

# Final Project Report

**Title:** Visualizing Housing Market Trends: An Analysis of Sale Prices and Features using Tableau

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## 1. INTRODUCTION

### *1.1 Project Overview*

This project utilizes Tableau to analyze and visualize housing market data. The focus is on identifying patterns in sale prices based on features such as renovation year, house condition, and basement area. Through interactive dashboards, the project aims to provide real estate stakeholders with tools for informed decision-making.

### *1.2 Purpose*

The purpose of this project is to transform raw housing data into meaningful insights using Tableau's visual analytics. It aims to simplify complex datasets, support comparative analysis, and uncover hidden patterns that influence housing prices.

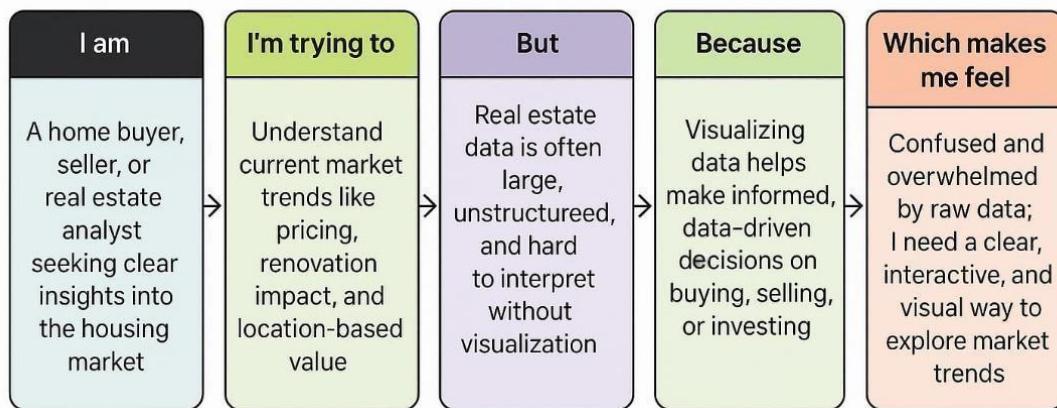
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## 2. IDEATION PHASE

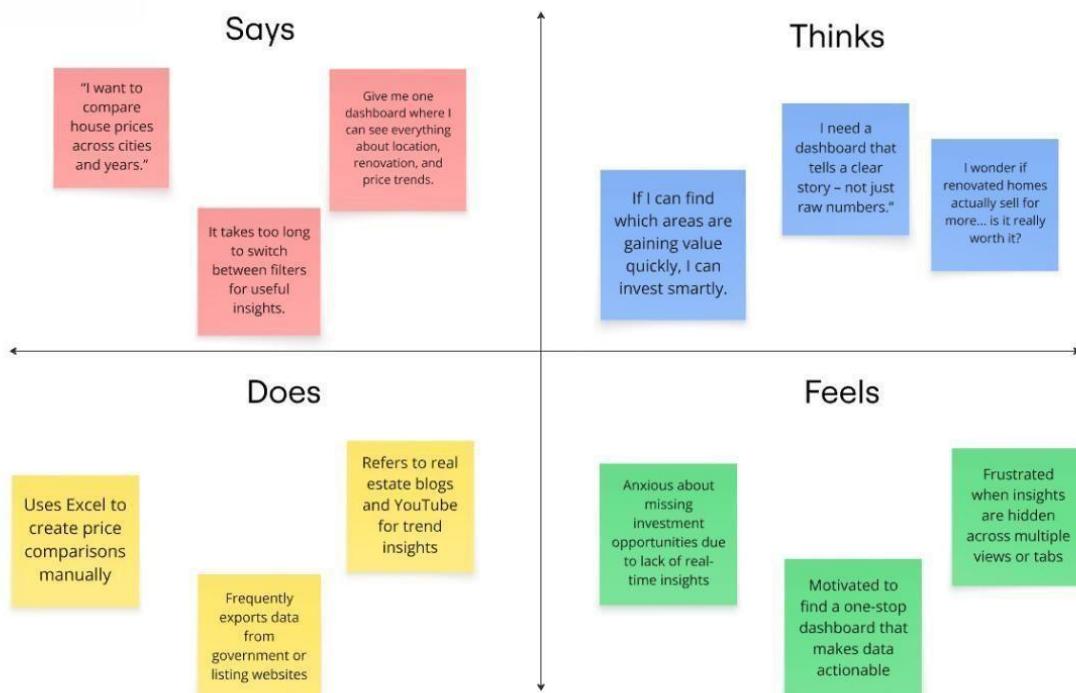
### *2.1 Problem Statement*

The real estate market involves multiple factors influencing house prices, making it difficult for buyers, sellers, and investors to draw conclusions from raw data. This project addresses this challenge by offering visual insights into these influencing factors.

## Customer Problem Statement Template



### 2.2 Empathy Map Canvas



### 2.3 Brainstorming

Key ideas and features discussed before implementation:

- Creating custom price bins (250K, 300K, ..., 600K)
  - Comparing price variation before and after renovations
  - Evaluating the impact of house condition and basement area
  - Calculating the age of houses based on the built year
  - Creating a unified story by combining key dashboards in Tableau
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### 3. REQUIREMENT ANALYSIS

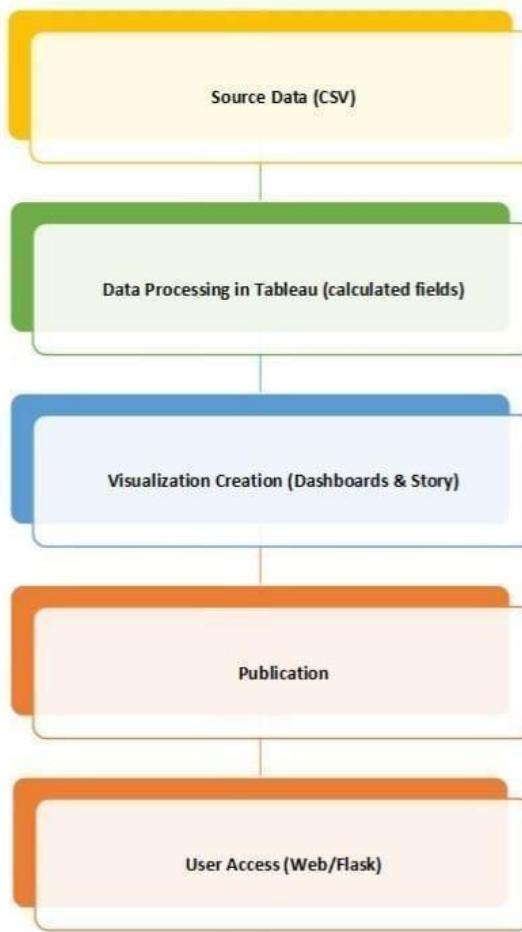
#### 3.1 Customer Journey Map

Users begin by exploring price trends, use filters (like condition, area, renovation year), analyze charts for insights, and finally make informed decisions about property investments.

#### 3.2 Solution Requirement

- Transformed dataset (CSV format from Kaggle)
- Tableau Desktop and Tableau Public for visualizations
- Optional: Python + Flask for embedding the dashboard into a web interface

#### 3.3 Data Flow Diagram



### 3.4 Technology Stack

- **Visualization Tool:** Tableau
- **Dataset:** Kaggle - Transformed Housing Data
- **Backend :** Python, Flask

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## 4. PROJECT DESIGN

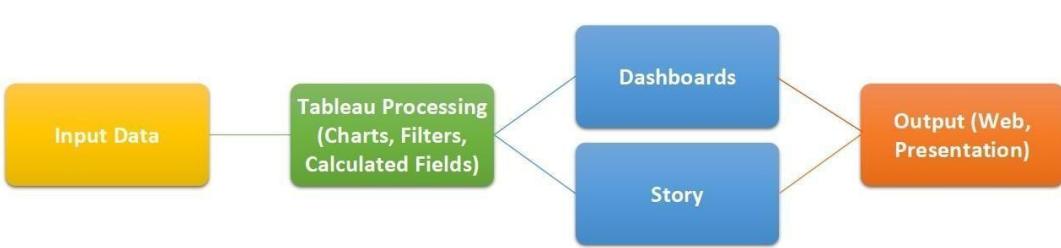
### 4.1 Problem-Solution Fit

The project simplifies raw data into visual formats, highlighting the relationship between property features and prices, thus offering an intuitive method to study the housing market.

## 4.2 Proposed Solution

- Create calculated fields (e.g., house age, sales price bins)
- Build multiple dashboards analyzing different variables
- Create a Tableau Story combining visual narratives
- Optionally integrate with a Flask-based user interface [4.3](#)

### Solution Architecture



## 5. PROJECT PLANNING & SCHEDULING

### 5.1 Project Planning

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection	USN-1	As a user, I can collect housing data and load the data into Tableau.	1	High	ALL

Sprint-2	Data Preprocessing	USN-3	As a user, I can handle missing values in the dataset.	3	Medium	ALL
Sprint-1	Data Preprocessing	USN-4	As a user, I can encode and clean categorical data.	2	Medium	ALL
Sprint-3	Making Graphs/Visualizations	USN-5	As a user, I can build models based on processed data.	5	High	ALL
Sprint-4	Dashboard & Story	USN-6	As a user, I can design HTML interface for dashboard and story view.	6	High	ALL
Sprint-5	Report & Documentation	USN-7	Step by step guide documentation	7	Medium	ALL

## 6. FUNCTIONAL AND PERFORMANCE TESTING

### 6.1 Performance Testing

S.No.	Parameter	Screenshot / Values
1	Data Rendered	Rendered from cleaned CSV containing ~21,000 housing records including Sale Price, Bedrooms, Bathrooms, Lot Area, Year Built, etc.

2	Data Preprocessing	Handled missing/null values, ensured correct data types (date, numeric), created calculated fields such as House Age.
3	Utilization of Filters	Applied filters in Tableau for Bedroom Count, House Condition, Renovation Year, House Age, and Price Range. Dashboard responsiveness under 2–3 seconds.
4	Calculation fields Used	- House Age - Total Sales by Renovation - Price per Square Foot - Sales by House Condition
5	Dashboard design	No of Visualizations/ Graphs - 1
6	Story Design	No of Visualizations/ Graphs – 1 story with 3 story points

- **Dashboard Load Time:** < 3 seconds (optimized by reducing unused fields)
- **Filter Responsiveness:** Filters like house condition, renovation year, and sale price bins responded without lag
- **Optimizations:** Used data extracts, avoided complex joins, applied filters only where necessary

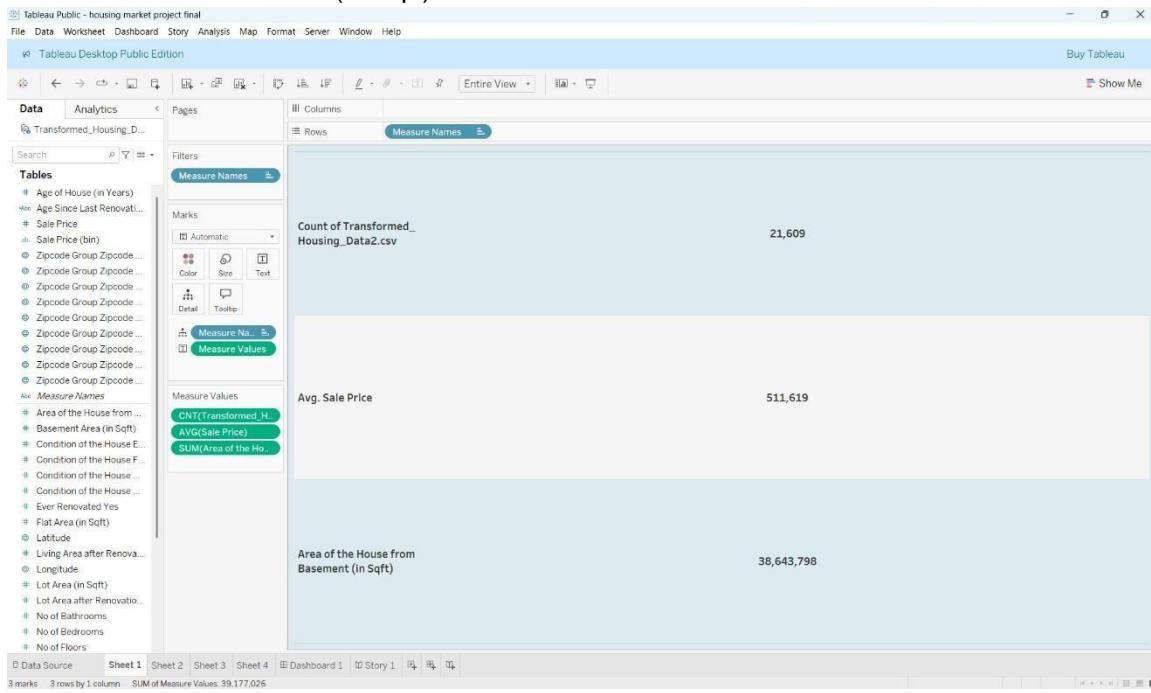
## 7. RESULTS

### 7.1 Output Screenshots

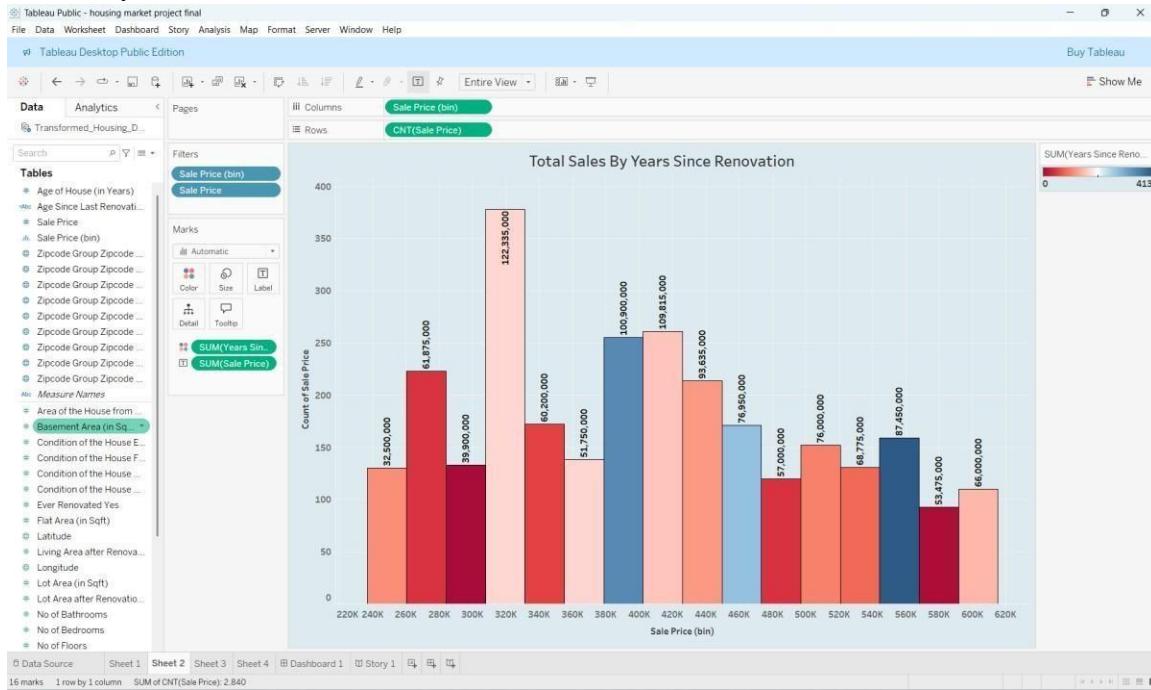
Count of Transformed\_Housing\_Data

Average Sale Prices

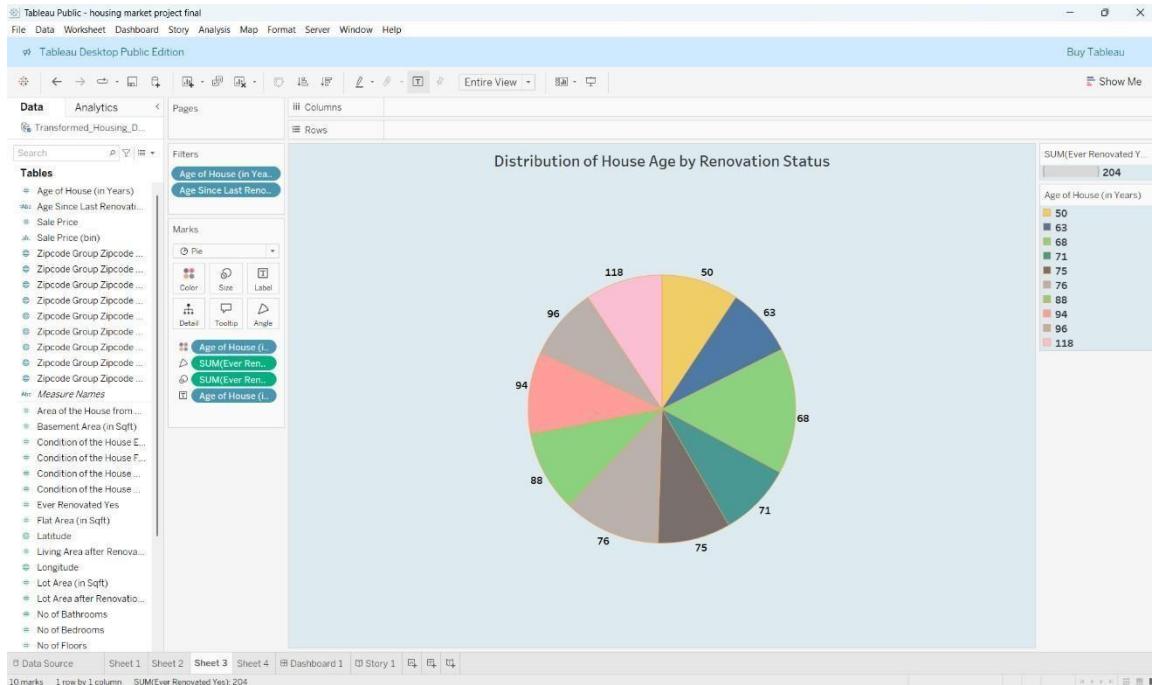
## Area of House from Basement(in Sqft)



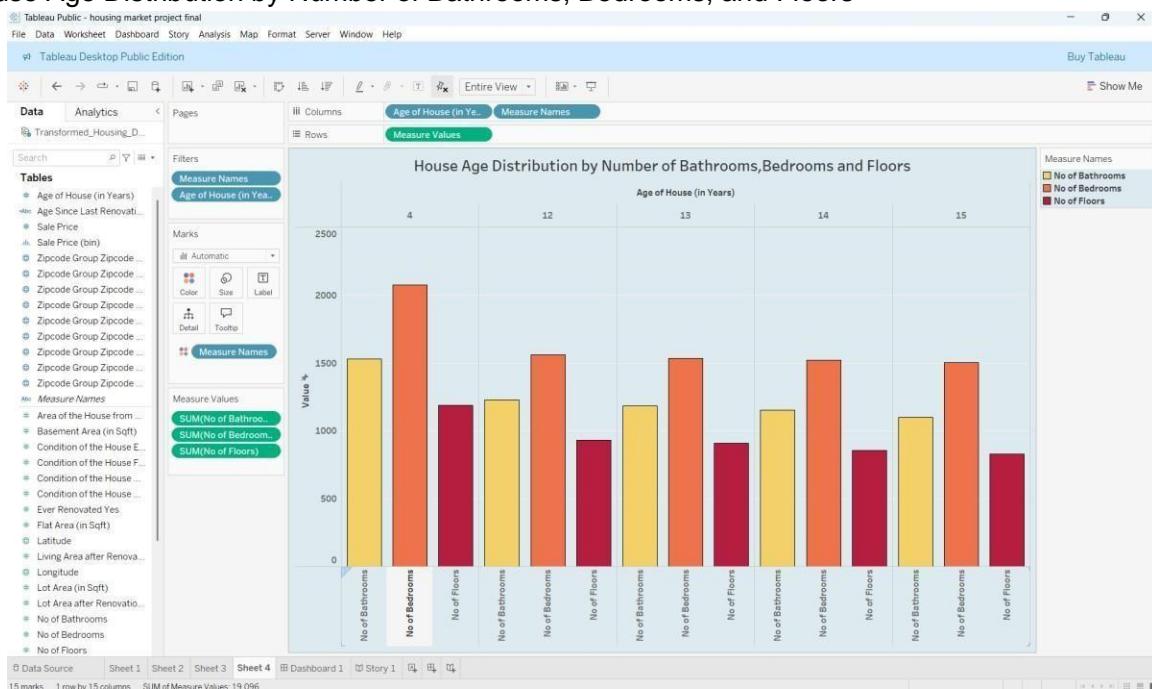
## Total Sales by Years Since Renovation



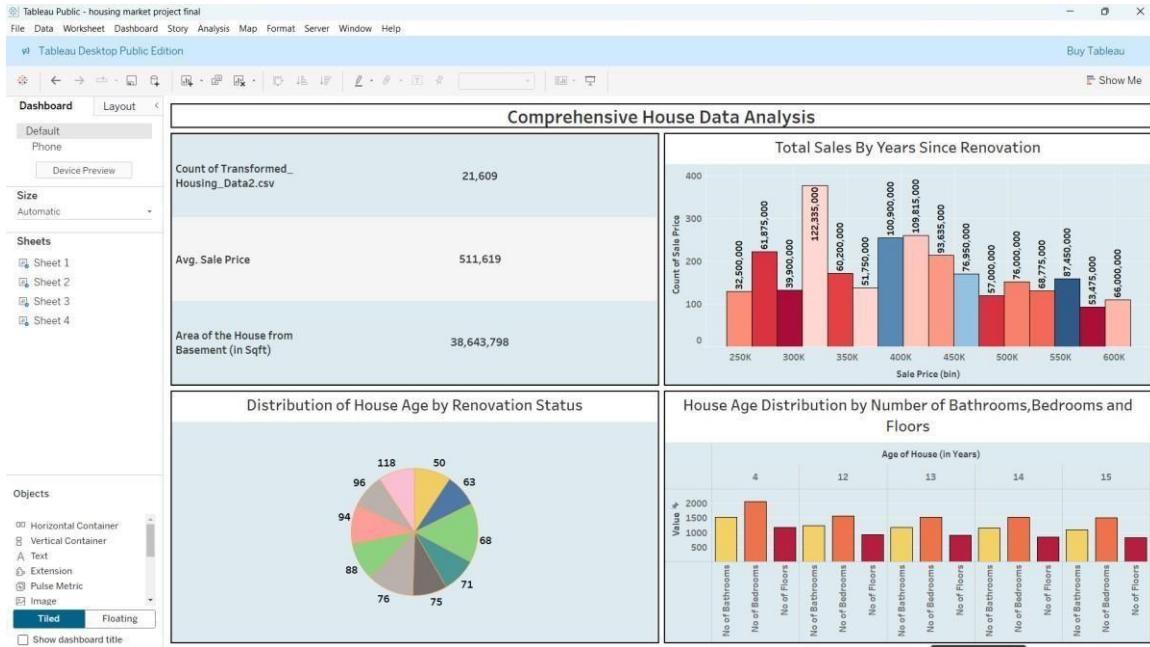
## Distribution of House Age by Renovation Status



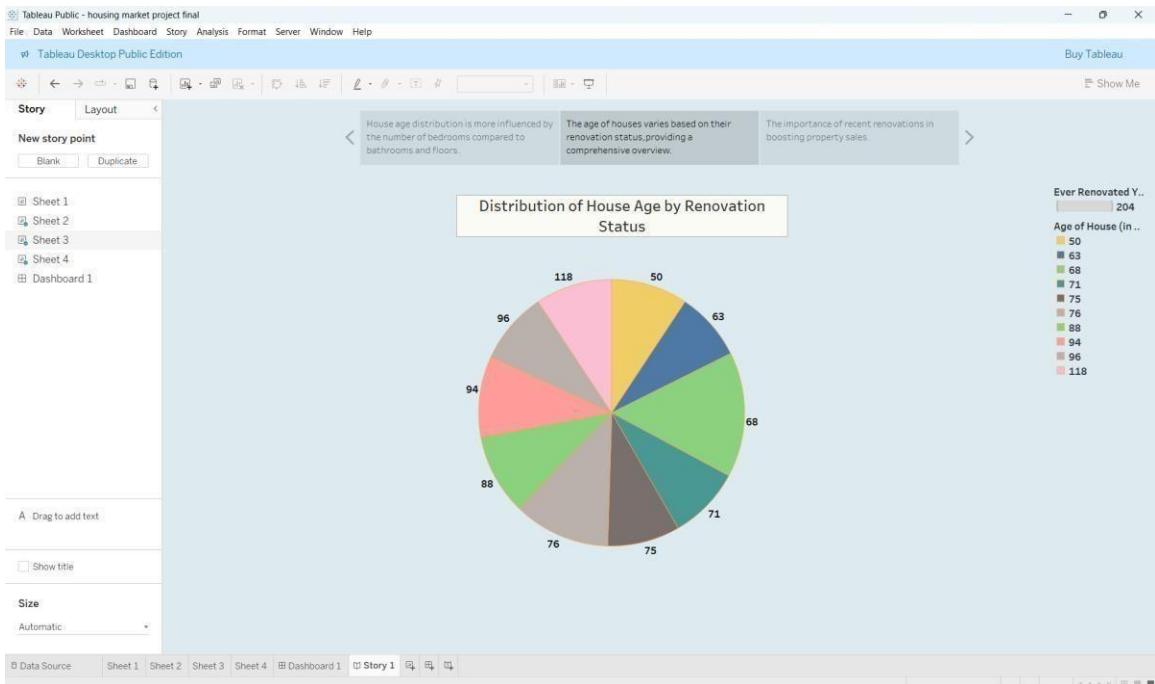
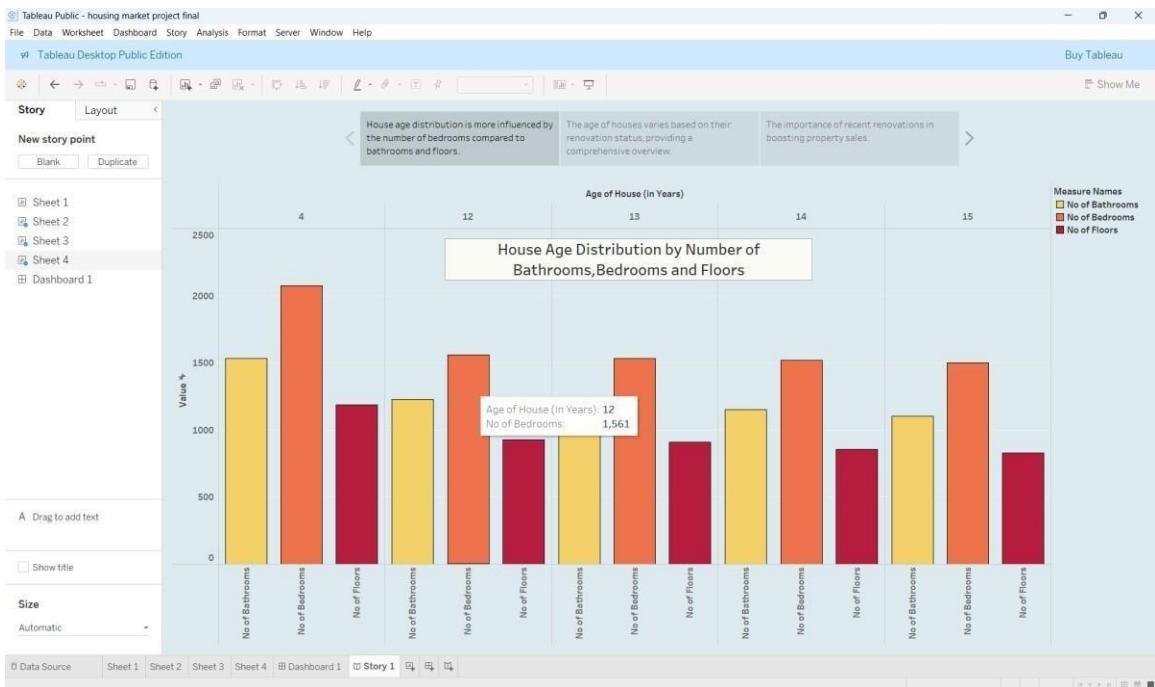
## House Age Distribution by Number of Bathrooms, Bedrooms, and Floors



## Dashboard



## Story





## 8. ADVANTAGES & DISADVANTAGES

### *Advantages*

- Visual representation simplifies complex data analysis
- Enhances user interaction with filters and drill-downs
- Reusable dashboards for various stakeholders
- Web-embeddable for ease of access *Disadvantages*
- Performance dependent on dataset size and design
- Public dashboards lack data confidentiality
- Limited machine learning integration without extra tools

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## 9. CONCLUSION

The Tableau-based housing market analysis provides a clear and accessible way to interpret key trends and patterns in real estate data. It supports better decision-making

for buyers, sellers, and investors by highlighting critical sale price factors in a visually compelling format.

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## 10. FUTURE SCOPE

- Add predictive models using machine learning for price forecasting
  - Integrate real-time APIs to fetch live market data
  - Use geolocation mapping for regional trend analysis
  - Provide user login functionality for personalized dashboards
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## 11. APPENDIX

- **Dataset:**  
<https://www.kaggle.com/datasets/rituparnaghosh18/transformedhousingdata-2>
- **Source Code:** <https://github.com/Aashifa05/Visualizing-Housing-MarketTrendsAnAnalysis-of-Sales-Prices-and-Features-using-Tableau/tree/main/6.Project%20Execution%20Phase/UI%20Executable%20Files>
- **GitHub Repo:** <https://github.com/Chandrasekhar8886/Visualizing-Housing-MarketTrends-An-Analysis-of-Sale-Prices-and-Features-using-Tableau.git>