Project Report

Team ID	LTVIP2026TMIDS38740
Project Name	Visualizing Housing Market Trends: An Analysis of Sale Prices and Features using Tableau

Index / Table of Contents

11. APPENDIX
- ▪ Source Code (if any)
- ▪ Dataset Link
- ▪ GitHub & Project Demo Link

🔷 1. INTRODUCTION

📌 1.1 Project Overview

The project titled:
🎯 "Visualizing Housing Market Trends: An Analysis of Sale Prices and Features using Tableau" aims to convert raw housing data into insightful, interactive visuals for real estate analysis.

This project explores:

- 🏠 Years Since Renovation
- 🛏️ Number of Bedrooms
- 🛁 Number of Bathrooms
- □ Number of Floors
- 🧮 House Age
- 💰 Sale Price Distributions

💡 The tool of choice is Tableau, supported optionally by Excel or Python for data preparation. Using dashboards and storytelling features, the system delivers clear, navigable insights that help users make informed decisions based on real housing market trends.

📊 The output includes:

- Interactive dashboards
- Story-based narratives
- Dynamic filters and charts
- Visual exploration of pricing behavior and buyer preferences

📌 1.2 Purpose

The purpose of this project is to:

✓ Provide an engaging visual interface to explore housing market data
✓ Identify how renovations and property features influence sale prices
✓ Visualize age-based sales distributions and renovation patterns
✓ Deliver clear, impactful insights using Tableau dashboards and stories

📈 By turning complex data into understandable visuals, the project enhances decision-making for:

- Real estate analysts
- Marketing teams
- Business executives

🔷 2. IDEATION PHASE

2.1 Problem Statement

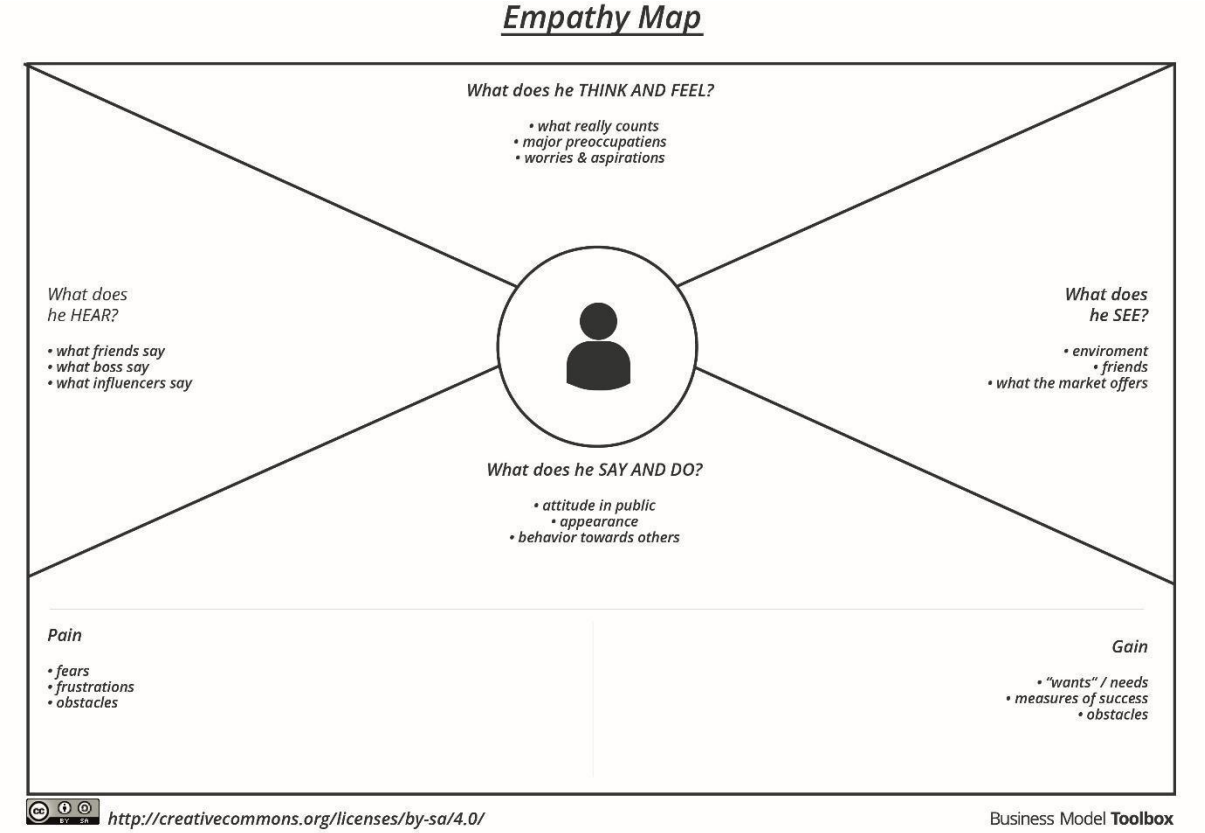
I am	Describe customer with 3-4 key characteristics - *who are they?*	Describe the customer and their attributes here
I'm trying to	*List their outcome or "job" the care about - what are they trying to achieve?*	List the thing they are trying to achieve here
but	Describe what problems or barriers stand in the way – *what bothers them most?*	Describe the problems or barriers that get in the way here
because	Enter the "root cause" of why the problem or barrier exists – *what needs to be solved?*	Describe the reason the problems or barriers exist
which makes me feel	Describe the emotions from the customer's point of view – *how does it impact them emotionally?*	Describe the emotions the result from experiencing the problems or barriers

Problem Statement (PS)	I am (Customer)	I'm trying to …	But …	Because …	Which makes me feel …
PS-1	a real-estate analyst at ABC Company	understand how renovation age affects sale prices	the data is too large to interpret manually	I don't have an intuitive visual tool	*frustrated* and unsure about pricing
PS-2	a marketing executive at ABC Company	identify which house features buyers value most	raw sales reports don't show patterns	spreadsheets don't highlight trends	*lost* and uncertain how to target promotions

---

2.2 Empathy Map Canvas

(Primary user = Real-estate analyst / marketing executive)

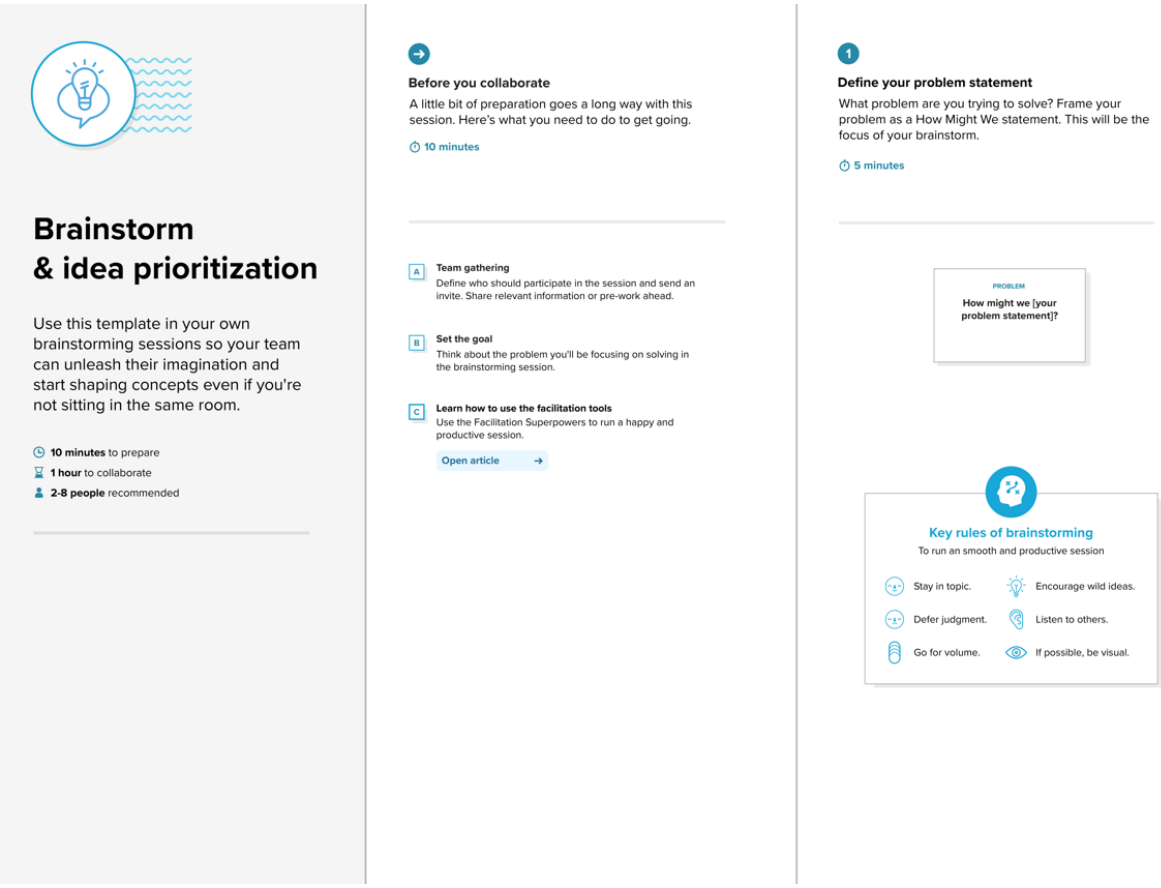


Section	Key Insights
Says	"We need clear insights into what drives house prices." "I want to compare renovated vs. non-renovated properties visually."
Thinks	"Is our pricing aligned with market trends?" "What hidden patterns are we missing?"
Does	Relies on Excel reports, manual trend spotting, and occasional ad-hoc charts.
Feels	Frustrated by unclear data; eager for confidence when presenting insights; curious about better tools.
Sees	Huge CSV files and basic, hard-to-read charts; spots opportunities for better storytelling.
Hears	Executives demanding smarter pricing models; marketing teams asking for buyer-preference data.

Section	Key Insights
Pains	Time-consuming manual analysis; lack of interactive visuals; difficulty persuading stakeholders.
Gains	Interactive dashboards for rapid decisions; data-driven insights on housing trends; stronger pricing & renovation strategy.

2.3 Brainstorming & Idea Prioritization

Step 1 – Team Gathering & Problem Selection



Final Problem:
"To analyze and visualize key trends affecting housing sale prices and features using Tableau, enabling stakeholders to make informed pricing, renovation, and investment decisions."

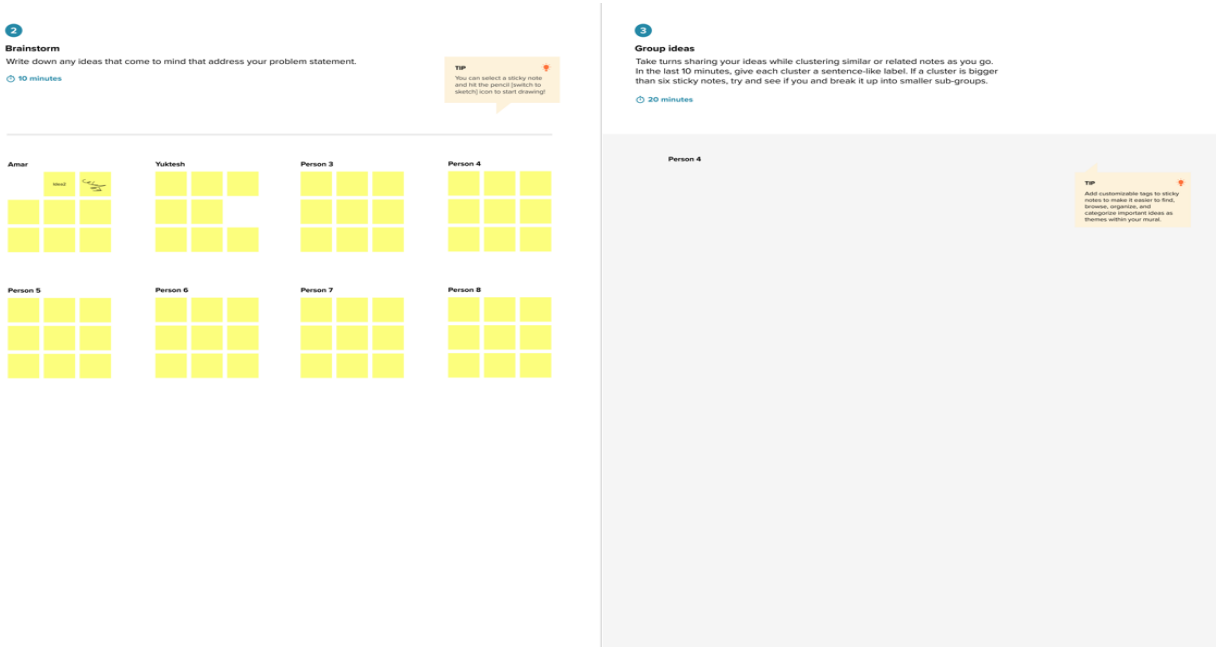
Step 2 – Idea Listing & Grouping

Raw Ideas

- Compare total sales by *years since renovation*
- Show house-age distribution vs. bathrooms, bedrooms, floors
- Visualize average sale price for key categories
- Display renovation-status distribution
- Pie chart: house age × renovation status
- Histogram: sale-price bins
- Summary KPI dashboard (records, avg price, total area)
- Explore renovation influence on price & age

Grouped Categories

1. 🏠 **Housing Characteristics** – age, bedrooms, bathrooms, floors, renovation status
2. 📊 **Visualization Methods** – histogram, pie, grouped bar, KPI overview
3. 📈 **Business Insights** – renovation impact, age-based market preference, sales trends



Step 3 – Idea Prioritization

Criteria: 💡 **Stakeholder Value** & 🔧 **Tableau Feasibility**

Priority Rank	Selected Idea
1	Visualize **total sales by years since renovation**

Priority Rank	Selected Idea
2	Pie chart – **house-age distribution by renovation status**
3	Grouped bar – **house age vs. bathrooms, bedrooms, floors**
4	KPI dashboard – **total records, avg price, total basement area**

These high-impact, feasible ideas became the backbone of the final Tableau dashboard and story.

🔷 3. REQUIREMENT ANALYSIS

📌 3.1 Customer Journey Map

The journey of a real estate analyst, from receiving raw sales data to deriving insights, is outlined below:

1 Raw Dataset: CSV file is provided (21613 records)
2 Preprocessing: Analyst cleans nulls, formats date columns, derives age & renovation fields
3 Visualization: Charts are created in Tableau (histograms, bar graphs, pie charts, KPIs)
4 Publishing: Dashboards and stories are published to Tableau Public
5 User Access: Stakeholders explore interactive insights, download reports, and use filters

🎯 Goal: Enable real estate professionals to explore data visually and answer key questions about renovation impact, house features, and pricing trends.

📌 3.2 Solution Requirements

 Functional Requirements

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data Upload	Upload housing dataset in CSV format
FR-2	Data Preprocessing	Clean null values, format columns, categorize variables
FR-3	Visualization	Create interactive dashboards using Tableau
FR-4	Filtering & Interactivity	Enable year-based and feature-based filters
FR-5	Dashboard Sharing	Publish dashboards to Tableau Public
FR-6	Report Generation	Export screenshots and insights as PDF

🛡 Non-Functional Requirements

NFR No.	Requirement	Description
NFR-1	Usability	Dashboards should be intuitive and user-friendly
NFR-2	Security	Protect data by anonymizing and securing links
NFR-3	Reliability	Dashboards must load properly without errors
NFR-4	Performance	Load time should be < 5 seconds
NFR-5	Availability	Dashboards available 24/7 via Tableau Public
NFR-6	Scalability	Should handle larger datasets in the future

---

📌 3.3 Data Flow Diagram

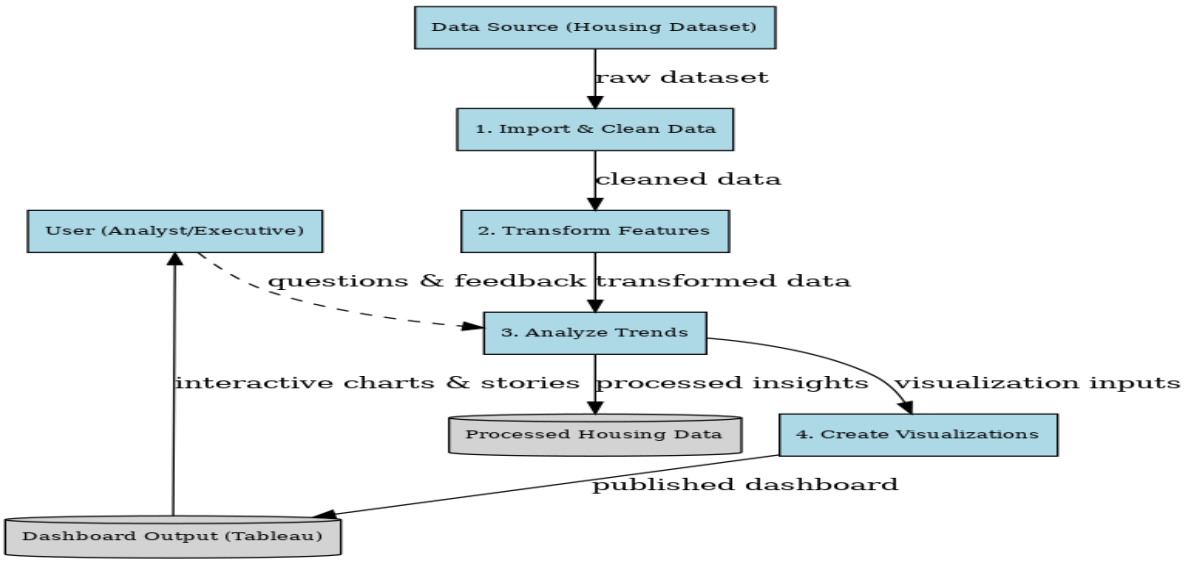
 Flow Summary:

1. 📥 Raw CSV dataset is uploaded into Tableau
2. Data is preprocessed: cleaned, transformed, calculated (age, renovation, etc.)
3. 📊 Charts and dashboards are created (bar, pie, histogram, etc.)
4. 🌐 Dashboards are published to Tableau Public
5. 👤 Stakeholders explore, filter, and download insights

🖼 DFD Entities:

- Source: Housing Sales Dataset (.csv)
- Processing: Excel or Tableau Prep (optional)
- Tool: Tableau Desktop
- Output: Visual Dashboards
- End Users: Analysts, Executives, Marketing

Example: DFD Level 0 (Industry Standard)



Flow Diagram:

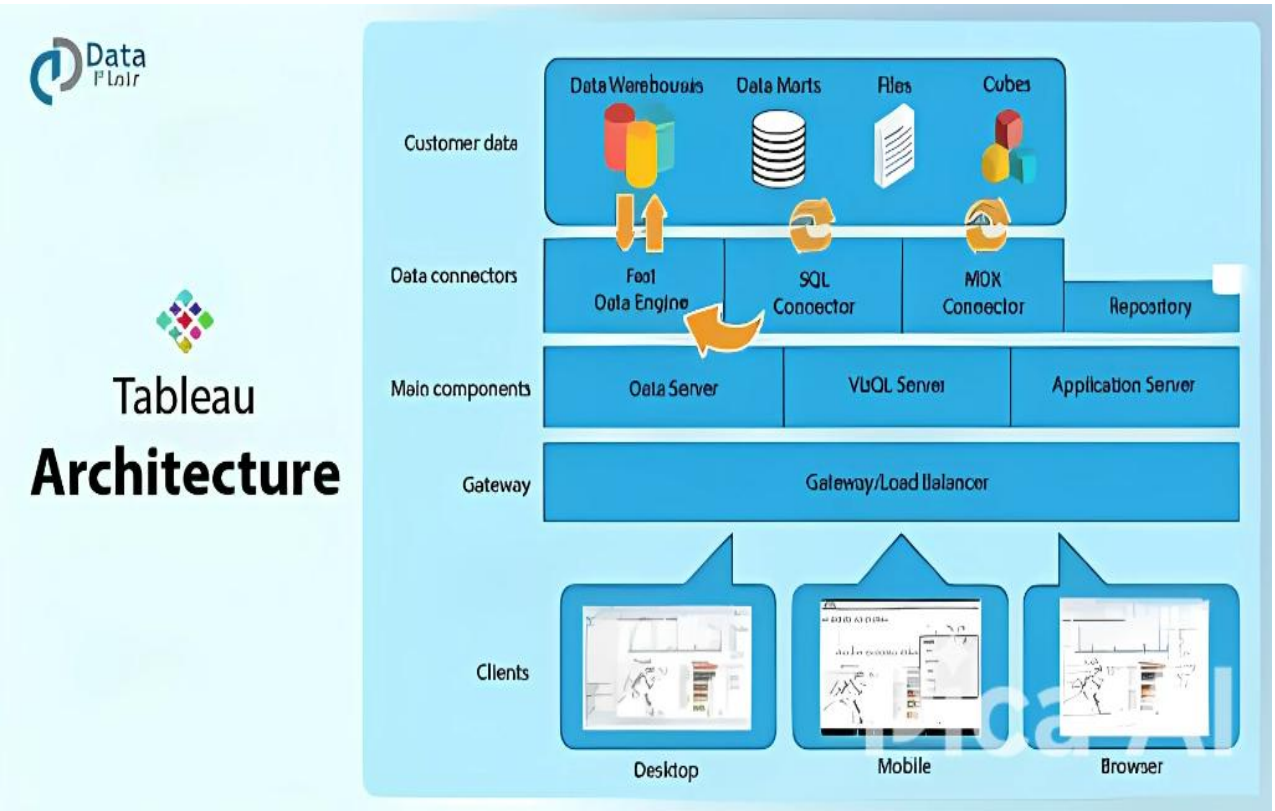
User Stories

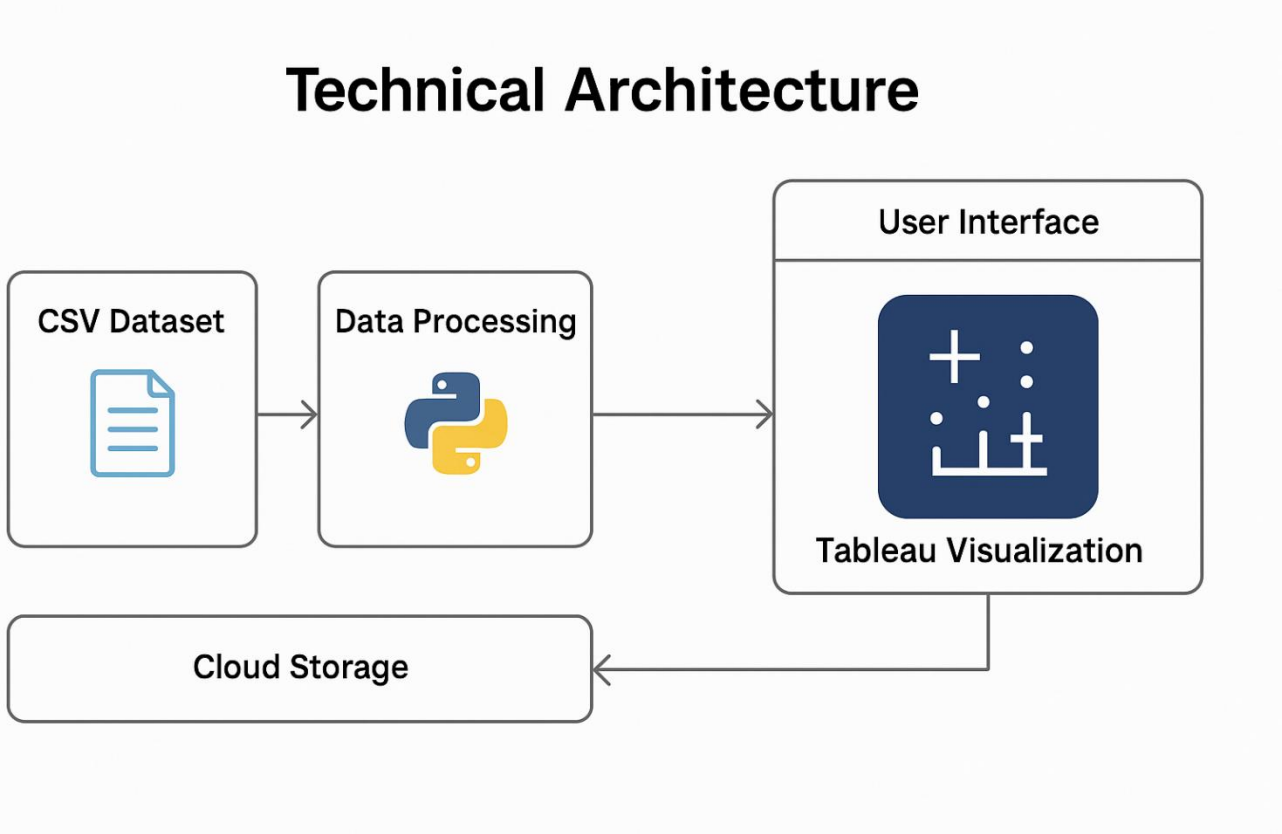
📋 User Stories Table (For Tableau Dashboard Project):

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority
Analyst (Dashboard User)	View Sales Overview	USN-1	As an analyst, I want to view the average sale price and total house area so I can understand market size.	I can see KPIs like Avg Price and Total Basement Area in a single overview chart.	High
Analyst (Dashboard User)	View Sales Overview	USN-1	As an analyst, I want to view the average sale price and total house area so I can understand market size.	I can see KPIs like Avg Price and Total Basement Area in a single overview chart.	High
Analyst (Dashboard User)	Renovation Insights	USN-2	As an analyst, I want to compare total sales based on years since renovation to understand value impact.	I can view a histogram of sales vs. renovation years.	High
Analyst (Dashboard User)	House Feature Distribution	USN-3	As an analyst, I want to explore house age grouped by number of bathrooms and floors.	I can view a grouped bar chart showing house age by floors, bathrooms, and bedrooms.	Medium
Marketing Executive	Understand Buyer Trends	USN-4	As a marketing exec, I want to visualize renovation trends to target potential customers.	I can use the pie chart to see what percent of houses are old, renovated, or new.	Medium
Admin (Dashboard Publisher)	Publish Dashboard	USN-5	As an admin, I want to upload dashboards to Tableau Public for stakeholder access.	I can publish the workbook and share the Tableau Public link.	High
Analyst (Dashboard User)	Filter Data by Year	USN-6	As an analyst, I want to filter dashboards by year or house age.	I can use filter controls to dynamically adjust views.	High
Executive	Export Visual Reports	USN-7	As an executive, I want to download and share charts with my team.	I can export visuals as images or PDFs from Tableau.	Medium
Analyst (Dashboard User)	House Feature Distribution	USN-3	As an analyst, I want to explore house age grouped by number of bathrooms and floors.	I can view a grouped bar chart showing house age by floors, bathrooms, and bedrooms.	Medium
Marketing Executive	Understand Buyer Trends	USN-4	As a marketing exec, I want to visualize renovation trends to target potential customers.	I can use the pie chart to see what percent of houses are old, renovated, or new.	Medium

📌 3.4 Technology Stack

 Technical Architecture Overview:





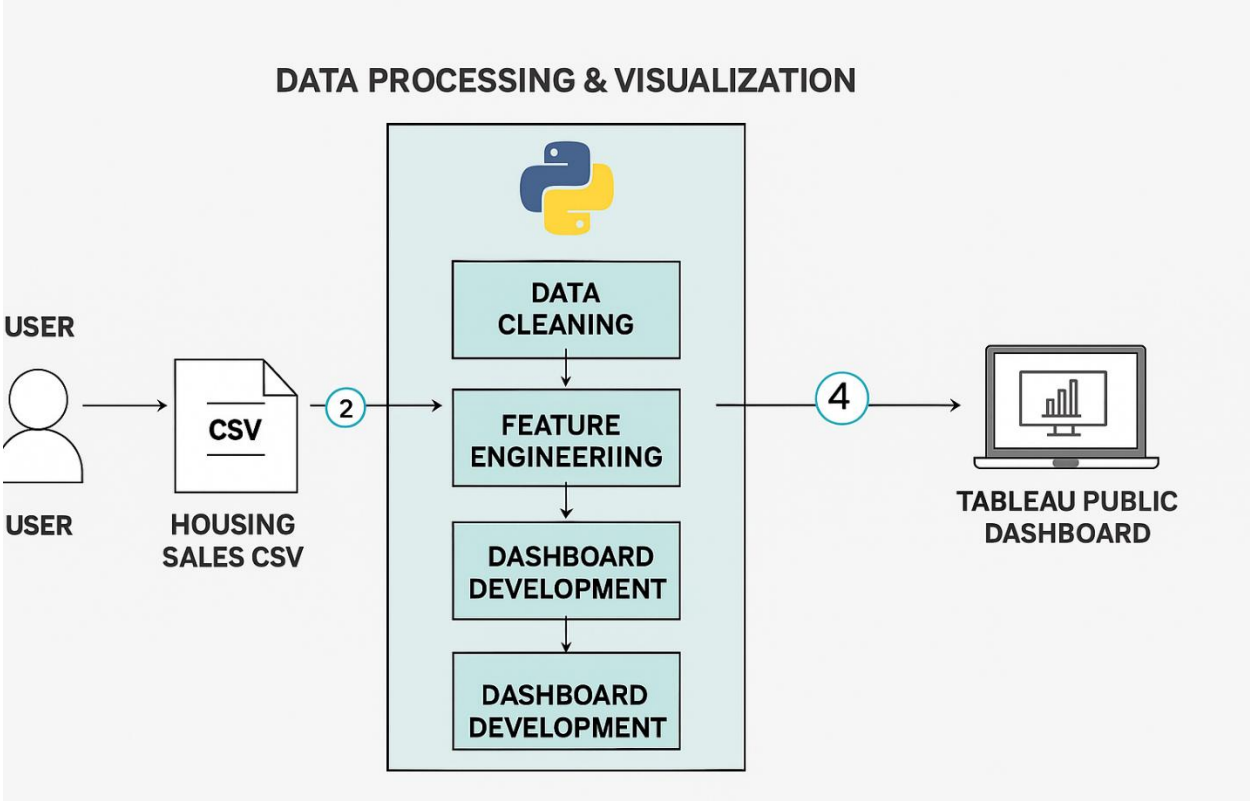
1. 🎁 CSV File Input (Housing Dataset)
2. □ Data Cleaning & Preparation (Excel / Python / Tableau Prep)
3. 📊 Dashboard Creation (Tableau Desktop)
4. 🌐 Hosting (Tableau Public)
5. 📸 Reporting (Screenshots exported as PNG/PDF)
6. 🔗 Sharing (Dashboard and Story links via Tableau Public)

□ Architecture Summary Table:

Component	Description	Technology Used
User Interface	Dashboard & Story Interface	Tableau Dashboard
Data Preprocessing	Cleaning, formatting, and calculations	Excel / Python / Tableau Prep
Visualization Engine	Creates visualizations and interactivity	Tableau Desktop
Dashboard Hosting	Publishes and shares final product	Tableau Public
File Storage	Screenshots, workbook files	Local File System / GitHub

✅ Characteristics:

Trait	Explanation	Tools / Tech Used
Open-source Frameworks	Uses publicly available tools (Tableau Public)	Tableau Public, Excel
Performance	Optimized dashboard loading and interaction	Tableau rendering engine
Availability	Always accessible through shareable links	Tableau Public
Security	No sensitive PII in dataset; public links	Anonymized CSV, Public URLs
Scalability	Capable of adapting to larger or future datasets	Tableau filter & grouping



🔷 4. PROJECT DESIGN

📌 4.1 Problem–Solution Fit

A successful project begins with identifying a real customer need and aligning the solution to address it clearly and effectively. This section outlines the Problem–Solution Fit for our housing market visualization project.

 Purpose of Problem–Solution Fit:

- ✓ Solve real problems using tools the customer already uses or trusts
- 🚀 Accelerate solution adoption through intuitive design
- 💬 Sharpen messaging with visuals instead of text-heavy data
- Build trust by solving recurring frustrations and improving efficiency
- 🔍 Understand pain points and craft better data experiences

📋 Problem–Solution Canvas:

Category	Description
🎯 Customer Segment	Real estate analysts, marketing teams, company executives
❗ Key Problem(s)	Difficulty understanding how house features & renovations affect pricing
Why it's a problem	Leads to inaccurate pricing, poor targeting, and loss of market advantage
Existing Alternatives	Manual spreadsheet analysis, static reports, lack of interactive insights
💡 Your Solution	Tableau dashboards that visualize renovation impact, price distribution, and house features
✅ Main Benefit	Clear, visual, interactive insights that support faster, more accurate decisions
📈 Success Criteria	Improved pricing strategy, stakeholder clarity, increased use of dashboards

Template:

📚 References:

1. https://www.ideahackers.network/problem-solution-fit-canvas/
2. https://medium.com/@epicantus/problem-solution-fit-canvas-aa3dd59cb4fe

---

📌 4.2 Proposed Solution

To address the data interpretation challenges in the housing industry, we developed a solution based on visual analytics using Tableau.

📝 Description:

- ✅ Import housing sales data (CSV format)
- ✅ Clean and prepare the dataset (Excel, Tableau Prep, Python optional)
- ✅ Design a suite of visualizations: bar charts, histograms, KPIs, pie charts
- ✅ Build interactive dashboards for executives and analysts
- ✅ Create a story flow that captures renovation, pricing, and age distribution insights
- ✅ Publish all results to Tableau Public for universal access

The proposed solution combines business value with technical feasibility, emphasizing usability and clarity for all non-technical stakeholders.

📌 4.3 Solution Architecture

Solution architecture bridges business problems with appropriate technical tools and defines the flow from raw data to strategic insight. This project's architecture ensures scalability, performance, and clarity for users.

🎯 Objectives:

- ✅ Choose tools that simplify data storytelling (e.g., Tableau, Excel, CSV)
- ✅ Show clear flow from data upload → visualization → stakeholder usage
- ✅ Provide an accessible, self-service reporting platform

🧩 Solution Flow:

1️⃣ Data Collection
Raw housing sales data is sourced in CSV format with 21 fields and 21,613 rows.

2️⃣ 🧹 Data Cleaning (Optional)
Null values are removed and fields such as age, renovation status, and sale price bins are created (via Excel or Python).

3️⃣ 📊 Tableau Processing
The cleaned data is imported into Tableau Desktop. Visualizations are built using Show Me, filters, calculated fields, and bins.

4️⃣ 📈 Dashboard Compilation
Charts are organized into multiple dashboards with filters, annotations, and labels.

5️⃣ ☁️ Publication
The final packaged workbook (.twbx) is published to Tableau Public.

6️⃣ 👥 Stakeholder Access
Executives and analysts explore dashboards and download visuals using shareable Tableau links.

📌 Architecture Overview (Text Summary):

Stage	Description	Tool Used
Data Input	Raw dataset in CSV format	Excel / CSV
Preprocessing	Cleanup, feature creation	Python / Excel
Visualization Building	Charts, filters, dashboards	Tableau Desktop
Hosting	Online dashboard access	Tableau Public

Stage	Description	Tool Used
Export & Reporting	PDF/PNG report generation	Tableau Screenshot
Sharing	Public URL sharing	Tableau Public

🖼

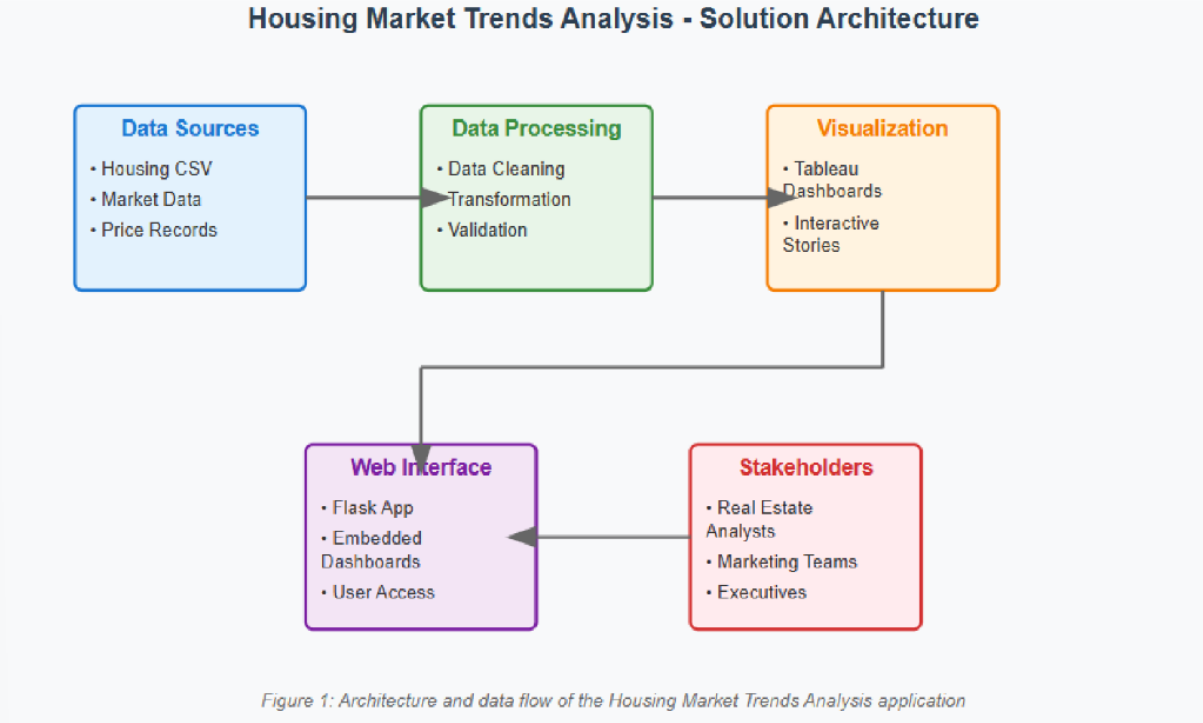


Figure 1: Architecture and data flow of the Housing Market Trends Analysis application

---

🔷 5. PROJECT PLANNING & SCHEDULING

📌 5.1 Project Planning

🏭 Product Backlog, Sprint Schedule & Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Assigned To
Sprint-1	Data Preparation	USN-1	Upload housing dataset in CSV format	3	High	TL
Sprint-1	Data Cleaning	USN-2	Clean and prepare the dataset for use in Tableau	4	High	M2

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Assigned To
Sprint-1	Visualizations	USN-3	Create bar, pie, and donut charts for sales trends	5	High	M3
Sprint-2	Filter Integration	USN-4	Apply filters (top-N, price range, age) in the dashboard	4	Medium	M2
Sprint-2	Story Creation	USN-5	Build a Tableau story with scenes, titles, and captions	5	High	TL
Sprint-2	Dashboard Publishing	USN-6	Publish the dashboard to Tableau Public and generate a link	3	High	M3
Sprint-3	Performance Testing	USN-7	Test dashboard performance with filters and load	4	Medium	TL
Sprint-3	Screenshot & Documentation	USN-8	Capture screenshots and export insights for the final report	4	Medium	M2
Sprint-3	GitHub Folder Setup	USN-9	Organize files and submit using required folder structure	4	High	M3
Sprint-4	Final Review	USN-10	Review and validate all content before submission	6	High	All 3
Sprint-4	Video Demo	USN-11	Record walkthrough demo of the dashboard and upload	6	High	TL + M3

 Project Tracker & Velocity

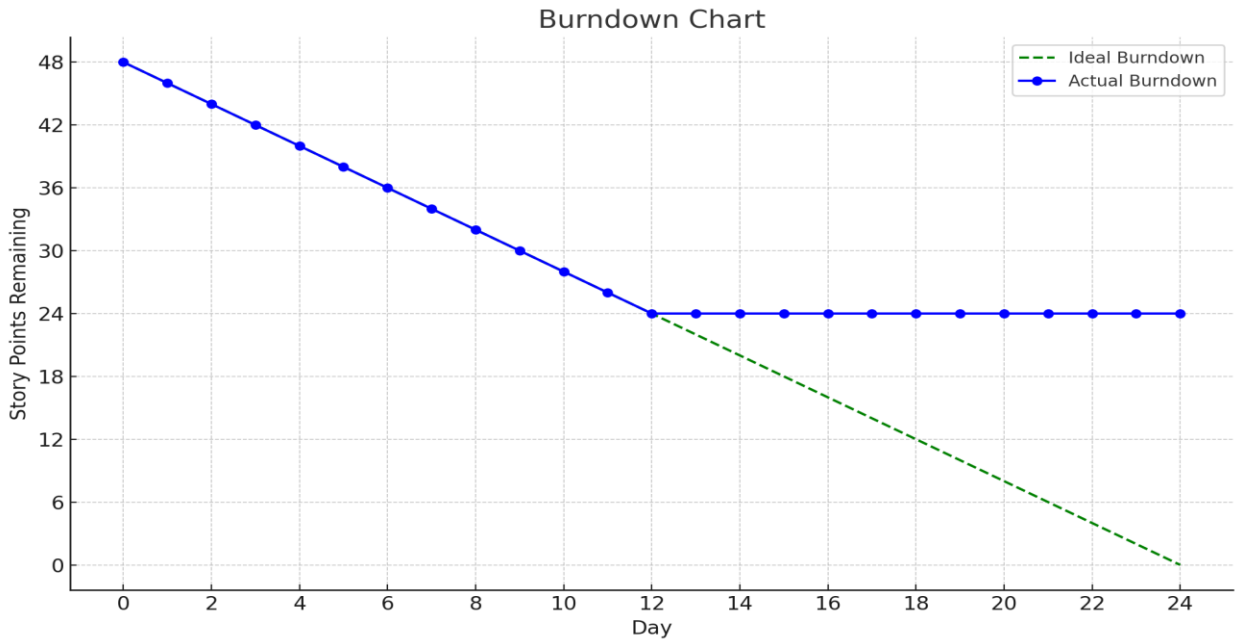
Sprint	Total Story Points	Duration	Start Date	End Date	Story Points Completed	Sprint Release Date
Sprint-1	12 SP	6 Days	20 Jan 2025	25 Jan 2025	12 SP	25 Jan 2025
Sprint-2	12 SP	6 Days	26 Jan 2025	1 Feb 2025	12 SP	1 Feb 2025
Sprint-3	12 SP	6 Days	2 Feb 2025	7 Feb 2025	-	-

Sprint	Total Story Points	Duration	Start Date	End Date	Story Points Completed	Sprint Release Date
Sprint-4	12 SP	6 Days	8 Feb 2025	13 Feb 2025	-	-

📈 Velocity Calculation:

- AV = Total Completed Story Points ÷ Number of Days
- AV = 24 ÷ 12 = ✅ 2 SP/day

📉 Burndown Chart:
A burn down chart was tracked per sprint to visualize progress vs. remaining work.



📌 The green dashed line shows the Ideal Burndown (smooth reduction over 24 days).

🟢 The blue line represents Actual Burndown:

- Story points completed in Sprint-1 and Sprint-2 (24 points total),
- No progress yet in Sprint-3 and Sprint-4 (flat line after day 12)

📌 Reference:

- https://www.visual-paradigm.com/scrum/scrum-burndown-chart/

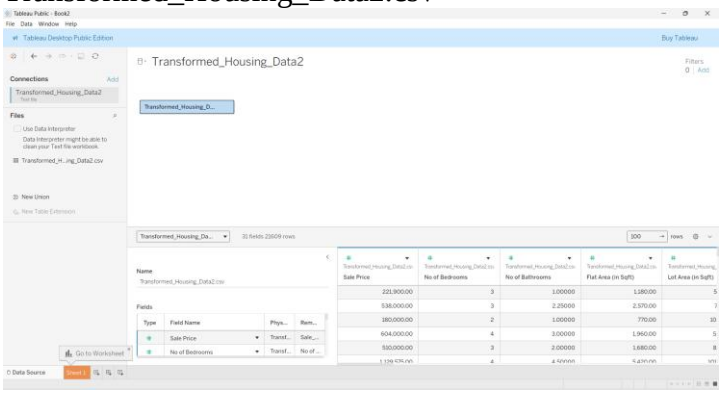
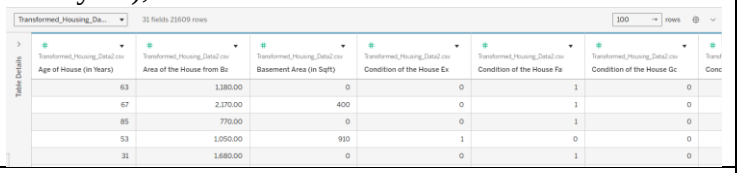
- https://www.atlassian.com/agile/tutorials/burndown-charts

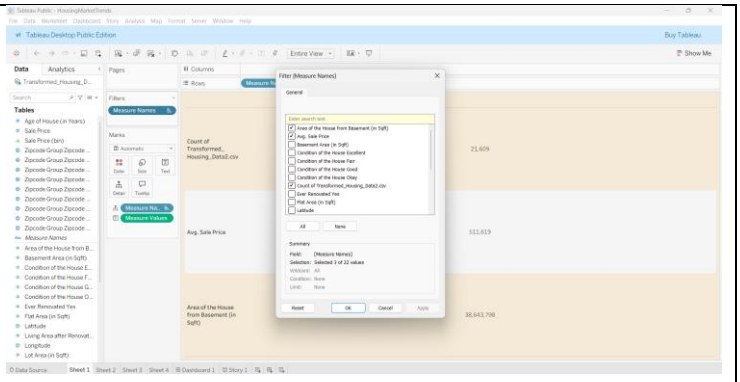
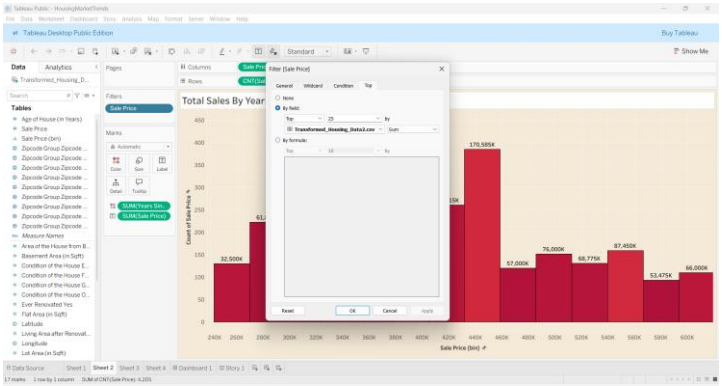
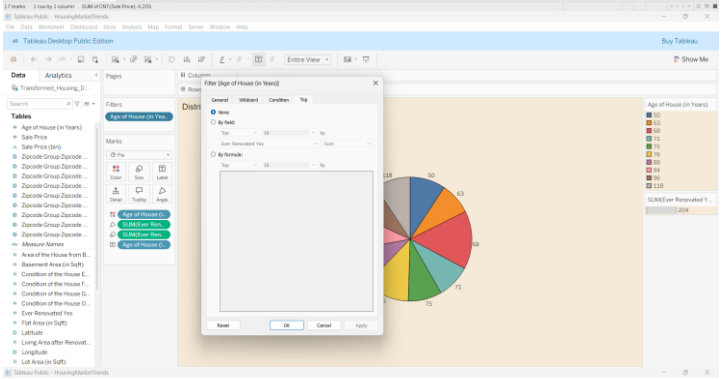
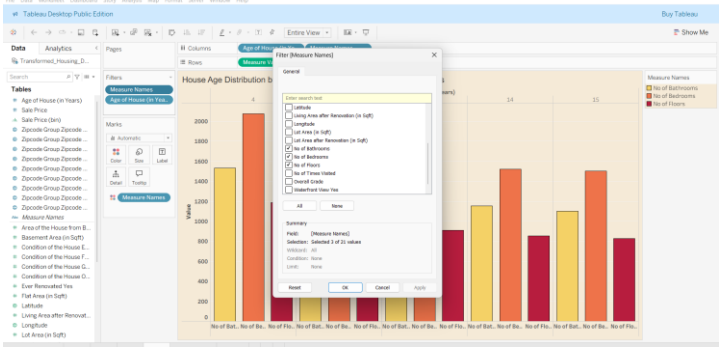
🔷 6. FUNCTIONAL AND PERFORMANCE TESTING

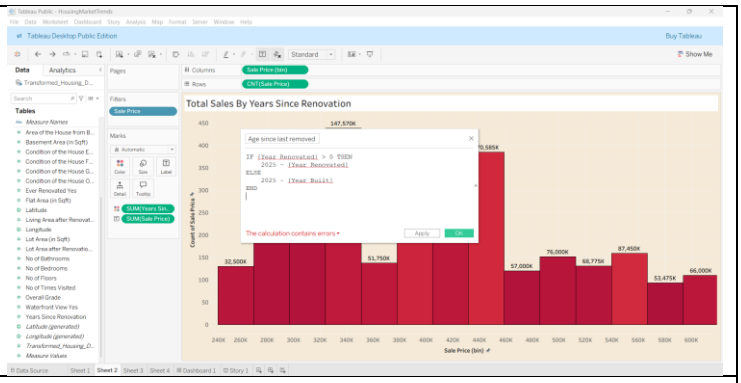
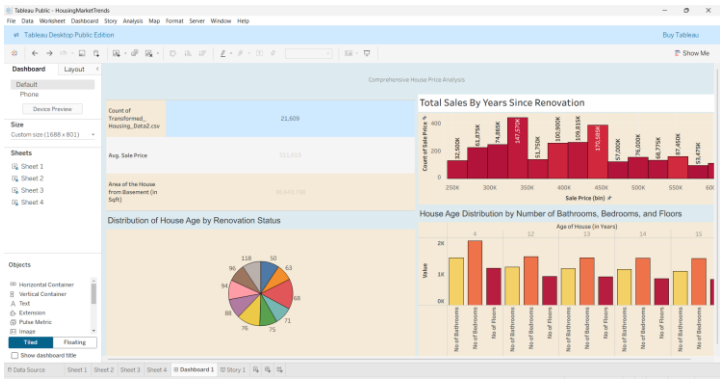
📌 6.1 Model Performance Testing

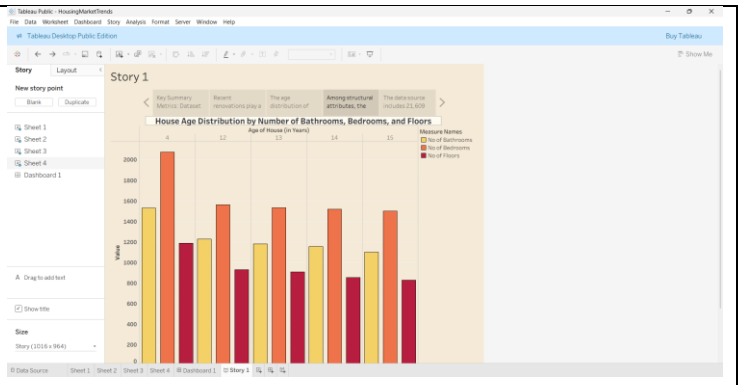
Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Screenshot / Values
1	Data Rendered	Full dataset with 21 columns and 21613 rows from Transformed_Housing_Data2.csv 
2	Data Preprocessing	Handled missing values, converted types (e.g., age from year), created bins 
3	Utilization of Filters	Used Top N filters (e.g., Sale Price), categorical filters (Bedrooms, Renovation)

		   
4	Calculation Fields Used	- Years Since Renovation - House Age - Sale Price Bins (Histogram logic)

		
5	Dashboard Design	6 Visualizations: • Count Summary • Avg Sale Price • Basement Area • Histogram by Renovation • Pie Chart (Age vs Renovation) • Grouped Bar (Age vs Features)  Link: https://public.tableau.com/views/HousingMarketTrends_17511035380890/Dashboard1?:language=en-US&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link
6	Story Design	6 Story Scenes (one for each visualization with captions and interpretation)

		 Link: https://public.tableau.com/views/HousingMarketTrends_17511035380890/Dashboard1?:language=en-US&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

---

🔷 7. RESULTS

📌 7.1 Output Screenshots

The Tableau dashboard was successfully developed with six distinct visualizations, arranged into both individual views and a cohesive story presentation.

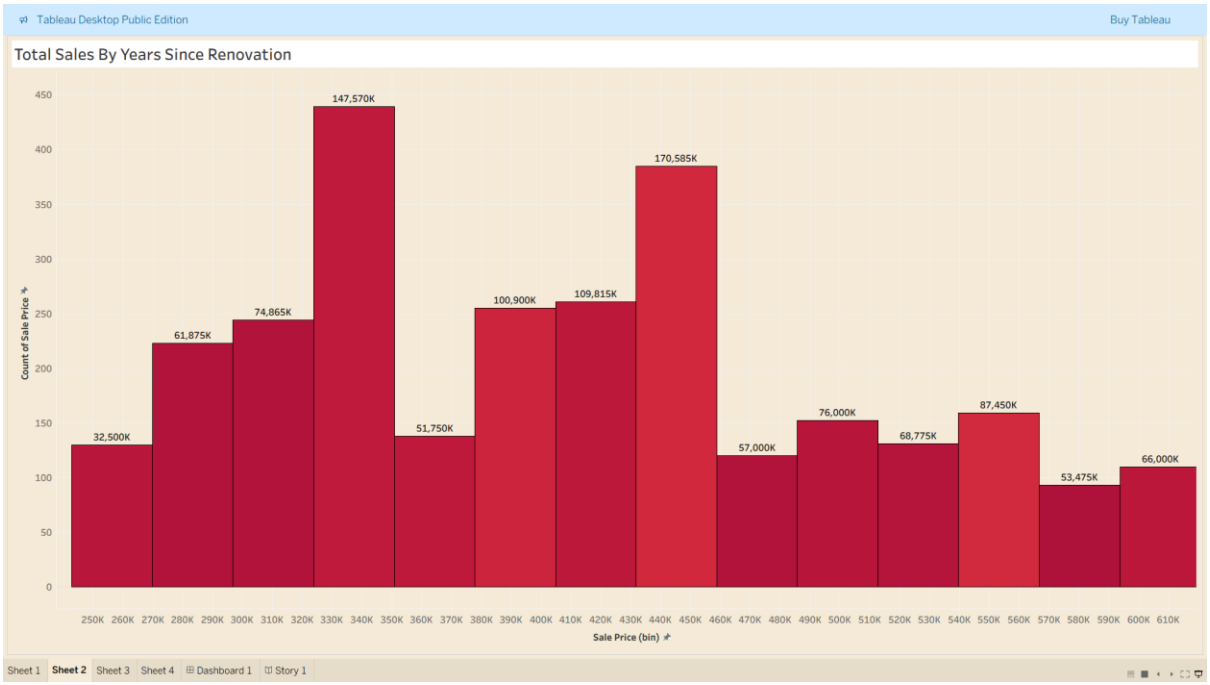
🖼 Output Visuals:

 1. Summary Metrics – Count, Average Sale Price, Basement Area
Filename: Summary_Metrics_Overview.png
Includes:

- Activity 1.1: Count of Transformed Housing Records
- Activity 1.2: Average Sale Price
- Activity 1.3: Total Area from Basement (in Sqft)

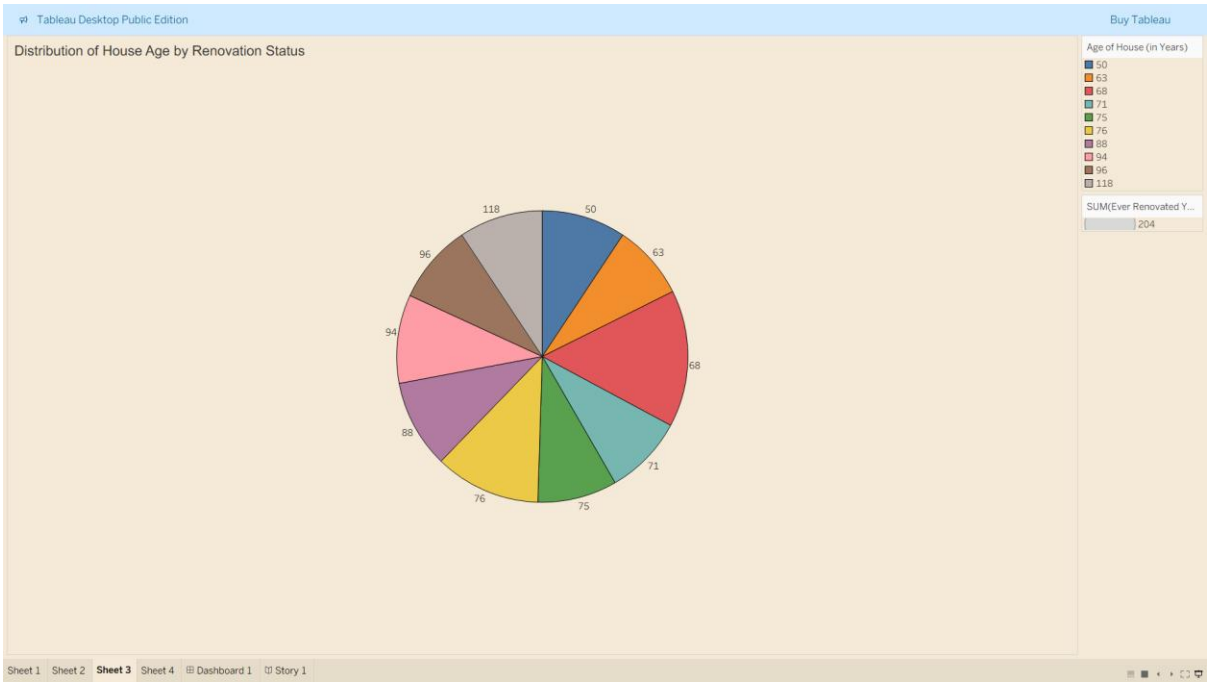
  📝 Caption: This summary view provides an overview of dataset size, financial metrics, and house size to establish analytical context.

📊 2. Total Sales by Years Since Renovation
Filename: Sales_By_Renovation_Histogram.png
📝 Caption: A histogram showing how sale price distribution varies based on the number of years since renovation. Useful for renovation impact analysis.

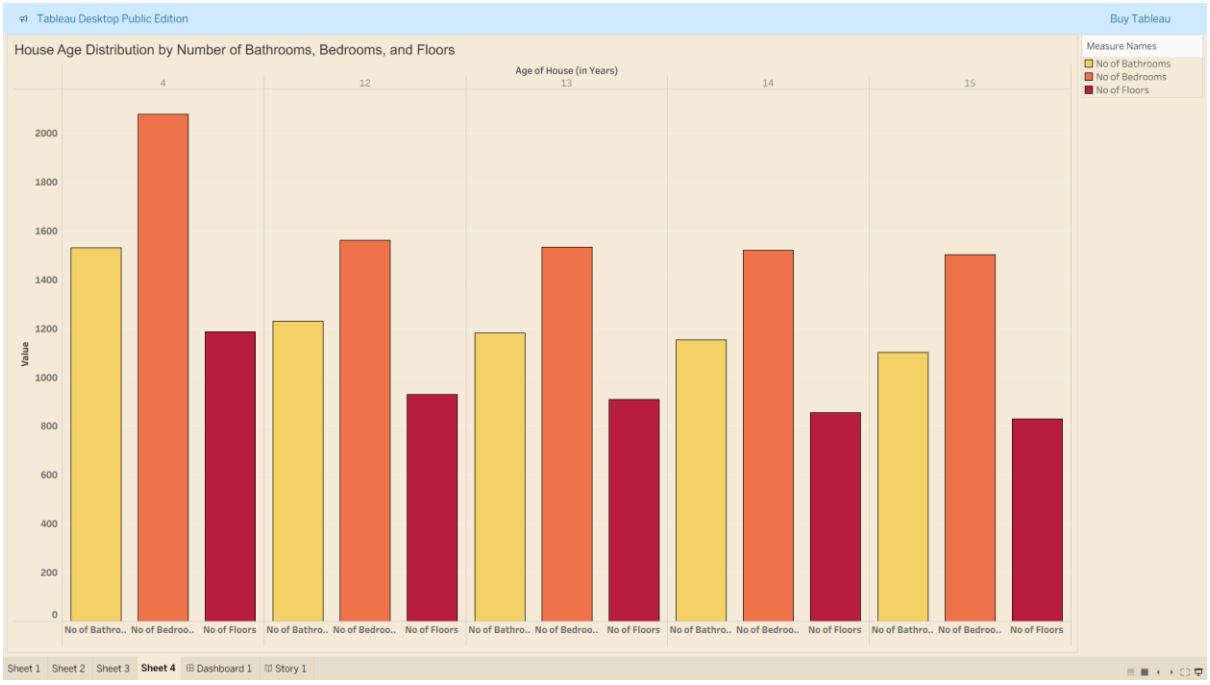


📈 3. House Age Distribution by Renovation Status
Filename: Age_Renovation_PieChart.png

📝 Caption: A pie chart displaying the percentage of houses grouped by age and renovation status, providing insights into property lifecycle trends.



🏠 4. House Age vs. Bathrooms, Bedrooms, and Floors
Filename: Feature_Age_Distribution_BarChart.png
📝 Caption: A grouped bar chart mapping house age with key structural attributes. Reveals how feature count correlates with house age.



 5. Final Dashboard View
Filename: Final_Dashboard_Full.png
📝 Caption: This interactive Tableau dashboard compiles all the above visualizations, complete with filters and tooltips for user interaction.

📖 6. Tableau Story Screens
Filename: Tableau_Story_Scenes.png
📝 Caption: The story view walks users through each visualization in a narrative format with titles and captions, ideal for stakeholder presentation.


Tableau Desktop Public Edition
Buy Tableau
Story 1
Key Summary Metrics: Dataset
Recent renovations play a
The age distribution of
Among structural attributes, the
The data source includes 21,609
Count of Transformed_ Housing_Data2.csv
21,609
Avg. Sale Price
511,619
Area of the House from Basement (in Sqft)
38,643,798
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Dashboard 1
Story 1

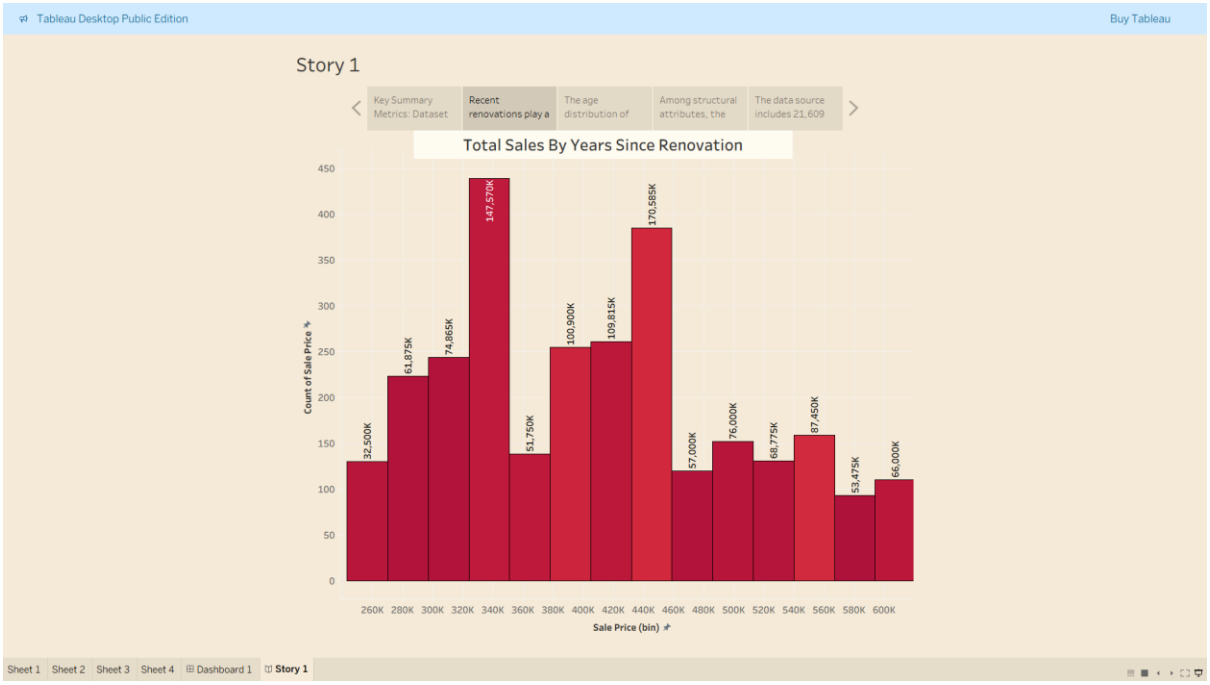


Tableau Desktop Public Edition
Buy Tableau
Story 1
Key Summary Metrics: Dataset
Recent renovations play a
The age distribution of
Among structural attributes, the
The data source includes 21,609
Total Sales By Years Since Renovation
Count of Sale Price
Sale Price (bin)
32,500K
61,875K
74,865K
147,570K
51,750K
100,900K
109,815K
170,585K
57,000K
76,000K
68,775K
87,450K
53,475K
66,000K
260K 280K 300K 320K 340K 360K 380K 400K 420K 440K 460K 480K 500K 520K 540K 560K 580K 600K
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Dashboard 1
Story 1


Tableau Desktop Public Edition
Buy Tableau
Story 1
Key Summary Metrics: Dataset
Recent renovations play a
The age distribution of
Among structural attributes, the
The data source includes 21,609
Distribution of House Age by Renovation Status
Age of House (in Ye..
50
63
68
71
75
76
88
94
96
118
Ever Renovated Yes
204
118
50
63
96
94
68
88
71
76
75
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Dashboard 1
Story 1

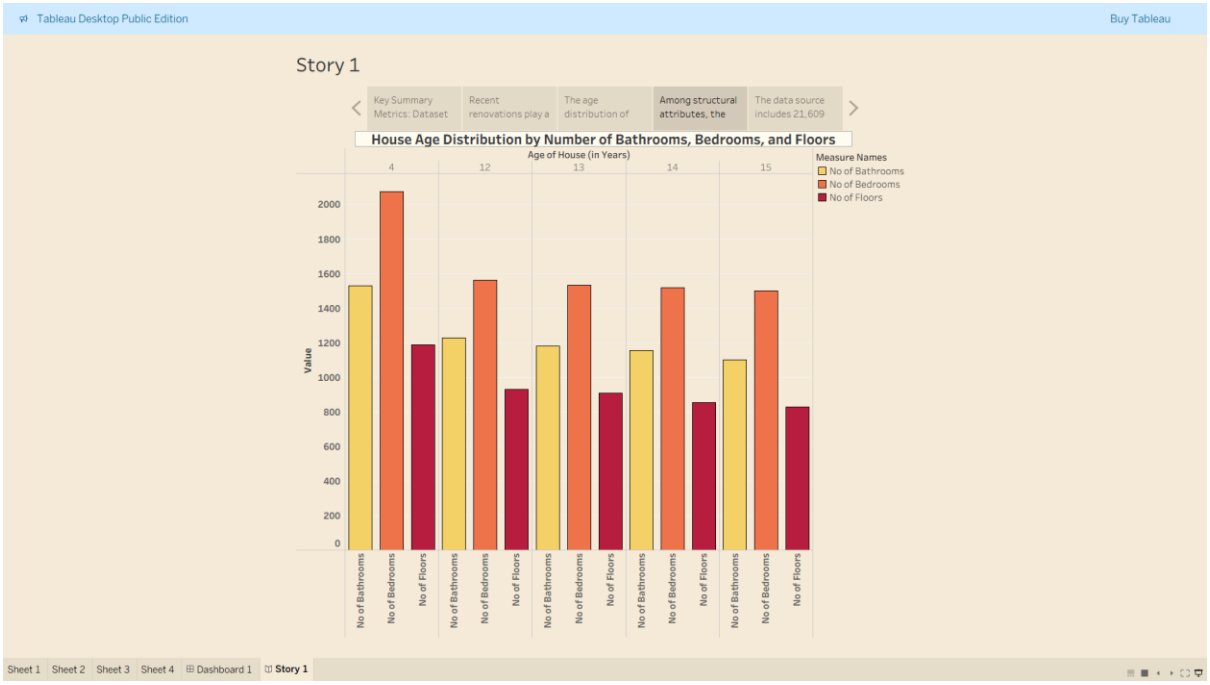


Tableau Desktop Public Edition
Buy Tableau
Story 1
Key Summary Metrics: Dataset
Recent renovations play a
The age distribution of
Among structural attributes, the
The data source includes 21,609
House Age Distribution by Number of Bathrooms, Bedrooms, and Floors
Age of House (in Years)
4
12
13
14
15
Measure Names
No of Bathrooms
No of Bedrooms
No of Floors
Value
2000
1800
1600
1400
1200
1000
800
600
400
200
0
No of Bathrooms
No of Bedrooms
No of Floors
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Dashboard 1
Story 1

📝 Note: Screenshots are stored in the folders:

- 📁 /6. Project Executable Files/Dashboard Screenshots/
- 📁 /6. Project Executable Files/Report Screenshots/

🔗 Dashboard & Story Link:
View the interactive dashboard and story here:
https://public.tableau.com/views/HousingMarketTrends_17511035380890/Dashboard1

🔷 8. ADVANTAGES & DISADVANTAGES

✅ Advantages

- 📊 Visual Insights: Complex data is simplified into easy-to-understand dashboards and charts.
- 🖱️ Interactivity: Users can apply filters and explore data dynamically (Top-N, Year, Features).
- 🌐 Accessibility: Dashboards are hosted on Tableau Public and accessible from anywhere.
- 📈 Informed Decisions: Helps analysts and executives make data-driven pricing and renovation strategies.

- 📎 Easy Sharing: Dashboards and stories can be shared instantly via public links.
- ⏱ Time-Saving: Reduces time spent on manual data exploration using spreadsheets.

⚠ Disadvantages

- 📡 Internet Dependency: Requires stable internet to access Tableau Public dashboards.
- 🔒 Limited Privacy: As dashboards are public, datasets must be anonymized before use.
- 🔍 No Predictive Analysis: Focuses on descriptive analytics only—does not include forecasting or machine learning.
- 🛍 Static Dataset: Visualizations are based on a fixed dataset and must be manually updated for new data.

🔷 9. CONCLUSION

This project successfully demonstrates how data visualization can be applied to understand trends in the housing market. Using Tableau, we transformed a large and complex housing dataset into a series of intuitive dashboards and visual stories that provide actionable insights into:

- Renovation impact on sale price
- Distribution of house features and age
- Buyer preferences based on property characteristics

The final result is a professional, interactive tool that empowers real estate stakeholders—including analysts, executives, and marketing teams—to explore market behavior and improve strategic decision-making.

🔷 10. FUTURE SCOPE

To extend and enhance this project, the following improvements are proposed:

- ⏱ Integrate predictive models to forecast pricing based on house features and renovations.
- ⏱ Automate data refresh using live connections or scheduled updates in Tableau.
- 🌍 Expand to include geospatial analysis using map visualizations for location-based insights.
- 📡 Integrate real-time data from real estate APIs or listing websites for up-to-date trends.