

Final Report

1.Introduction

1.1 Project Overview:

The project “Visualizing Housing Market Trends” aims to analyze and present housing market data in a meaningful and interactive manner. Housing market datasets are often large, complex, and difficult to interpret using traditional methods such as spreadsheets or static reports. This project addresses that challenge by transforming raw housing data into visual insights that highlight trends, patterns, and relationships between house prices and key features.

The project follows a structured workflow starting from dataset collection and data preprocessing to visualization and dashboard creation. Housing market data is cleaned and prepared using Python-based data processing techniques. The processed data is then used to create visualizations and dashboards using...

The project “Visualizing Housing Market Trends” is designed to analyze housing market data and present meaningful insights through interactive visualizations. Housing market datasets typically contain a large number of records with multiple attributes such as location, sale price, size, number of rooms, and other features. Analyzing such datasets using traditional methods like spreadsheets or static reports is time-consuming and often fails to provide clear insights.

This project addresses these challenges by applying data preprocessing, visualization, and dashboard techniques to convert raw housing data into easily understandable visual formats. The workflow begins with dataset collection from reliable sources, followed by data cleaning and preprocessing to ensure accuracy and consistency. Preprocessing steps include handling missing values, removing duplicate records, correcting data types, and preparing the dataset for analysis.

After preprocessing, the cleaned data is used to create visualizations using Tableau Desktop. Tableau enables the creation of charts, graphs, and dashboards that help in identifying housing price trends, regional variations, and the impact of different features on house prices. These visualizations make it easier to explore patterns that are difficult to detect in raw data.

To improve accessibility and usability, the Tableau dashboard is integrated with a Flask-based web application. Flask acts as a lightweight backend framework that serves the dashboard through a web interface. This integration allows users to view analytical insights using a browser without directly interacting with Tableau Desktop. The project does not include user authentication or transactional features; instead, it focuses purely on data analysis and visualization.

Overall, this project demonstrates how data analytics tools and web technologies can be combined to build an effective analytical system. It is primarily intended for academic learning and project demonstration purposes, helping students understand real-world data analysis workflows.

1.2 Purpose:

The primary purpose of this project is to simplify the understanding of housing market trends by representing complex datasets in a visual and interactive manner. Housing data often contains hidden patterns that are difficult to identify through manual analysis. By using visualization techniques, the project helps highlight trends, comparisons, and relationships between different housing attributes.

Another important purpose is to support data-driven analysis. Instead of relying on assumptions or manual calculations, the project enables structured exploration of housing prices and features using dashboards. This approach improves clarity and reduces the effort required to interpret large datasets.

The project also aims to provide practical exposure to modern data analysis tools and technologies. Students gain hands-on experience in data preprocessing using Python, creating professional dashboards with Tableau Desktop, and integrating analytical outputs with a web application using Flask. This combination of skills is highly relevant in the fields of data analytics, business intelligence, and software development.

From an academic perspective, the project serves as a learning-oriented analytical system rather than a commercial product. It helps demonstrate how raw data can be transformed into useful insights through a structured process. Additionally, the project promotes better decision-making by presenting data in a clear and understandable format, which can be useful for academic analysis, research, and educational demonstrations.

In summary, the purpose of the project is not only to visualize housing market data but also to showcase the complete lifecycle of a data analytics project—from data collection and preprocessing to visualization and web-based presentation.

2. Ideation Phase

2.1 Problem Statement:

Customer Problem Statement Template:

Problem Statement (PS)	I am	I'm trying to	But	Because	Which makes me feel
PS-1	a Real Estate Analyst at ABC Company	Analyze housing sale prices and trends based on renovation status, house age, and structural features.	I struggle with making sense of raw data and identifying key influencing factors.	the data is large, unstructured, and lacks visual storytelling.	frustrated and unsure about providing accurate, strategic insights to decision-makers.
PS-2	A company executive at ABC Company	Make data driven decisions to optimize housing pricing strategies.	I can not easily interpret detailed data or compare features like bathrooms, floors and renovations.	Traditional reports are too complex and not visually accessible.	Disconnected from real trends in the housing market and hesitant to make confident business decisions.

Problem Statement (PS)-1

Customer Problem Statement Template

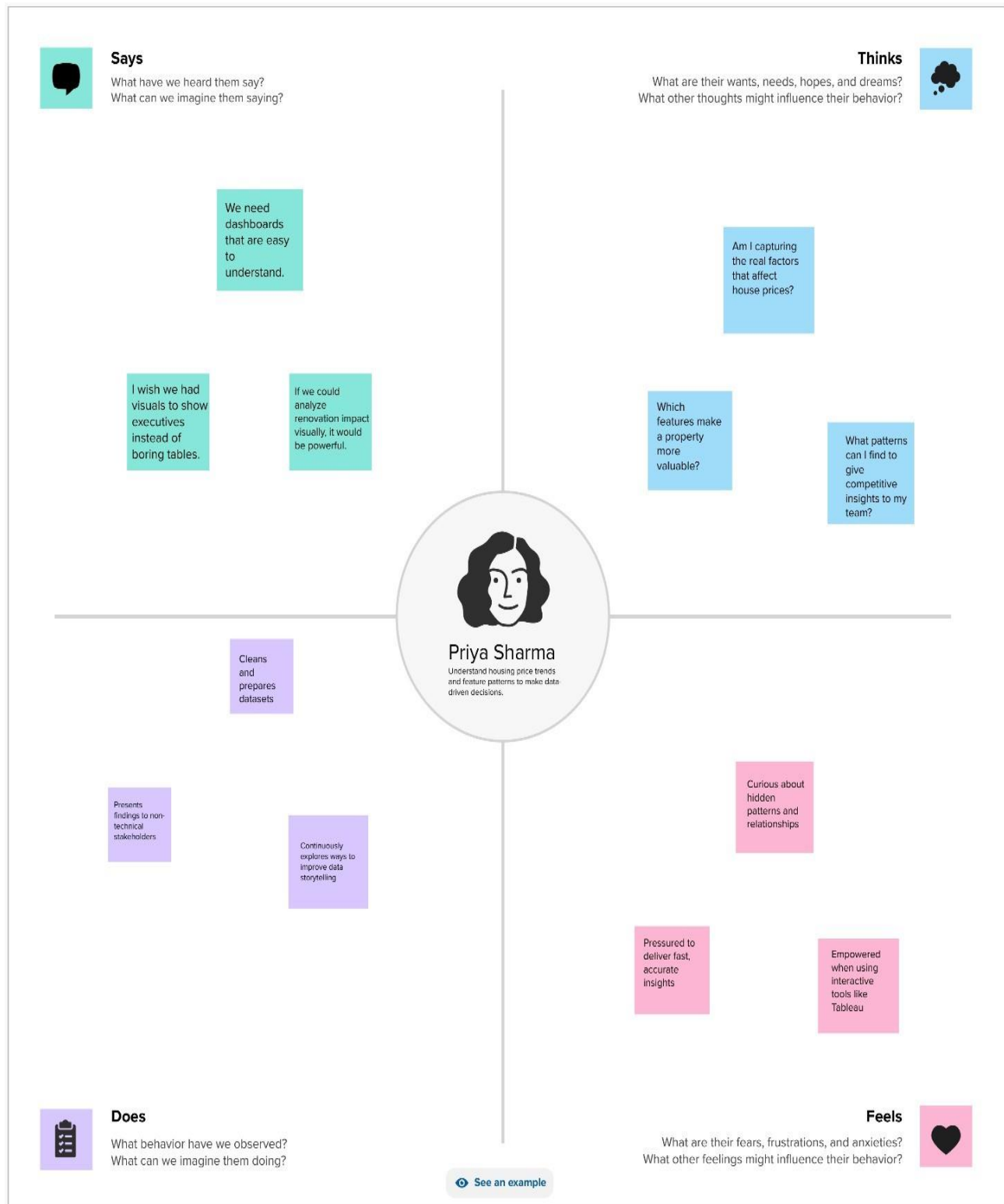
I am	I'm trying to	But	Because	Which makes me feel
a Real Estate Analyst at ABC Company.	analyze housing sale prices and trends based on renovation status, house age, and structural features.	I struggle with making sense of raw data and identifying key influencing factors.	the data is large, unstructured, and lacks visual storytelling.	frustrated and unsure about providing accurate, strategic insights to decision-makers.

Problem Statement (PS)-2

Customer Problem Statement Template

I am	I'm trying to	But	Because	Which makes me feel
a company Executive at ABC Company	make data-Driven decisions to optimize housing pricing strategies	I cannot easily interpret Detailed data or compare features like bathrooms, floors, and renovations	traditional Reports are too complex and not visually accessible.	disconnected from the real trends in the housing market and hesitant to make confident business decisions.


2.2 Empathy Map



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

- A Team gathering**
 Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.
- B Set the goal**
 Think about the problem you'll be focusing on solving in the brainstorming session.
- C Learn how to use the facilitation tools**
 Use the Facilitation Superpowers to run a happy and productive session.

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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

Understanding housing market trends and key price factors is difficult due to large and complex datasets.



Key rules of brainstorming

To run an 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

Visualizing Housing Market Trend

4

Brainstorm

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

10 minutes

TIP
You can select a sticky note and drag it onto a group to add it to that group.

Person 1

Housing Market Trends Visualization using Tableau

Person 2

Sale Price Analysis Dashboard based on Housing Features

Person 3

Total Sales Analysis by Years Since Renovation Visualization

Person 5

House Age Distribution Analysis by Bedrooms, Bathrooms and Floors

Person 4

Comprehensive Housing Data Analysis Dashboard using Tableau

5

Group Ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

20 minutes

TIP
If you have a lot of ideas to share, try to group them into a few main categories. If you have a lot of ideas, try to group them into a few main categories.

Group 1

Housing Market Trends Visualization using Tableau

Comprehensive Housing Data Analysis Dashboard using Tableau

Group 2

Sale Price Analysis Dashboard based on Housing Features

Total Sales Analysis by Years Since Renovation Visualization

Group 3

House Age Distribution Analysis by Bedrooms, Bathrooms and Floors

Step-3: Idea Prioritization



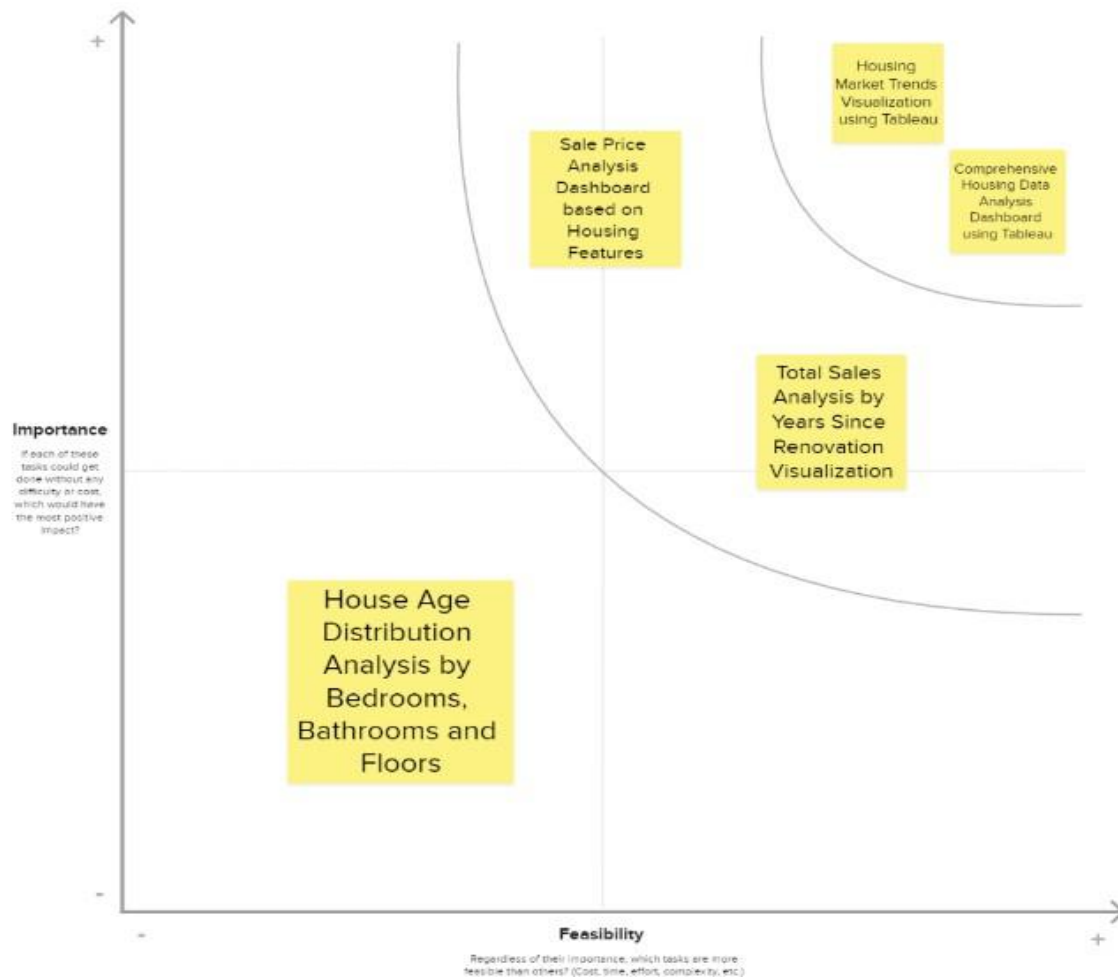
Prioritize

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

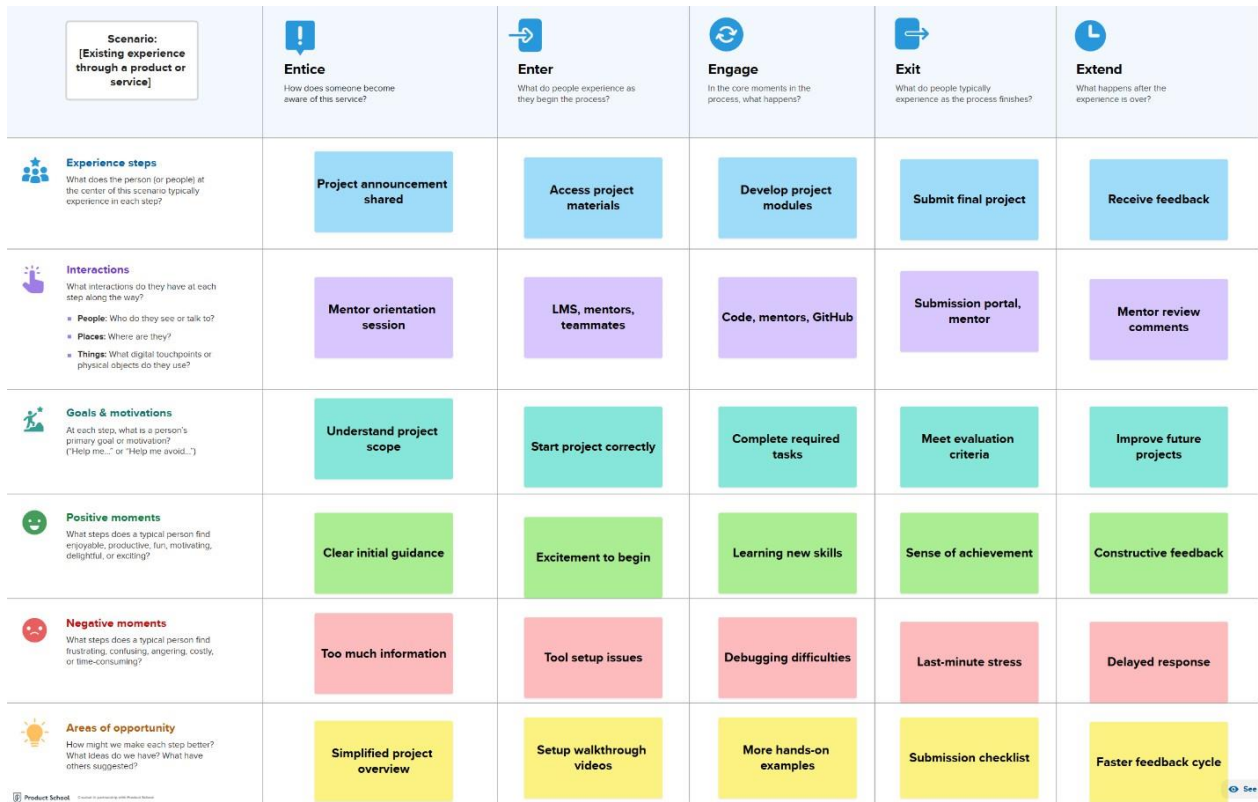
TIP

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:



3.2 Solution Requirement:

Functional Requirements:

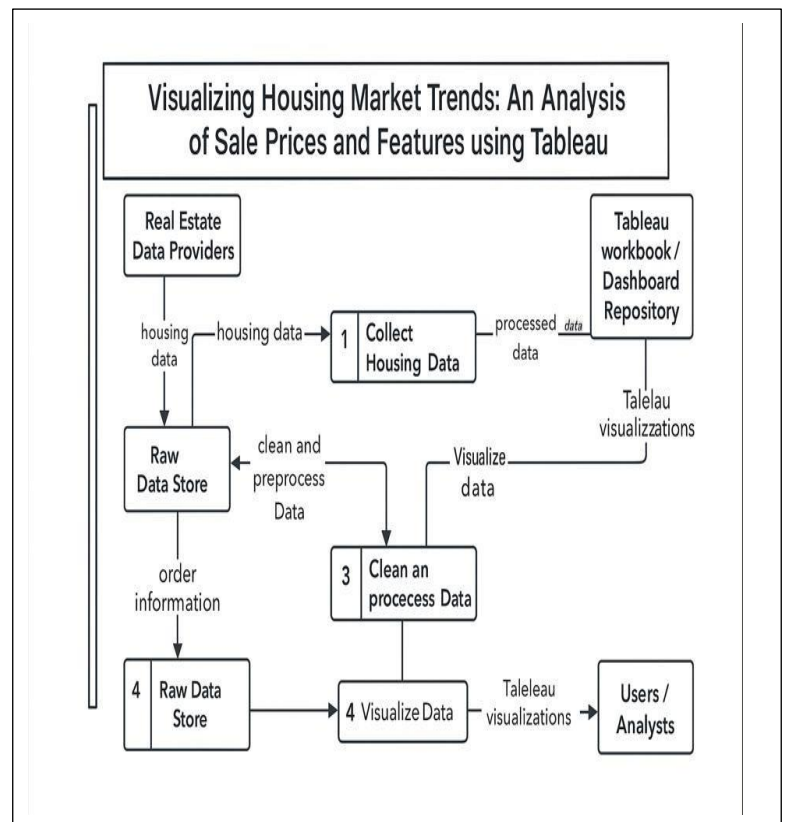
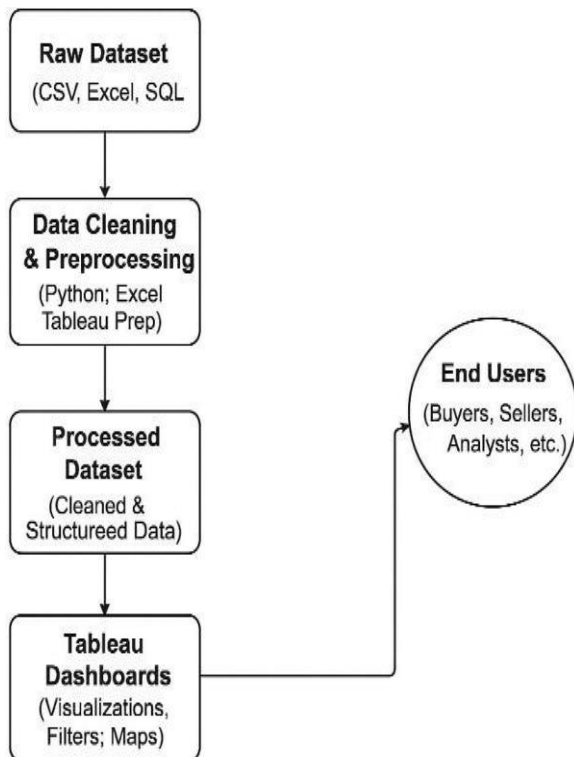
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data Collection	Import housing dataset (CSV/Excel)
FR-2	Data Cleaning	Handle missing values, remove duplicates
FR-3	Data Preparation	Create calculated fields, filters
FR-4	Feature Analysis	Compare price vs location, size, rooms
FR-5	Interactive Dashboards	Filters for location, price range
FR-6	Visualization Creation	Bar charts, line charts, pie charts
FR-7	Insight Generation	Identify key price influencing factors
FR-8	Dashboard Publishing	Share Tableau dashboard online

FR-9	User Interaction	View, filter, explore insights
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Non-functional Requirements:

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Dashboards should be easy to understand with clear charts and filters
NFR-2	Security	Housing dataset should be protected from unauthorized modifications
NFR-3	Reliability	Visualizations should consistently show correct data insights
NFR-4	Performance	Dashboard should load and respond quickly to user interactions
NFR-5	Availability	Tableau dashboard should be accessible whenever required
NFR-6	Scalability	Dashboard should support additional housing data in the future

3.3 Data Flow Diagram:



User Stories:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
User (Analyst)	Data Loading	USN-1	As a user, I can load a housing dataset into the system	Dataset loads without errors	High	Sprint-1
User (Analyst)	Data Processing	USN-2	As a user, I can preprocess and clean housing data	Cleaned data available for analysis	High	Sprint-1
User (Analyst)	Visualization	USN-3	As a user, I can generate visualizations for price trends and features	Charts render correctly	High	Sprint-1
User (Viewer)	Dashboard Access	USN-4	As a user, I can access the dashboard through a Flask web interface	Dashboard loads in browser	High	Sprint-2
User (Viewer)	Interactivity	USN-5	As a user, I can filter data on the dashboard	Dashboard updates dynamically	Medium	Sprint-2
User (Viewer)	Insight Viewing	USN-6	As a user, I can view insights and summaries	Insights are clearly displayed	Medium	Sprint-2

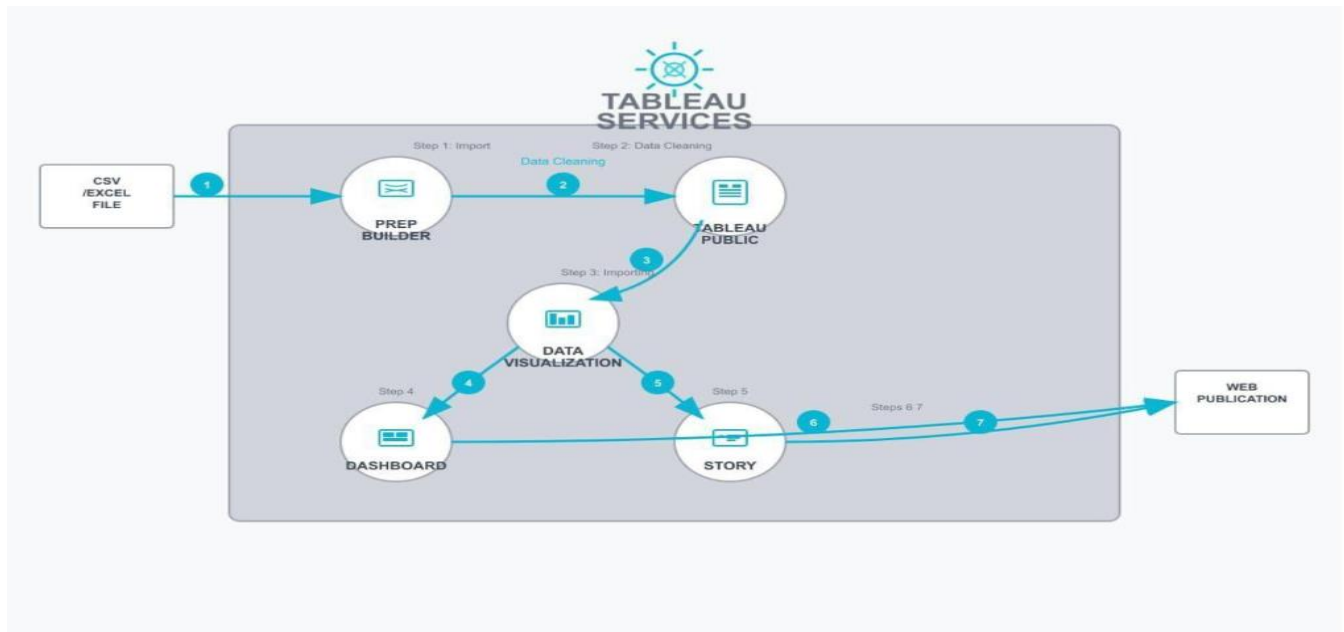
3.4 Technology Stack:**Technical Architecture:**

Table-1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	Flask, HTML, CSS
2.	Application Logic-1	Logic for a process in the application	Python
3.	Application Logic-2	Logic for a process in the application	-
4.	Application Logic-3	Logic for a process in the application	-
5.	Database	Data Type, Configurations etc.	-
6.	Cloud Database	Database Service on Cloud	-
7.	File Storage	File storage requirements	Local Filesystem
8.	External API-1	Purpose of External API used in the application	-
9.	External API-2	Purpose of External API used in the application	-
10.	Tableau	Purpose of Machine Learning Model	Tableau Desktop/Public 2025.3.2
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration:	Local.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Tableau public, Flask, VS code, Tableau prep Builder
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	-
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	-
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Available whenever server runs
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	Fast data processing and loading

4. Project Design

4.1 Problem Solution Fit:

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS 1.Home buyers 2.Real estate analysts 3.students & researchers	6. CUSTOMER CONSTRAINTS CC What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices. 1.Lack of data analysis skills 2.Large and complex dataset 3.Time constraints	5. AVAILABLE SOLUTIONS AS Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What prior & come do these solutions have? i.e. pen and paper is an alternative to digital notetaking 1.Excel sheets 2.Static reports 3.Online property websites	Explore AS, differentiate
	2. JOBS-TO-BE-DONE / PROBLEMS J&P Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one, explore different sides. 1.Understanding housing price trends 2.Compare prices across locations 3.Identify price influencing features	9. PROBLEM ROOT CAUSE RC What is the real reason that this problem exists? What is the back story behind the need to do this job? i.e. customers have to do it because of the change in regulations 1.Housing data is complex 2.Lack of visualization based tools 3.Difficulty extracting insights	7. BEHAVIOUR BE What does your customer do to address the problem and get the job done? i.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace) 1.Searching housing data online 2.Manually compare prices 3.Refer reports and blogs	
Identify strong TR & EM	3. TRIGGERS TR What triggers customers to act? i.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news. 1.Understanding housing price trends 2.Compare prices across locations 3.Identify price influencing features	10. YOUR SOLUTION SL If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits really. If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour. 1.Interactive housing dashboard 2.Flask based web application 3.Visual price & feature analysis	8. CHANNELS of BEHAVIOUR CH 8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7 1.Viewing dashboard 2.Applying filters 3.Analyzing charts 8.2 OFFLINE What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development. 1.Discussions with peers 2.Academic reviews 3.Decision documentation	Extract online & offline CH of BE
	4. EMOTIONS: BEFORE / AFTER EM How do customers feel when they face a problem or a job and afterwards? i.e. lost, insecure > confident, in control - use it in your communication strategy & design. Before: Confused, overwhelmed After: Confident, informed			

4.2 Proposed Solution:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Understanding housing price trends is difficult due to large and complex datasets.
2.	Idea / Solution description	An interactive Flask-based dashboard to visualize housing market trends.
3.	Novelty / Uniqueness	Combines data visualization with a simple web dashboard.
4.	Social Impact / Customer Satisfaction	Helps users make informed housing decisions easily.
5.	Business Model (Revenue Model)	Academic and research-based usage.

6.	Scalability of the Solution	Can support additional datasets and features.
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4.3 Solution Architecture:

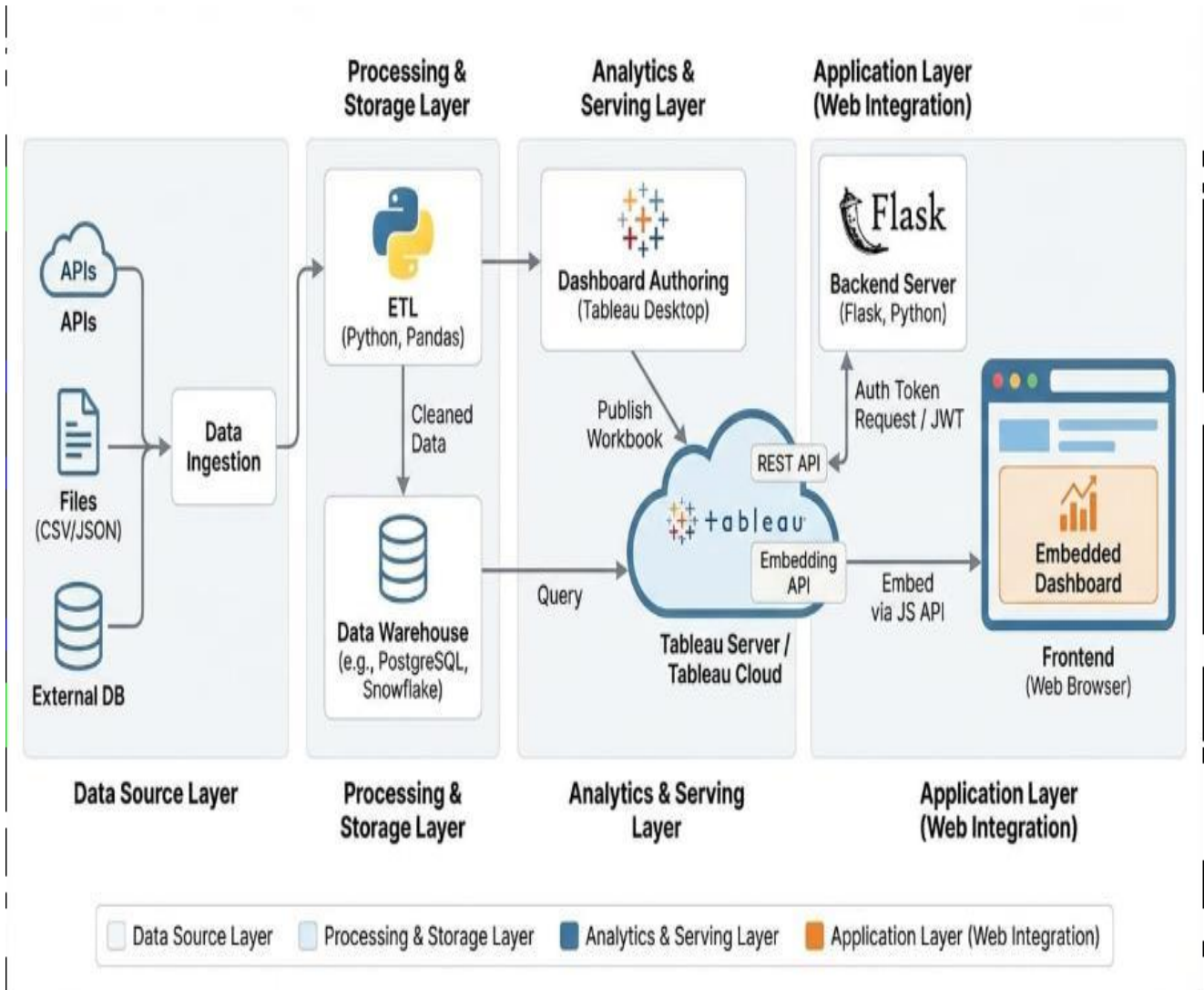


Figure 1: Architecture of Python-Tableau-Flask Integrated Data Stack

5. Project Planning & Scheduling

5.1 Project Planning:

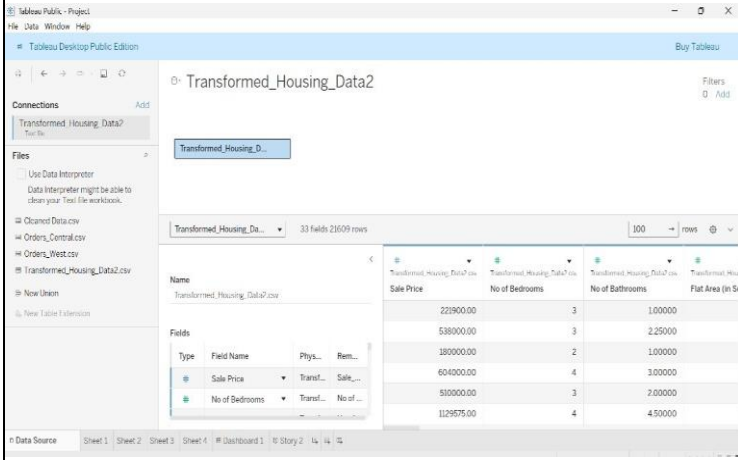
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Dataset Collection	USN-1	As a developer, I can collect housing market dataset from reliable sources	2	High	Peddisetty Mahesh
Sprint-1	Data Cleaning	USN-2	As a developer, I can clean the dataset by handling missing and inconsistent values	4	High	Kethineni Aravind
Sprint-1	Data Preprocessing	USN-3	As a developer, I can preprocess data for analysis and visualization	4	High	Munukuri Sai Lakshmi
Sprint-2	Data Storage	USN-4	As a developer, I can store the processed data in structured format (CSV)	3	Medium	Midabala Jaswanth Sai
Sprint-2	Data Visualization	USN-5	As a developer, I can create housing market Visualizations using Tableau Desktop	5	High	Sakhamuri Sri Rama Krishna
Sprint-2	Dashboard Creation	USN-6	As a developer, I can build an interactive Tableau dashboard	4	High	Kethineni Aravind
Sprint-3	Web Integration	USN-7	As a developer, I can integrate the Tableau dashboard with Flask	5	High	Peddisetty Mahesh
Sprint-3	Deployment	USN-8	As a developer, I can deploy the Flask application locally	3	Medium	Midabala Jaswanth Sai
Sprint-4	Template understanding	USN-9	As a developer, I can understand the assigned project templates	2	High	Munukuri Sai Lakshmi
Sprint-4	Templates Filling	USN-10	As a developer, I can fill the assigned templates with project details	4	High	Peddisetty Mahesh

Project Tracker, Velocity & Burndown Chart:

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed	Sprint Release Date (Actual)
Sprint-1	20	3 Days	30 Jan 2026	01 Feb 2026	20	01 Feb 2026
Sprint-2	20	5 Days	01 Feb 2026	08 Feb 2026	20	08 Feb 2026
Sprint-3	20	4 Days	09 Feb 2026	12 Feb 2026	20	12 Feb 2026
Sprint-4	20	6 Days	13 Feb 2026	18 Feb 2026	20	18 Feb 2026

6. Functional and Performance Testing

6.1 Performance Testing:

S.No.	Parameter	Screenshot / Values																												
1.	Data Rendered	<p>Our Data Set name is Transformed_Housing_Data2 , It contains information about houses . including their price, area, number of bedrooms and bathrooms.</p> <p>we have loaded it in into tableau and then we moved to preprocessing of data.</p>  <table><thead><tr><th>Sale Price</th><th>No of Bedrooms</th><th>No of Bathrooms</th><th>Flat Area (in Sq Ft)</th></tr></thead><tbody><tr><td>223900.00</td><td>3</td><td>1.000000</td><td></td></tr><tr><td>538000.00</td><td>3</td><td>2.250000</td><td></td></tr><tr><td>180000.00</td><td>2</td><td>1.000000</td><td></td></tr><tr><td>604000.00</td><td>4</td><td>3.000000</td><td></td></tr><tr><td>500000.00</td><td>3</td><td>2.000000</td><td></td></tr><tr><td>1129575.00</td><td>4</td><td>4.500000</td><td></td></tr></tbody></table>	Sale Price	No of Bedrooms	No of Bathrooms	Flat Area (in Sq Ft)	223900.00	3	1.000000		538000.00	3	2.250000		180000.00	2	1.000000		604000.00	4	3.000000		500000.00	3	2.000000		1129575.00	4	4.500000	
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2.	Data Preprocessing	<ol style="list-style-type: none">Handled null values.Removed unwanted fields.																												

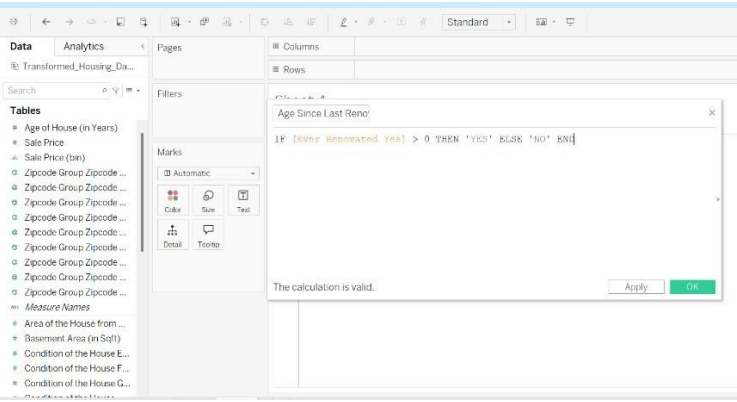

3.

Utilization of Filters

Filters applied on: Sales Price Age of House (in years)

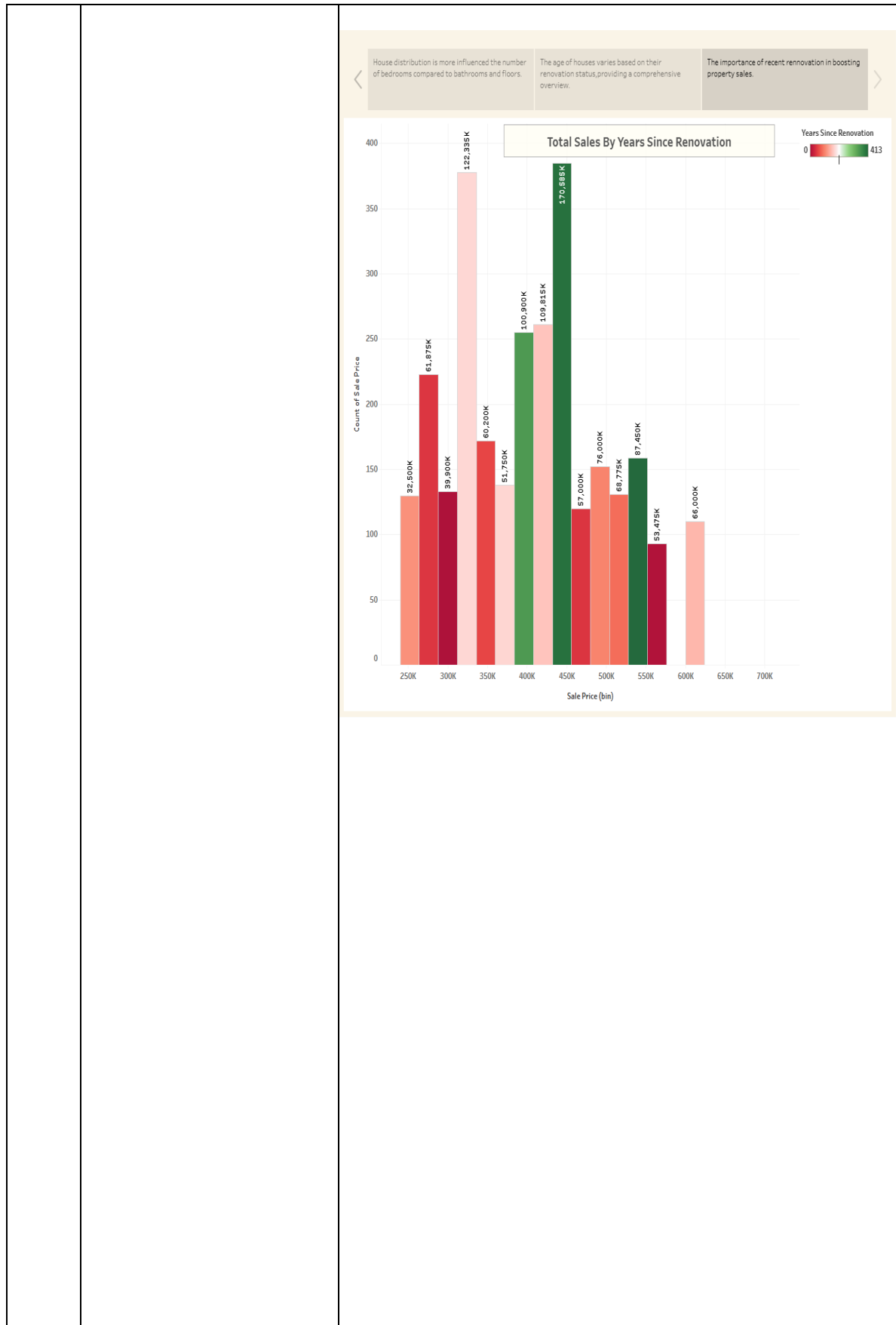
The screenshot shows the Tableau interface with a bar chart titled 'Count of Sale Price' on the y-axis and price bins (550K, 600K, 650K) on the x-axis. A 'Filter [Sale Price]' dialog box is open, showing the 'General' tab. The 'By field' option is selected, and the field 'Age of House (in Years)' is chosen with the 'Sum' aggregation. The 'Top' value is set to 10. The background chart shows bars for each price bin with values: 550K (68,775,000), 600K (87,450,000), and 650K (53,475,000).

The screenshot shows the Tableau interface with a bar chart titled 'Count of Sale Price' on the y-axis and price bins (550K, 600K, 650K) on the x-axis. A 'Filter [Age of House (in Years)]' dialog box is open, showing the 'General' tab. The 'By field' option is selected, and the field 'Transformed_Housing_Data2.csv' is chosen with the 'Sum' aggregation. The 'Top' value is set to 10. The background chart shows bars for each price bin with values: 550K (68,775,000), 600K (87,450,000), and 650K (53,475,000).

4.	Calculation fields Used	<p>Age Since Last Renovation=IF[EverRenovatedYes]>0THEN‘YES’ ELSE ‘NO’ END</p> 																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
5.	Dashboard design	<p>No of Visualizations/Graphs–4</p> <p>Data Overview, Total Sales By Year Since Renovation, Distribution of House Age by Renovation Status , House Age Distribution by Number of Bathrooms, Bedrooms and Floors</p> <p>Dashboard 1</p>  <p>Data Overview</p> <table border="1"> <thead> <tr> <th>Metric</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Count of Transformed_Housing_Sales</td> <td>21,559</td> </tr> <tr> <td>Avg Sale Price</td> <td>\$21,618</td> </tr> <tr> <td>Area of the House from Basement (in SqFt)</td> <td>20,642.788</td> </tr> </tbody> </table> <p>Total Sales By Years Since Renovation</p> <table border="1"> <thead> <tr> <th>Year Since Renovation</th> <th>Count of Sales Price</th> </tr> </thead> <tbody> <tr><td>1</td><td>100,000</td></tr> <tr><td>2</td><td>150,000</td></tr> <tr><td>3</td><td>200,000</td></tr> <tr><td>4</td><td>250,000</td></tr> <tr><td>5</td><td>300,000</td></tr> <tr><td>6</td><td>350,000</td></tr> <tr><td>7</td><td>400,000</td></tr> 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<tr><td>400</td><td>20,050,000</td></tr> <tr><td>401</td><td>20,100,000</td></tr> <tr><td>402</td><td>20,150,000</td></tr> <tr><td>403</td><td>20,200,000</td></tr> <tr><td>404</td><td>20,250,000</td></tr> <tr><td>405</td><td>20,300,000</td></tr> <tr><td>406</td><td>20,350,000</td></tr> <tr><td>407</td><td>20,400,000</td></tr> <tr><td>408</td><td>20,450,000</td></tr> <tr><td>409</td><td>20,500,000</td></tr> <tr><td>410</td><td>20,550,000</td></tr> <tr><td>411</td><td>20,600,000</td></tr> <tr><td>412</td><td>20,650,000</td></tr> <tr><td>413</td><td>20,700,000</td></tr> <tr><td>414</td><td>20,750,000</td></tr> <tr><td>415</td><td>20,800,000</td></tr> <tr><td>416</td><td>20,850,000</td></tr> <tr><td>417</td><td>20,900,000</td></tr> <tr><td>418</td><td>20,950,000</td></tr> <tr><td>419</td><td>21,000,000</td></tr> <tr><td>420</td><td>21,050,000</td></tr> <tr><td>421</td><td>21,100,000</td></tr> <tr><td>422</td><td>21,150,000</td></tr> <tr><td>423</td><td>21,200,000</td></tr> 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Price	1	100,000	2	150,000	3	200,000	4	250,000	5	300,000	6	350,000	7	400,000	8	450,000	9	500,000	10	550,000	11	600,000	12	650,000	13	700,000	14	750,000	15	800,000	16	850,000	17	900,000	18	950,000	19	1,000,000	20	1,050,000	21	1,100,000	22	1,150,000	23	1,200,000	24	1,250,000	25	1,300,000	26	1,350,000	27	1,400,000	28	1,450,000	29	1,500,000	30	1,550,000	31	1,600,000	32	1,650,000	33	1,700,000	34	1,750,000	35	1,800,000	36	1,850,000	37	1,900,000	38	1,950,000	39	2,000,000	40	2,050,000	41	2,100,000	42	2,150,000	43	2,200,000	44	2,250,000	45	2,300,000	46	2,350,000	47	2,400,000	48	2,450,000	49	2,500,000	50	2,550,000	51	2,600,000	52	2,650,000	53	2,700,000	54	2,750,000	55	2,800,000	56	2,850,000	57	2,900,000	58	2,950,000	59	3,000,000	60	3,050,000	61	3,100,000	62	3,150,000	63	3,200,000	64	3,250,000	65	3,300,000	66	3,350,000	67	3,400,000	68	3,450,000	69	3,500,000	70	3,550,000	71	3,600,000	72	3,650,000	73	3,700,000	74	3,750,000	75	3,800,000	76	3,850,000	77	3,900,000	78	3,950,000	79	4,000,000	80	4,050,000	81	4,100,000	82	4,150,000	83	4,200,000	84	4,250,000	85	4,300,000	86	4,350,000	87	4,400,000	88	4,450,000	89	4,500,000	90	4,550,000	91	4,600,000	92	4,650,000	93	4,700,000	94	4,750,000	95	4,800,000	96	4,850,000	97	4,900,000	98	4,950,000	99	5,000,000	100	5,050,000	101	5,100,000	102	5,150,000	103	5,200,000	104	5,250,000	105	5,300,000	106	5,350,000	107	5,400,000	108	5,450,000	109	5,500,000	110	5,550,000	111	5,600,000	112	5,650,000	113	5,700,000	114	5,750,000	115	5,800,000	116	5,850,000	117	5,900,000	118	5,950,000	119	6,000,000	120	6,050,000	121	6,100,000	122	6,150,000	123	6,200,000	124	6,250,000	125	6,300,000	126	6,350,000	127	6,400,000	128	6,450,000	129	6,500,000	130	6,550,000	131	6,600,000	132	6,650,000	133	6,700,000	134	6,750,000	135	6,800,000	136	6,850,000	137	6,900,000	138	6,950,000	139	7,000,000	140	7,050,000	141	7,100,000	142	7,150,000	143	7,200,000	144	7,250,000	145	7,300,000	146	7,350,000	147	7,400,000	148	7,450,000	149	7,500,000	150	7,550,000	151	7,600,000	152	7,650,000	153	7,700,000	154	7,750,000	155	7,800,000	156	7,850,000	157	7,900,000	158	7,950,000	159	8,000,000	160	8,050,000	161	8,100,000	162	8,150,000	163	8,200,000	164	8,250,000	165	8,300,000	166	8,350,000	167	8,400,000	168	8,450,000	169	8,500,000	170	8,550,000	171	8,600,000	172	8,650,000	173	8,700,000	174	8,750,000	175	8,800,000	176	8,850,000	177	8,900,000	178	8,950,000	179	9,000,000	180	9,050,000	181	9,100,000	182	9,150,000	183	9,200,000	184	9,250,000	185	9,300,000	186	9,350,000	187	9,400,000	188	9,450,000	189	9,500,000	190	9,550,000	191	9,600,000	192	9,650,000	193	9,700,000	194	9,750,000	195	9,800,000	196	9,850,000	197	9,900,000	198	9,950,000	199	10,000,000	200	10,050,000	201	10,100,000	202	10,150,000	203	10,200,000	204	10,250,000	205	10,300,000	206	10,350,000	207	10,400,000	208	10,450,000	209	10,500,000	210	10,550,000	211	10,600,000	212	10,650,000	213	10,700,000	214	10,750,000	215	10,800,000	216	10,850,000	217	10,900,000	218	10,950,000	219	11,000,000	220	11,050,000	221	11,100,000	222	11,150,000	223	11,200,000	224	11,250,000	225	11,300,000	226	11,350,000	227	11,400,000	228	11,450,000	229	11,500,000	230	11,550,000	231	11,600,000	232	11,650,000	233	11,700,000	234	11,750,000	235	11,800,000	236	11,850,000	237	11,900,000	238	11,950,000	239	12,000,000	240	12,050,000	241	12,100,000	242	12,150,000	243	12,200,000	244	12,250,000	245	12,300,000	246	12,350,000	247	12,400,000	248	12,450,000	249	12,500,000	250	12,550,000	251	12,600,000	252	12,650,000	253	12,700,000	254	12,750,000	255	12,800,000	256	12,850,000	257	12,900,000	258	12,950,000	259	13,000,000	260	13,050,000	261	13,100,000	262	13,150,000	263	13,200,000	264	13,250,000	265	13,300,000	266	13,350,000	267	13,400,000	268	13,450,000	269	13,500,000	270	13,550,000	271	13,600,000	272	13,650,000	273	13,700,000	274	13,750,000	275	13,800,000	276	13,850,000	277	13,900,000	278	13,950,000	279	14,000,000	280	14,050,000	281	14,100,000	282	14,150,000	283	14,200,000	284	14,250,000	285	14,300,000	286	14,350,000	287	14,400,000	288	14,450,000	289	14,500,000	290	14,550,000	291	14,600,000	292	14,650,000	293	14,700,000	294	14,750,000	295	14,800,000	296	14,850,000	297	14,900,000	298	14,950,000	299	15,000,000	300	15,050,000	301	15,100,000	302	15,150,000	303	15,200,000	304	15,250,000	305	15,300,000	306	15,350,000	307	15,400,000	308	15,450,000	309	15,500,000	310	15,550,000	311	15,600,000	312	15,650,000	313	15,700,000	314	15,750,000	315	15,800,000	316	15,850,000	317	15,900,000	318	15,950,000	319	16,000,000	320	16,050,000	321	16,100,000	322	16,150,000	323	16,200,000	324	16,250,000	325	16,300,000	326	16,350,000	327	16,400,000	328	16,450,000	329	16,500,000	330	16,550,000	331	16,600,000	332	16,650,000	333	16,700,000	334	16,750,000	335	16,800,000	336	16,850,000	337	16,900,000	338	16,950,000	339	17,000,000	340	17,050,000	341	17,100,000	342	17,150,000	343	17,200,000	344	17,250,000	345	17,300,000	346	17,350,000	347	17,400,000	348	17,450,000	349	17,500,000	350	17,550,000	351	17,600,000	352	17,650,000	353	17,700,000	354	17,750,000	355	17,800,000	356	17,850,000	357	17,900,000	358	17,950,000	359	18,000,000	360	18,050,000	361	18,100,000	362	18,150,000	363	18,200,000	364	18,250,000	365	18,300,000	366	18,350,000	367	18,400,000	368	18,450,000	369	18,500,000	370	18,550,000	371	18,600,000	372	18,650,000	373	18,700,000	374	18,750,000	375	18,800,000	376	18,850,000	377	18,900,000	378	18,950,000	379	19,000,000	380	19,050,000	381	19,100,000	382	19,150,000	383	19,200,000	384	19,250,000	385	19,300,000	386	19,350,000	387	19,400,000	388	19,450,000	389	19,500,000	390	19,550,000	391	19,600,000	392	19,650,000	393	19,700,000	394	19,750,000	395	19,800,000	396	19,850,000	397	19,900,000	398	19,950,000	399	20,000,000	400	20,050,000	401	20,100,000	402	20,150,000	403	20,200,000	404	20,250,000	405	20,300,000	406	20,350,000	407	20,400,000	408	20,450,000	409	20,500,000	410	20,550,000	411	20,600,000	412	20,650,000	413	20,700,000	414	20,750,000	415	20,800,000	416	20,850,000	417	20,900,000	418	20,950,000	419	21,000,000	420	21,050,000	421	21,100,000	422	21,150,000	423	21,200,000	424	21,250,000	425	21,300,000	426	21,350,000	427	21,400,000	428	21,450,000	429	21,500,000	430	21,550,000
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Visualizing Housing Market Trend



7 . Results

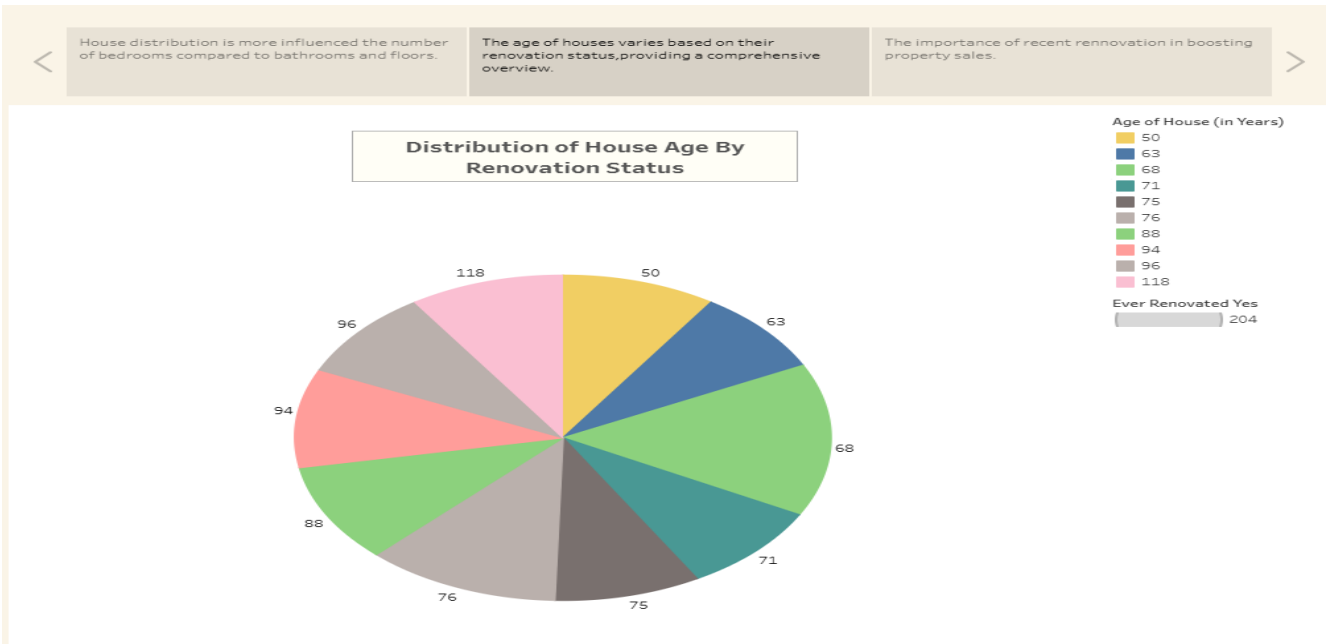
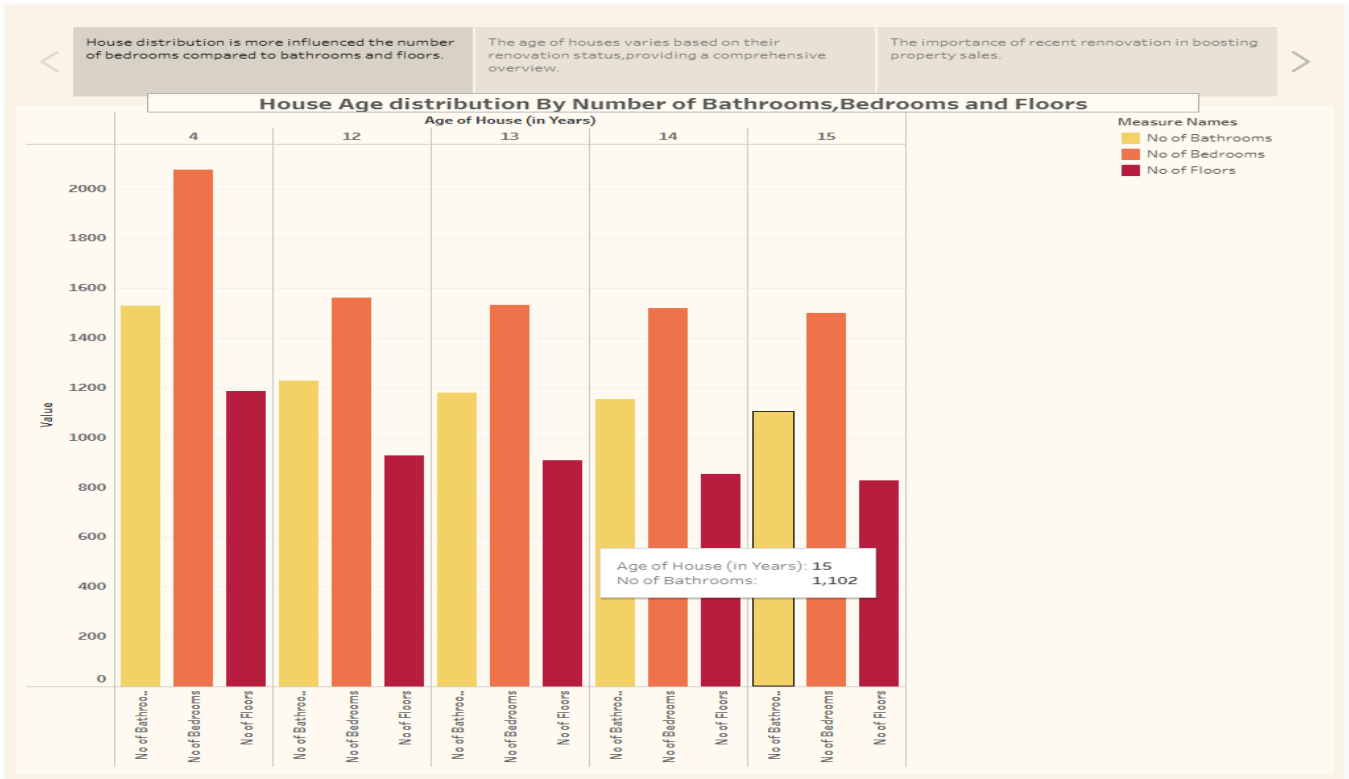
7.1 Output Screenshots:

Dashboard:

Dashboard 1



Story:

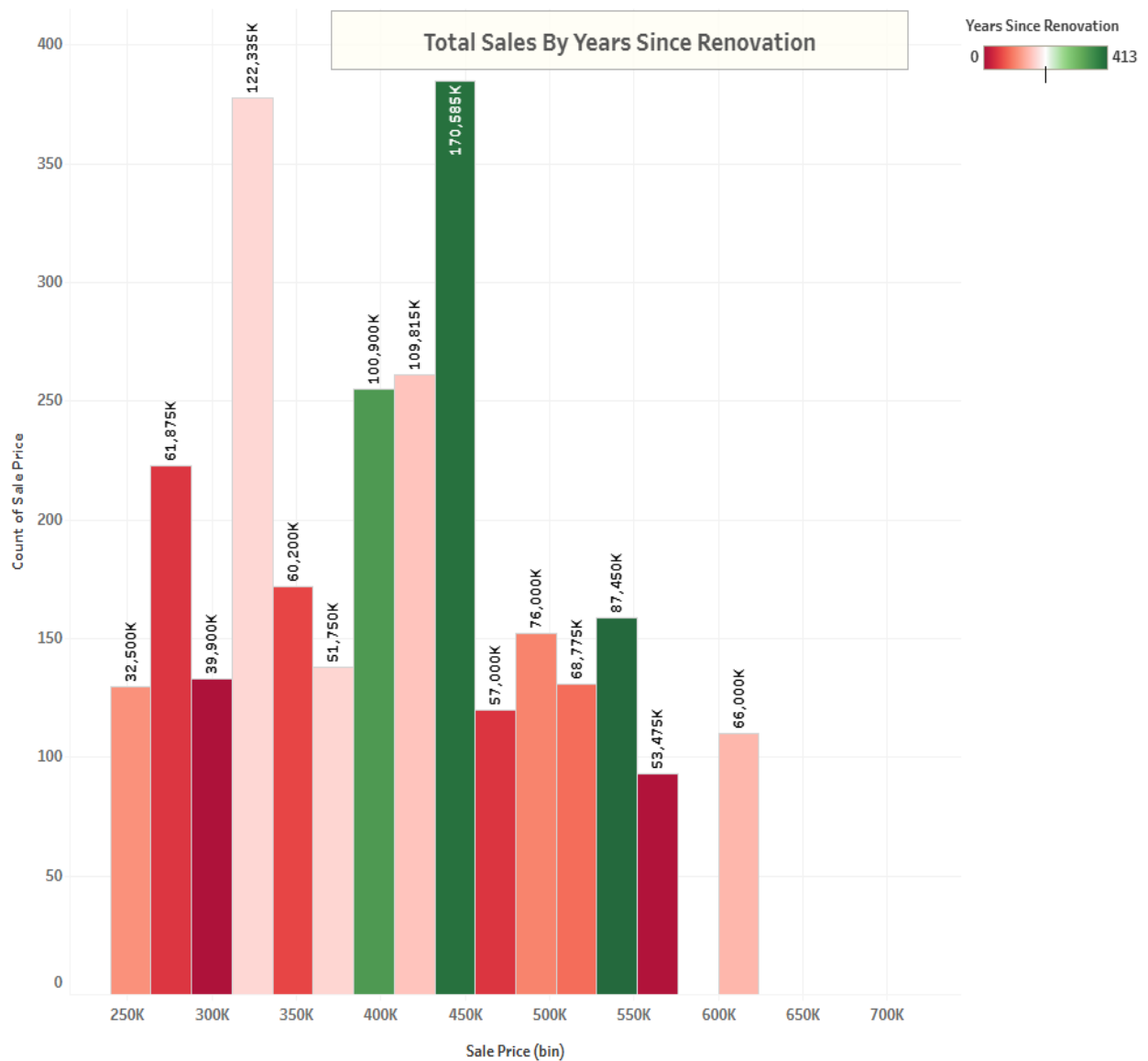


Visualizing Housing Market Trend

House distribution is more influenced the number of bedrooms compared to bathrooms and floors.

The age of houses varies based on their renovation status, providing a comprehensive overview.

The importance of recent renovation in boosting property sales.



Visualizing Housing Market Trend

Web Integration:

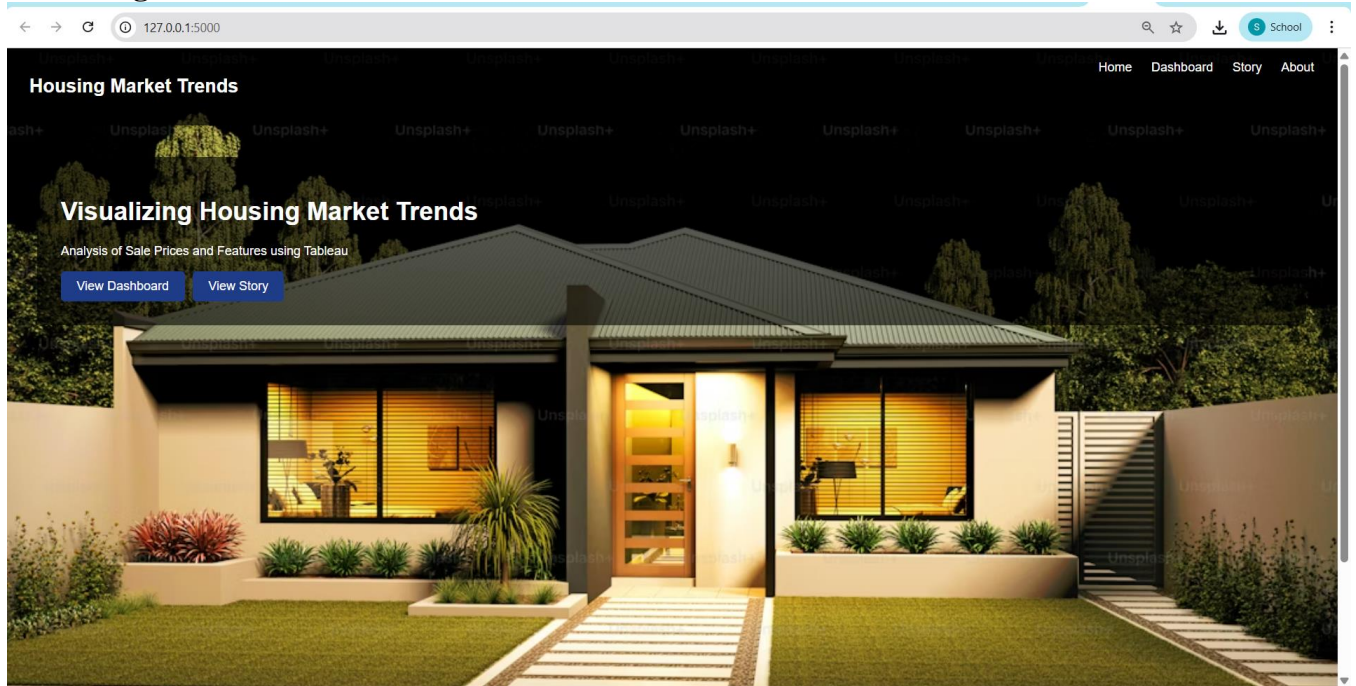


Fig : Home page of the Web

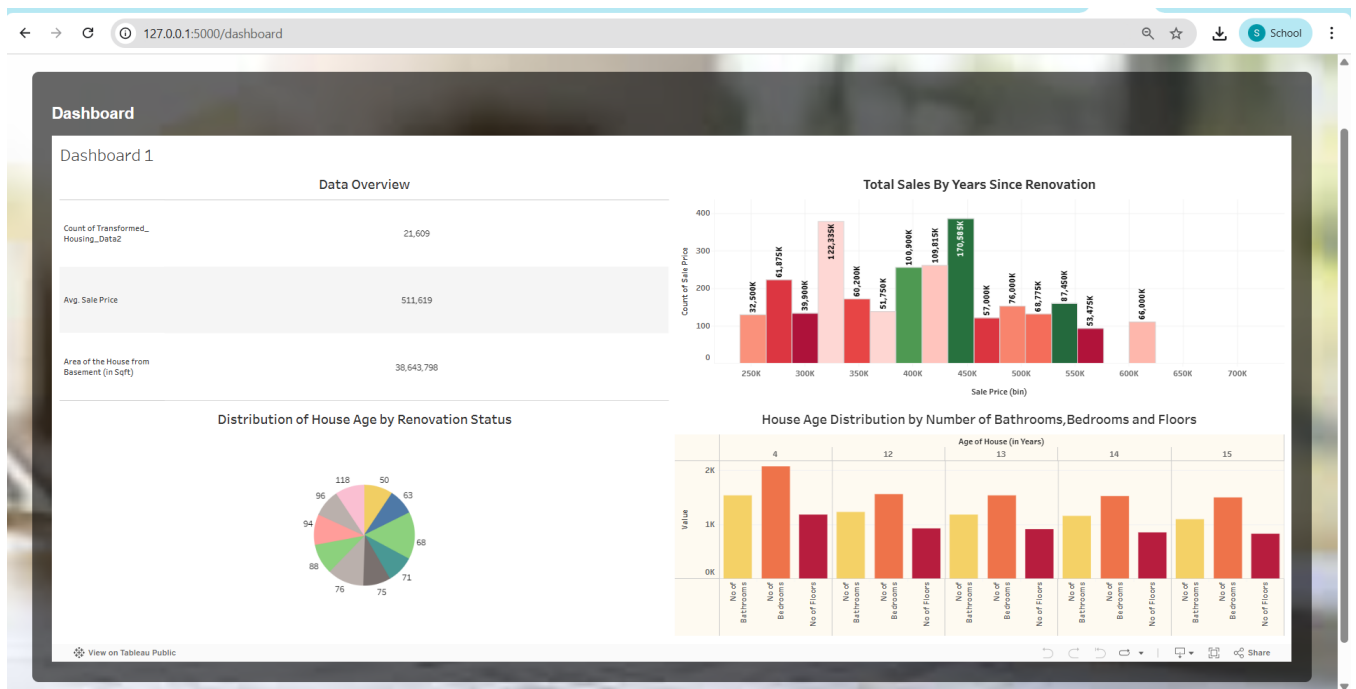
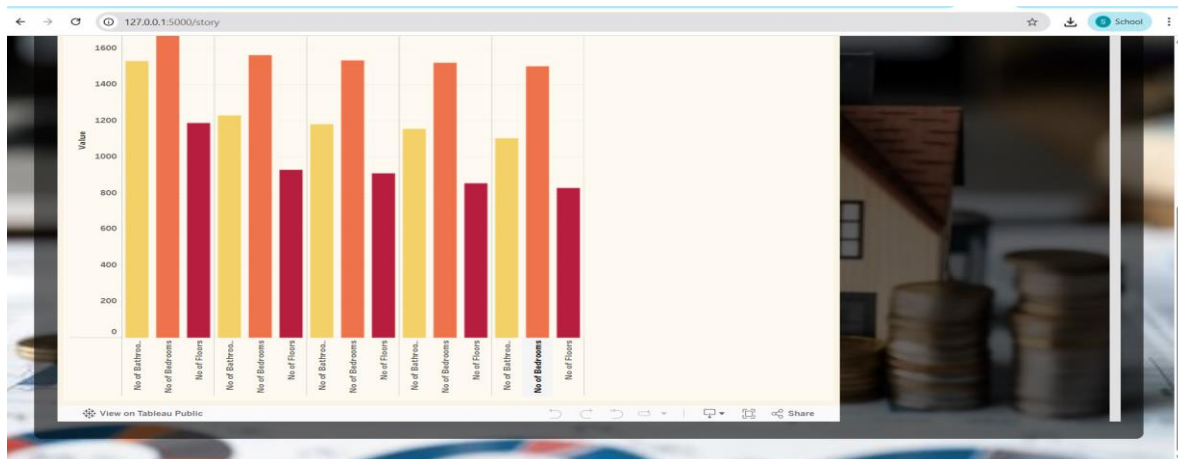
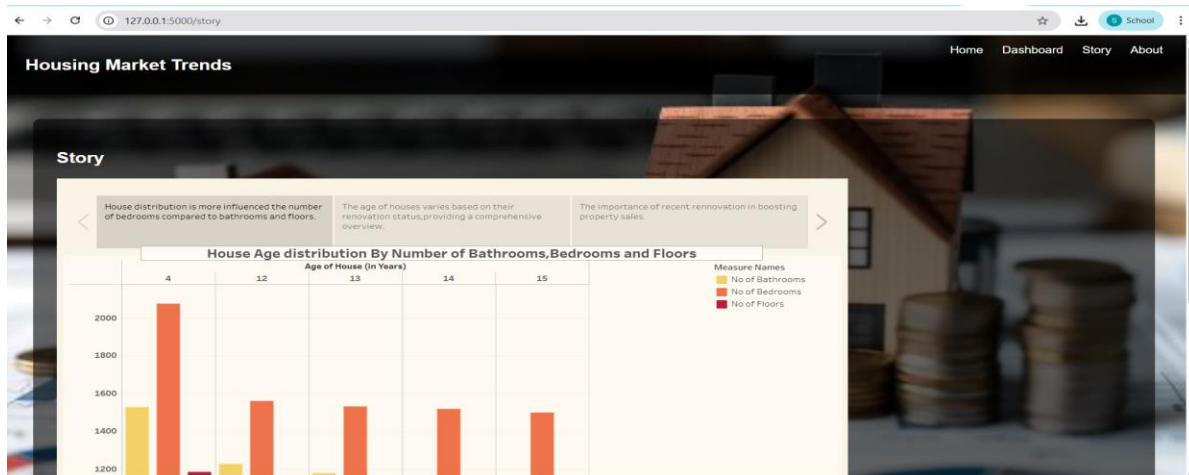


Fig: Dashboard page of the web

Visualizing Housing Market Trend



Figures: Story Page of the web

About This Project

Problem Statement

The housing market is influenced by multiple factors such as property features, location characteristics, and economic conditions. Understanding how these factors impact sale prices is essential for buyers, sellers, and investors.

Objectives

- To analyze housing sale prices using data visualization.
- To identify key features influencing property value.
- To explore patterns and trends within the housing market dataset.
- To present insights through interactive Tableau dashboards and stories.

Methodology

The dataset was processed and visualized using Tableau Public. Various charts, filters, and interactive elements were created to analyze relationships between sale prices and housing attributes such as area, number of rooms, and other features. The project was integrated into a Flask web application for deployment.

Conclusion

The analysis highlights significant correlations between housing features and sale prices. Interactive dashboards provide meaningful insights, enabling better decision-making in the real estate market.

Fig: About page of the web

7. Advantages and Disadvantages

Advantages:

1. Improved Data Understanding

The project converts large and complex housing datasets into visual formats, making it easier to understand trends, patterns, and relationships between housing features and prices.

2. Interactive Visual Analysis

Using Tableau dashboards allows users to interact with data through filters and charts, enabling deeper exploration compared to static reports or spreadsheets.

3. Efficient Data Analysis

Visualization reduces the time and effort required to analyze housing market data and helps in quickly identifying important insights.

4. Educational Value

The project provides hands-on experience with real-world tools such as Python, Tableau Desktop, and Flask, enhancing practical learning and technical skills.

5. User-Friendly Presentation

Integrating the dashboard with a Flask web application allows insights to be viewed through a browser, improving accessibility.

6. Scalable Design

The system can be extended with additional datasets, more visualizations, or advanced analytics without major architectural changes.

Disadvantages

1. Static Dataset Dependency

The project relies on pre-collected datasets and does not support real-time data updates.

2. Limited Analytical Scope

The system focuses on visualization and exploratory analysis and does not include predictive or machine learning-based forecasting.

3. Performance Limitations

Handling very large datasets may affect dashboard performance and loading time.

4. Manual Data Preparation

Data collection and preprocessing require manual effort, which can be time-consuming.

5. Local Deployment

The Flask application runs on a local server and is not deployed on a cloud platform.

No User Authentication

6. The system does not include user login or role-based access control.

8. Conclusion

The project Visualizing Housing Market Trends successfully demonstrates how housing market data can be analyzed and presented using data visualization techniques. By collecting, preprocessing, and analyzing housing datasets, the project transforms raw and complex data into meaningful visual insights. The use of Tableau Desktop enables the creation of interactive charts and dashboards that clearly represent housing price trends and the influence of various housing features.

Integrating the Tableau dashboard with a Flask-based web application improves accessibility by allowing users to view insights through a web interface. The project emphasizes analytical visualization rather than transactional or user-centric features, making it suitable for academic and learning purposes. Overall, the project achieves its objective of simplifying housing market analysis and provides practical exposure to data analytics, visualization, and basic web integration concepts.

9. Future Scope

The project can be enhanced and extended in several ways in the future. Real-time data integration can be implemented to keep housing market insights updated continuously. Advanced analytical techniques such as predictive modeling and machine learning algorithms can be added to forecast housing prices and trends.

The system can also be deployed on cloud platforms to improve availability and scalability. Additional features such as user authentication, role-based access, and region-specific dashboards can be introduced. Furthermore, support for larger datasets and multiple data sources can be added to improve performance and analytical depth. These enhancements would make the system more robust, scalable, and suitable for real-world applications.

10. Appendix

Source Code:

Tableau public Dashboard Link:

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

Tableau public Story Link:

https://public.tableau.com/views/VisualizingHousingMarketTrends-story/Story1?:language=en-US&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

Dataset Link:

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

GitHub:

<https://github.com/peddisettymahesh07/Visualizing-Housing-Market-Trends-An-analysis-of-Sale-Prices-and-Features-Using-Tableau>

Project Demo Link:

<https://drive.google.com/file/d/18O5-HAoBTD6x33NCIKwRfW9j17WOzHo9/view?usp=sharing>

