



GOVERNMENT ARTS COLLEGE (AUTONOMOUS), COIMBATORE – 18.

DEPARTMENT OF PHYSICS

A PROJECT REPORT ON

ANALYSING HOUSING PRICES IN METROPOLITAN AREAS OF INDIA

BASED ON THE COURSE

FUNDAMENTALS OF DATA ANALYTICS WITH TABLEAU - SMARTBRIDGE

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SUBMITTED TO

NAAN MUDHALVAN – SMART INTERNZ

DATA ANALYTICS UPSKILL PROGRAMING



Dissertation submitted in partial fulfilment of the requirements for the course of

**FUNDAMENTALS OF DATA ANALYTICS WITH TABLEAU -
SMARTBRIDGE**

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INTRODUCTION

1.1 OVERVIEW

The project aims to analyze housing prices in metropolitan areas across India. It involves collecting and evaluating data from various sources, including real estate listings, economic indicators, and demographic trends. By employing statistical and machine learning techniques, the study seeks to identify key factors influencing housing prices, such as location, property size, amenities, and market demand. The findings will provide valuable insights for homebuyers, investors, and policymakers, helping them make informed decisions about housing investments and urban development strategies in India's rapidly growing metropolitan regions.

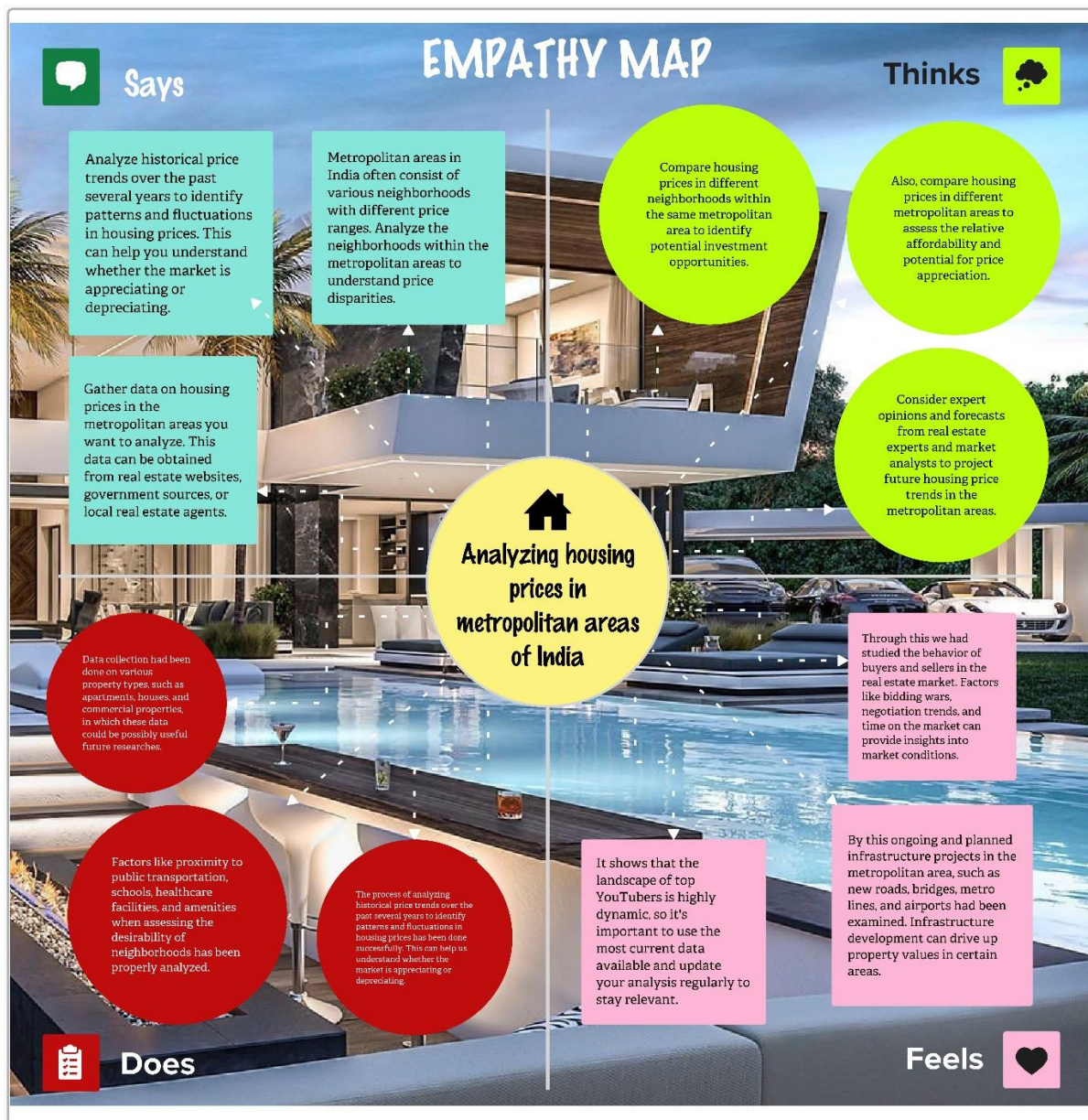
1.2 PURPOSE

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.

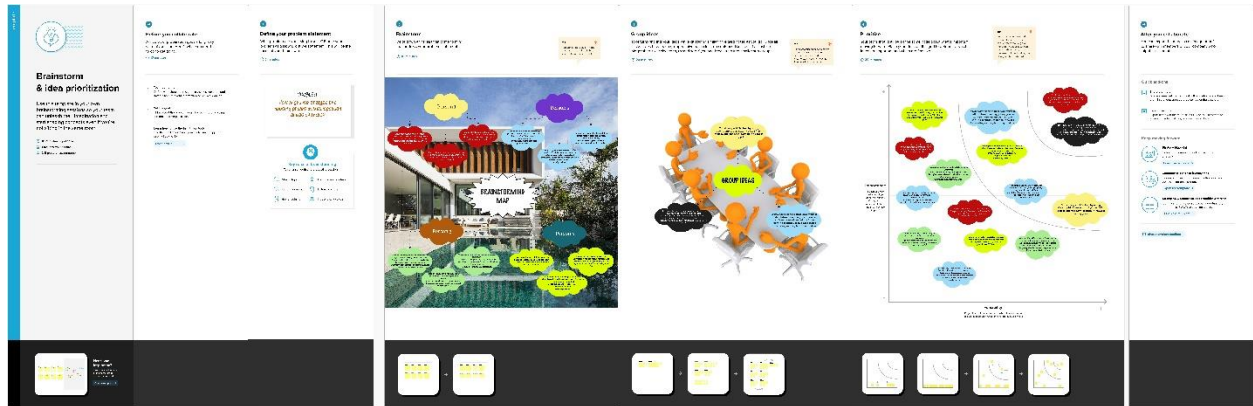
PROBLEM DEFINITION & DESIGN THINKING

In order to fulfil the milestone **Empathy map** and **Brainstorming map** was created by group discussions. Those maps are uploaded in github and the links to access those files are hyperlinked here [empathy map](#) , [brainstorming map](#).

2.1 EMPATHY MAP



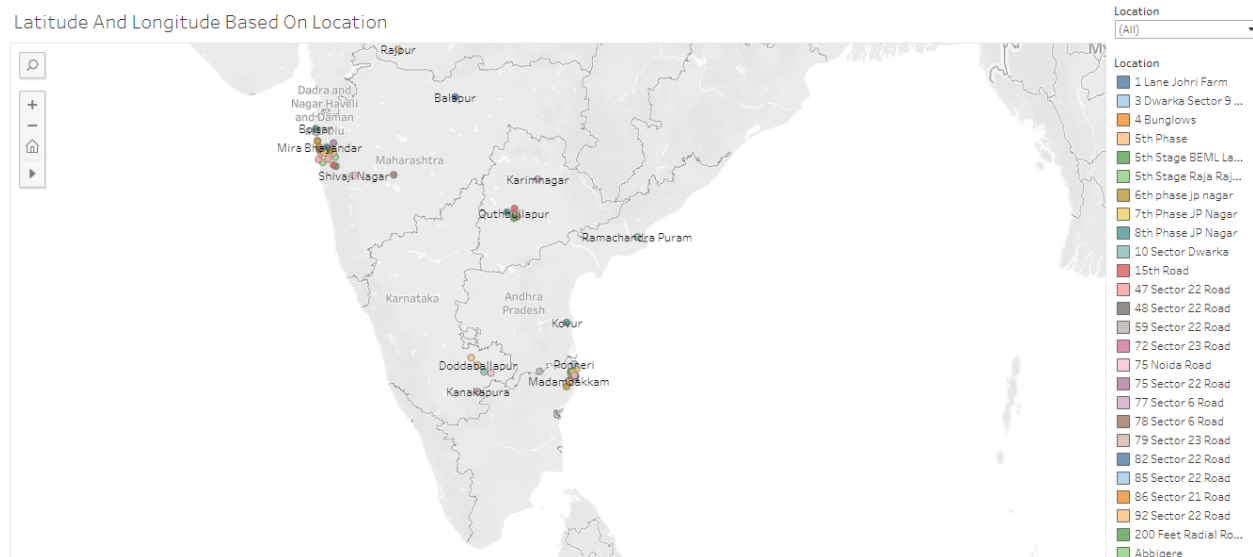
2.2 BRAINSTORMING MAP



RESULTS

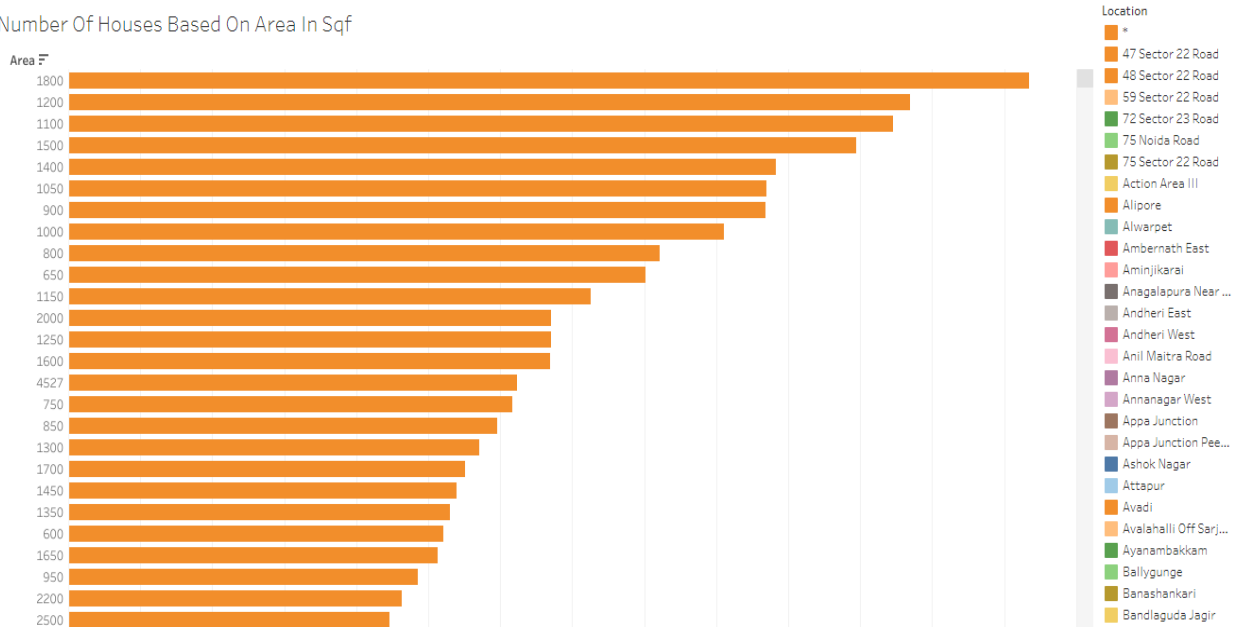
VISUALISATIONS OF SHEETS

1. Latitude and longitude based on locations



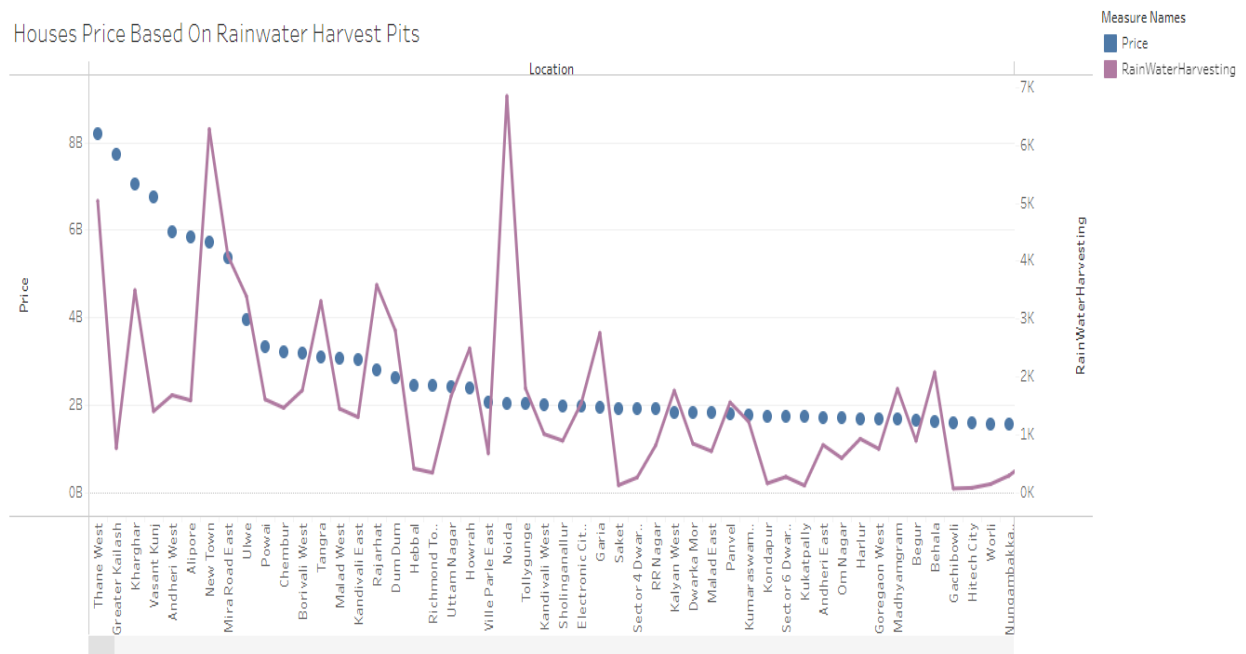
2. Number of houses based on area in sq. feet

Number Of Houses Based On Area In Sqf

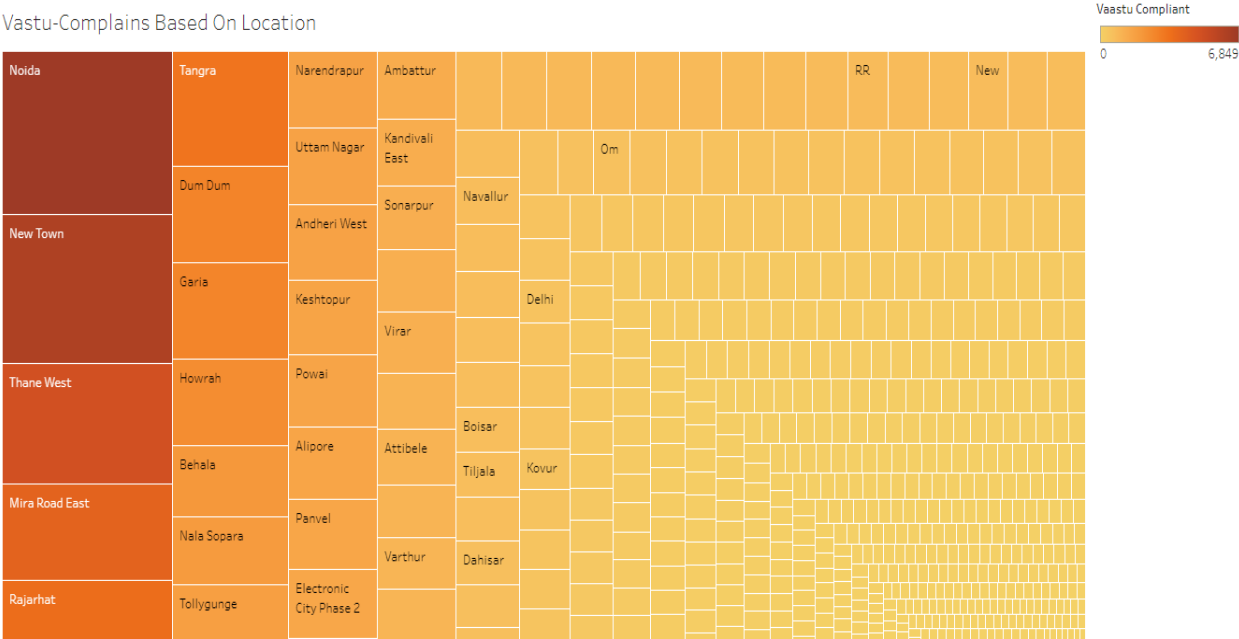


3. Houses price based on rainwater harvest pits

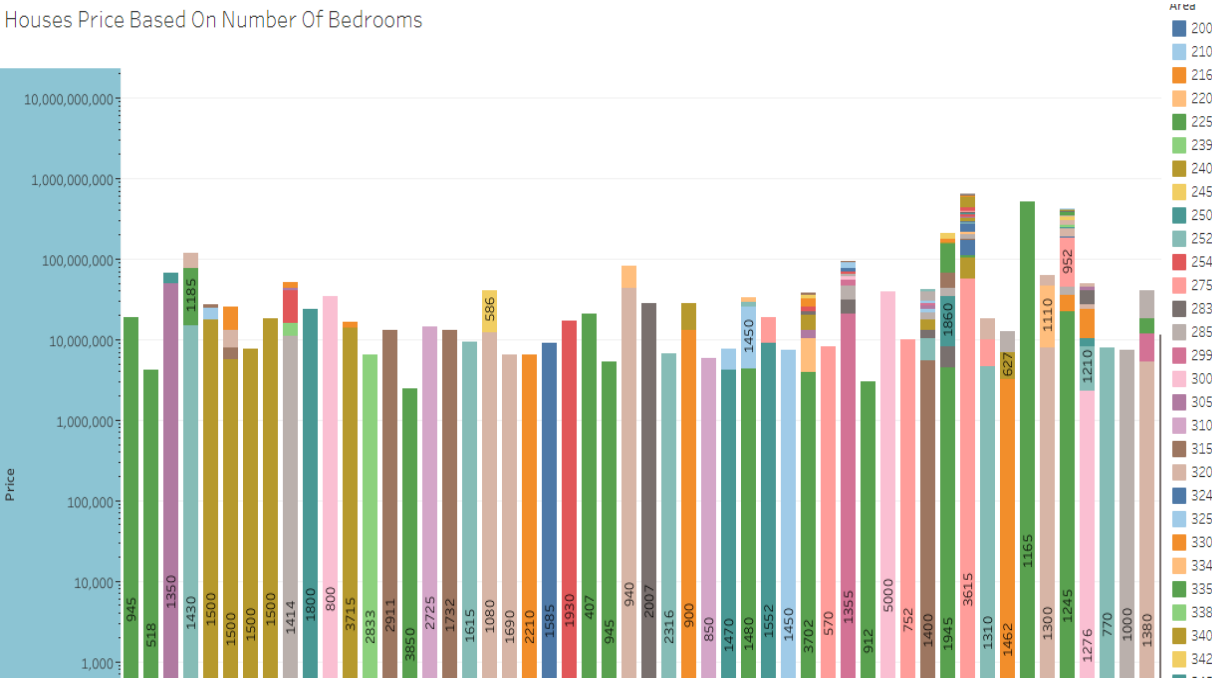
Houses Price Based On Rainwater Harvest Pits



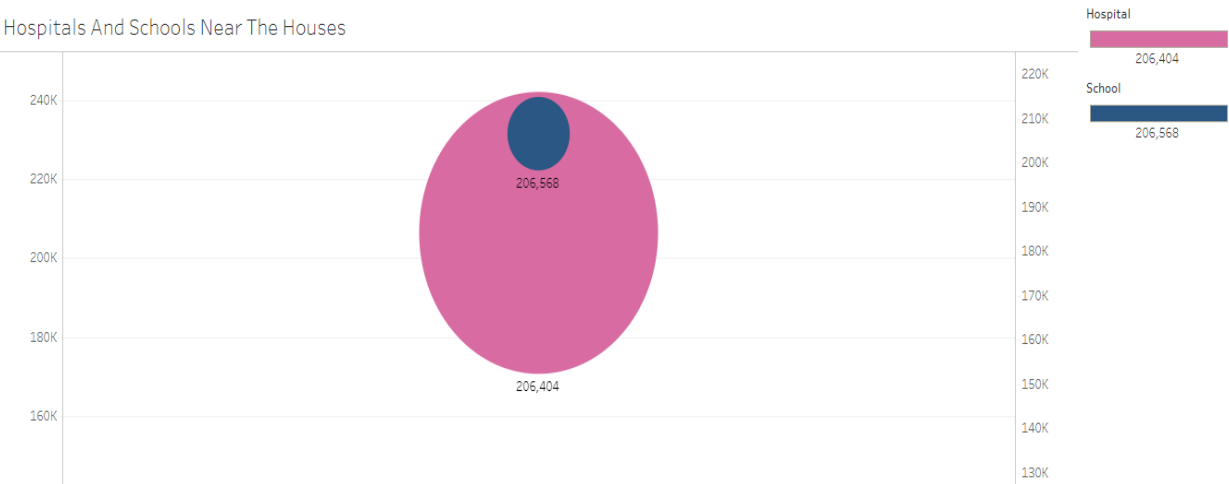
4. Vastu-Complaints based on location



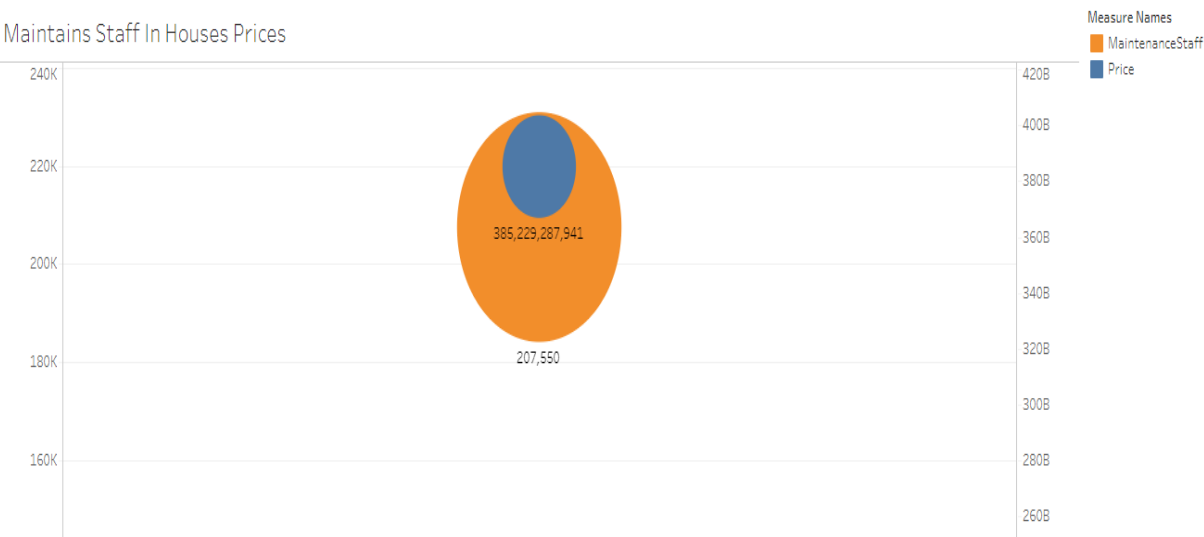
5. Houses price based on number of bedrooms



6. Hospitals and schools near the houses



7. Maintains staff in houses prices



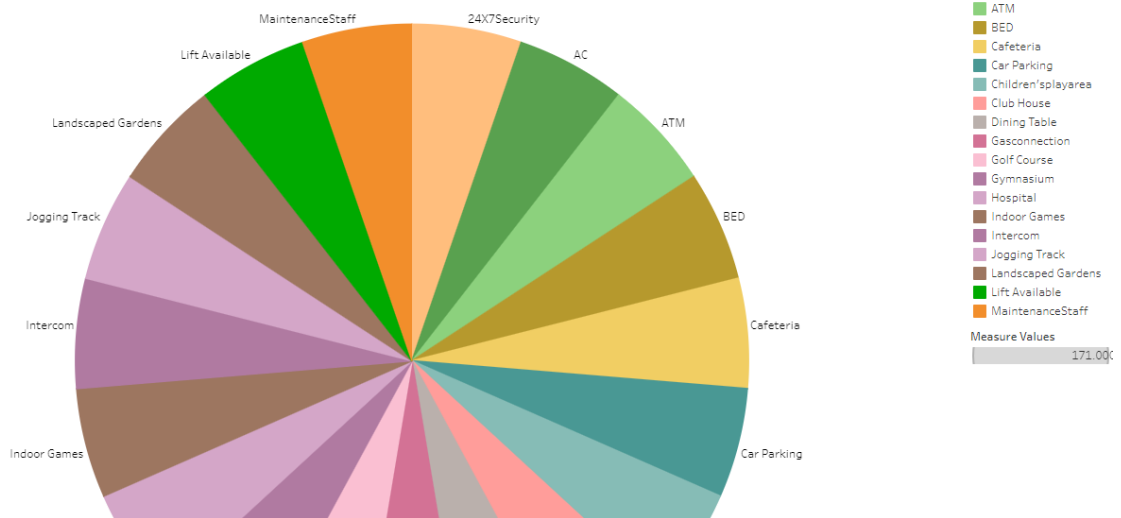
8. Houses prices and intercom

Houese Prices And Intercom



9. All services based on location

All Services Dased 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 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.

DASHBOARD 1

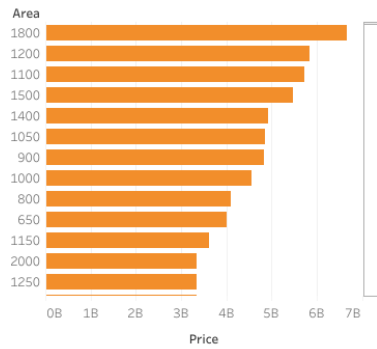
HOUSE PRICE PREDICTION IN INDIA

Latitude And Longitude Based On Location

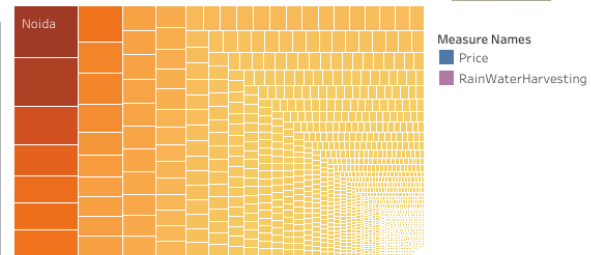


DASHBOARD 2

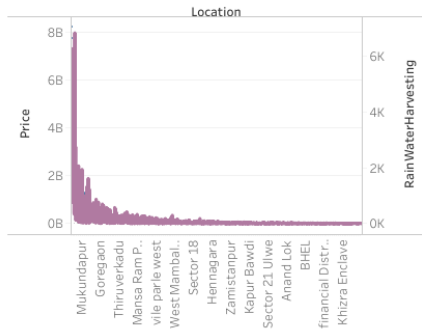
Number Of Houses Based On Area In Sqf



Vastu-Complains Based On Location

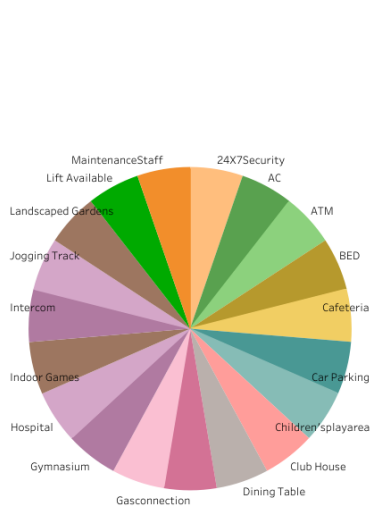


Houses Price Based On Rainwater Harvest Pits

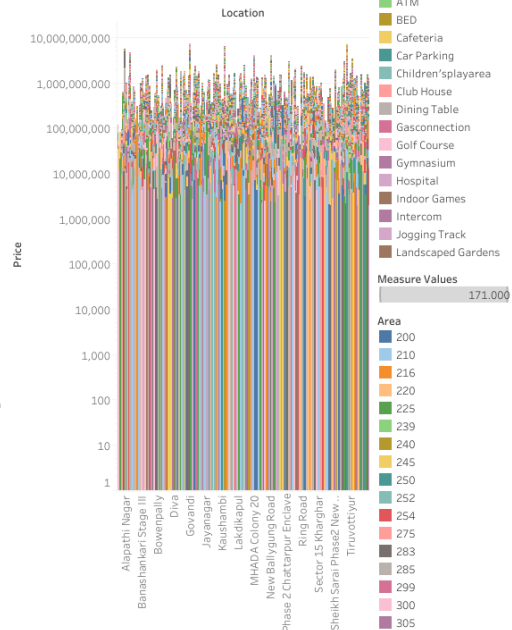


DASHBOARD 3

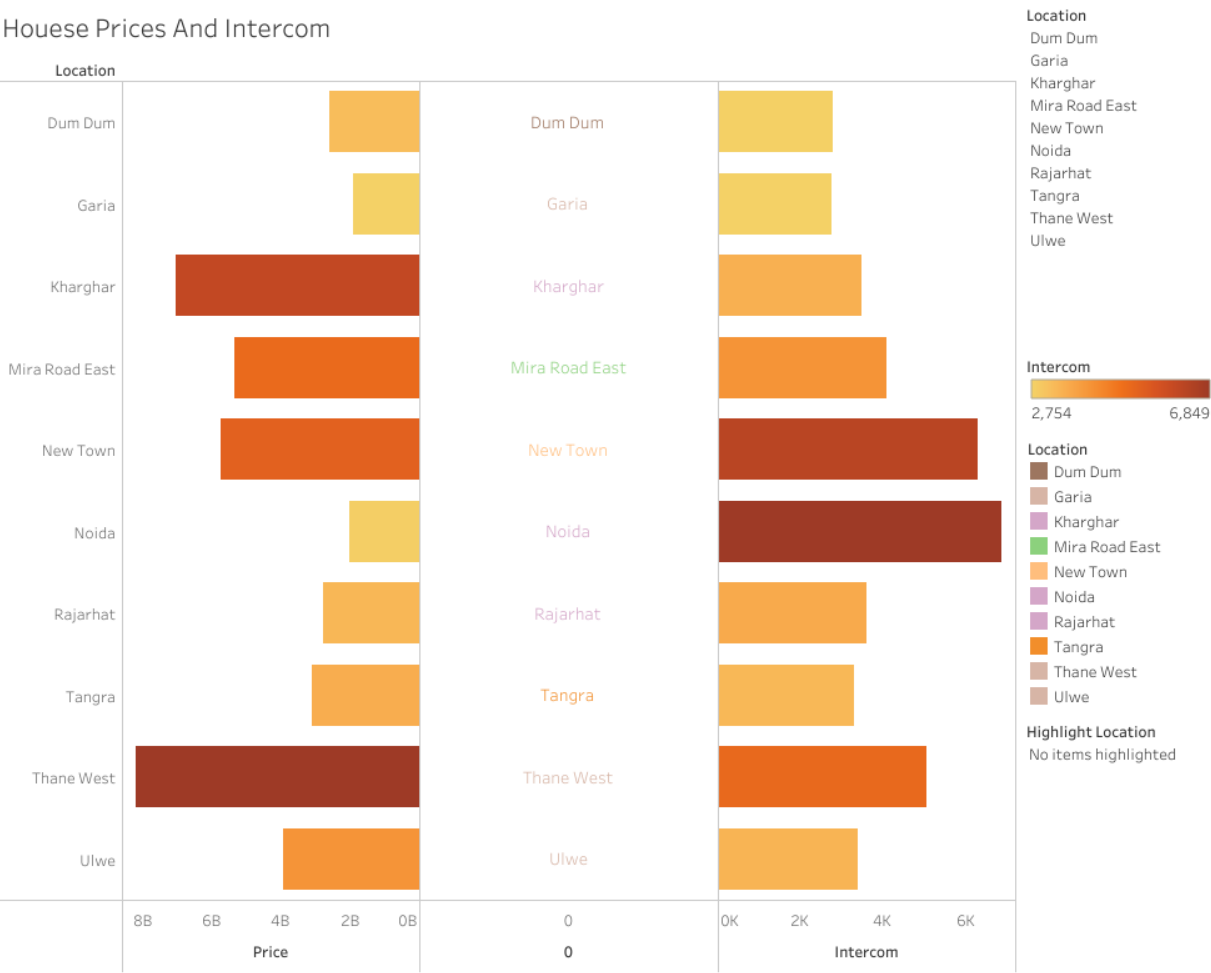
All Services Dased On Location



Houses Price Based On Number Of Bedrooms



DASHBOARD 4



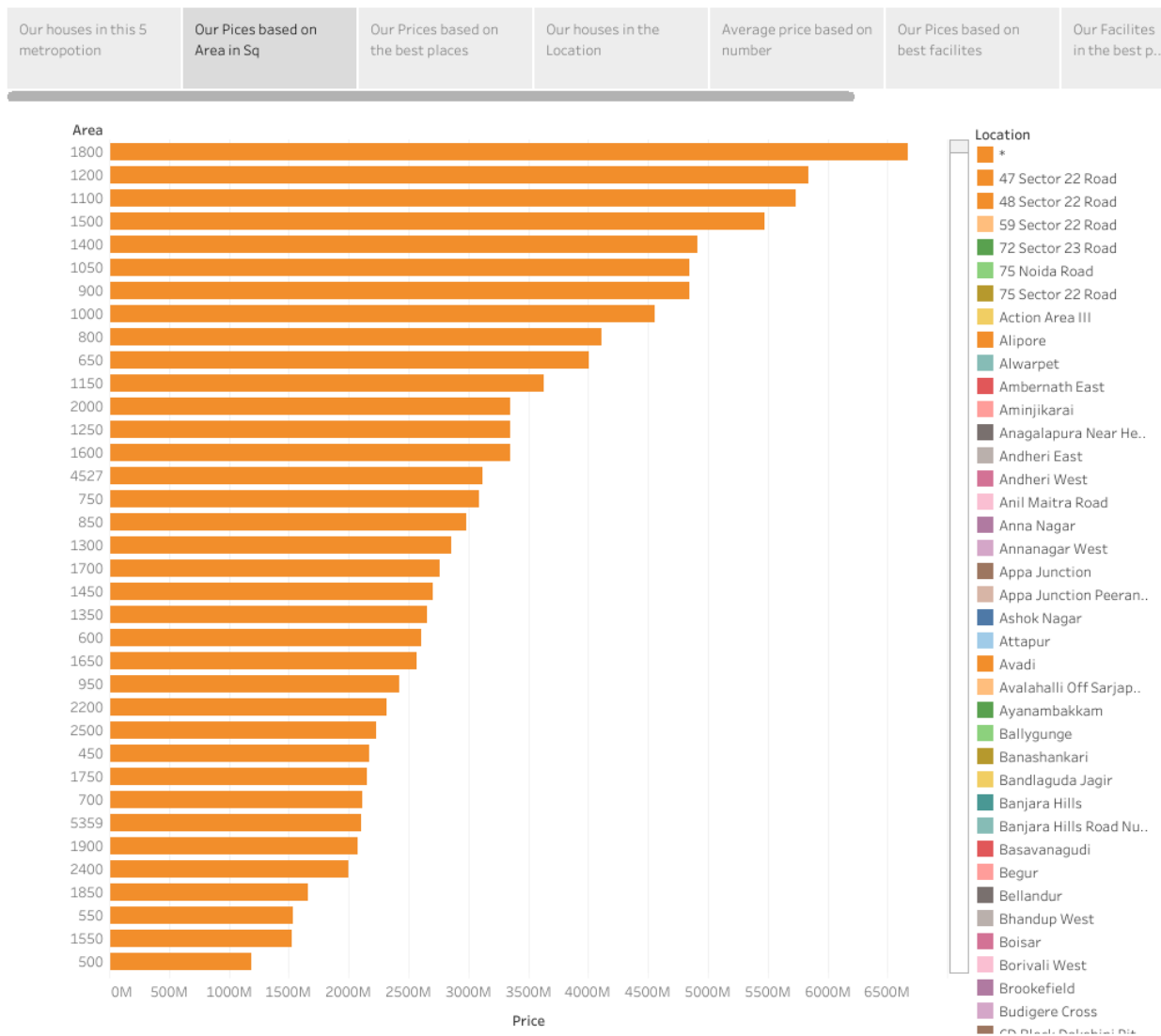
STORY

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.

NUMBER OF SCENES OF STORY

The number of scenes in a storyboard for a data visualization analysis vehicle collisions 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.

House Price Prediction

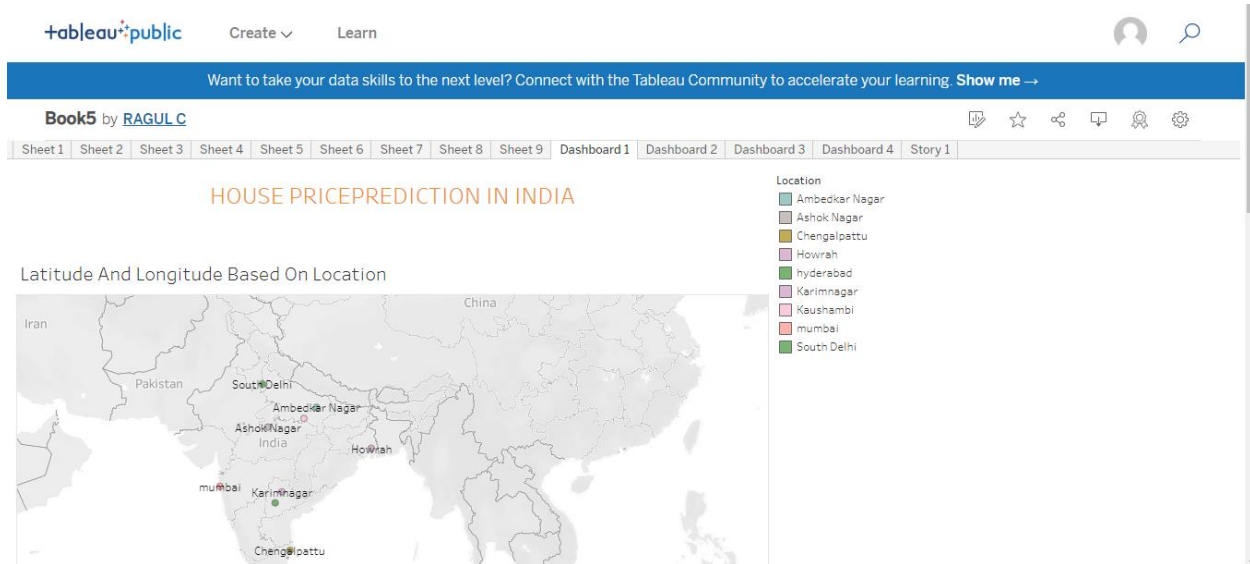


In the created storyline, we have a total of 9 scenes showcasing the details of created worksheets.

The story is uploaded to tableau public server.

PUBLISHING

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. The story and dashboard are published in the tableau public server. The link for visiting the site is hyperlinked here – [Link](#).



LINKS TO ACCESS PROJECT FILES :

1. [Github Repository](#).
2. [Brainstorming Map](#).
3. [Empathy Map](#).
4. [Dashboard](#) uploaded in github as pdf.
5. Tableau Public Server – [Link](#).
6. [Story](#) is uploaded in github.

ADVANTAGES

Analyzing housing prices in metropolitan areas of India through a data analytics project can provide numerous advantages. Here are some of the key benefits:

1. **Informed Decision-Making:** Data analytics allows for a comprehensive analysis of housing market data, helping potential buyers, sellers, investors, and policymakers make well-informed decisions about buying or selling properties.

2. **Price Prediction:** Data analytics can be used to build predictive models that forecast future housing prices, enabling stakeholders to anticipate market trends and plan their investments accordingly.

3. **Market Trends:** Analyzing historical data can reveal important market trends, including areas with rising or declining property values, helping investors and developers identify opportunities and challenges.

4. **Location Insights:** Data analytics can provide insights into which neighborhoods or areas are more attractive for potential buyers, considering factors like safety, amenities, transportation, and schools.

5. **Investment Opportunities:** Investors can use data analysis to identify high-potential locations for property investment, maximizing returns on their investments.

6. **Risk Management:** Housing market data analysis can help identify potential risks, such as overvalued properties or regions susceptible to market crashes, enabling stakeholders to take precautions.

7. **Housing Affordability:** Data analytics can assess housing affordability by analyzing factors like income levels, mortgage rates, and property prices. This is particularly helpful for policy makers addressing housing affordability issues.

8. **Targeted Marketing:** Real estate agents and developers can use data analytics to tailor their marketing efforts by understanding the preferences and needs of potential buyers.

9. **Improved Pricing Strategies:** Sellers can optimize their pricing strategies based on data-driven insights, helping to sell properties faster and at the best possible prices.

10. **Regulatory Compliance:** Property developers and policymakers can use data analytics to ensure that housing projects comply with local regulations, promoting sustainable and responsible development.

11. **Urban Planning:** City planners can use housing price data to inform urban development decisions, including infrastructure investments and zoning regulations.

12. **Market Transparency:** Data analytics enhances market transparency by providing accurate and up-to-date information to all stakeholders, reducing information asymmetry and promoting fair transactions.

13. **Economic Growth:** A healthy housing market is often indicative of a thriving economy. By understanding housing price dynamics, governments and economists can gauge the overall economic health of a region.

14. **Quality of Life:** Housing price analysis can indirectly reflect the quality of life in different areas, as it considers factors like schools, healthcare, public services, and crime rates.

15. **Research and Policy Development:** Housing price data analysis can support academic research and inform the development of housing-related policies that aim to address societal needs.

DISADVANTAGES

Analyzing housing prices in metropolitan areas of India using data analytics can provide valuable insights, but it also comes with several disadvantages:

1. **Data Quality and Availability :** One of the most significant challenges in housing price analytics is the quality and availability of data. In India, data collection and maintenance can be inconsistent and unreliable, making it challenging to obtain accurate and up-to-date information.
2. **Data Privacy Concerns :** Handling personal data and property details requires careful consideration of privacy laws and ethical concerns. Adhering to data protection regulations while conducting analysis can be complex and time-consuming.
3. **Data Bias:** Housing data often suffers from bias, as it may not fully represent the diverse socioeconomic and demographic backgrounds in metropolitan areas. Biased data can lead to inaccurate predictions and analysis.
4. **Complexity of the Real Estate Market:** The real estate market is influenced by numerous factors, including economic conditions, government policies, and local trends. These complexities can make it challenging to build accurate predictive models.
5. **Model Complexity:** Developing effective predictive models for housing prices is complex. Factors like seasonality, neighborhood dynamics, and property-specific attributes can make it difficult to create models that capture all relevant variables.
6. **Cost and Resource Intensiveness:** Data analytics projects, especially in the context of housing prices, can be resource-intensive. Collecting, cleaning, and processing data, as well as developing and maintaining models, can be costly and time-consuming.

7. **Market Volatility:** Housing markets can be highly volatile, and external events like economic downturns or policy changes can significantly impact prices. Predicting such market shifts can be challenging.

8. **Interpretation Challenges:** The results of data analytics projects may not always provide straightforward solutions. Interpretation of complex models and their implications for decision-making can be a hurdle.

9. **Lack of Domain Expertise:** Effective analysis of housing prices often requires domain knowledge in real estate and economics. A lack of expertise can result in suboptimal insights and recommendations.

10. **Ethical Considerations:** Housing price analysis can have far-reaching social and economic implications, including issues related to affordability and displacement. Ethical considerations need to be taken into account when conducting such analyses.

In conclusion, while data analytics can offer valuable insights into housing prices in Indian metropolitan areas, it is essential to be aware of these disadvantages and work diligently to mitigate them to ensure the accuracy and ethical integrity of the analysis.

APPLICATIONS

Analyzing housing prices in metropolitan areas of India using data analytics can be a valuable project with various applications. Here are some key applications and insights that such a project can provide:

1. **Price Prediction:** Develop a model to predict future housing prices based on historical data. This can be used by both buyers and sellers to make informed decisions.
2. **Market Trends:** Analyze the trends in housing prices over time to understand market dynamics. This can help investors identify the best times to buy or sell properties.
3. **Location Analysis:** Determine the impact of location on housing prices. Identify areas that have shown significant appreciation in property values and those that have remained stagnant.
4. **Demographic Analysis:** Explore how housing prices are influenced by the demographics of an area. For example, you can assess how proximity to schools, offices, or transportation hubs affects property values.
5. **Market Saturation:** Assess the level of saturation in the housing market in metropolitan areas. This can help developers and investors identify areas with high demand and areas where the market may be oversaturated.
6. **Risk Assessment:** Evaluate the potential risks associated with investing in different areas. This can include factors like economic stability, political climate, and environmental risks.
7. **Affordability Analysis:** Determine the affordability of housing for different income groups. This can help policymakers and housing authorities address issues of housing affordability.

8. **Real Estate Investment:** Provide insights to real estate developers and investors about the areas with the highest return on investment (ROI) potential.

9. **Policy Implications:** Assess the impact of government policies and regulations on housing prices. This can help policymakers make informed decisions about housing-related policies.

10. **Customer Segmentation:** Identify different segments of buyers based on their preferences and affordability. This information can be used by real estate agents and developers to target specific customer groups more effectively.

11. **Property Valuation:** Develop a model for property valuation that takes into account various factors such as location, amenities, square footage, and more.

12. **Economic Impact:** Analyze the economic impact of the real estate sector in metropolitan areas. This can include job creation, tax revenues, and contributions to the local economy.

CONCLUSION

In conclusion, our data analytics project on analyzing housing prices in metropolitan areas of India has yielded valuable insights. Through extensive data collection, cleansing, and analysis, we have identified key trends and factors influencing housing prices. It is evident that location, infrastructure development, and economic growth are significant drivers of property values in these urban centers. Furthermore, our predictive models have the potential to assist homebuyers, investors, and policy-makers in making informed decisions. As India's urbanization continues, understanding housing price dynamics is crucial for sustainable urban development. However, it is imperative to note that housing affordability remains a challenge in many metropolitan areas. Therefore, addressing this issue should be a priority for policymakers to ensure accessible housing options for all. Our project underscores the importance of data analytics in addressing complex real estate challenges and provides a foundation for further research and decision-making in the Indian housing market.

FUTURE SCOPES

The future scope of a data analytics project focused on analyzing housing prices in metropolitan areas of India is promising. As urbanization continues to grow in India, the demand for housing in major cities is increasing, making this analysis highly relevant. Data analytics can help in several ways:

1. **Market Insights:** Predictive modeling can provide insights into future housing price trends, helping both buyers and investors make informed decisions.
2. **Government Policy:** Analyzing data can assist policymakers in formulating effective housing policies and urban planning.
3. **Investment Opportunities:** Investors can leverage data to identify lucrative real estate investment opportunities.
4. **Affordable Housing:** Analytics can contribute to understanding how to make housing more affordable for a broader section of the population.
5. **Risk Mitigation:** Banks and financial institutions can use data analytics to assess the risk associated with housing loans.
6. **Sustainability:** Data can be used to promote sustainable urban development by identifying areas with potential for growth without overburdening resources.

In conclusion, a data analytics project in this domain offers valuable insights and can influence various sectors, from real estate to urban planning and policy development, in India's ever-evolving metropolitan areas.