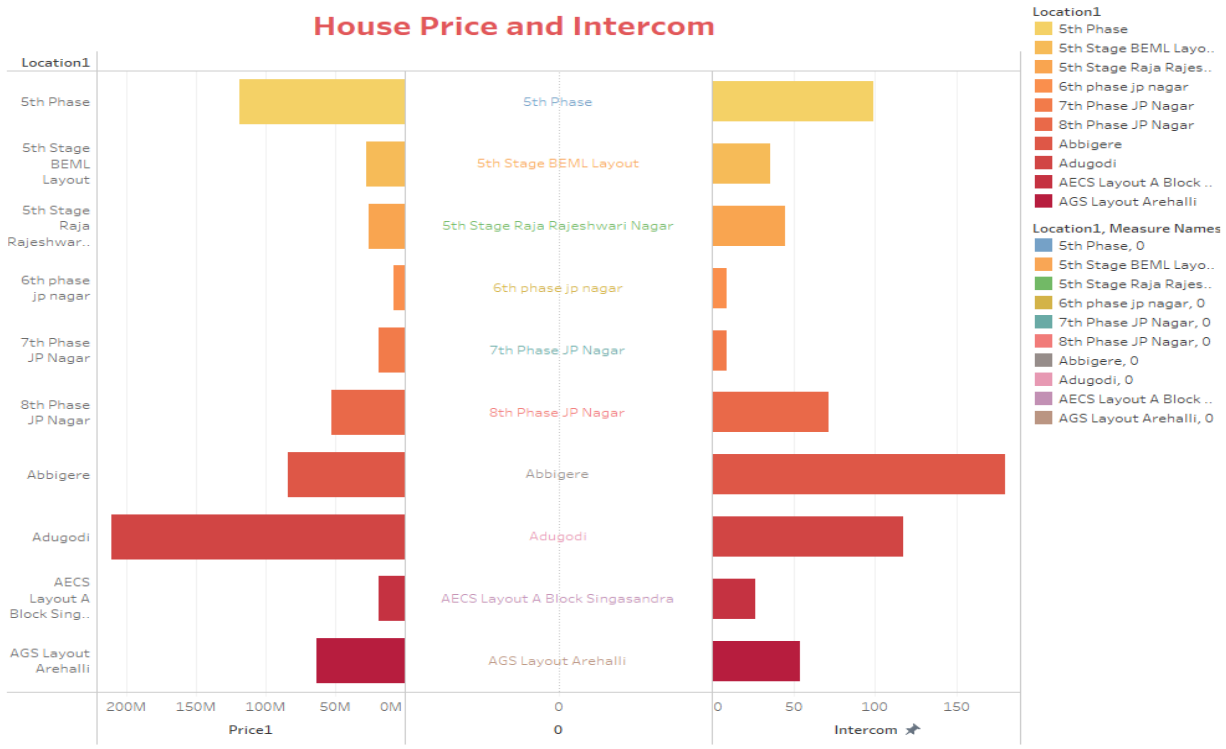

Houses price based on rainwater harvest pits
Location1
Price1
2B
1B
0B
1500
1000
500
0
Rain Water Harvesting1
Narayan..
JP Nagar..
Hulimavu
JP Nagar..
Gottigere
Near Pe..
Lingaraj..
Kanakap..
AGS Lay..
Banneru..
KR Pura..
Kenchen..
Off Bann..
Budigere
Hennaga..
NRI Layo..
JP Nagar
Resident..
Banneg..
RT Nagar


Area1
415
427
430
435
445
465
486
488
520
525
538
Vaastu Compliant
0
1,521

DASHBOARD 3


All Services based on Locations
Maintenance Staff
24X7Security
Landscaped Gardens
ATM
Jogging Track
BED
Intercom
Cafeteria
Indoor Games
Car Parking
Hospital
Children'splayarea
Gymnasium
Club House
Gasconnection
Dining Table
No. of Bedrooms
1 to 4
and Null values
Area1
415
427
430
435
445
486
525
540
550
605
611
618
620
634
649
672
677
680
690
691
711
712
721
740
743
763
776
792
793
809
825
827
828
House price based on Number of Bedrooms
Location1
Price1
2B
1B
0B
7th Phase JP Nagar
Amruthahalli
Armane Nagar
Babusabpalya
Banashankari Stag..
Basapura Main Road
Bellari Road
Bharath Housing S..
Brookefield
Chamrajpet
Chikkanayakanahal..
Devanahalli
Dr.Vishnuvardhan R..
Frazer Town
Harlur
Hennagara Main Ro..
Hosa Road Electron..
Hurulichikanahalli
Jalbharath Nagar B..
JP Nagar 8th Phase
JP Nagar Phase 7
Kachanayakanahalli
Kalyan Nagar
Kannuron Thanisa..
Kodigehalli
Koramangala
Kudlu
Lavelle Road
Manyata Tech Park
Munnekollal
Nandini Layout
Nirman Layout
Panathur Road
R T Nagar
Ramamurthy Nagar
RMV 2nd Stage
Sampangiram Nagar
Sarjapur Road Till..
Singasandra
TC Palya Road
Uttarahalli Hobli
Vijaya Bank Layout
Yelahanka..

DASHBOARD 4


House Price and Intercom
Location1
5th Phase
5th Stage BEML Layout
5th Stage Raja Rajeshwar..
6th phase jp nagar
7th Phase JP Nagar
8th Phase JP Nagar
Abbigere
Adugodi
AECS Layout A Block Sing..
AGS Layout Arehalli
200M
150M
100M
50M
0M
Price1
0
0
50
100
150
Intercom
Location1
5th Phase
5th Stage BEML Layo..
5th Stage Raja Rajes..
6th phase jp nagar
7th Phase JP Nagar
8th Phase JP Nagar
Abbigere
Adugodi
AECS Layout A Block ..
AGS Layout Arehalli
Location1, Measure Names
5th Phase, 0
5th Stage BEML Layo..
5th Stage Raja Rajes..
6th phase jp nagar, 0
7th Phase JP Nagar, 0
8th Phase JP Nagar, 0
Abbigere, 0
Adugodi, 0
AECS Layout A Block ..
AGS Layout Arehalli, 0

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.

The below is the link for story:

https://drive.google.com/file/d/182DjdNy9GojrI3NVLXKwAsl8TYftzM2h/view?usp=drivesdk

Publish Dashboard & Story to Tableau Public

We have published the results of our analysis in Tableau Public and given the link below.

https://public.tableau.com/app/profile/saravana.karthikeyan.k/vizzes

PROJECT DEMONSTRATION:

Video explanation of our work have been recorded and the link for access is given here.

https://drive.google.com/file/d/14pmkXCrkO8M_OpPkHEGFZ4GZTY37-HQO/view?usp=drivesdk

RESULTS AND DISCUSSIONS:

We have studied the housing prices in metropolitan areas of India by creating Charts

- Empathy map
- Brain Storming And Idea Prioritization map
- Latitude and Longitude based on Location
- Number of houses based on area in sq ft.
- Houses price based on rainwater harvesting pits
- Vastu-complains based on location
- House price based on Number of Bedrooms
- Hospitals and schools near the Houses
- Maintains staff in houses prices
- House Price and Intercom
- All Services based on locations

THANK YOU