

An internship in
Data Analytics with Tableau

by
SmartInternz

Project Name: Visualizing housing market trends: an analysis of sale prices and features

Project Id: LTVIP2025TMID47753

Project Mentor: Dr. G. Balakrishna

Team Members:

- | | |
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DEPARTMENT OF CSE

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I convey my thanks to **Dr. G.Balakrishna**, principal of Srinivasa Ramanujan Institute of technology and **Mr. P. Veera Prakash, M.Tech, (ph.D),** Head of the Department of CSE for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project mentor **Dr. G. Balakrishna**, for his valuable guidance, suggestions and constant encouragement pavedway for the successful completion of my project work.

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ABSTRACT

This project, titled “Visualizing Housing Market Trends: An Analysis of Sale Prices and Features using Tableau,” focuses on transforming complex real estate data into clear, actionable insights through interactive data visualization. By cleaning and preparing a dataset containing various housing attributes—such as sale price, area, number of bedrooms, renovation status, and location—key trends were uncovered using Tableau’s powerful visual analytics. The project involved the creation of calculated fields (e.g., TotalAreaSqft, SalePriceBin), the use of filters (e.g., condition, renovation status, zipcode group), and the development of dashboards and stories that narrate insights across multiple dimensions. These dashboards were then embedded into a Flask web application, ensuring easy accessibility and deployment. The resulting solution empowers users—including buyers, real estate agents, and policy makers—to make datadriven decisions. With its scalability and modular structure, the project lays a foundation for further enhancements like live data integration, predictive analytics, and expanded geographic coverage.

Key Words:

- Tableau Dashboard
- Housing Market Analysis
- Data Visualization
- Sale Price Prediction
- Property Features
- Renovation Insights

Project Report Format

1. INTRODUCTION

- 1.1 Project Overview
- 1.2 Purpose

2. IDEATION PHASE

- 2.1 Problem Statement
- 2.2 Empathy Map Canvas
- 2.3 Brainstorming

3. REQUIREMENT ANALYSIS

- 3.1 Customer Journey map
- 3.2 Solution Requirement
- 3.3 Dataflow Diagram
- 3.4 Technology Stack

4. PROJECT DESIGN

- 4.1 Problem Solution Fit
- 4.2 Proposed Solution
- 4.3 Solution Architecture

5. PROJECT PLANNING & SCHEDULING

- 5.1 Project Planning

6. FUNCTIONAL AND PERFORMANCE TESTING

- 6.1 Performance Testing

7. RESULTS

- 7.1 Output Screenshots

8. ADVANTAGES & DISADVANTAGES

9. CONCLUSION

10. FUTURE SCOPE

11. APPENDIX Dataset

Link

GitHub & Project Demo Link

1. Introduction

The real estate market is influenced by various factors such as house age, renovation status, number of bedrooms and bathrooms, and overall size. This project aims to analyze housing market trends and visualize key insights using Tableau to better understand how different features impact sale prices.

1.1. Project overviews

The dataset contains Transformed housing data and 21,609 house sale records, including Property features such as Sales price, area, bedrooms, bathrooms, floors and location. There are a total of 31 columns, out of which Sale Price can be supposedly taken as a dependent variable. The other variables are different features, locations and date, etc. regarding the houses. This project, "Visualizing Housing Market Trends: An Analysis of Sale Prices and Features using Tableau," aims to explore and analyze housing market trends using the Transformed Housing Data 2 dataset from Kaggle. The objective is to identify key factors influencing house prices, such as location, size, number of bedrooms, bathrooms, floors and basement area.

By leveraging Tableau, the project will create interactive dashboards, story, bar chart, histogram, summary dashboard to visualize patterns, compare regional price variations, and gain insights into how different features impact house sale prices. The analysis will help in making datadriven decisions for buyers, sellers, and real estate professionals.

1.2. Objectives

- Identify key factors influencing house prices.
- Analyze the effect of renovations on property value.
- Explore the distribution of house sales across different price ranges.
- Create interactive Tableau dashboards to present findings effectively.

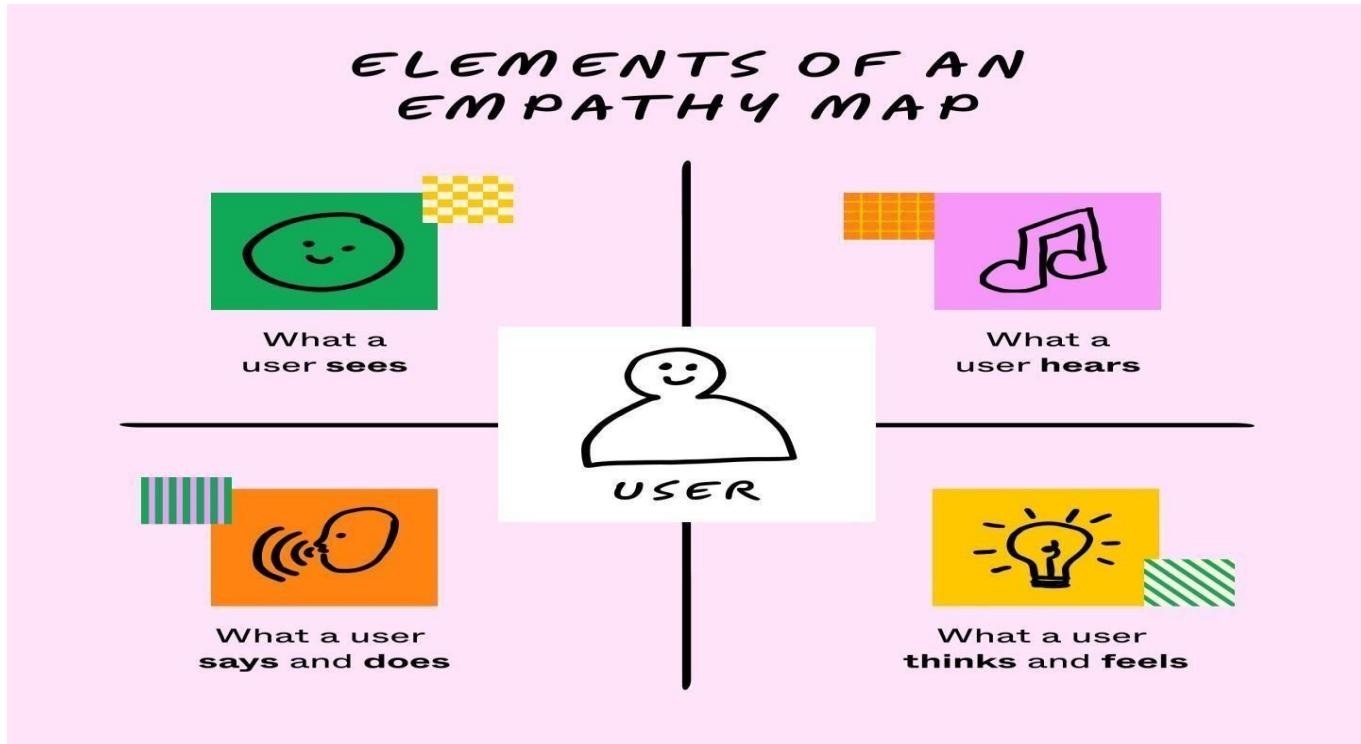
2. Project Initialization and Planning Phase

2.1. Define Problem Statement

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A first-time homebuyer who wants to make an informed decision	Find a home within my budget that meets my needs	The available market data is difficult to interpret and scattered across multiple sources	There is no centralized, easy-to-use tool that visualizes housing trends based on historical sales data	Confused and overwhelmed, making me hesitant to proceed
PS-2	A real estate investor looking for high-return properties	Identify profitable properties based on price trends and key influencing factors	Existing datasets require extensive manual analysis and lack clear insights	No interactive visualization tool allows me to compare property appreciation trends effectively	Frustrated and uncertain about making investment decisions

PS-3	A real estate agent aiming to assist clients efficiently	Provide accurate and insightful recommendations based on market data	The data is time-consuming to analyze and spread across various reports	There is no comprehensive tool to aggregate and visualize pricing trends for quick insights	Less efficient, unable to provide quick, data-backed advice to clients
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2.2 Empathy Map Canvas



2.3 Brain Storming

Step 1: Team Gathering, Collaboration and Problem Statement

Our team collaborated to identify pressing challenges in the real estate market, particularly in understanding how various property features influence housing sale prices. After exploring themes like housing affordability, real estate investment planning, urban development, and smart property insights, we narrowed down our focus to uncover actionable insights hidden in housing data. The objective was to visually explore trends using Tableau that would help buyers, sellers, investors, and policy makers understand patterns of sale prices based on features like area, bedrooms, renovation status, condition, location (zipcode groups), and more.

Problem Statement:

How can housing sale price trends and property characteristics be visualized and analyzed using Tableau to identify patterns, improve buyer/seller decision-making, and uncover insights that support strategic real estate planning? Team Members:

- Team Leader: Varsha S
- Team Member: Yamunasree Mylari
- Team Member: Sukanya M
- Team Member: Manidhar M
- Team Member: Navadeep P

Step 2: Brainstorming, Idea Listing and Grouping

Idea	Group
Collect historical housing price data	Data Collection
Analyze price variation by location (city/region-wise)	Market Trends
Visualize average prices using area charts	Visualization
Identify demand based on property type (apartment, villa, etc.)	Segmentation
Use Tableau dashboards for dynamic filtering	Tools & Features
Study impact of number of bedrooms, size, and age of property on price	Feature Analysis
Build a dashboard to show trends over years/months	Time-Series
Add interactivity with filters (location, price, date)	UX/Interactivity
Compare affordability index across cities	Comparative Study
Highlight hotspots of rising or falling prices	Predictive Insights

Step 3: Idea Prioritization Table

Idea	Priority (High/Medium/Low)	Reason
Analyze price variation by location	High	Direct insight into regional trends
Time-series trends of housing prices	High	Strong visual and analytical impact
Interactivity using filters	High	Improves dashboard usability
Feature-wise price analysis (bedrooms, area)	Medium	Adds value, but depends on data availability
Affordability index comparison	Medium	Requires external data
Hotspot prediction	Low	Advanced; out of scope for basic dashboard

3. Requirement Analysis

3.1 Customer journey map

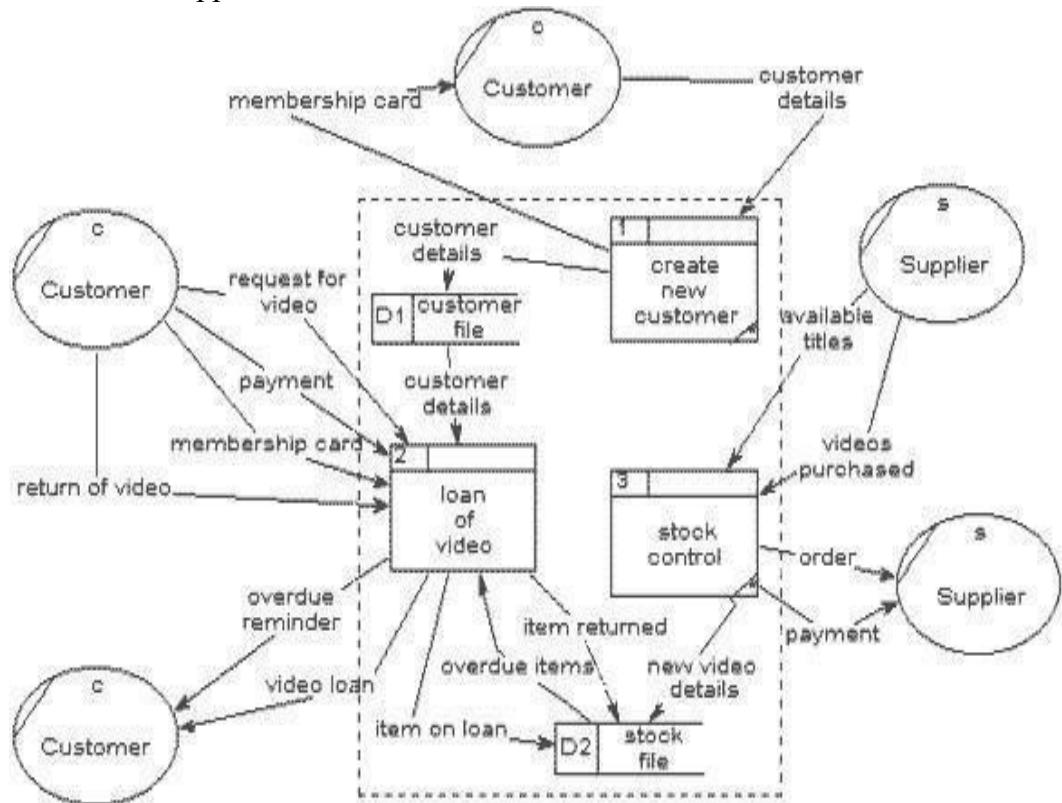
Stage	User Goal	Actions	Touchpoints	Pain Points	Opportunities
1. Awareness	Understand the availability of housing data & visual tools	Searching online for real estate trend data or tools like Tableau dashboards	Google search, blog posts, social media, Tableau Public, real estate forums	Overwhelming amount of data sources, low trust in sources	Create SEO-friendly landing pages, share Tableau dashboards on popular platforms
2. Discovery	Identify relevant data visualizations for housing trends	Browses Tableau dashboards, real estate datasets, looks for ZIP-level trends	Tableau Public, Zillow Research, Redfin Data Center, local government sites	Dashboards are too complex, or not relevant to user's location	Provide clear filters by region, date, and property type; concise summary views
3. Consideration	Explore features and trends (e.g., prices, sqft, # of beds)	Uses filters in Tableau dashboard to explore data	Interactive Tableau filters, maps, charts, tooltips	Charts may be slow or not mobile-friendly; data may not be current	Optimize performance, provide refresh dates, include predictive insights
4. Engagement	Dive into detailed comparisons by neighborhood or time	Interacts with dashboards, compares ZIP codes, views time series, histograms, correlation plots scatter plots	Tableau story points, dashboards, maps, price trend lines, correlation plots	Confusion over interpreting complex visualizations or statistical terms	Add explanatory tooltips, glossary popups, embed guided analysis or scenarios
5. Decision	Draw insights or make decisions (buy, wait, invest)	Screenshots or exports Tableau visuals, discusses with partner/agent	Dashboard download/export, shared links, printed	Lack of ability to share/export easily, insights not personalized	Enable story exports, PDF download, user-specific bookmarks
6. Feedback/Follow-up	Revisit or subscribe to housing updates	Returns to dashboard for updated insights, subscribes to alerts	Email alerts, Tableau subscriptions, follow-up surveys	No clear way to stay updated or submit feedback	Add newsletter, alert system, feedback form or star-rating for dashboards

3.2 Data Flow Diagram

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right

amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

1. Data collected from POSOCO in CSV format.
2. Cleaned and transformed, with calculated fields like Year and Lockdown.
3. Visualizations built in Tableau using multiple worksheets.
4. Users review the dashboard and may request changes.
5. Final version archived after approval.



User Stories – Visualizing Housing Market Trends Use Agile-style user stories based on different personas:

As a Homebuyer...

1. ...I want to see how housing prices have changed over time in my neighborhood, so I can decide when to buy.
2. ...I want to compare median home prices across nearby ZIP codes, so I can find more affordable areas.
3. ...I want to filter listings by number of bedrooms and square footage, so I can see trends specific to my needs.

As a Real Estate Analyst...

4. ...I want to analyze trends in home features (e.g., garage, pool, lot size), so I can identify what's driving price changes.
5. ...I want to export charts and data from the dashboard, so I can include them in market reports.

6. ...I want to overlay housing price trends with demographic data (e.g., income, population growth), so I can assess market potential.

As an Investor...

7. ...I want to identify ZIP codes where housing prices are increasing fastest, so I can find investment opportunities.
8. ...I want to forecast price trends for the next year, so I can plan my purchases.
9. ...I want to receive alerts when certain market conditions are met, so I don't miss critical timing.

3.3 Solution Requirements

Functional Requirements:

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	- Registration through Form - Registration through Gmail - Registration through LinkedIn
FR-2	User Confirmation	- Confirmation via Email - Confirmation via OTP
FR-3	User Login	- Login with Email/Password - Login via Gmail - Login via LinkedIn
FR-4	Profile Management	- View Profile - Edit Profile Information - Upload Profile Picture - Change Password

Non-functional Requirements:

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The user interface should be intuitive, easy to navigate, and responsive across all devices.
NFR-2	Security	All data should be encrypted in transit and at rest. Multi-factor authentication (MFA) should be supported.
NFR-3	Reliability	The system should be highly reliable with a failure rate of less than 0.1%. Daily backups should be maintained.
NFR-4	Performance	The system should load within 3 seconds under normal network conditions.
NFR-5	Availability	The system should maintain 99.9% uptime on a monthly basis.
NFR-6	Scalability	The application should be able to scale horizontally to handle increasing numbers of users without performance degradation.

3.4 Technology Stack

1. Architecture Overview:

Client-Server Architecture (Three-Tier Architecture)

- **Presentation Layer (Frontend):** Handles the user interface and user interactions.
- **Application Layer (Backend):** Handles business logic, authentication, and data processing.
- **Data Layer (Database):** Manages data storage and retrieval.

2. Technology Stack:

Component	Technology	Purpose
Frontend	React.js / Next.js / Angular / Vue.js	Build interactive and responsive UI
Mobile App (Optional)	React Native / Flutter	Cross-platform mobile application
Backend	Node.js with Express.js / Django / Spring Boot	API development, business logic
Authentication	Firebase Auth / OAuth 2.0 / JWT	User authentication and authorization
Database	PostgreSQL / MySQL / MongoDB	Persistent data storage
Cloud Hosting	AWS / Google Cloud / Azure / Vercel / Netlify	Deploying frontend/backend applications
CI/CD	GitHub Actions / GitLab CI / Jenkins	Continuous integration & deployment
Version Control	Git (GitHub / GitLab / Bitbucket)	Code versioning and collaboration
Email Service	SendGrid / Mailgun / Firebase	For sending email confirmations
Storage (if needed)	AWS S3 / Firebase Storage	For storing profile pictures or files
Monitoring & Logging	Sentry / LogRocket / New Relic	Error tracking and performance monitoring

4. Project design

4.1 Problem Solution Fit

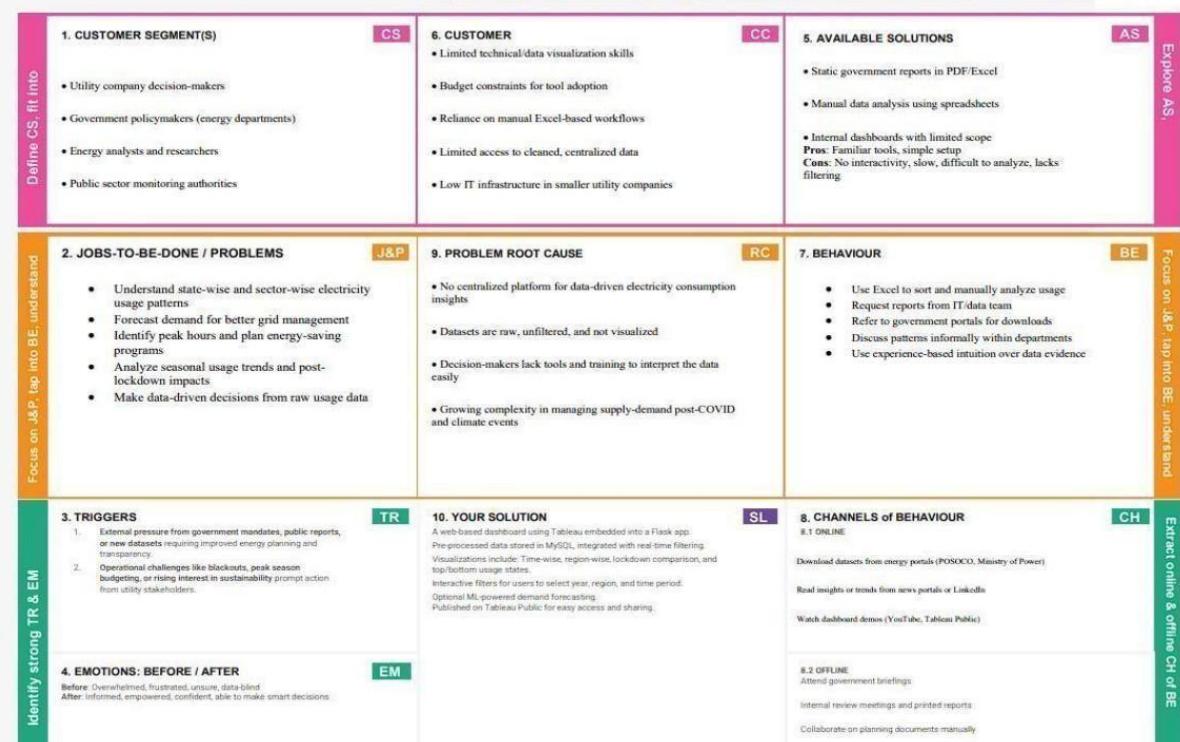
The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem. It helps entrepreneurs, marketers and corporate innovators identify behavioral patterns and recognize what would work and why.

Purpose:

- Solve complex problems in a way that fits the state of your customers.
 - Succeed faster and increase your solution adoption by tapping into existing mediums and channels of behavior.
 - Sharpen your communication and marketing strategy with the right triggers and messaging.
- Increase touch-points with your company by finding the right problem-behavior fit and building trust by solving frequent annoyances, or urgent or costly problems.
- Understand the existing situation in order to improve it for your target group.

Problem-Solution fit canvas 2.0

Purpose / Vision: To visualize electricity consumption patterns and empower smarter, data-driven energy decisions for a sustainable future.



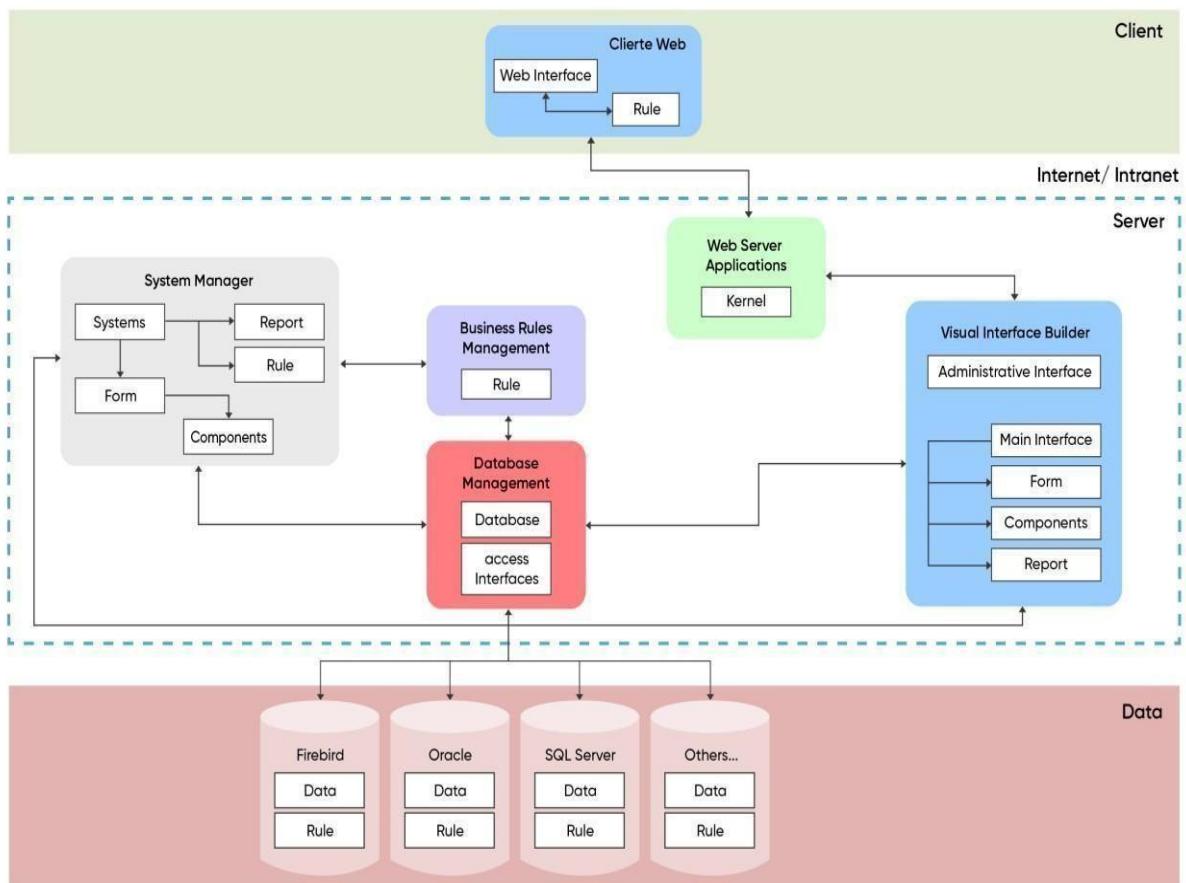
4.2 Proposed Solution

Proposed Solution Template

S. No.	Parameter	Description
1	Problem Statement (Problem to be solved)	<p>There is a lack of an accessible, real-time, and user-friendly platform for analyzing housing market trends. Homebuyers, investors, planners, and policymakers struggle to make data-driven decisions due to fragmented and non-visual data sources.</p>
2	Idea / Solution Description	<p>The proposed solution is an interactive web platform that aggregates housing data from various sources (e.g., Zillow, Census APIs), visualizes pricing and availability trends on maps and charts, and provides predictive analytics to forecast future trends. Users can filter data by location, time range, property type, and more.</p>
3	Novelty / Uniqueness	<p>Unlike typical real estate platforms, this solution focuses on visual intelligence, trend prediction, and open data integration. It combines geospatial visualization (Mapbox/Leaflet), real-time data ingestion, and machine learning models for housing forecasts, delivering more than just static listings.</p>
4	Social Impact / Customer Satisfaction	<p>The platform empowers users to make informed decisions on housing, which is a critical aspect of financial planning and quality of life. It benefits low-income communities by providing free access to housing trends, and helps governments plan infrastructure and housing policies more effectively.</p>
5	Business Model (Revenue Model)	<p>The core platform can be freemium: free for basic features, with premium access for advanced analytics, custom reports, and API access. Revenue can also be generated from B2B partnerships with real estate agencies, urban planning departments, and property developers. Advertisements and sponsorships may also be integrated.</p>
6	Scalability of the Solution	<p>The system is designed using scalable cloud services and modular architecture. It can easily support additional cities, countries, or data types. The backend is capable of processing large datasets, and the frontend is optimized for high-performance rendering even with millions of data points.</p>

4.3 Solution Architecture

- The architecture separates data preprocessing, storage, visualization, and UI layers—making it easy to maintain, scale, and enhance.
- Cleaned data from MySQL is visualized using Tableau dashboards, offering region-wise, yearwise, and seasonal insights with filtering capabilities.
- Dashboards are embedded into a Flask-based web interface, allowing end users to interact with visual data through a user-friendly portal.
- The solution supports future extensions like forecasting models and can be deployed locally or on cloud platforms like Heroku or AWS.



5. Project Planning & Scheduling

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection & Extraction	USN-1	As a user, I can collect housing market data from reliable sources, including prices, property types, and trend.	2	High	2
Sprint-1	Data Preprocessing	USN-2	As a user, I can preprocess data to clean and filter out unnecessary information, such as outliers, duplicates, or missing values	3	High	2
Sprint-2	Data Visualization	USN-3	As a user, I can visualize housing trends using charts, graphs, and heatmaps to understand the current market dynamics and pricing fluctuations	3	High	3

Sprint-2	Interactive Dashboard	USN-4	As a user, I can interact with a dashboard that displays live market trends, data filters, and performance insights for better decision-making	2	High	1
Sprint-3	User Stories (Dashboard Views)	USN-5	As a user, I can set custom views of the dashboard to save preferences for quick future reference (e.g., specific locations, budget, etc.)	3	Medium	2
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3	Web Integration	USN-6	As a user, I can integrate the dashboard and data visualizations into a website for online accessibility and usability	2	Medium	1

Project Tracker, Velocity & Burndown Chart: (4 Marks)

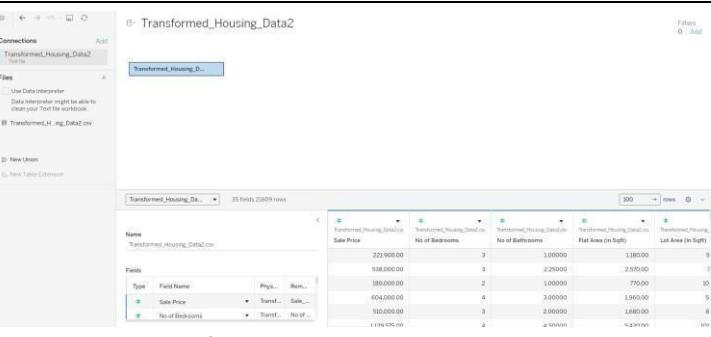
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	5	2 Days	18 Jun 2025	19 Jun 2025	5	19 Jun 2025
Sprint-2	5	3 Days	21 Jun 2025	23 Jun 2025	5	23 Jun 2025
Sprint-3	5	2 Days	24 Jun 2025	25 Jun 2025	5	25 Jun 2025

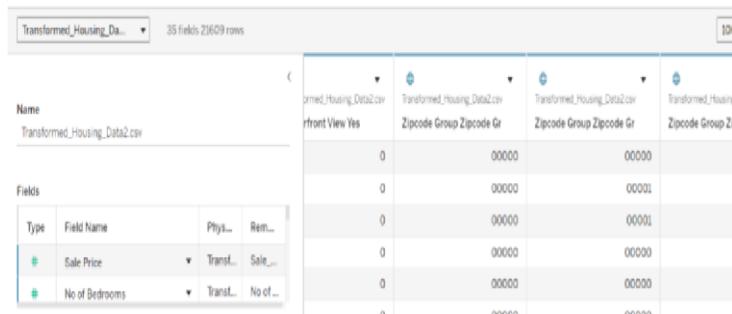
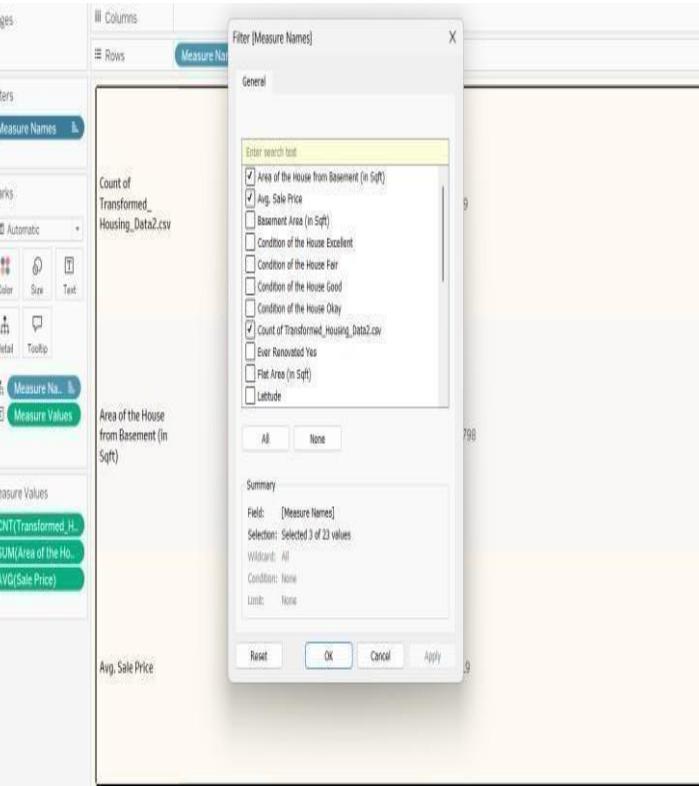
Velocity:

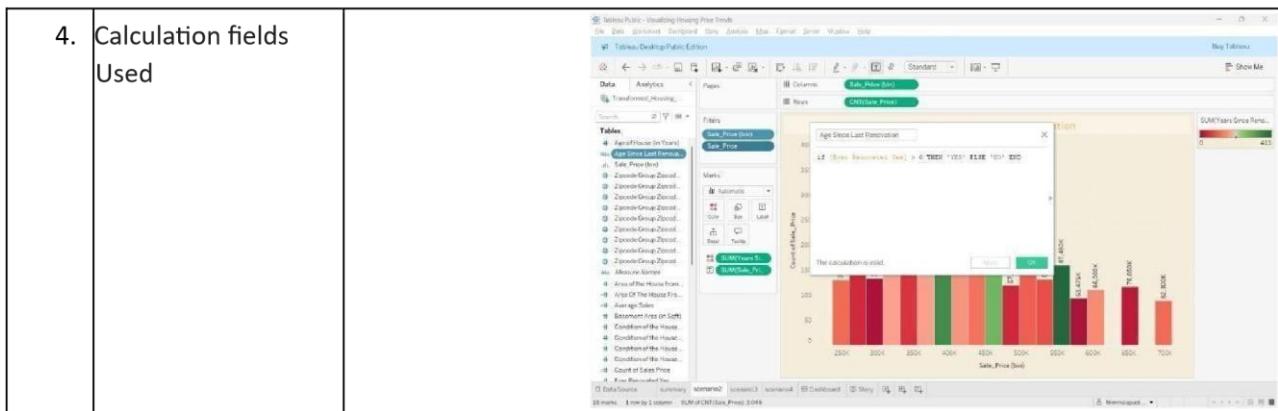
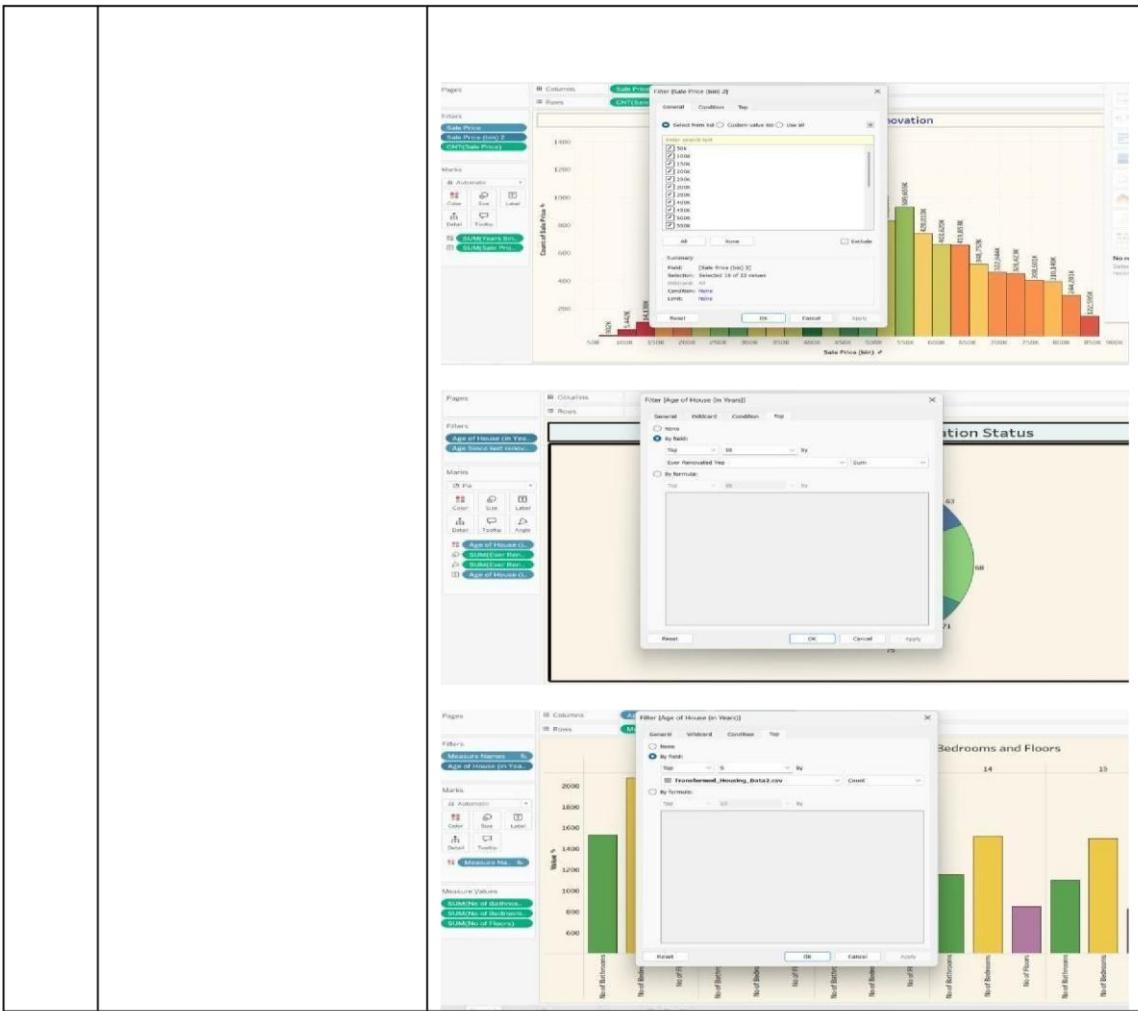
Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = 15/3 = 5$$

6.Functional and Performance Testing

S.No.	Parameter	Screenshot / Values																														
1.	Data Rendered	 <p>The screenshot shows a data rendering interface with the following details:</p> <ul style="list-style-type: none"> Connections: Transformed_Housing_Data2 Files: Transformed_Housing_Data2.csv Fields: 35 fields, 21609 rows Table Headers: <table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Field Name</th> <th>Physical Name</th> <th>Format</th> </tr> </thead> <tbody> <tr> <td>Transformed_Housing_Data2</td> <td>Double</td> <td>Sale Price</td> <td>SalePrice</td> <td>#,###,##0.00</td> </tr> <tr> <td>Transformed_Housing_Data2</td> <td>Double</td> <td>No of Bedrooms</td> <td>NoofBedrooms</td> <td>#,###,##0.00</td> </tr> <tr> <td>Transformed_Housing_Data2</td> <td>Double</td> <td>No of Bathrooms</td> <td>NoofBathrooms</td> <td>#,###,##0.00</td> </tr> <tr> <td>Transformed_Housing_Data2</td> <td>Double</td> <td>Flat Area (in Sqft)</td> <td>FlatArea</td> <td>#,###,##0.00</td> </tr> <tr> <td>Transformed_Housing_Data2</td> <td>Double</td> <td>Lot Area (in Sqft)</td> <td>LotArea</td> <td>#,###,##0.00</td> </tr> </tbody> </table> <p>Data Contains 35 fields 21609 rows</p>	Name	Type	Field Name	Physical Name	Format	Transformed_Housing_Data2	Double	Sale Price	SalePrice	#,###,##0.00	Transformed_Housing_Data2	Double	No of Bedrooms	NoofBedrooms	#,###,##0.00	Transformed_Housing_Data2	Double	No of Bathrooms	NoofBathrooms	#,###,##0.00	Transformed_Housing_Data2	Double	Flat Area (in Sqft)	FlatArea	#,###,##0.00	Transformed_Housing_Data2	Double	Lot Area (in Sqft)	LotArea	#,###,##0.00
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2.	Data Preprocessing	 <p>Removed unnecessary columns zipcodes or null values</p>
3.	Utilization of Filters	



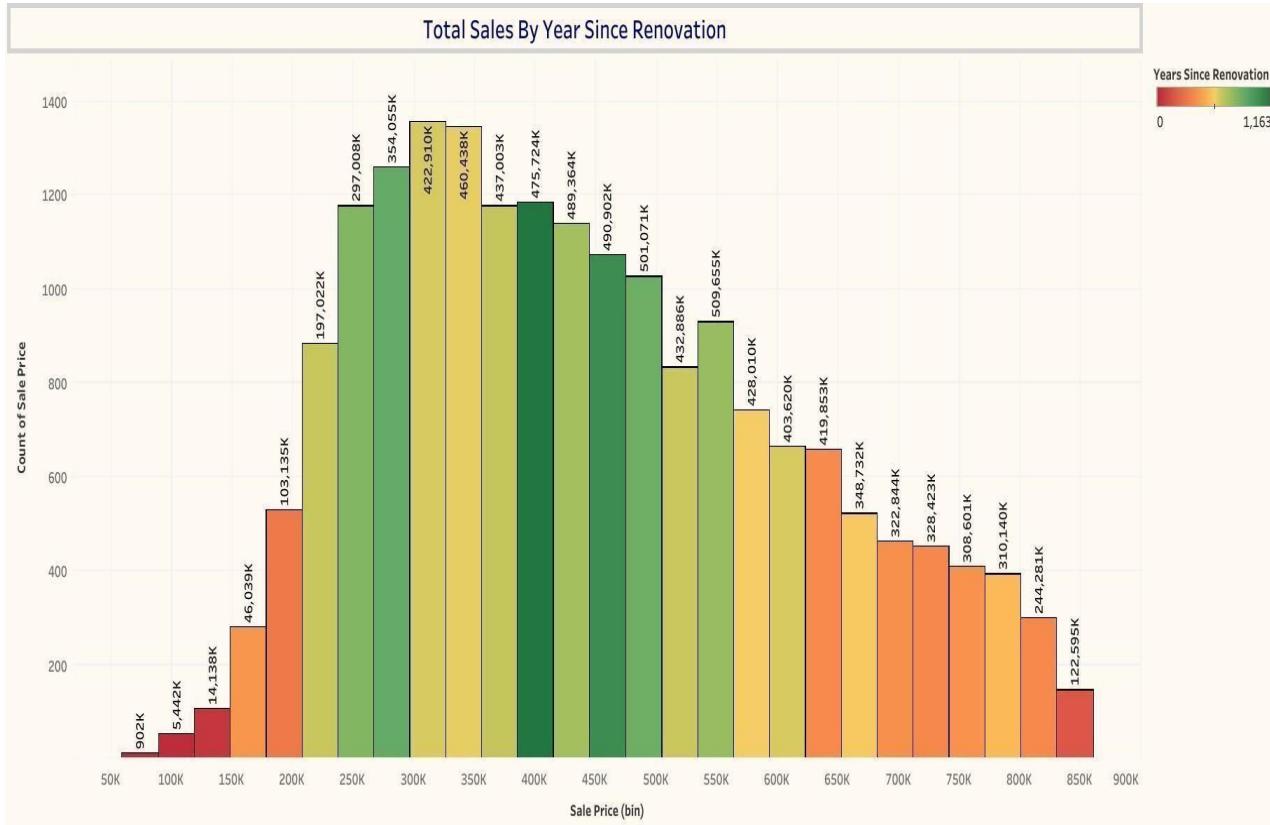
5.	Dashboard design	<p>Dashboard https://public.tableau.com/views/dasboard_17512864065580/Dashboard1?:language=en-US&publish=yes&:sid=&:redirect=auth&:&display_count=n&:origin=viz_share_link</p>	No of Visualizations / Graphs – 4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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(USD)	0-10	100	11-20	140	21-30	210	31-40	310	41-50	410	51-60	510	61-70	610	71-80	710	81-90	810	91-100	910	101-110	1010	111-120	1110	121-130	1210	131-140	1310	141-150	1410	151-160	1510	161-170	1610	171-180	1710	181-190	1810	191-200	1910	201-210	2010	211-220	2110	221-230	2210	231-240	2310	241-250	2410	251-260	2510	261-270	2610	271-280	2710	281-290	2810	291-300	2910	301-310	3010	311-320	3110	321-330	3210	331-340	3310	341-350	3410	351-360	3510	361-370	3610	371-380	3710	381-390	3810	391-400	3910	401-410	4010	411-420	4110	421-430	4210	431-440	4310	441-450	4410	451-460	4510	461-470	4610	471-480	4710	481-490	4810	491-500	4910	501-510	5010	511-520	5110	521-530	5210	531-540	5310	541-550	5410	551-560	5510	561-570	5610	571-580	5710	581-590	5810	591-600	5910	601-610	6010	611-620	6110	621-630	6210	631-640	6310	641-650	6410	651-660	6510	661-670	6610	671-680	6710	681-690	6810	691-700	6910	701-710	7010	711-720	7110	721-730	7210	731-740	7310	741-750	7410	751-760	7510	761-770	7610	771-780	7710	781-790	7810	791-800	7910	801-810	8010	811-820	8110	821-830	8210	831-840	8310	841-850	8410	851-860	8510	861-870	8610	871-880	8710	881-890	8810	891-900	8910	901-910	9010	911-920	9110	921-930	9210	931-940	9310	941-950	9410	951-960	9510	961-970	9610	971-980	9710	981-990	9810	991-1000	9910	Age of House (In Years)	Count	0-10	100	11-20	140	21-30	210	31-40	310	41-50	410	51-60	510	61-70	610	71-80	710	81-90	810	91-100	910	101-110	1010	111-120	1110	121-130	1210	131-140	1310	141-150	1410	151-160	1510	161-170	1610	171-180	1710	181-190	1810	191-200	1910	201-210	2010	211-220	2110	221-230	2210	231-240	2310	241-250	2410	251-260	2510	261-270	2610	271-280	2710	281-290	2810	291-300	2910	301-310	3010	311-320	3110	321-330	3210	331-340	3310	341-350	3410	351-360	3510	361-370	3610	371-380	3710	381-390	3810	391-400	3910	401-410	4010	411-420	4110	421-430	4210	431-440	4310	441-450	4410	451-460	4510	461-470	4610	471-480	4710	481-490	4810	491-500	4910	501-510	5010	511-520	5110	521-530	5210	531-540	5310	541-550	5410	551-560	5510	561-570	5610	571-580	5710	581-590	5810	591-600	5910	601-610	6010	611-620	6110	621-630	6210	631-640	6310	641-650	6410	651-660	6510	661-670	6610	671-680	6710	681-690	6810	691-700	6910	701-710	7010	711-720	7110	721-730	7210	731-740	7310	741-750	7410	751-760	7510	761-770	7610	771-780	7710	781-790	7810	791-800	7910	801-810	8010	811-820	8110	821-830	8210	831-840	8310	841-850	8410	851-860	8510	861-870	8610	871-880	8710	881-890	8810	891-900	8910	901-910	9010	911-920	9110	921-930	9210	931-940	9310	941-950	9410	951-960	9510	961-970	9610	971-980	9710	Age of House (In Years)	No of Bathrooms	No of Bedrooms	No of Floors	0-10	100	100	100	11-20	140	140	140	21-30	210	210	210	31-40	310	310	310	41-50	410	410	410	51-60	510	510	510	61-70	610	610	610	71-80	710	710	710	81-90	810	810	810	91-100	910	910	910	101-110	1010	1010	1010	111-120	1110	1110	1110	121-130	1210	1210	1210	131-140	1310	1310	1310	141-150	1410	1410	1410	151-160	1510	1510	1510	161-170	1610	1610	1610	171-180	1710	1710	1710	181-190	1810	1810	1810	191-200	1910	1910	1910	201-210	2010	2010	2010	211-220	2110	2110	2110	221-230	2210	2210	2210	231-240	2310	2310	2310	241-250	2410	2410	2410	251-260	2510	2510	2510	261-270	2610	2610	2610	271-280	2710	2710	2710	281-290	2810	2810	2810	291-300	2910	2910	2910	301-310	3010	3010	3010	311-320	3110	3110	3110	321-330	3210	3210	3210	331-340	3310	3310	3310	341-350	3410	3410	3410	351-360	3510	3510	3510	361-370	3610	3610	3610	371-380	3710	3710	3710	381-390	3810	3810	3810	391-400	3910	3910	3910	401-410	4010	4010	4010	411-420	4110	4110	4110	421-430	4210	4210	4210	431-440	4310	4310	4310	441-450	4410	4410	4410	451-460	4510	4510	4510	461-470	4610	4610	4610	471-480	4710	4710	4710	481-490	4810	4810	4810	491-500	4910	4910	4910	501-510	5010	5010	5010	511-520	5110	5110	5110	521-530	5210	5210	5210	531-540	5310	5310	5310	541-550	5410	5410	5410	551-560	5510	5510	5510	561-570	5610	5610	5610	571-580	5710	5710	5710	581-590	5810	5810	5810	591-600	5910	5910	5910	601-610	6010	6010	6010	611-620	6110	6110	6110	621-630	6210	6210	6210	631-640	6310	6310	6310	641-650	6410	6410	6410	651-660	6510	6510	6510	661-670	6610	6610	6610	671-680	6710	6710	6710	681-690	6810	6810	6810	691-700	6910	6910	6910	701-710	7010	7010	7010	711-720	7110	7110	7110	721-730	7210	7210	7210	731-740	7310	7310	7310	741-750	7410	7410	7410	751-760	7510	7510	7510	761-770	7610	7610	7610	771-780	7710	7710	7710	781-790	7810	7810	7810	791-800	7910	7910	7910	801-810	8010	8010	8010	811-820	8110	8110	8110	821-830	8210	8210	8210	831-840	8310	8310	8310	841-850	8410	8410	8410	851-860	8510	8510	8510	861-870	8610	8610	8610	871-880	8710	8710	8710	881-890	8810	8810	8810	891-900	8910	8910	8910	901-910	9010	9010	9010	911-920	9110	9110	9110	921-930	9210	9210	9210	931-940	9310	9310	9310	941-950	9410	9410	9410	951-960	9510	9510	9510	961-970	9610	9610	9610	971-980	9710	9710	9710
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7.Results

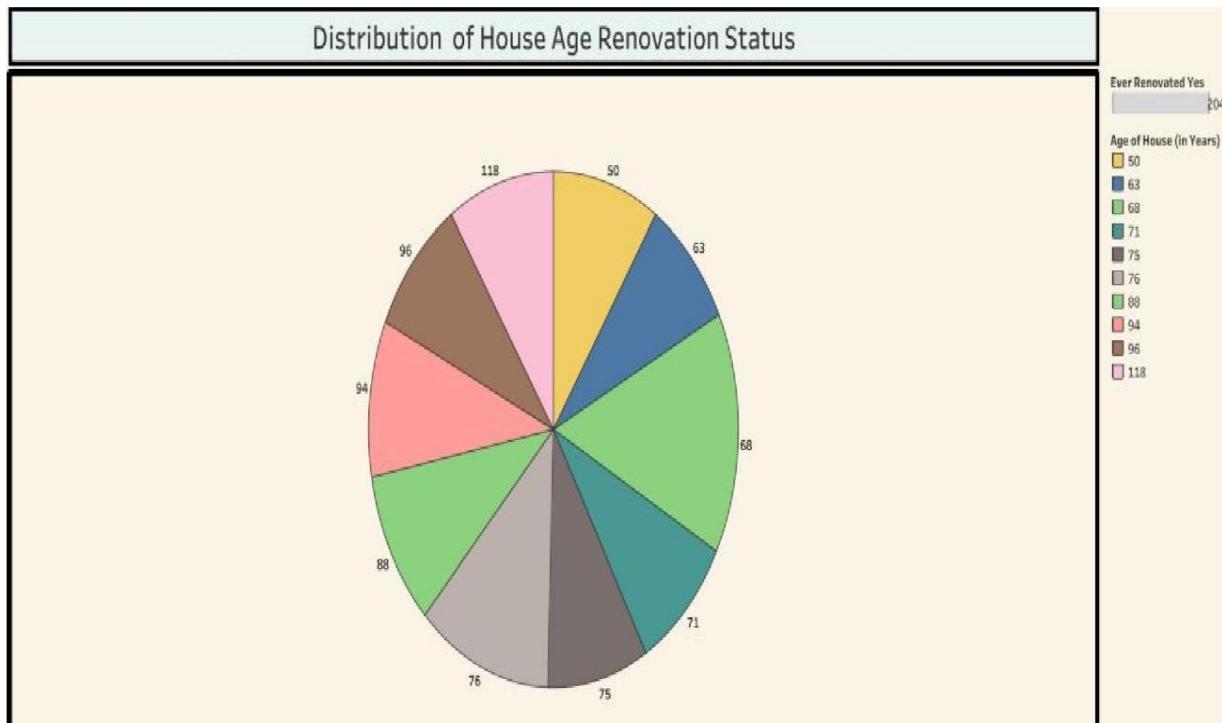
output of scenario1



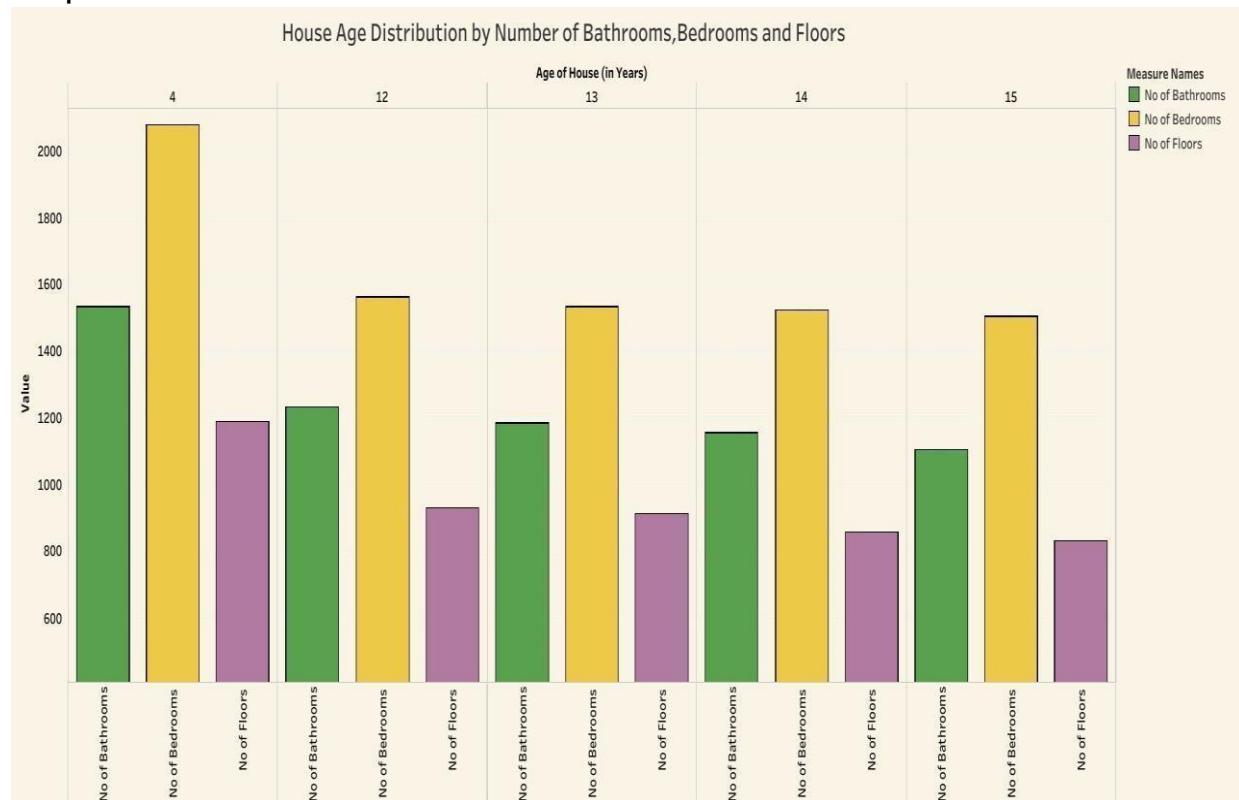
output of Scenario 2:



output of Scenario3:

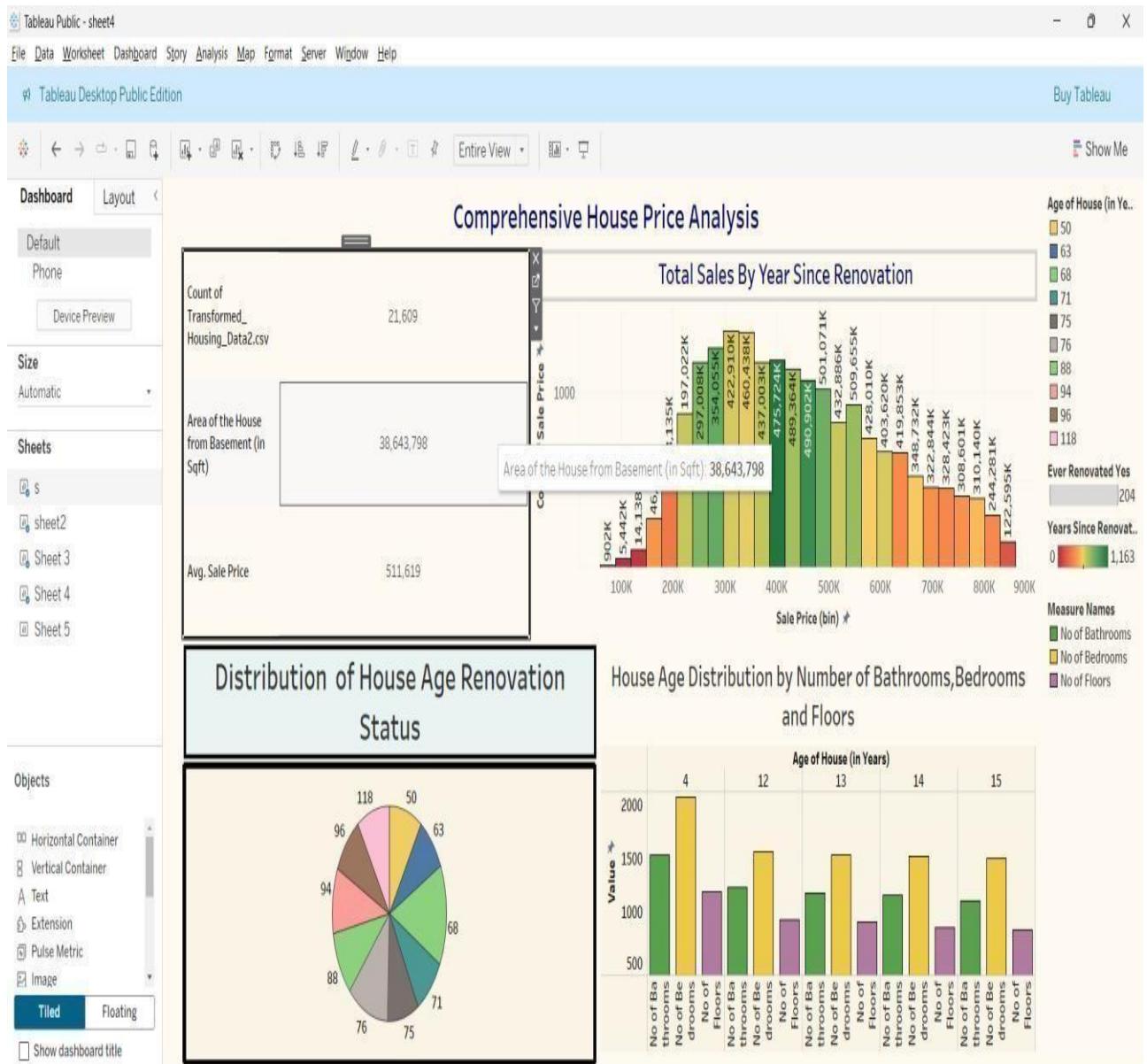


output of Scenario4



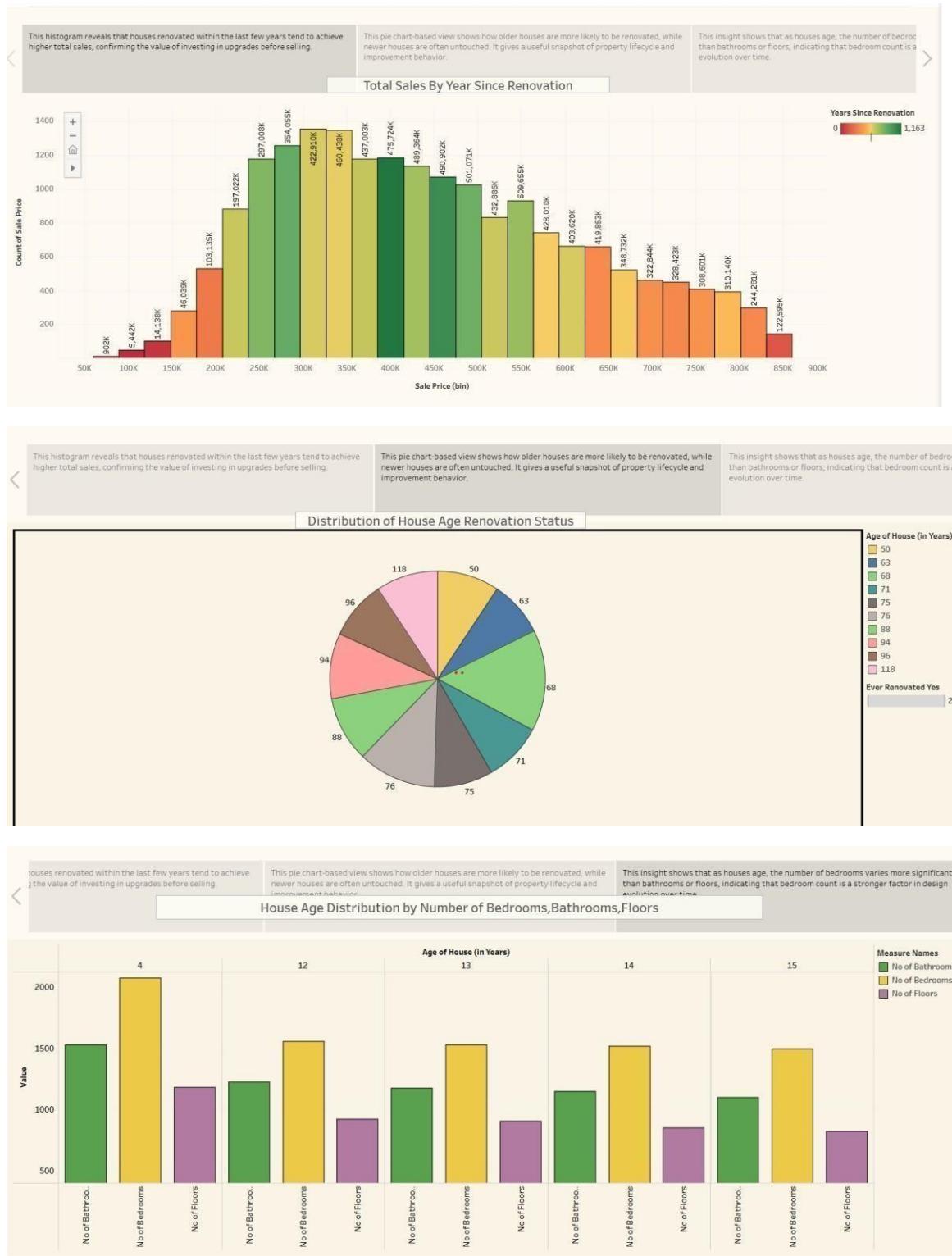
Dashboard:

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Story:

https://public.tableau.com/views/MyStory_17510922375570/Story1?:language=enUS&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link



8. Advantages & disadvantages

Advantages:

1. Interactive Analysis:

The Tableau dashboard allows users to explore data with filters (e.g., bedrooms, renovation status, price bins), enhancing understanding through dynamic interactions.

2. Informed Decision-Making:

Buyers, sellers, agents, and investors can make data-driven decisions by identifying which features (e.g., area, renovations, number of floors) impact property value.

3. Data Storytelling:

The Tableau Story feature presents insights in a sequential, digestible narrative—great for business reports or stakeholder presentations.

4. Geographic Visualization:

Zipcode grouping allows regional comparison of price trends and property types, revealing market opportunities and local disparities.

5. Calculated Metrics & KPIs:

Metrics like Average Sale Price and Total Area improve business clarity and enable fast comparisons across categories.

6. Web Accessibility:

Embedding the dashboard into a Flask web app increases accessibility—users can view it from any browser without needing Tableau Desktop.

7. Modular & Scalable Design:

The project structure supports additional data (e.g., rental prices, future years), making it expandable to other regions or market conditions.

8. Minimal Coding Required:

Most of the visualizations are created using Tableau's drag-and-drop interface—making it ideal for analysts without deep programming expertise.

Disadvantages:

1. Static Dataset Limitation:

The analysis depends on a preloaded CSV file; it doesn't support real-time updates unless integrated with live databases or APIs.

2. Tool Dependency:

The system relies on Tableau Public, which has limitations like no row-level security and requires dashboards to be public. **3. Learning Curve for Tableau:**

While Tableau is user-friendly, new users may need time to understand calculated fields, filters, and advanced charting options.

4. Limited Predictive Power:

This is a descriptive and visual analytics project—it does not use machine learning or predictive modeling to forecast housing prices.

5. Browser Compatibility:

Older browsers or low-resolution screens may not render complex dashboards optimally, especially if not designed responsively.

6. Manual Data Preprocessing:

Initial data cleaning, renaming, and transformation were done manually using Python or within Tableau, which might be error-prone at scale.

9.Conclusion:

The project "Visualizing Housing Market Trends: An Analysis of Sale Prices and Features using Tableau" successfully demonstrates how complex real estate data can be transformed into meaningful, interactive visual insights. By leveraging Tableau's powerful visualization capabilities, we have made it easier for buyers, sellers, investors, and analysts to understand the key factors influencing house prices. Our dashboard enables quick comparisons based on features like number of bedrooms, renovations, house age, and geographic location. The integration with Flask provides a seamless web interface, enhancing accessibility and usability. Overall, this project bridges the gap between raw housing data and strategic real estate decision-making, allowing users to gain actionable insights with minimal technical expertise.

10.Future scope:

1. Live Data Integration:

Future versions can integrate live property listings or transaction data via APIs or real-time databases to provide up-to-date market insights.

2. Machine Learning Forecasting:

Incorporating regression models or time-series forecasting can help predict future housing prices based on historical trends and features.

3. Rental Market Visualization:

Extend the dashboard to include rental data analysis, enabling a broader comparison between buying vs. renting decisions.

4. Mobile Optimization:

Responsive design enhancements can be implemented to ensure the dashboard performs well across tablets and smartphones.

5. Advanced User Access Control:

By using Tableau Server or Tableau Online, dashboards can be secured with role-based access for different stakeholders.

6. Location Intelligence Enhancements:

Integration of geospatial data, satellite maps, or demographic overlays can improve locationbased insights (e.g., school zones, crime rates).

7. Recommendation Engine:

Develop a recommendation system to suggest optimal property types using user-input filters.

11. Appendix

Dataset Link

https://drive.google.com/file/d/1p1uuGWuafO6CqH6gqt6STzEP7HnGzewC/view?usp=drive_link

Project Demo Video Link https://drive.google.com/file/d/1SVm7rb_-DgR26NIdZRQMYYhdklqA3kHE/view?usp=drive_link

GitHub Repository Link

<https://github.com/sreeyamuna198/Visualizing-Housing-Market-Trends-an-analysis-of-sale-prices-and-features-using-tableau>