

Project Report

Team ID	PNT2025TMID10194
Project Name	visualizing housing market trends: an analysis of sale prices and features using tableau

1. INTRODUCTION

1.1 Project Overview

The project titled “**Visualizing Housing Market Trends: An Analysis of Sale Prices and Features using Tableau**” aims to transform raw housing data into meaningful visual insights. It focuses on analyzing factors such as **years since renovation, house age, number of bathrooms, bedrooms, and floors**, and how these impact **house sale prices**.

Using **Tableau** and **Tableau Prep Builder**, this project cleans, processes, and visualizes the data through interactive dashboards and storytelling features. The result is a powerful tool that helps users **understand pricing trends**, observe **buyer behavior**, and **explore property feature patterns** through engaging, data-driven visuals.

1.2 Purpose

The purpose of this project is to:

- Provide an **interactive platform** to explore housing market data.
- Identify and visualize how **specific features and renovations** influence house sale prices.
- Help users understand **sales distribution trends** based on age and renovations.
- Deliver **clear, visual narratives** for analytical insights using Tableau's storytelling capability.

2. IDEATION PHASE

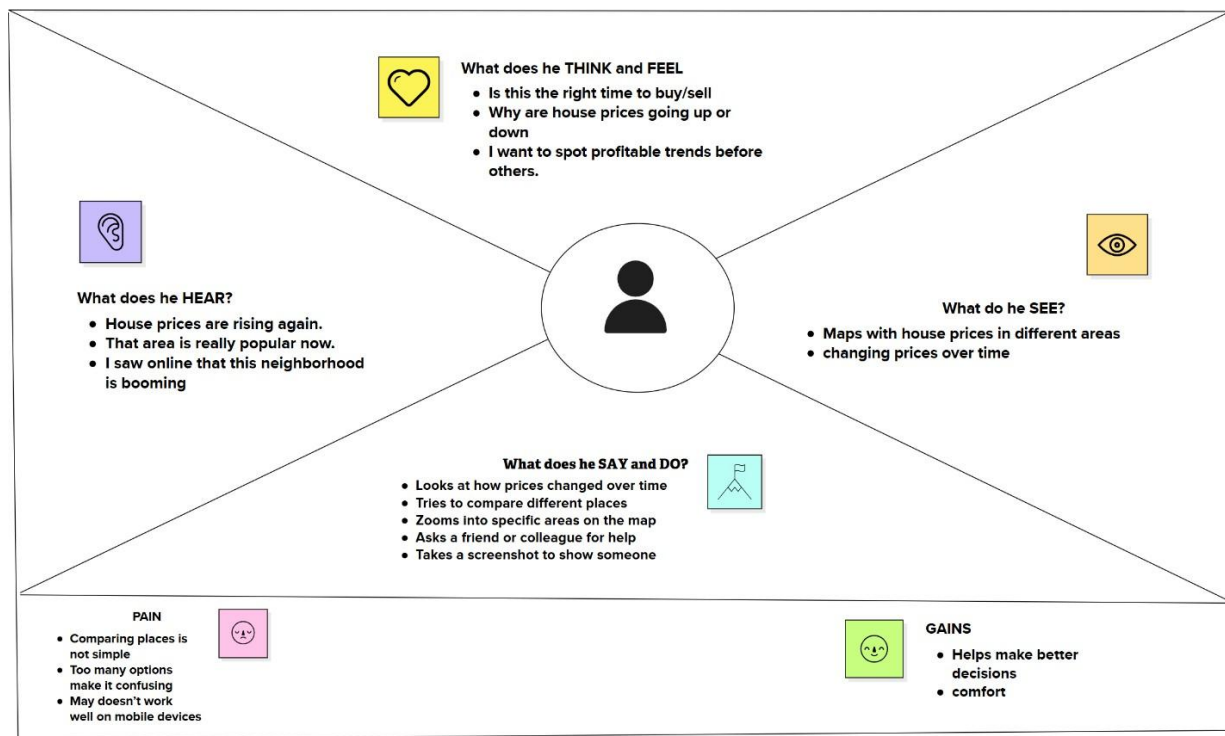
2.1 Problem Statement



Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A real estate analyst	understand what features affect house prices	the data is too complex and scattered	I don't have a single dashboard that shows clear trends	frustrated and unsure about my decisions
PS-2	A marketing strategist	target the right segment of buyers	I don't know what trends are	I can't link buyer behavior to house characteristics	ineffective and misaligned

			influencing sales		
PS-3	A company executive	make strategic investment decisions	I can't clearly see performance patterns	current reports lack visual clarity and interactivity	hesitant and data-blind


2.2 Empathy Map Canvas



2.3 Brainstorming

Step-1: Team Gathering, Collaboration and Select the Problem Statement

Template



Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

⌚ 10 minutes to prepare
 🕒 1 hour to collaborate
 👤 2-8 people recommended

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

⌚ 10 minutes

Team gathering

Teammates who understand the project or know about houses and buyers. Send them a short message or invite with the basic info they need to understand what the session is about

Set the goal

The goal is to come up with ideas that help people (especially buyers/investors) understand what's happening in the housing market — trends, price shifts, area comparisons.

Learn how to use the facilitation tools

Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#) →

1 Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

⌚ 5 minutes

PROBLEM

How might we help buyers feel confident about choosing the right neighborhood based on current housing trends?

Key rules of brainstorming

To run a smooth and productive session

🗣️ Stay in topic.

🕒 Defer judgment.

🗣️ Go for volume.

💡 Encourage wild ideas.

👂 Listen to others.

👁️ If possible, be visual.

Step-2: Brainstorm, Idea Listing and Grouping

2 Brainstorm

Write down any ideas that come to mind that address your problem statement.

⌚ 10 minutes

TIP

You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

Person 1

Neighborhood scorecards with key factors like schools, safety, and commute time

Person 2

Compare neighborhoods side-by-side based on price growth, amenities, and ratings

Person 3

Personalized suggestions based on buyer preferences (budget, family, investment)

Person 4

Highlight “up-and-coming” areas based on recent market activity

3 Group ideas

- Interactive map showing price changes in each neighborhood over time
- Simple graphs showing average house prices, rent trends, and demand in each area
- Set alerts for areas where prices are rising or falling quickly
- Explain housing trends in simple terms (e.g., “Prices are rising due to new metro station”)

⌚ 20 minutes

TIP

Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

Step-3: Idea Prioritization

4

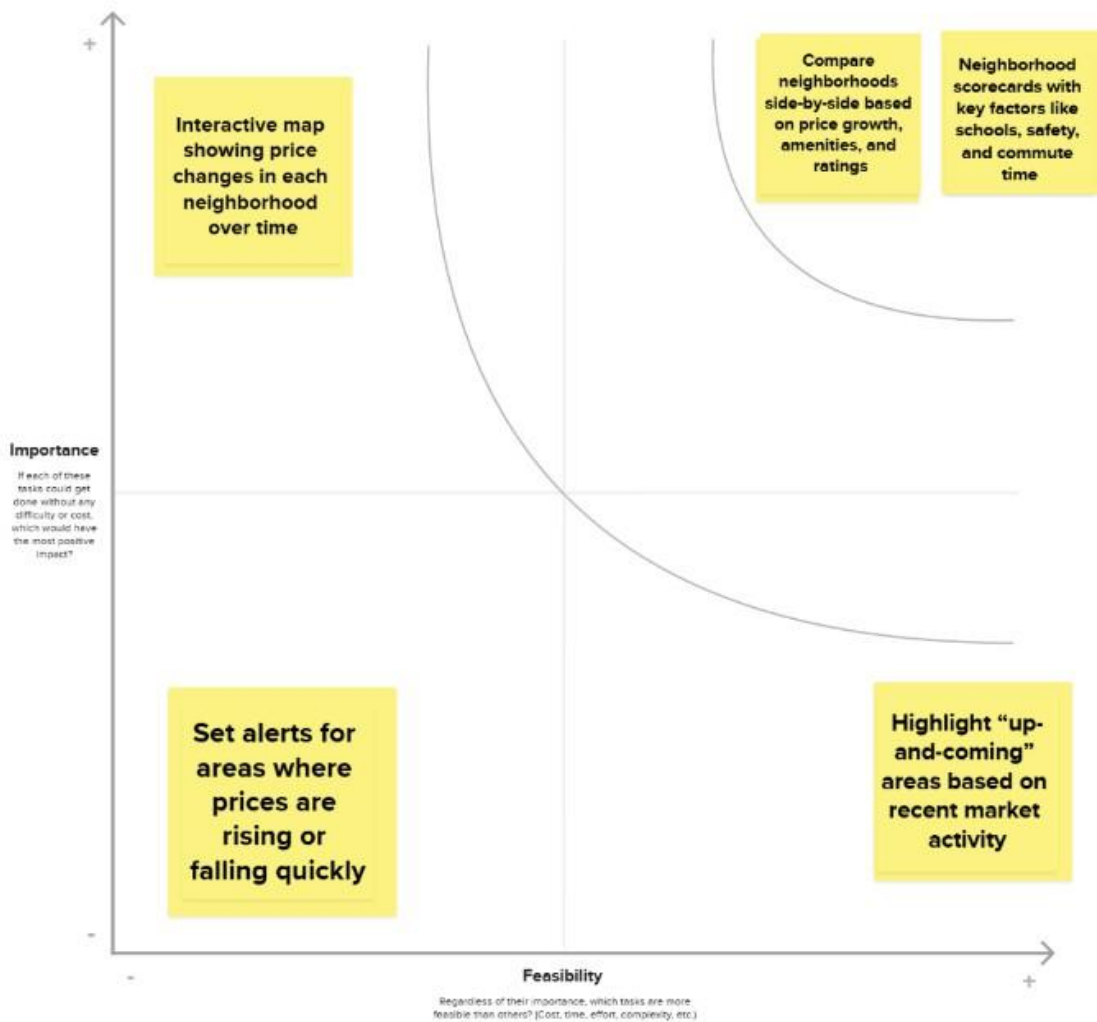
Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

⌚ 20 minutes

TIP

Participants can use their cursors to point at where sticky notes should go on the grid. The facilitator can confirm the spot by using the laser pointer holding the H key on the keyboard.



3. REQUIREMENT ANALYSIS

3.1 Customer Journey map

CUSTOMER JOURNEY MAP									
ABC COMPANY - HOUSING MARKET ANALYSIS									
SCENARIO: Real estate analysts, marketing teams, and executives accessing, analyzing, and utilizing Tableau visualizations for housing market insights to inform strategic decisions, optimize pricing									
Steps	Enter Initial access to system	Enter Discovering available insights	Engage Core analysis activities	Engage Deep data exploration	Engage Pattern identification	Engage Cross-validation	Exit Insights extraction	Exit Decision making	Exit Knowledge sharing
What does the person typically experience?	Access Tableau Dashboard User logs into Tableau system and navigates to housing market analysis dashboard	Review Data Overview User examines Scenario 1: overall dataset summary, record count, average prices, and total area metrics	Analyze Renovation Impact User explores Scenario 2: histogram showing sales distribution by years since renovation	Examine Age Distribution User reviews Scenario 3: pie chart of house age distribution by renovation status	Study Feature Correlations User analyzes Scenario 4: grouped bar chart of house age vs bathrooms, bedrooms, and floors	Cross-Reference Data User compares insights across multiple scenarios to validate patterns and correlations	Generate Insights User synthesizes findings into actionable insights about market trends and pricing factors	Strategic Planning User applies insights to develop pricing strategies, investment recommendations, or marketing approaches	Executive Buy-in User presents findings to stakeholders and obtains approval for data-driven strategic recommendations
What interactions do they have?	Things: Tableau interface, login credentials, computer/tablet Places: Office, remote workspace People: IT support if needed	Things: Dashboard overview, summary statistics, data filters Places: Tableau workspace People: Data analysts, colleagues	Things: Interactive histogram, filter controls, hover tooltips Places: Scenario 2 visualization People: Team members for discussion	Things: Pie chart segments, legend, percentage displays Places: Scenario 3 visualization People: Subject matter experts	Things: Grouped bar charts, multi-dimensional filters, drill-down options Places: Scenario 4 visualization People: Real estate professionals	Things: Multiple dashboard views, comparison tools, notes feature Places: Integrated workspace People: Validation team members	Things: Export functions, reporting tools, presentation software Places: Report generation area People: Report reviewers	Things: Meeting rooms, presentation displays, strategic planning documents Places: Conference rooms, executive offices People: Executives, decision makers	Things: Training rooms, knowledge base, training resources Places: Documentation systems People: Colleagues, trainees, stakeholders
Primary goals at each step	Help me quickly access the housing market analysis system without technical barriers	Help me understand the scope and scale of the data I'm working with	Help me understand how renovations impact house prices and sales patterns	Help me see the relationship between house age and renovation decisions	Help me identify patterns between house features and age distributions	Help me validate insights across multiple data perspectives	Help me transform data patterns into actionable business insights	Help me apply insights to create competitive advantages in the market	Help me build organizational capability and knowledge around housing market analysis
Enjoyable, productive experiences	Clean, intuitive interface makes system access straightforward and professional	Comprehensive overview provides immediate confidence in data quality and scope	Clear visualization reveals surprising insights about renovation ROI that weren't obvious before	Pie chart effectively communicates age distribution patterns at a glance	Multi-dimensional analysis reveals complex relationships between house features and market trends	"Aha moments" when patterns align across different visualizations, building confidence in insights	Satisfaction from transforming complex data into clear, actionable recommendations	Executive buy-in and appreciation for data-driven strategic recommendations	Recognition for bringing valuable insights to the organization and industry
Frustrating, confusing experiences	Login issues or system slowness creates initial frustration and delays analysis	Overwhelming amount of data makes it difficult to know where to focus attention first	Complex histogram may be difficult to interpret for users without strong data visualization experience	Pie chart segments may be too similar in size, making precise comparisons challenging	Information overload from multiple variables makes it hard to extract clear conclusions	Conflicting patterns between visualizations create uncertainty about data reliability	Pressure to generate insights quickly may lead to oversimplified or incomplete analysis	Resistance from stakeholders who prefer traditional decision-making approaches	Difficulty in scaling knowledge transfer across different skill levels within organization
How might we improve?	How might we implement single sign-on and optimize system performance for faster access?	How might we create guided tours or progressive disclosure to help users navigate complex datasets?	How might we add interactive tutorials or interpretation guides for complex visualizations?	How might we use different chart types or add data labels to improve clarity of comparisons?	How might we create simplified summary views alongside detailed multi-variable analyses?	How might we build confidence indicators or data quality scores into visualizations?	How might we create automated insight generation to supplement human analysis?	How might we provide change management support and stakeholder education programs?	How might we create role-based training programs and mentorship systems?
Based on stakeholder interviews and analysis requirements from ABC Company Housing Market Analysis team									
Sarah Chen Real Estate Analyst		Michael Rodriguez Marketing Manager		Jennifer Park Data Analyst		David Thompson Executive Director		Lisa Wang Strategy Consultant	

CUSTOMER JOURNEY MAP									
ABC COMPANY - HOUSING MARKET ANALYSIS									
and executives accessing, analyzing, and utilizing Tableau visualizations for housing market insights to inform strategic decisions, optimize pricing strategies, and enhance market competitiveness.									
Engage Deep data exploration	Engage Pattern identification	Engage Cross-validation	Exit Insights extraction	Exit Decision making	Extend Implementation	Extend Monitoring results	Extend Continuous improvement	Extend Knowledge sharing	Extend Knowledge sharing
Examine Age Distribution User reviews Scenario 3: pie chart of house age distribution / renovation status	Study Feature Correlations User analyzes Scenario 4: grouped bar chart of house age vs bathrooms, bedrooms, and floors	Cross-Reference Data User compares insights across multiple scenarios to validate patterns and correlations	Generate Insights User synthesizes findings into actionable insights about market trends and pricing factors	Strategic Planning User applies insights to develop pricing strategies, investment recommendations, or marketing approaches	Execute Strategy User implements decisions based on analysis in real estate operations or marketing campaigns	Track Performance User monitors outcomes of implemented strategies against market performance	Refine Analysis User returns to dashboard with new data or questions based on real-world results	Share Knowledge User presents findings to stakeholders and contributes to organizational learning	Share Knowledge User presents findings to stakeholders and contributes to organizational learning
Things: Pie chart segments, legend, percentage displays Places: Scenario 3 visualization People: Subject matter experts	Things: Grouped bar charts, multi-dimensional filters, drill-down options Places: Scenario 4 visualization People: Real estate professionals	Things: Multiple dashboard views, comparison tools, notes feature Places: Integrated workspace People: Validation team members	Things: Export functions, reporting tools, presentation software Places: Report generation area People: Report reviewers	Things: Meeting rooms, presentation displays, strategic planning documents Places: Conference rooms, executive offices People: Executives, decision makers	Things: Implementation tools, CRM systems, marketing platforms Places: Operational environments People: Operations teams, clients	Things: Performance dashboards, KPI tracking tools, comparison reports Places: Monitoring systems People: Performance analysts	Things: Updated datasets, new visualizations, feedback systems Places: Enhanced dashboard People: Data team, end users	Things: Presentation materials, knowledge base, training resources Places: Training rooms, documentation systems People: Colleagues, trainees, stakeholders	Things: Presentation materials, knowledge base, training resources Places: Training rooms, documentation systems People: Colleagues, trainees, stakeholders
Help me see the relationship between house age and renovation decisions	Help me identify patterns between house features and age distributions	Help me validate insights across multiple data perspectives	Help me transform data patterns into actionable business insights	Help me apply insights to create competitive advantages in the market	Help me successfully execute data-driven strategies	Help me measure the effectiveness of my data-driven decisions	Help me continuously improve analysis accuracy and relevance	Help me build organizational capability and knowledge around housing market analysis	Help me build organizational capability and knowledge around housing market analysis
Pie chart effectively communicates age distribution patterns at a glance	Multi-dimensional analysis reveals complex relationships between house features and market trends	"Aha moments" when patterns align across different visualizations, building confidence in insights	Satisfaction from transforming complex data into clear, actionable recommendations	Executive buy-in and appreciation for data-driven strategic recommendations	Successful implementation leads to improved market performance and competitive advantage	Validation that data-driven decisions outperform traditional approaches	Continuous learning cycle improves both analysis skills and business outcomes	Recognition for bringing valuable insights to the organization and industry	Recognition for bringing valuable insights to the organization and industry
Pie chart segments may be too similar in size, making precise comparisons challenging	Information overload from multiple variables makes it hard to extract clear conclusions	Conflicting patterns between visualizations create uncertainty about data reliability	Pressure to generate insights quickly may lead to oversimplified or incomplete analysis	Resistance from stakeholders who prefer traditional decision-making approaches	Implementation challenges when insights don't translate smoothly to operational reality	Market volatility makes it difficult to attribute performance to specific strategic changes	Analysis becomes stale quickly as market conditions change rapidly	Difficulty in scaling knowledge transfer across different skill levels within organization	Difficulty in scaling knowledge transfer across different skill levels within organization
How might we use different chart types or add data labels to improve clarity of comparisons?	How might we create simplified summary views alongside detailed multi-variable analyses?	How might we build confidence indicators or data quality scores into visualizations?	How might we create automated insight generation to supplement human analysis?	How might we provide change management support and stakeholder education programs?	How might we create implementation playbooks and best practice guides?	How might we develop more sophisticated attribution models and control groups?	How might we implement real-time data updates and automated refresh schedules?	How might we create role-based training programs and mentorship systems?	How might we create role-based training programs and mentorship systems?
Based on stakeholder interviews and analysis requirements from ABC Company Housing Market Analysis team									
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3.2 Solution Requirement

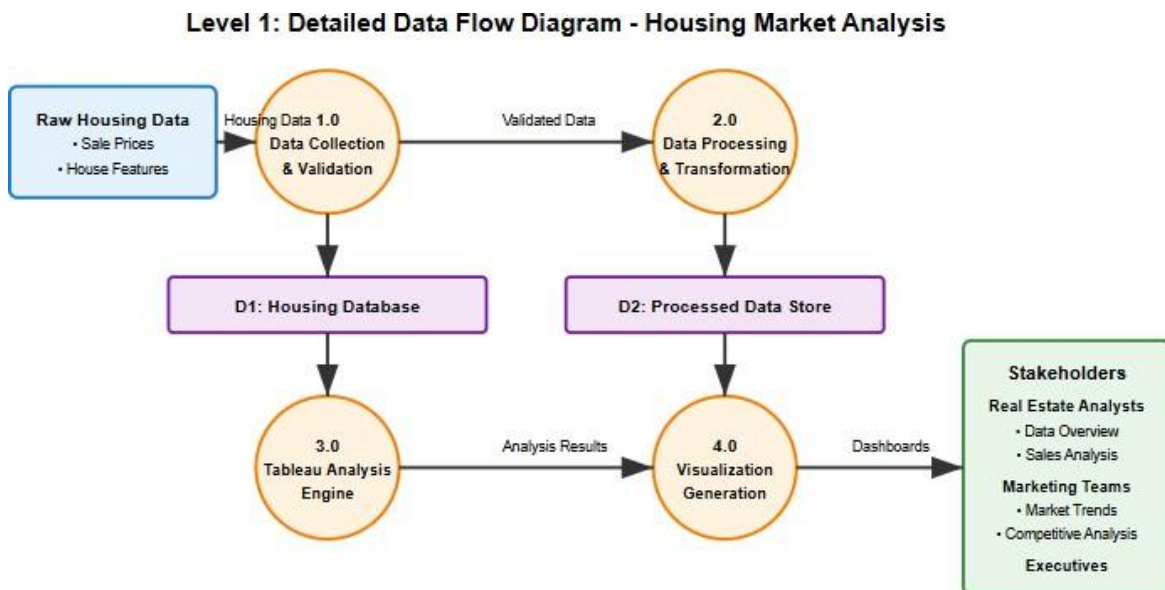
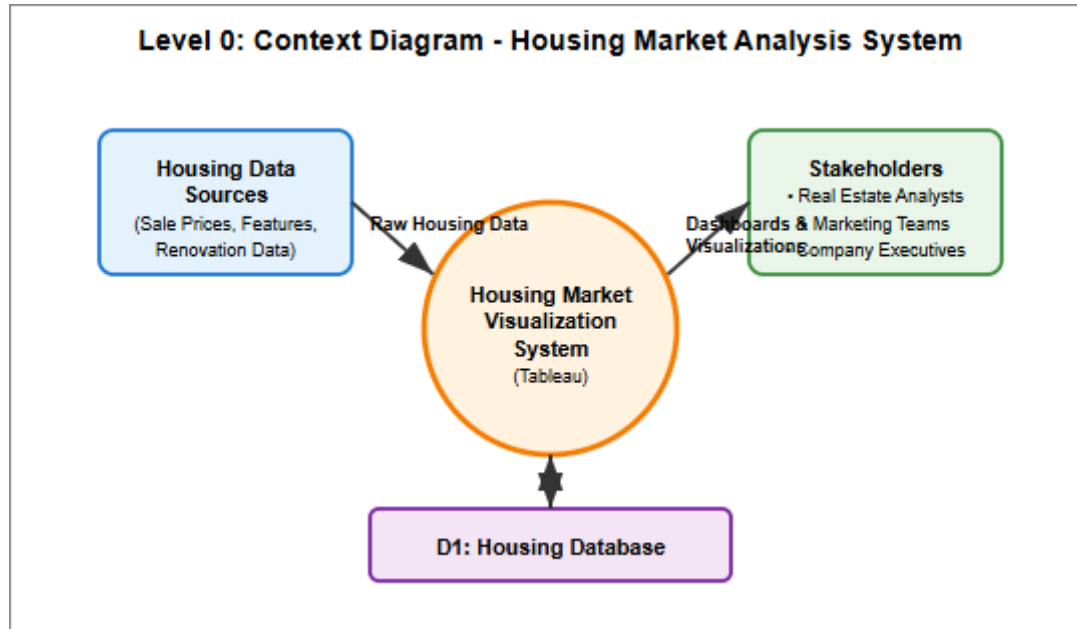
Functional Requirements:

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data Import and Processing	Import housing dataset into Tableau
		Data transformation and cleaning
		Validate data quality and completeness
FR-2	Interactive Dashboard Creation	Create overall data overview dashboard
		Develop sales by renovation years histogram
		Build house age distribution pie chart
		Design grouped bar chart for house features
FR-3	Data Visualization and Analytics	Generate average sales price calculations
		Calculate total area metrics
		Analyze renovation impact on pricing
		Create age-based distribution analytics
FR-4	Reporting and Export Functionality	Export visualizations as images/PDFs
		Generate summary reports
		Create stakeholder presentation materials

Non-functional Requirements:

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Dashboard should be intuitive and easy to navigate for real estate analysts, marketing teams, and executives with minimal training required
NFR-2	Security	Ensure data privacy and secure access to housing market data with appropriate user authentication and authorization controls
NFR-3	Reliability	System should provide consistent and accurate visualizations with 99.5% uptime and reliable data processing capabilities
NFR-4	Performance	Dashboard should load within 3 seconds and handle interactive filtering smoothly even with large datasets containing thousands of housing records
NFR-5	Availability	Tableau dashboard should be accessible 24/7 to stakeholders across different time zones with minimal scheduled maintenance downtime
NFR-6	Scalability	Solution should accommodate growing datasets and additional visualization requirements as ABC Company expands its housing market analysis

3.3 Data Flow Diagram



Scenarios Supported:

1. Overall Data Overview - Summary statistics and key metrics
2. Total Sales by Years Since Renovation - Histogram analysis
3. House Age Distribution by Renovation Status - Pie chart visualization
4. House Age by Bathrooms, Bedrooms, Floors - Grouped bar charts

Data Flows: Raw Data → Validation → Processing → Analysis → Visualization → Stakeholders

User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Real Estate Analyst	Data analysis & Visualization	USN-1	As a real estate analyst, I can view the overall data overview dashboard to understand the dataset scale and key metrics	I can see count of housing records, average sales price, and total basement area	High	Sprint-1
Real Estate Analyst	Renovation Impact analysis	USN-2	As a real estate analyst, I can analyze total sales by years since renovation through histogram visualization	I can identify correlation between renovation timing and price ranges	High	Sprint-1
Real Estate Analyst	House Age Distribution	USN-3	As a real estate analyst, I can view house age distribution by renovation status through pie chart	I can assess age characteristics and renovation prevalence	High	Sprint-1
Real Estate Analyst	Feature analysis	USN-4	As a real estate analyst, I can analyze house age distribution by number of bathrooms, bedrooms, and floors	I can identify patterns in housing characteristics over time	High	Sprint-2
Real Estate Analyst	Interactive dashboard	USN-5	As a real estate analyst, I can access an interactive dashboard combining all visualizations	I can navigate between different views and filter data dynamically	Medium	Sprint-2

3.4 Technology Stack

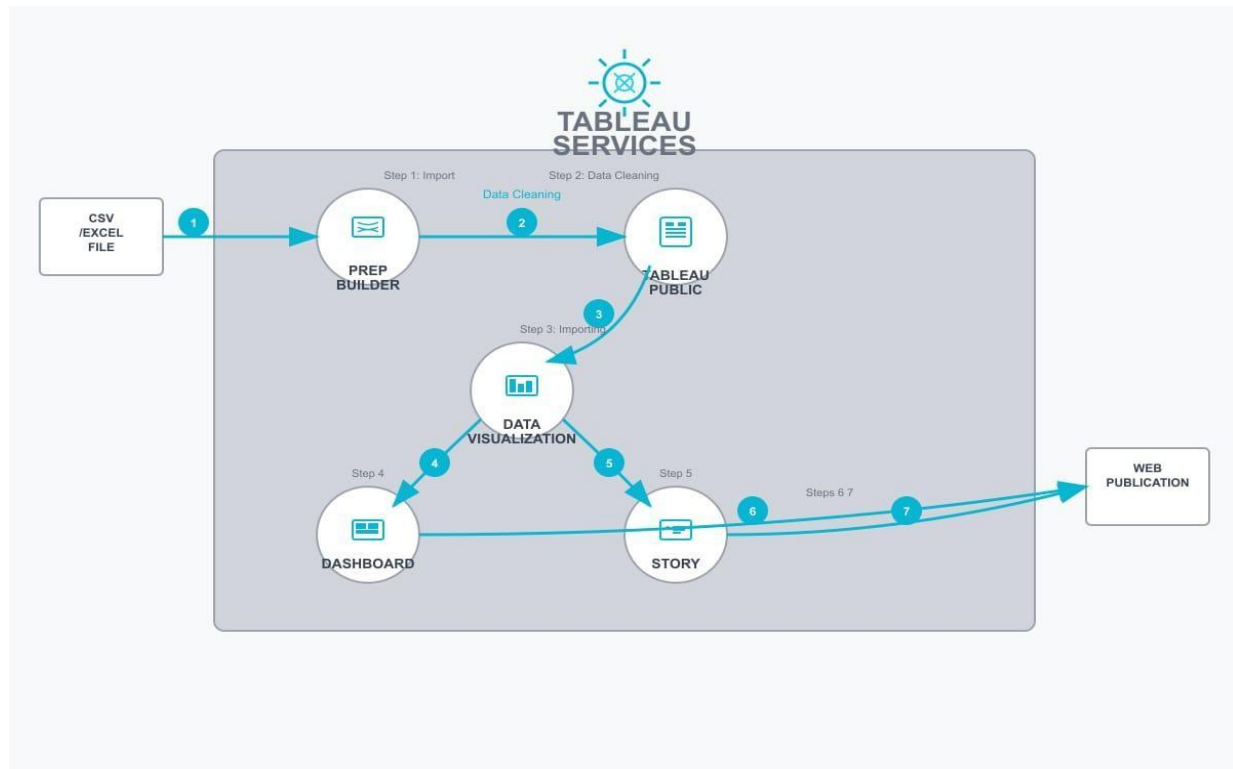
Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web-based dashboards for viewing and interaction	Tableau Public
2.	Application Logic-1	Data preprocessing and transformation workflows	Tableau Prep Builder
3.	Application Logic-2	Interactivity using filters, parameters, and actions	Tableau Filters, Parameters, Actions
4.	Dashboard/Story Logic	Logical flow of insights using story features	Tableau Story Feature
5.	Data Source	Flat files used as housing market datasets	CSV
6.	File Storage	Housing datasets stored locally	Local File System / Google Drive

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	yes	Tableau Public
2.	Security Implementations	N/A	N/A
3.	Scalable Architecture	Can scale by publishing to Tableau Cloud for wider access	Tableau Public
4.	Availability	Dashboards available online 24/7	Tableau Public
5	Performance	Good \ Better performance	Tableau Public

Technical Architecture:



4. PROJECT DESIGN

4.1 Problem Solution Fit

✓ 1. Problem Statement

What is the customer struggling with?

Stakeholders in the real estate sector—such as analysts, marketing teams, and executives—face challenges in:

- Identifying which property features influence pricing trends
- Understanding how renovations affect buyer interest and price
- Making strategic decisions without data-backed insights
- Communicating property trends effectively to clients or investors

💡 2. Existing Behavior / Situation

How are they currently addressing the problem?

- Based on spreadsheets and static reports with limited visual context
- Heavily reliant on manual analysis with potential data misinterpretation
- Missing comprehensive dashboards for interactive exploration
- Not leveraging full potential of historical or feature-specific data

🎯 3. Desired Outcome / Ideal Scenario

What would a better world look like for them?

- Ability to visually explore and interpret housing trends easily
- Understand how each feature (renovation, age, rooms/floors) impacts sale price
- Make informed and fast decisions using an interactive Tableau dashboard
- Identify actionable trends and optimize pricing strategies

🛠️ 4. Our Solution

How does your solution address the problem effectively?

An interactive Tableau dashboard that:

- Provides overall data summaries with key KPIs (Scenario 1)
- Visualizes sales trends based on years since renovation (Scenario 2)
- Breaks down age distribution by renovation status (Scenario 3)
- Analyzes house features like bathrooms, bedrooms, and floors by age (Scenario 4)
- Offers drill-down capabilities and filters for customized insights
- Can be embedded in a web app using Flask for broader accessibility

🚀 5. Why It Works

How does it align with customer behavior and needs?

- Real estate teams already work with data but lack intuitive tools → Tableau adds clarity
- Renovations and house features are top decision factors → directly visualized
- Users prefer visually rich, interactive reports over static spreadsheets
- Immediate insights help close decisions faster, leading to business growth

🏠 6. Marketing / Communication Strategy

What messaging and touch-points help adoption?

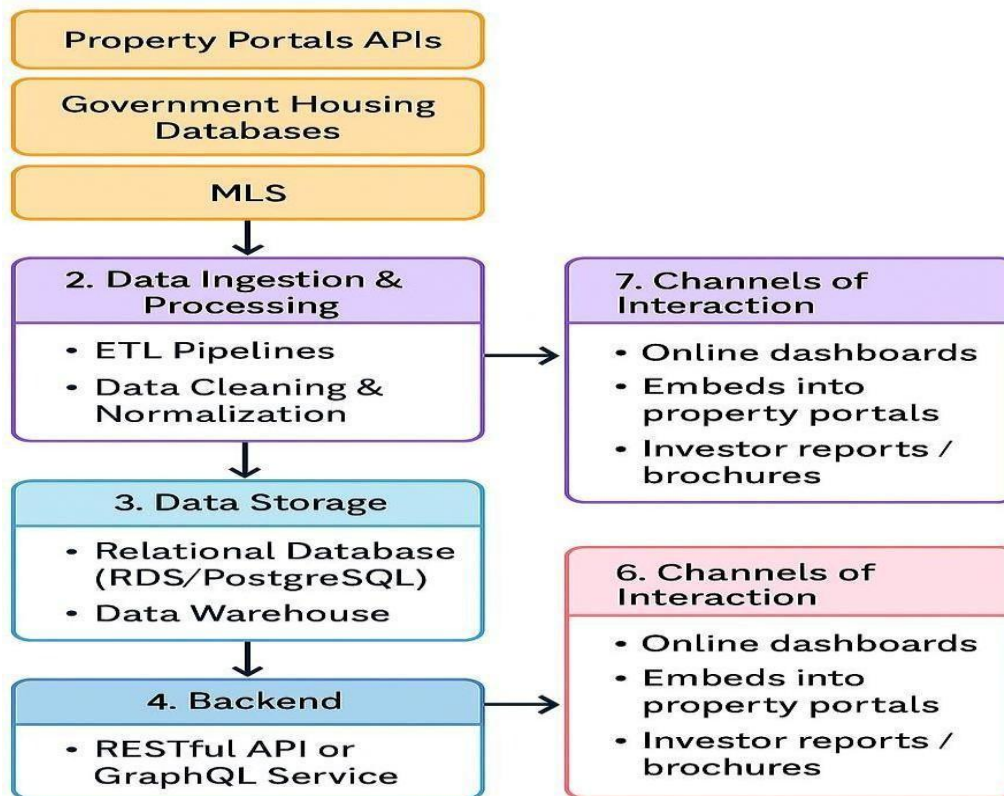
- Messaging Angle: "Turn your housing data into decisions"
- Emotional Trigger: Solve the frustration of slow, unclear analysis
- Rational Trigger: Improve accuracy and speed of market evaluations
- Touch-points: Demo sessions, tutorials, integration in existing dashboards
- Performance-based dashboards shared with stakeholders

4.2 Proposed Solution

S. No	Parameter	Description
	Problem Statement (Problem to be solved)	The housing market often lacks clarity regarding how property renovations impact sales prices over time. Buyers and sellers struggle to assess the return on investment for renovations due to the absence of clear data analytics. This limits effective decision-making and market efficiency.
2.	Idea / Solution description	Our project addresses this issue by visualizing total sales in relation to the number of years since a house was renovated. Using Tableau, we created a histogram that displays how recently renovated properties correlate with various sales price ranges. This visualization enables stakeholders to identify patterns and trends in buyer preferences and renovation impact.
3.	Novelty / Uniqueness	This solution stands out by offering an interactive, visual data analysis centered around the renovation timeline—a variable rarely explored in depth in traditional market reports. It brings actionable insights to the forefront using clear, user-friendly dashboards, making the data more accessible to both experts and laypeople.
4.	Social Impact / Customer Satisfaction	The solution empowers homebuyers with valuable insights into how renovation age affects home value, leading to more informed purchasing decisions. It also helps sellers and agents time renovations effectively to increase profits. Overall, it supports transparency, enhances consumer trust, and contributes to better housing policy and urban planning.
5.	Business Model (Revenue Model)	The solution can be monetized through a subscription-based model targeting real estate agencies, property investors, and developers. Additional income streams include custom dashboard development, real-time market reporting, and integration services with existing property listing platforms or CRMs.
6.	Scalability of the Solution	This model can be extended to include multiple variables such as location, square footage, number of bedrooms, or neighborhood crime rates. It can also scale geographically to analyze real estate markets across different cities or countries. With integration into national real estate databases, it can provide ongoing, large-scale market intelligence.

Problem Statement (Problem to be Solved): The housing market often lacks clarity regarding how property renovations impact sales prices over time. Buyers and sellers struggle to assess the return on investment for renovations due to the absence of clear data analytics. This limits effective decision-making and market efficiency.	2. Idea/solution description Our project addresses this issue by visualizing total sales in relation to the number of years since a house was renovated. Using Tableau, we created a histogram that displays how recently renovated properties correlate with various sales price ranges. This visualization enables stakeholders to identify patterns and trends in buyer preferences and renovation impact.	3. Novelty/Uniqueness This solution stands out by offering an interactive, visual data analysis centered around the renovation timeline—a variable rarely explored in depth in traditional market reports. It brings actionable insights to the forefront using clear, user-friendly dashboards, making the data more accessible to both experts and laypeople.
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4.3 Solution Architecture



5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Product Backlog, Sprint Schedule, and Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection & Overview	USN-1	As a stakeholder, I want to collect and transform housing market data to create a comprehensive dataset overview.	1	High	Team Member -2
Sprint-1	Data Analysis Setup	USN-2	As a real estate analyst, I want to load housing data into Tableau for visualization and analysis.	2	High	Team Member -2
Sprint-1	Data Preprocessing	USN-3	As a user, I want to clean and prepare housing data including sales prices, renovation years, and house features.	2	High	Team Member -1
Sprint-2	Renovation Impact Analysis	USN-4	As a stakeholder, I want to visualize total sales by years since renovation to understand renovation impact on pricing.	3	High	Team Member -2

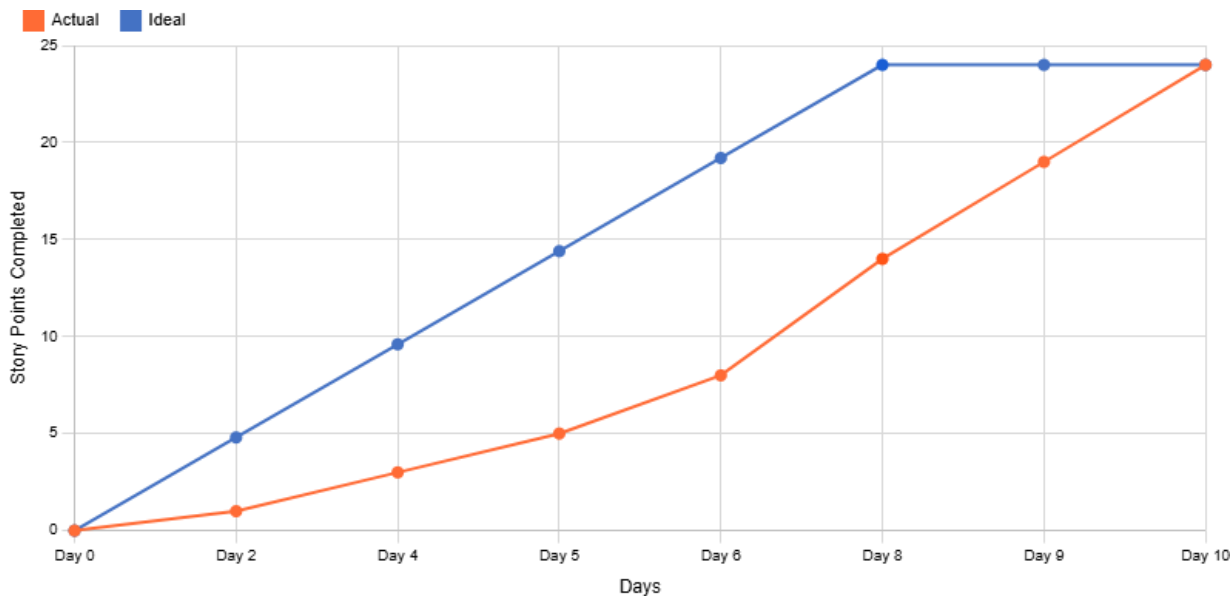
Sprint-2	Age Distribution Analysis	USN-5	As a real estate analyst, I want to create a pie chart showing house age distribution by renovation status.	3	Medium	Team Member -2
Sprint-2	Feature-Based Analysis	USN-6	As a marketing team member, I want to analyze house age distribution by number of bathrooms, bedrooms, and floors.	3	High	Team Member -2
Sprint-2	Dashboard Creation	USN-7	As an executive stakeholder, I want an interactive dashboard combining all visualizations for strategic decision making.	5	High	Team Member -1
Sprint-2	Story Development	USN-8	As a company executive, I want a Tableau story that presents insights in a narrative format for presentations.	5	Medium	Team Member -2

[Project Tracker, Velocity & Burndown Chart](#)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed	Sprint Release Date
Sprint-1	8	5 Days	16 JULY 2025	20 JULY 2025	5	20 JULY 2025

Sprint-2	18	5 Days	21 JULY 2025	25 JULY 2025	19	25 JULY 2025
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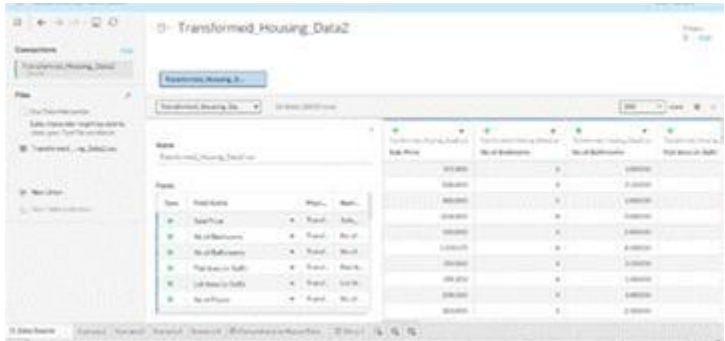
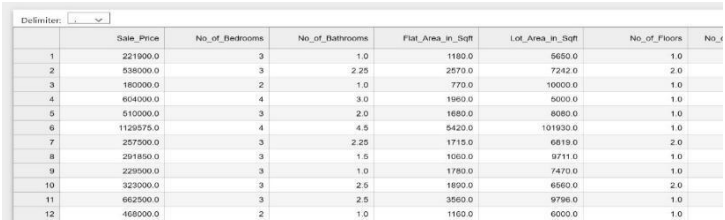
Burndown Chart



6. FUNCTIONAL AND PERFORMANCE TESTING

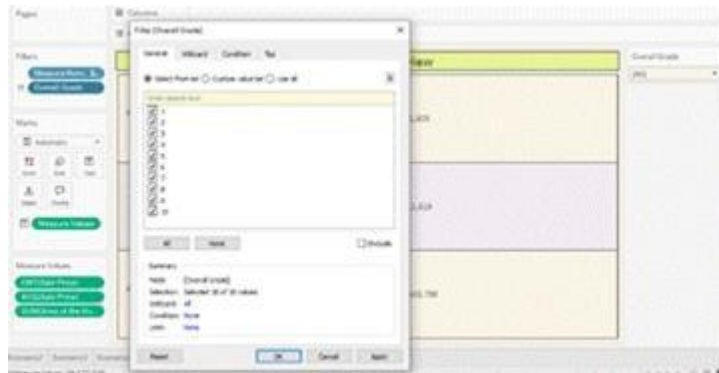
6.1 Performance Testing

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

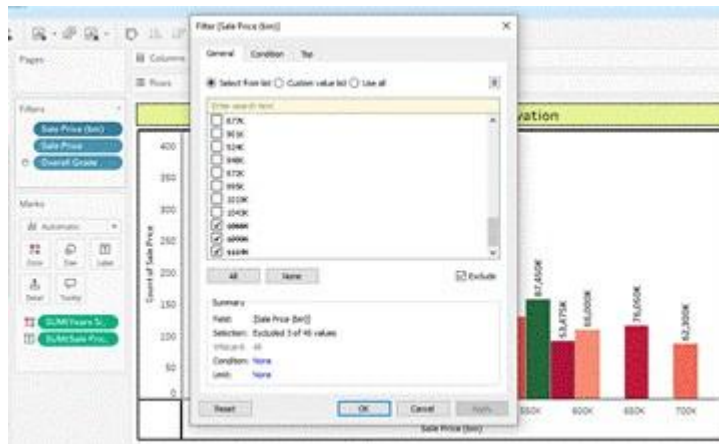
S.No.	Parameter	Screenshot / Values																																																																																																								
1.	Data Rendered	<div>Data contains 33 fields and 21609 rows</div> <div></div>																																																																																																								
2.	Data Preprocessing	<div>Identified 11 duplicate rows , removed unnecessary columns like zipcodes, no missing or null values.</div> <div><table><thead><tr><th></th><th>Sale Price</th><th>No. of Bedrooms</th><th>No. of Bathrooms</th><th>Flat Area in Sqft</th><th>Lot Area in Sqft</th><th>No. of Floors</th><th>No. of Units</th></tr></thead><tbody><tr><td>1</td><td>221900.0</td><td>3</td><td>1.0</td><td>1180.0</td><td>5650.0</td><td>1.0</td><td></td></tr><tr><td>2</td><td>538000.0</td><td>3</td><td>2.25</td><td>2570.0</td><td>7242.0</td><td>2.0</td><td></td></tr><tr><td>3</td><td>180000.0</td><td>2</td><td>1.0</td><td>770.0</td><td>10000.0</td><td>1.0</td><td></td></tr><tr><td>4</td><td>604000.0</td><td>4</td><td>3.0</td><td>1960.0</td><td>5000.0</td><td>1.0</td><td></td></tr><tr><td>5</td><td>510000.0</td><td>3</td><td>2.0</td><td>1680.0</td><td>8080.0</td><td>1.0</td><td></td></tr><tr><td>6</td><td>1129575.0</td><td>4</td><td>4.5</td><td>5420.0</td><td>101930.0</td><td>1.0</td><td></td></tr><tr><td>7</td><td>257500.0</td><td>3</td><td>2.25</td><td>1715.0</td><td>6819.0</td><td>2.0</td><td></td></tr><tr><td>8</td><td>291850.0</td><td>3</td><td>1.5</td><td>1060.0</td><td>9711.0</td><td>1.0</td><td></td></tr><tr><td>9</td><td>229500.0</td><td>3</td><td>1.0</td><td>1780.0</td><td>7470.0</td><td>1.0</td><td></td></tr><tr><td>10</td><td>323000.0</td><td>3</td><td>2.5</td><td>1800.0</td><td>6560.0</td><td>2.0</td><td></td></tr><tr><td>11</td><td>662500.0</td><td>3</td><td>2.5</td><td>3560.0</td><td>9796.0</td><td>1.0</td><td></td></tr><tr><td>12</td><td>468000.0</td><td>2</td><td>1.0</td><td>1160.0</td><td>6000.0</td><td>1.0</td><td></td></tr></tbody></table></div> <div>zipcodes, no missing or null values.</div>		Sale Price	No. of Bedrooms	No. of Bathrooms	Flat Area in Sqft	Lot Area in Sqft	No. of Floors	No. of Units	1	221900.0	3	1.0	1180.0	5650.0	1.0		2	538000.0	3	2.25	2570.0	7242.0	2.0		3	180000.0	2	1.0	770.0	10000.0	1.0		4	604000.0	4	3.0	1960.0	5000.0	1.0		5	510000.0	3	2.0	1680.0	8080.0	1.0		6	1129575.0	4	4.5	5420.0	101930.0	1.0		7	257500.0	3	2.25	1715.0	6819.0	2.0		8	291850.0	3	1.5	1060.0	9711.0	1.0		9	229500.0	3	1.0	1780.0	7470.0	1.0		10	323000.0	3	2.5	1800.0	6560.0	2.0		11	662500.0	3	2.5	3560.0	9796.0	1.0		12	468000.0	2	1.0	1160.0	6000.0	1.0	
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3. Utilization of Filters

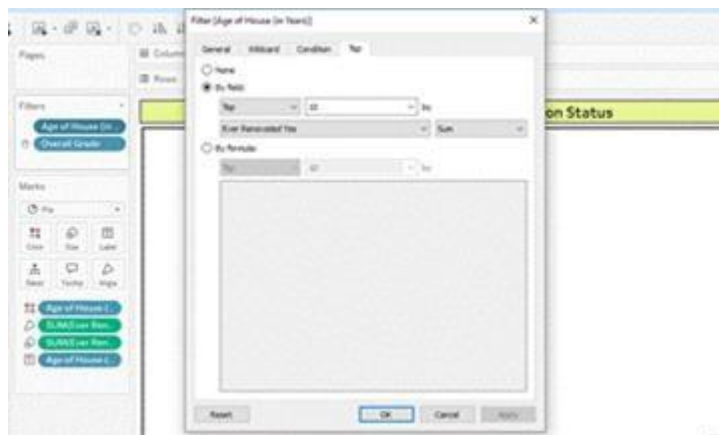
For scenario – 1



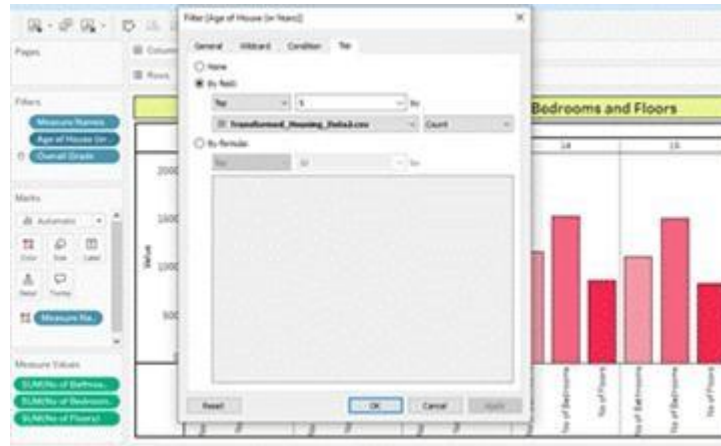
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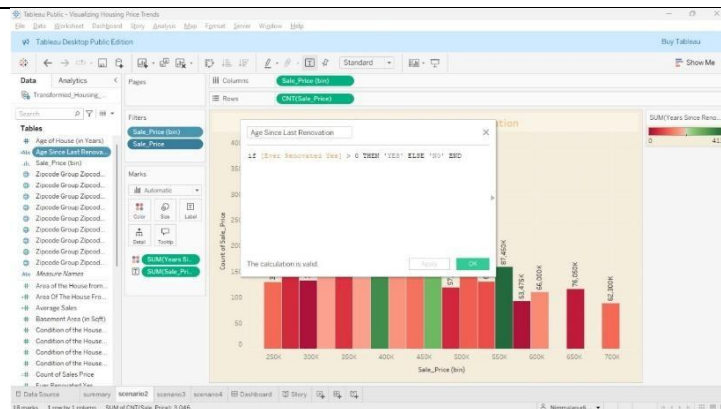
For scenario – 3



For scenario – 4

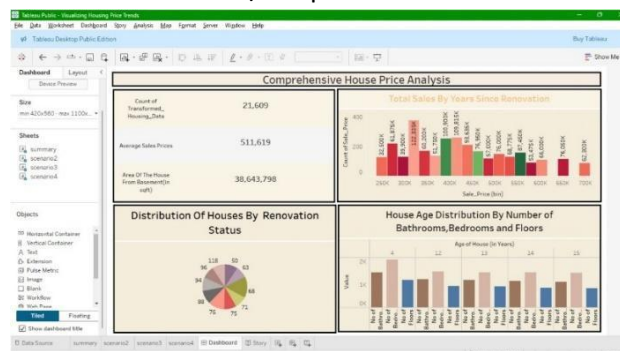


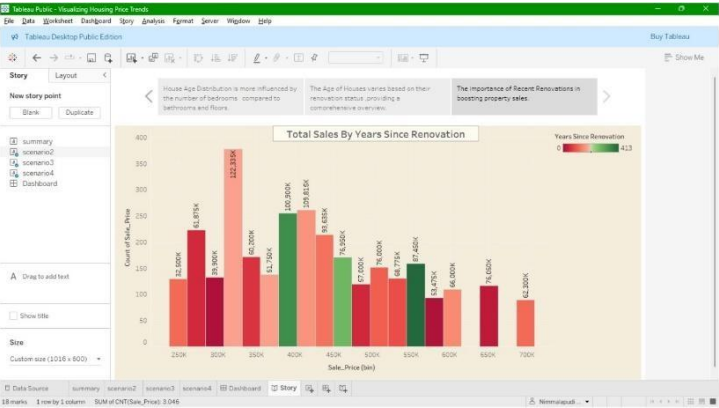
4. Calculation fields Used



5. Dashboard design

No of Visualizations / Graphs – 4

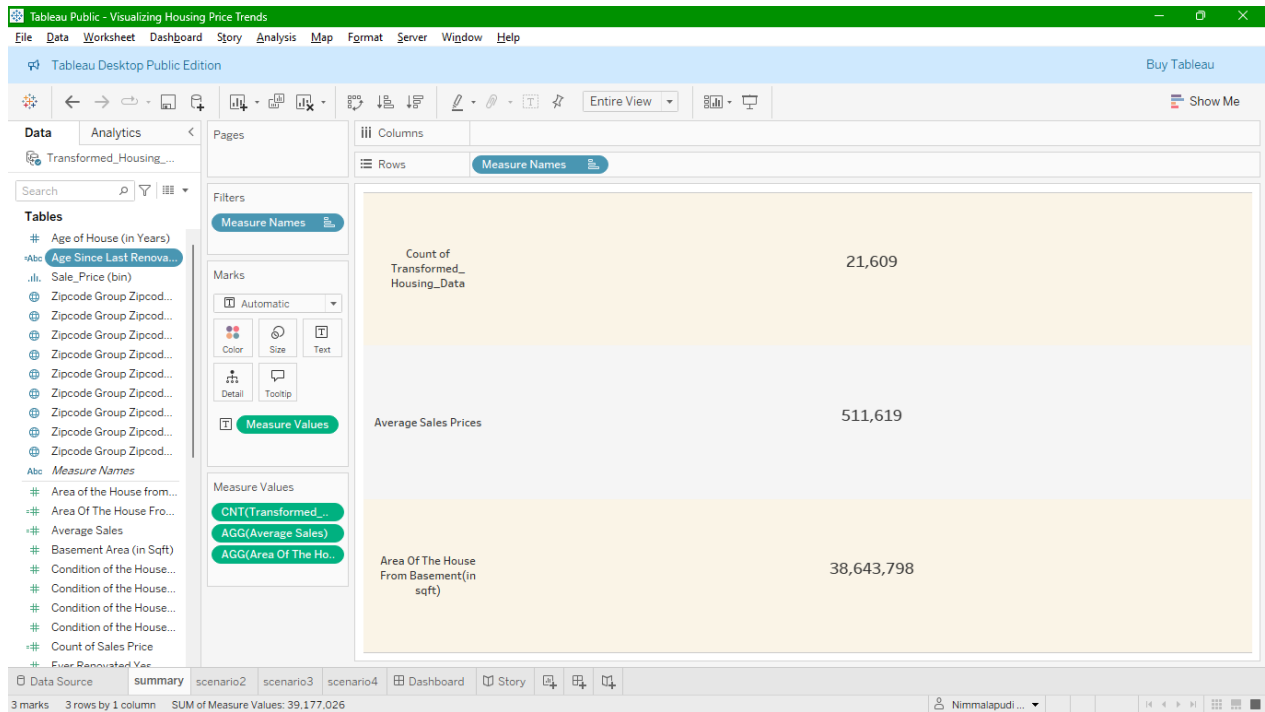


6	Story Design	<div><div>No of Visualizations / Graphs – 4</div><div></div></div>

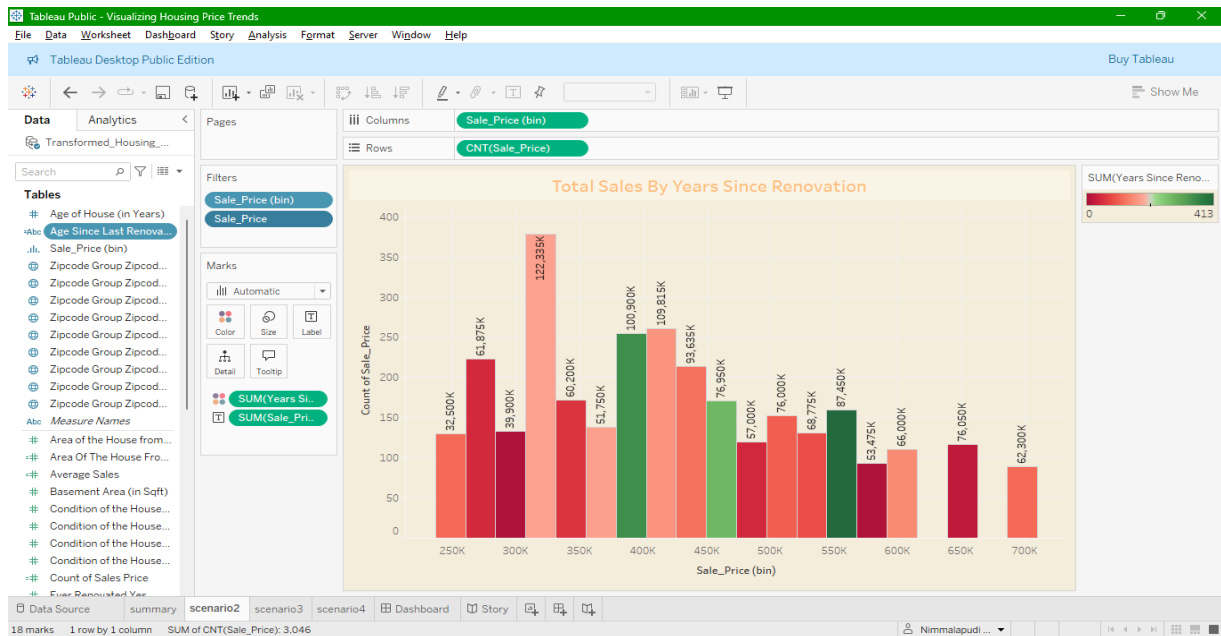
7. RESULTS

7.1 Output Screenshots

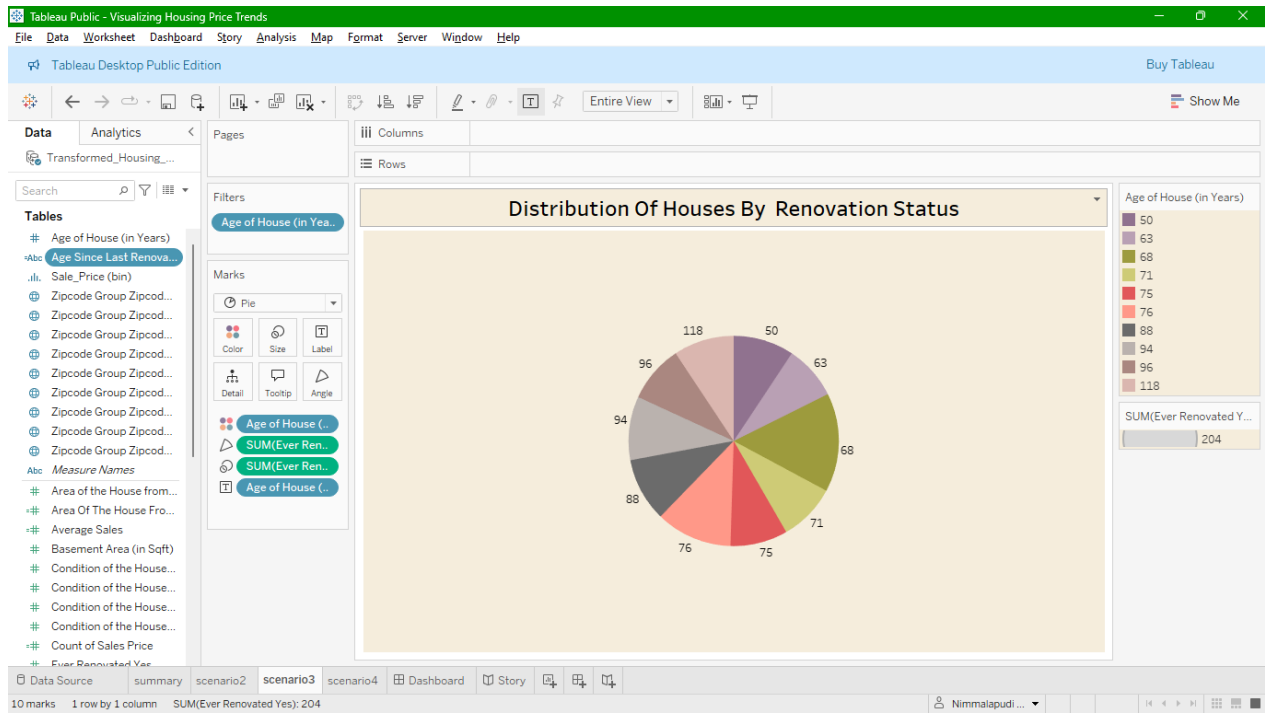
Scenario-1



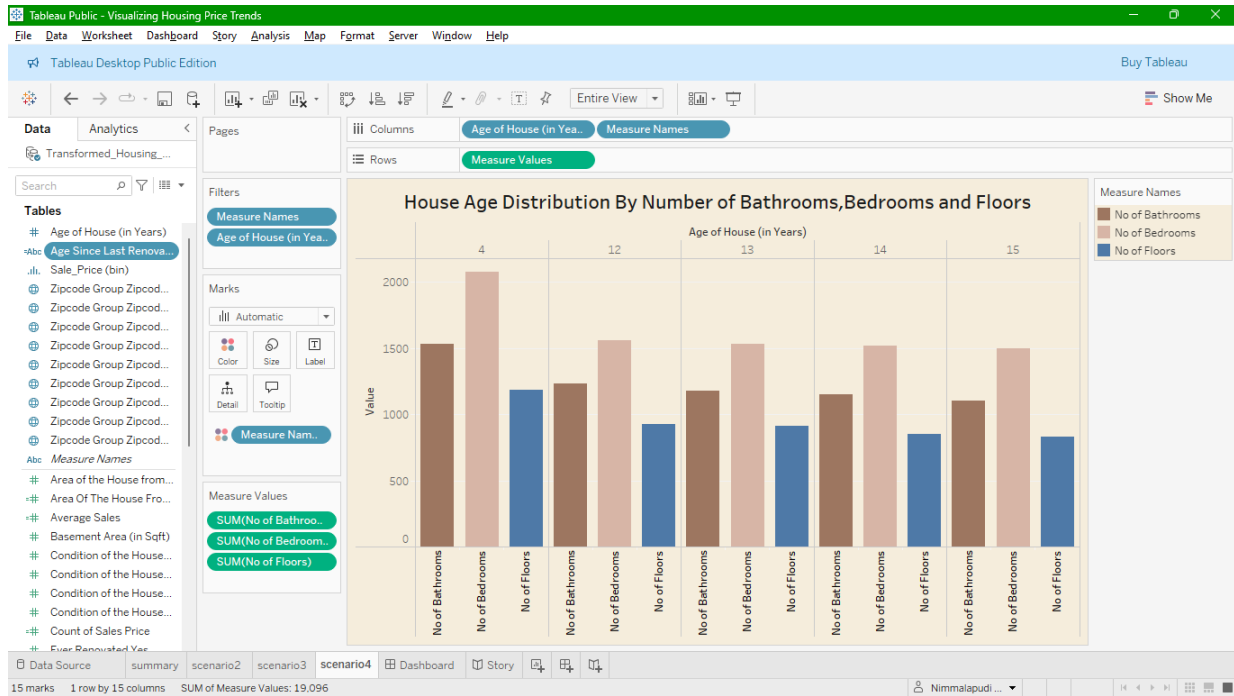
Scenario-2



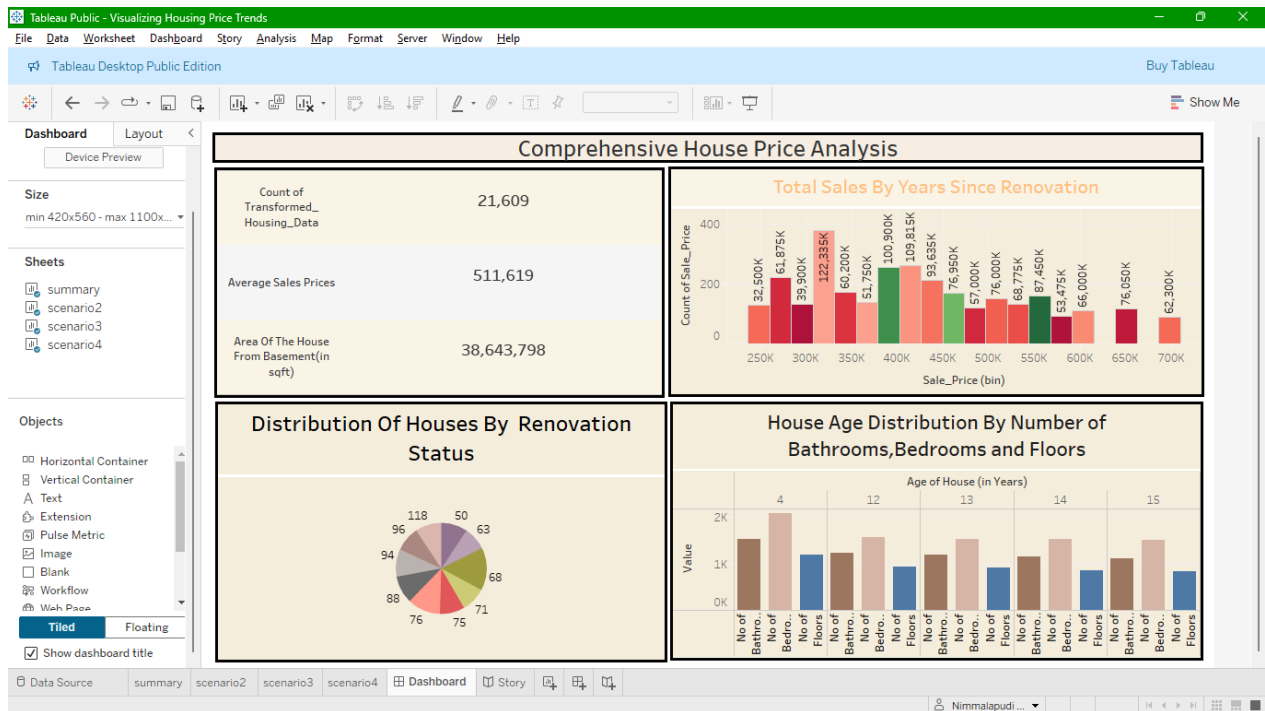
Scenario-3



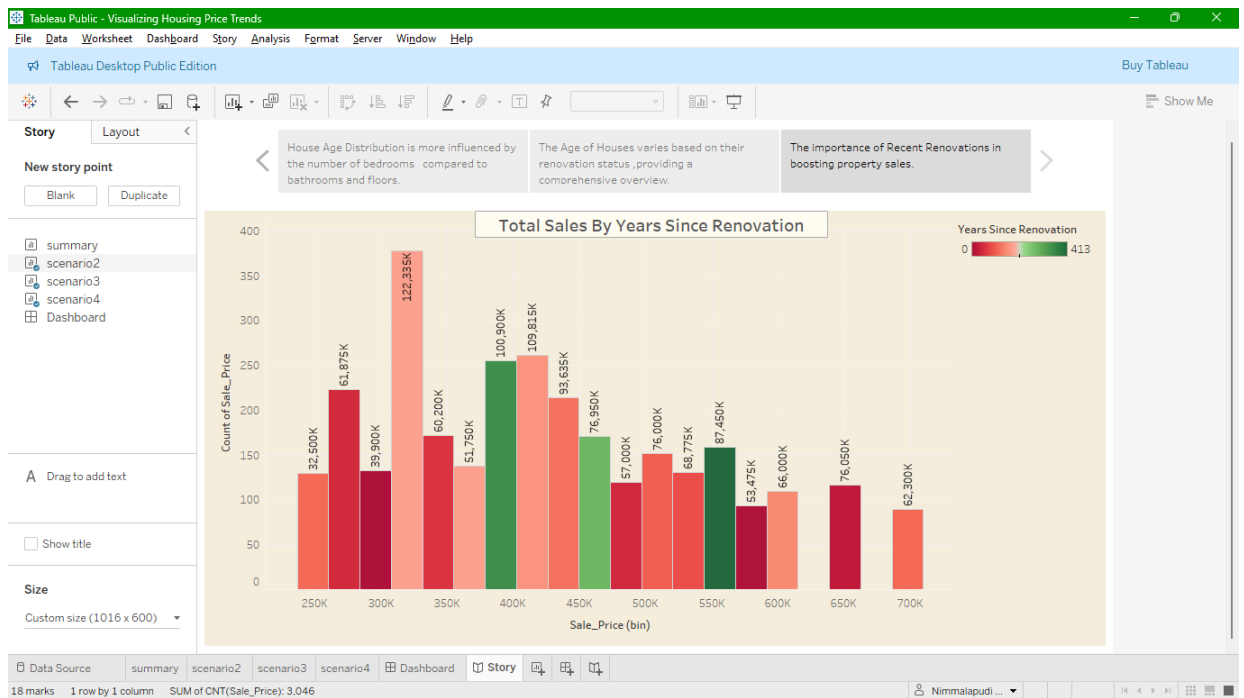
Scenario-4



Dashboard



Story



8. ADVANTAGES & DISADVANTAGES

8.1 ADVANTAGES

1. **Visual Clarity:** Tableau enables intuitive, easy-to-understand visualizations for complex housing datasets.
2. **Interactive Dashboards:** Users can filter data dynamically based on features like renovations, age, or number of rooms.
3. **Business Insights:** Helps stakeholders identify trends and patterns that influence pricing strategies and buyer behavior.
4. **Time-Efficient:** Reduces manual analysis through automated and visual insights.
5. **Storytelling Capability:** Tableau's story feature allows presenting data as step-by-step narratives.
6. **Non-technical Accessibility:** Designed for business users with minimal technical skills.
7. **Improves Decision Making:** Enhances strategic planning through data-driven recommendations.
8. **Flexible Data Sources:** Supports a wide range of formats like Excel, CSV, and cloud-based data.

8.1 DISADVANTAGES

1. **No Predictive Modeling:** Tableau lacks built-in machine learning or forecasting capabilities.
2. **Dependence on Data Quality:** Inaccurate or unclean data can lead to misleading visualizations.
3. **Limited Data Cleaning:** Complex data transformations require external tools like Tableau Prep.
4. **Performance Issues:** Can slow down with very large datasets if not optimized properly.

5. **Story Limitations:** Tableau's story feature is static and not as flexible as interactive dashboards.
6. **Cost (for full version):** Tableau Creator licenses and cloud solutions may be expensive.
7. **No Native Real-Time Streaming:** Tableau is not ideal for real-time dynamic updates.
8. **Requires Training:** Users need time to become proficient in designing meaningful dashboards.

9. CONCLUSION

This project demonstrates the effective use of **Tableau** and **Tableau Prep Builder** to analyze and visualize housing market data in a meaningful and interactive way. By examining patterns related to **sale prices, renovations, house age, and structural features**, the project reveals key insights that support a deeper understanding of real estate trends.

Through a combination of **interactive dashboards** and **story-driven visualizations**, the project transforms raw datasets into easily interpretable insights. It proves how data visualization can **enhance clarity, support decision-making**, and provide a **structured narrative** around complex datasets. The approach used ensures the findings are accessible to both technical and non-technical users, making it a valuable asset for real estate data analysis.

10. FUTURE SCOPE

1. **Add Predictive Analytics:** Integrate machine learning to forecast housing prices.
2. **Use Real-Time APIs:** Connect to real estate APIs (like Zillow or Realtor.com) for live data updates.
3. **Enhance with Maps:** Use Tableau's map visualizations for geospatial housing trends.
4. **Deploy on Tableau Server:** Expand collaboration through server-hosted dashboards.
5. **Include External Data:** Add economic, demographic, or regional data to enrich insights.

6. **Mobile Dashboards:** Optimize dashboards for mobile accessibility.
7. **Automated Data Refresh:** Schedule regular updates from connected data sources.
8. **Multi-User Interaction:** Enable tailored views for different user types like analysts, buyers, or planners.

11. APPENDIX

Dataset Link :

<https://www.kaggle.com/datasets/rituparnaghosh18/transformed-housing-data-2>

Project Demo Link :

<https://drive.google.com/file/d/1oPvIY9hHnva5YzRDiOsJ6-M3IUhbM65c/view?usp=drivesdk>

Project GitHub Link :