



# ANALYSING HOUSING PRICES IN METROPOLITAN

---

**Project report**

**UNDER THE GUIDENCE OF**

---

**DR.V.Meena**

**Assistant Professor**

**Department of Mathematics**

**Government Arts & Science College,**

**Thirumangalam, Madurai-625702**



---

Submitted by

Team ID: NM2023TMID09018

- |                   |   |
|-------------------|---|
| 1. P. SUGANYA     | 236BEB5DDD661D4A3294E99A97D58424<br>(Team Leader) |
| 2. M. SANTHIYA    | EB65E432C5F64A19BDA421C5B6C92613                  |
| 3. G. MANORANJITH | 3F68BD8CF5ED0329D3F43A406A078C9A                  |
| 4. S. SIVA SAKTHI | 474C8E3B8B32BB5B210435F4A33843B3                  |

---

## **1 INTRODUCTION**

### **1.1 Overview**

A brief description about your project

### **1.2 Purpose**

The use of this project. What can be achieved using this.

## **2 Problem Definition & Design Thinking**

### **2.1 Empathy Map**

Paste the empathy map screenshot

### **2.2 Ideation & Brainstorming Map**

Paste the Ideation & brainstorming map screenshot

## **3 RESULT**

Final findings (Output) of the project along with screenshots.

## **4 ADVANTAGES & DISADVANTAGES**

List of advantages and disadvantages of the proposed solution

## **5 APPLICATIONS**

The areas where this solution can be applied

## **6 CONCLUSION**

Conclusion summarizing the entire work and findings.

## **7 FUTURE SCOPE**

Enhancements that can be made in the future.

## **8 APPENDIX**

### **A. Source Code**

Attach the code for the solution built.

---

# 1.Introduction

In India, the Census Commission defines a metropolitan city as urban agglomeration having a population of over four million. Delhi, Mumbai, Kolkata, Chennai, Hyderabad, Bangalore, Ahmedabad, Pune, Surat and Nashik are those Indian cities that have over 4 million people.

Mumbai, Pune, Delhi, Ahmedabad, Surat, Chennai, Kolkata, Bangalore, and Hyderabad are the nine metropolitan cities of India with a population of more than four million. According to the Indian Census Commission, cities in India with a population of more than four million are considered Metropolitan Cities of India.

## 1.1.Overview

- ❖ Real estate market size in India
- ❖ Housing price indicator value in major developed and emerging cities in India
- ❖ Annual change in real house prices in selected metropolitan cities in India
- ❖ Cumulative numbers of demand supply for housing in major cities of India
- ❖ Market size of housing prices in india
- ❖ It contains
  - i. Property prices,
  - ii. Launches and sales,
  - iii. Facilities of housing,
  - iv. Consmers outlook,
  - v. Locations of the Houses,
  - vi. Rooms and maintenance of the rooms,
  - vii. Staff charges,
  - viii. Provided serices,
  - ix. Further all statistics about the housing

---

## A Brief description about the project

### Metropolitan cities in India

India is home to several metropolitan cities, typically referred to as Tier-1 cities. These are classified based on several factors, including population size, infrastructure, and economic output. The following cities are considered as metropolitan cities in India.

These cities provide ample of job opportunities and have high standard of living, thereby making them an ideal city for homebuyers. This guide provides comprehensive information about such cities, helping you make an informed decision about where to purchase your dream home.

#### Mumbai

Popularly known as the 'City of Dreams', Mumbai offers a wide range of housing options, ranging from premium apartments to affordable houses. Try to understand the real estate market, neighbourhood profile, connectivity, and quality of life before making any investment here.

#### Delhi

The capital of India, Delhi provides both luxury and cost-effective housing solutions. Explore the best localities, infrastructure, and lifestyle before buying a house in Delhi.

#### Bangalore

Known as India's IT hub, Bangalore is an excellent choice for tech professionals looking to buy a house. Try to find out about the city's IT corridors, upcoming residential projects, and the pros and cons of living in Bangalore.

#### Hyderabad

Home to various IT and ITES companies, Hyderabad provides high-standard living with a touch of traditional charm. Discover the city's property market trends, promising locations, and the cost of living before making any investment move.

#### Kolkatta

A combination of both modern living and rich culture, Kolkata offers various housing options for homebuyers. Learn about its real estate market, cultural heritage, and the best places to live in Kolkata.

Chennai

---

Known for its booming automobile industry, Chennai is a good choice for automotive professionals. Delve into the city's housing market, family-friendly neighbourhoods, and the benefits of living in Chennai before making any investment.

1. ? **What facilities are available in these metropolitan cities**

These metropolitan cities are equipped with advanced healthcare and educational facilities, excellent public transportation, large shopping malls, entertainment options, and plenty of job opportunities.

**2. Are there any international airports in these metropolitan cities?**

Yes, all six metropolitan cities in India have international airports.

## **1.2.Purpose**

A real estate market analysis is a tool that helps us to gather information to know, for example, if we should invest in a property or to determine the rental potential of a city or district. It is the state of the economy, interest rates, actual revenues and shifts in the population, which influences the housing markets. Appropriate prices are determined by the offer available as well as these demand-side factors.

A residential market analysis is the process of determining the value of a home based on what other homes have sold for and what a buyer will be willing to pay. To determine the market value, you look at the home, its features, and how it compares to other homes that have recently sold.

## **The Use of this project and To be achieved using this**

Prediction house prices are expected to help people who plan to buy a house so they can know the price range in the future, then they can plan their finance well. In

---

addition, house price predictions are also beneficial for property investors to know the trend of housing prices in a certain location.

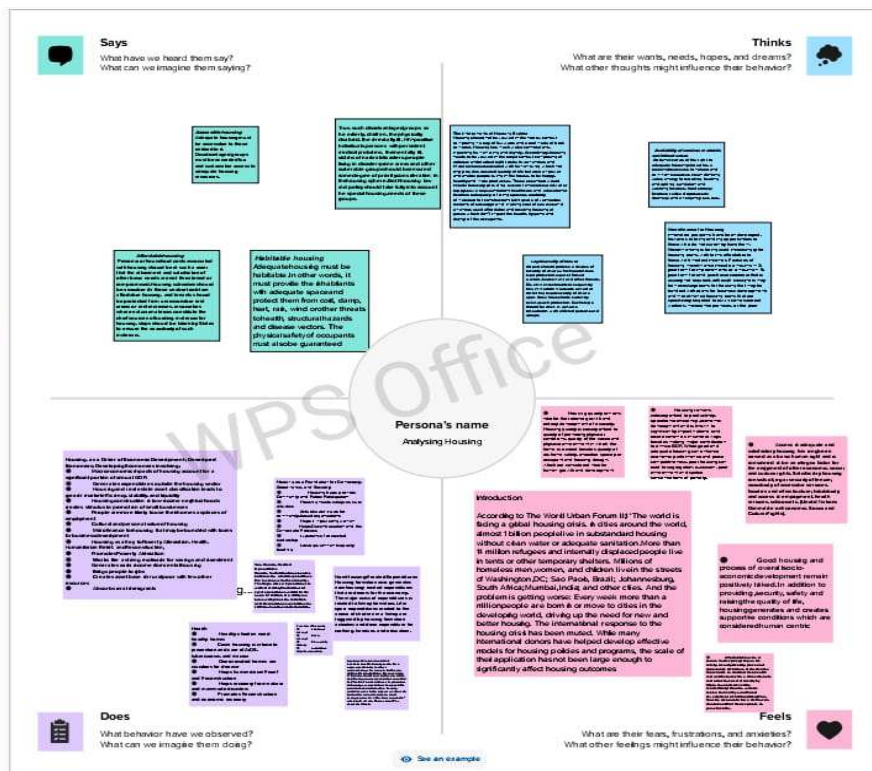
House price prediction in a metropolitan city in India is a valuable solution for potential home buyers, real estate agents, and investors. By leveraging historical sales data, property details, and location-specific information, a predictive model can accurately estimate house prices.

Affordable housing is known for its capacity to provide safety, security, identity, space and opportunity to children in low-income households to, maintain their health and well-being; achieve financial goals and reducing costs to society by improving and succeeding academically.

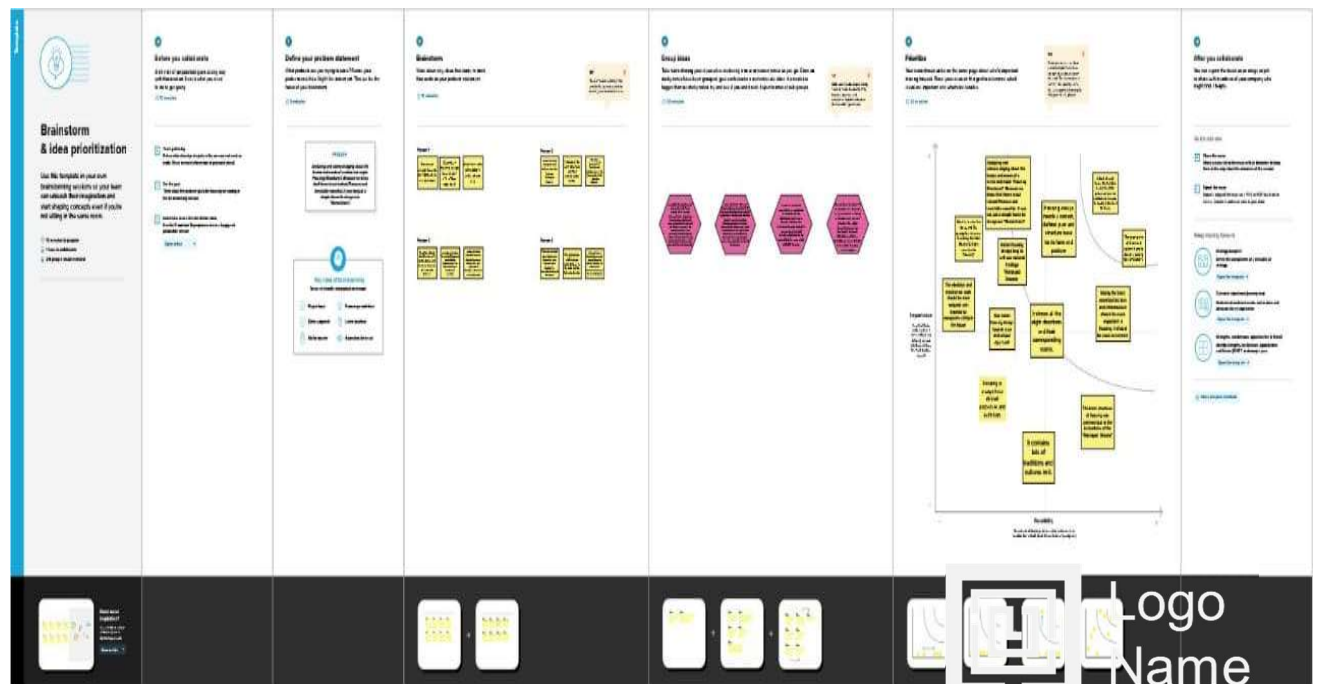
## 2.Problem Defining and Design Thinking

When you learn how to master the definition of your problem, problem statement, or design challenge, it will greatly improve your Design Thinking process and result. Why? A great definition of your problem statement will guide you and your team's work and kick start the ideation process in the right direction. It will bring about clarity and focus to the design space. On the contrary, if you don't pay enough attention to defining your problem, you will work like a person stumbling in the dark.

## Empathy Map



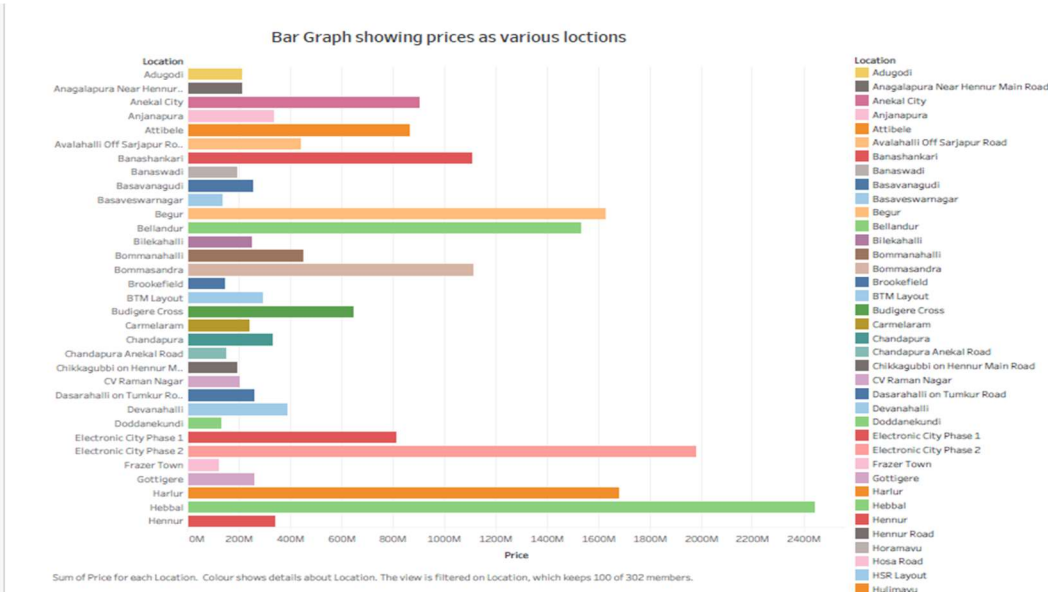
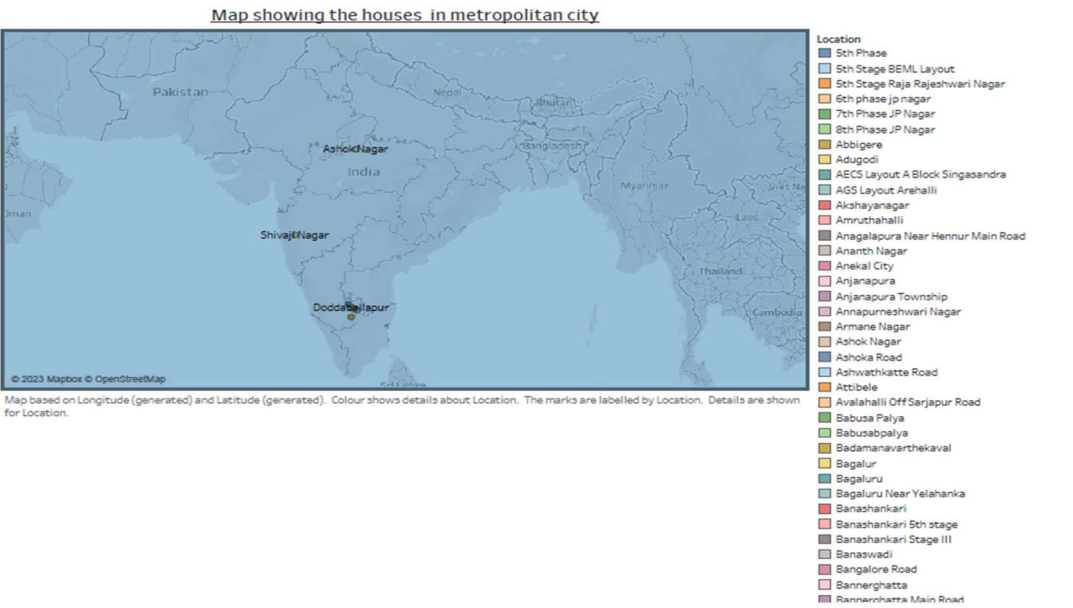
## 2.1 Ideation and Brainstorming Map



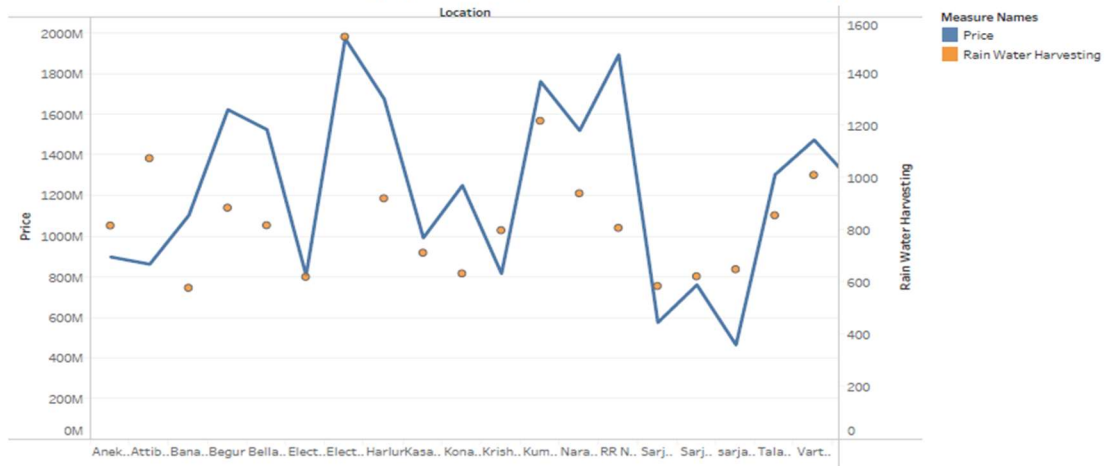


### 3. Result

#### Final findings of the project

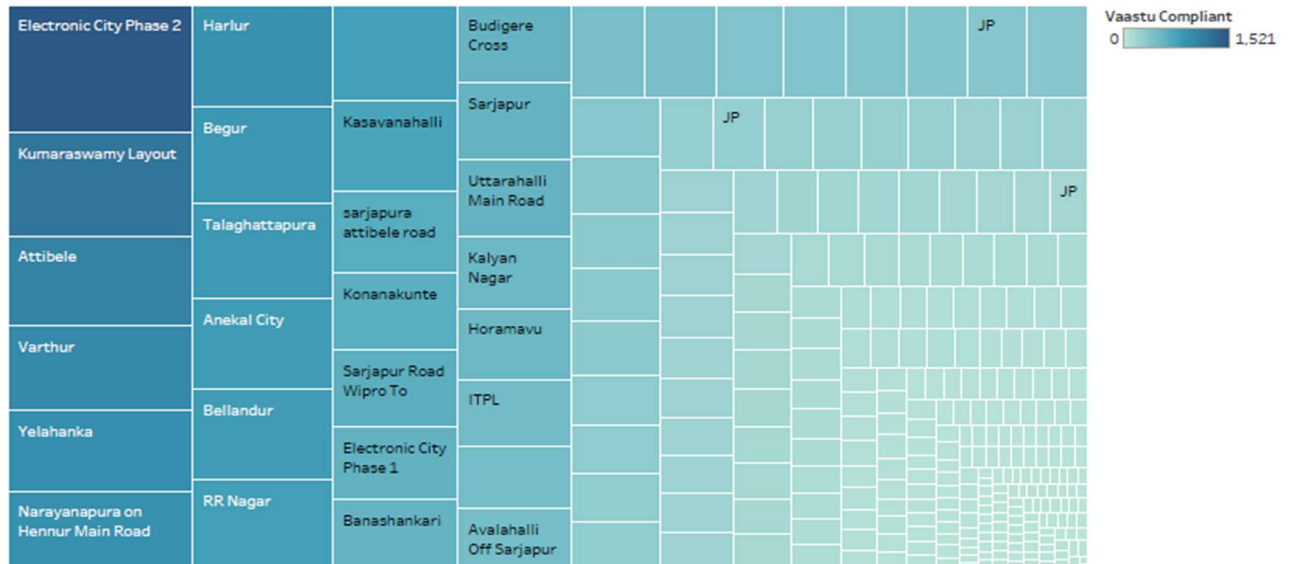


Combined line and location graph showing price and rain water harvesting



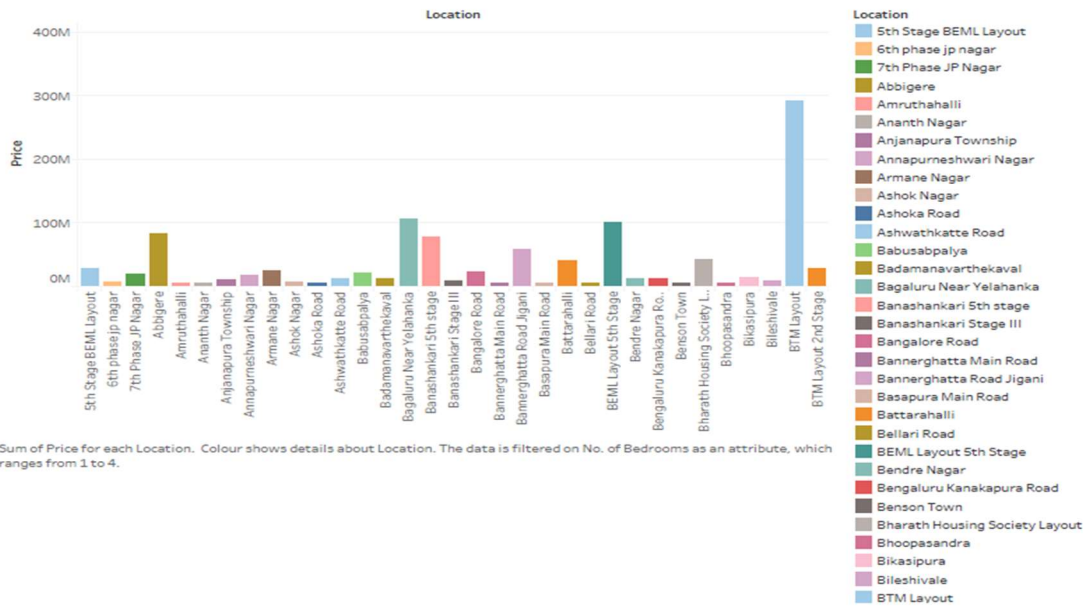
The trends of Price and Rain Water Harvesting for Location. Colour shows details about Price and Rain Water Harvesting. The view is filtered on Location, which keeps 20 of 302 members.

Tree Maps showing Vastu complaints

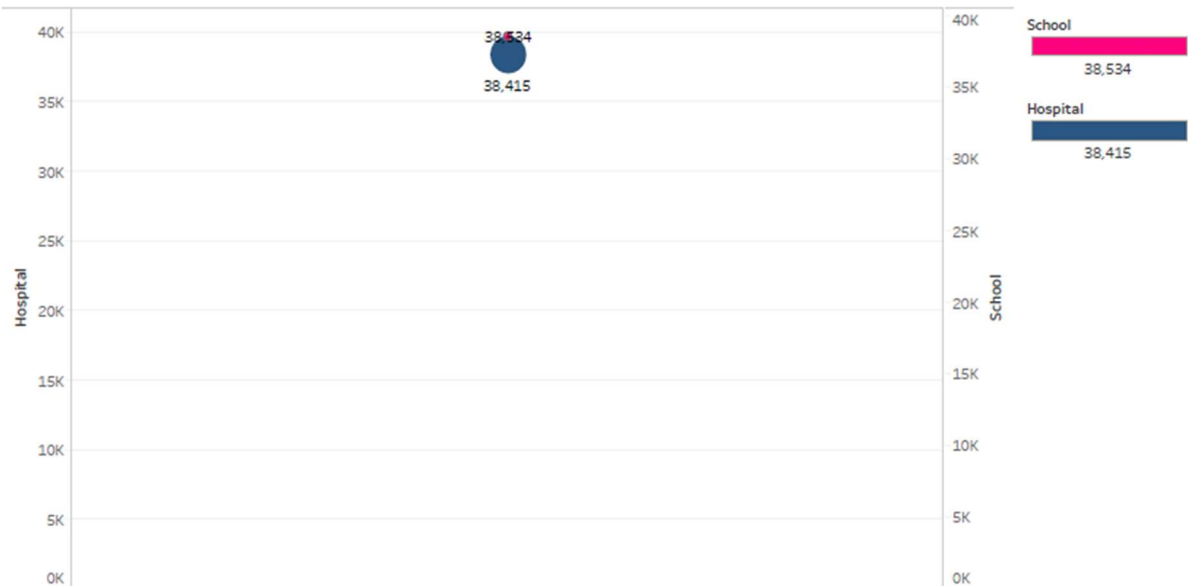


Location. Colour shows sum of Vastu Compliant. Size shows sum of Vastu Compliant. The marks are labelled by Location.

Bar graph showing no of bedrooms as per their prices

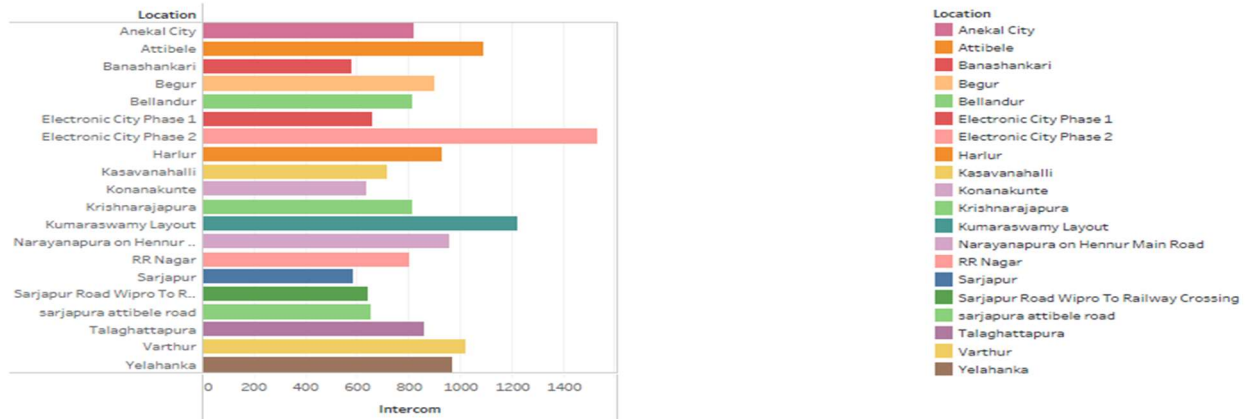


Pie chart showing hospitals and schools facilities



Sum of Hospital and sum of School. For pane Sum of Hospital: Colour shows sum of Hospital. The marks are labelled by sum of Hospital. For pane Sum of School: Colour shows sum of School. The marks are labelled by sum of School.

Bar Graph showing price vs intercom facilities with expected locations



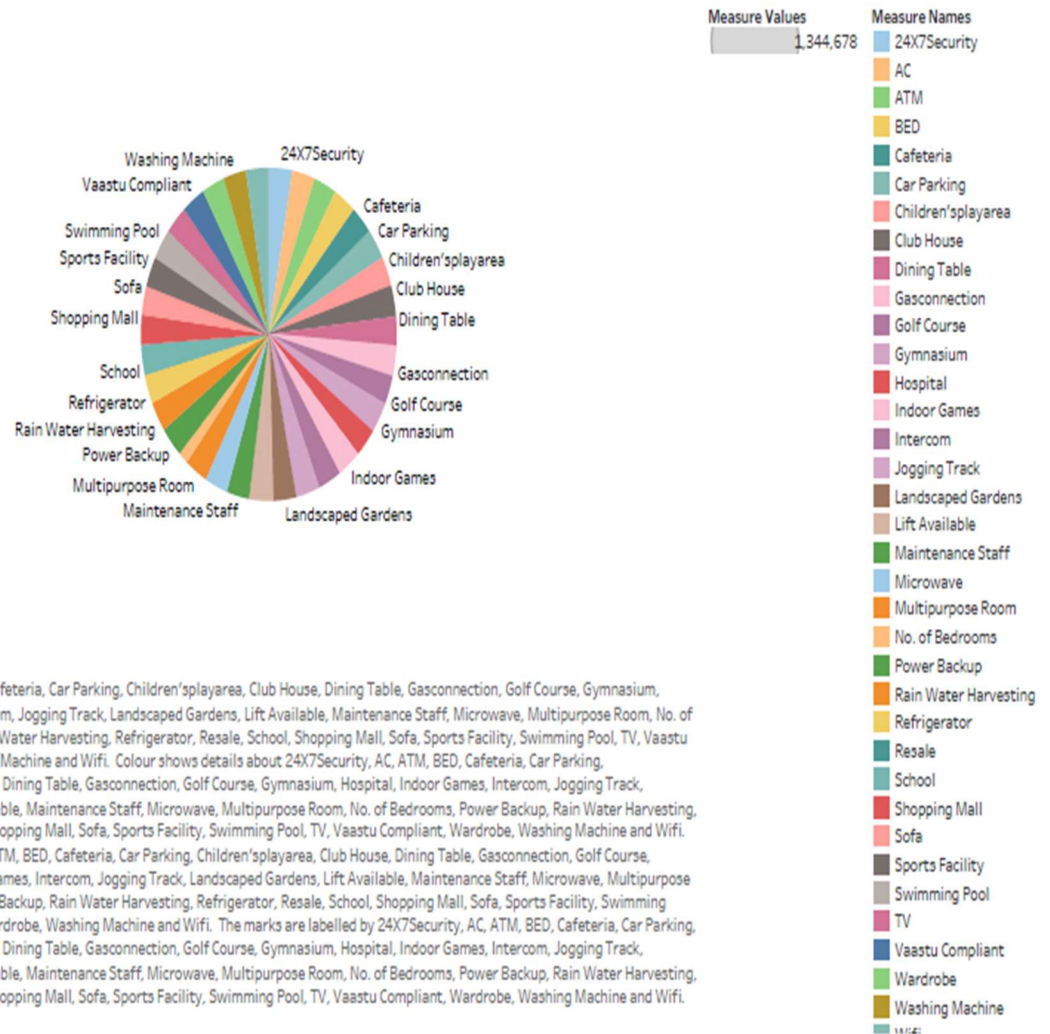
Sum of Price and sum of Intercom for each Location. Colour shows details about Location. The view is filtered on Location, which keeps 20 of 302 members.

Bar Graph showing price vs intercom facilities with expected locations

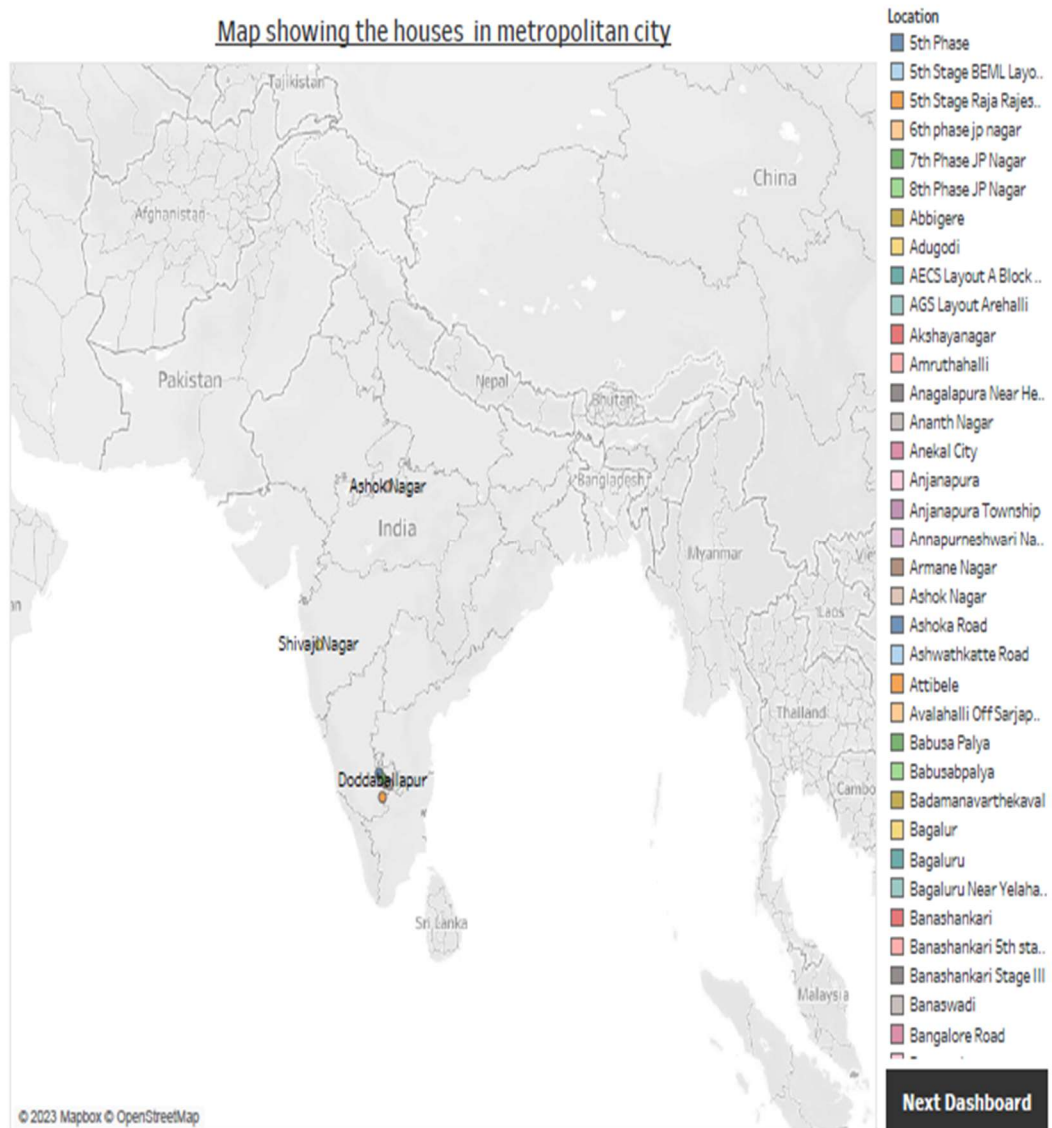


Sum of Price and sum of Intercom for each Location. Colour shows details about Location. The view is filtered on Location, which keeps 20 of 302 members.

Pie Chart showing various facilities



Map showing the houses in metropolitan city





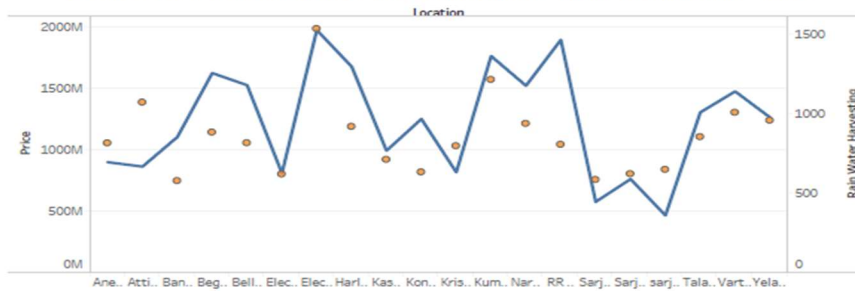
Bar Graph showing prices as various loctions



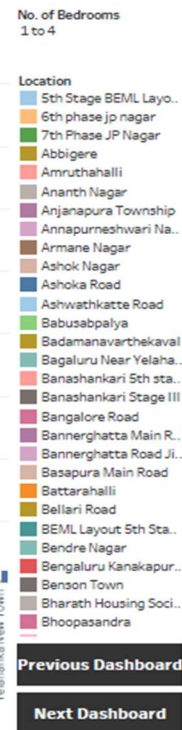
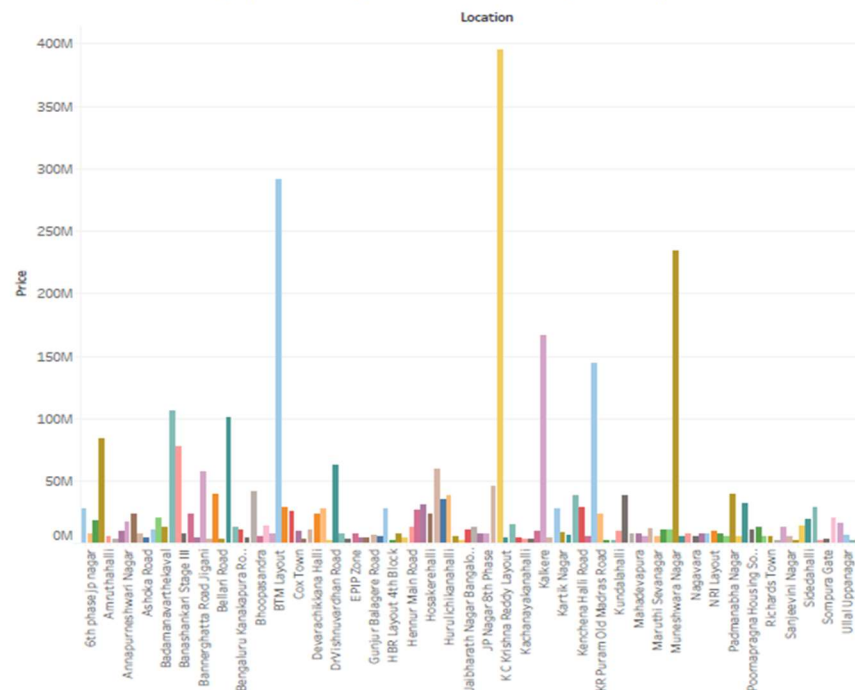
Tree Maps showing Vastu complaints



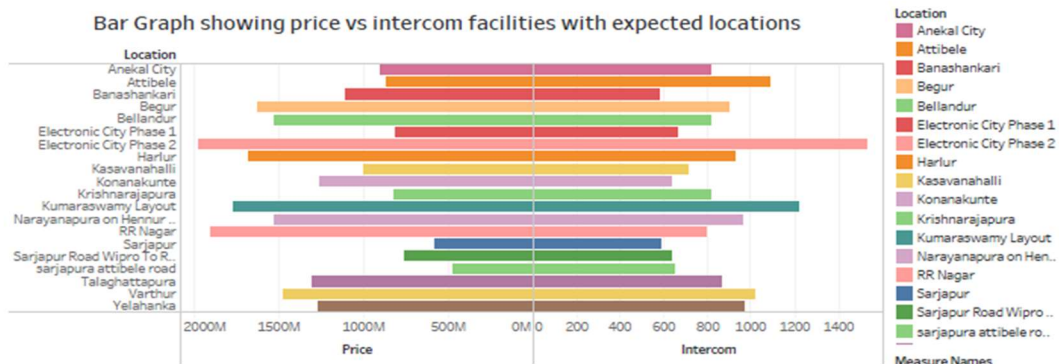
Combined line and location graph showing price and rain water harvesting



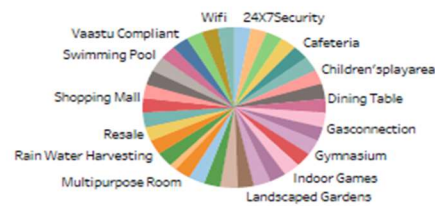
Bar graph showing no of bedrooms as per their prices



Bar Graph showing price vs intercom facilities with expected locations

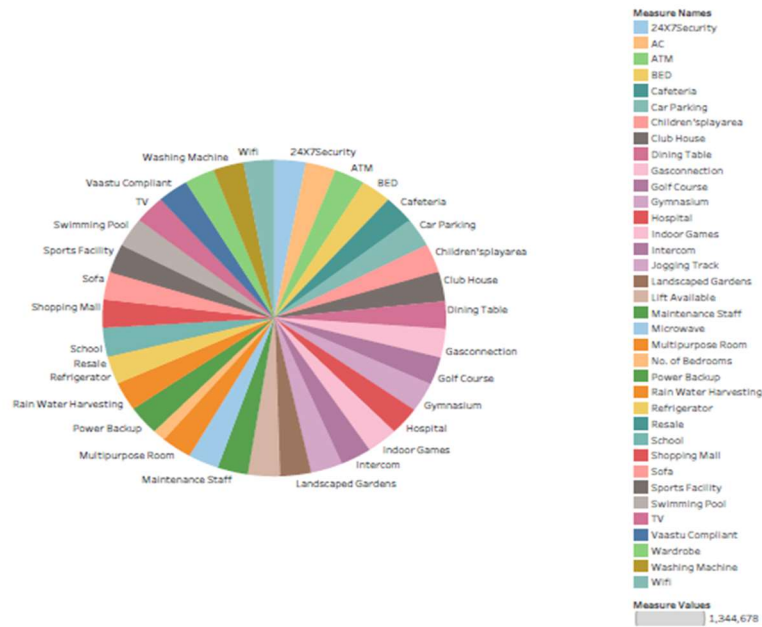


Pie Chart showing various facilities



## Story 1

Map showing the houses in metropolita... Bar Graph showing prices as various loctions Combined line and location graph showing price and rail... Tree Maps showing Vastu complaints Bar graph showing no of bedrooms as per their prices Bar Graph showing price vs intercom facilities with expect... Bar Graph showing price vs intercom facilities with expect...





---

## 4. Advantages and Disadvantages

- Estimating Property Value

Agents and brokers take numerous factors like target audience, location and type of neighbourhood into consideration when defining the selling price of an asset.

- Calculating Property Rentals

Tenants need a well-assessed estimate of the rentals that they'll have to pay for a particular property. On the contrary, investors would want to understand the profitability of investing in an income-generating asset in a particular demographic location.

- Predicting Price Appreciation

Whether it is for a client who intends to purchase a property or for a future investor, offering real-time insights on asset performance is essential for every real estate transaction.

- Improving Home Search Experience

With internet penetration reaching Tier-2 and Tier-3 cities, home buyers now search for properties online before reaching out to the real estate agents.

- Targeted Advertising & Marketing

Although customers visit your website by clicking on say Google or Facebook Ads, there is no guarantee of converting each visit into a sale.

## Disadvantages

Although new technologies like real estate tokenization have a myriad of advantages, they also come with their own set of risks and privacy concerns.

- Lack of Awareness

As much as technology in real estate is revolutionizing the sector, many agents and companies are reluctant to adopt these systems.

---

- **Complex Models**

Real estate is a very vast domain. In order to cover a wide region and to generate accurate and valuable insights, a number of input variables are added in predictive analysis models.

- **Data Risks**

When it comes to the risks associated with predictive analytics in real estate, it can be segregated into authenticity and privacy. Huge datasets will be sourced and evaluated from multiple sources

## **5.Applications**

Commercial investments are capital intensive. Hence, an in-depth market research and financial valuation has to be conducted. The highly-advanced algorithms of predictive analytics tools takes into consideration a plethora of factors, identifies the loopholes and generates valuable insights. Here's how predictive analytics in real estate is aiding in the development of the commercial sector.

- Occupancy rates,
- Number of educational institutes in vicinity,
- Proximity to commercial and business hubs,
- Food stores, retail outlets and shopping complexes,
- Infrastructural development and crime statistics, etc.

## **6.Conclusion**

This paper examined and analyzed the current research on the significant attributes of house prices and analyzed

thedata mining techniques used to predict house prices. The accurate prediction model would allow investors or

---

house buyers to determine the realistic price of a house as well as the house developers to decide the affordable

house price. This paper discusses an overview of the concept of machine learning and its various applications.

Taking the sample dataset for houses, and considering its various attributes, the prices for houses have been

predicted by employing machine learning methods of regression for predicting the price of the estate using prior

data.

## 7.Future scope

Just like other emerging technologies, predictive analytics in real estate is here to stay. The tools will generate relevant predictions based on customer priorities.

However, how you can better the process of driving profits by leveraging the predictive analytics models depends on your digital strategy and the sources from where you intend to club the data from.

## 8.Appendix

Regression algorithms, on the other hand, predict the continuous value i.e. the expected price of a house; the number of votes that a party is likely to get in general elections, the number of marks a student is expected to score etc.

