PROJECT WORK

Visualizing Housing Market Trends:

An Analysis of Sale Prices and Features

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INTRODUCTION

1.1 Project Overview

In today's dynamic real estate market, property prices are influenced by a combination of multiple factors — including the age of the house, whether it has been renovated, the number of bedrooms and bathrooms, the total built-up area, and other key features. However, raw housing datasets are often complex and unstructured, making it difficult for real estate analysts and decision-makers to identify meaningful trends and draw useful conclusions quickly.

This project focuses on analyzing and visualizing housing market trends using Tableau. The dataset includes detailed attributes about houses, such as age, renovation status, sale price, area, and features like the number of bedrooms, bathrooms, and floors. The goal is to uncover key factors that affect sale prices and help stakeholders like real estate analysts and company executives make informed decisions. As student interns, our aim is to apply data visualization techniques to real-world housing data to generate actionable insights and practice our skills in data analytics.

1.2 Purpose

The **purpose** of this project is to provide a clear solution to a common challenge faced by real estate professionals: understanding the multiple factors that drive housing prices and sales trends. Without meaningful visuals, even detailed data can remain hidden and underused.
Through this project, we aim to:

- **Transform** a complex housing dataset into an easy-to-navigate dashboard.
- **Create calculated fields** to derive new insights, such as *House Age* and *Years Since Renovation*.
- **Present multiple perspectives** using different visualizations like KPI cards, histograms, pie charts, and grouped bar charts.
- **Enable stakeholders** such as real estate analysts, marketing teams, and company executives to quickly grasp the key drivers behind pricing trends.
- **Develop our own skills** as student interns in using Tableau for real-world business cases, preparing us for larger data analytics and visualization tasks in the future.

2. IDEATION PHASE

2.1 Problem Statement

In the real world, housing companies or analysts often deal with large volumes of historical property data that include dozens of variables, but lack clear, actionable visual insights. Data in spreadsheets alone does not show clear relationships between house age, renovations, and sales trends — which leaves decision-makers struggling to prioritize investments or set optimal pricing.

Our project addresses this by asking:
"How can we help real estate stakeholders better understand the factors that impact house sale prices and market trends by visualizing key insights using Tableau?"

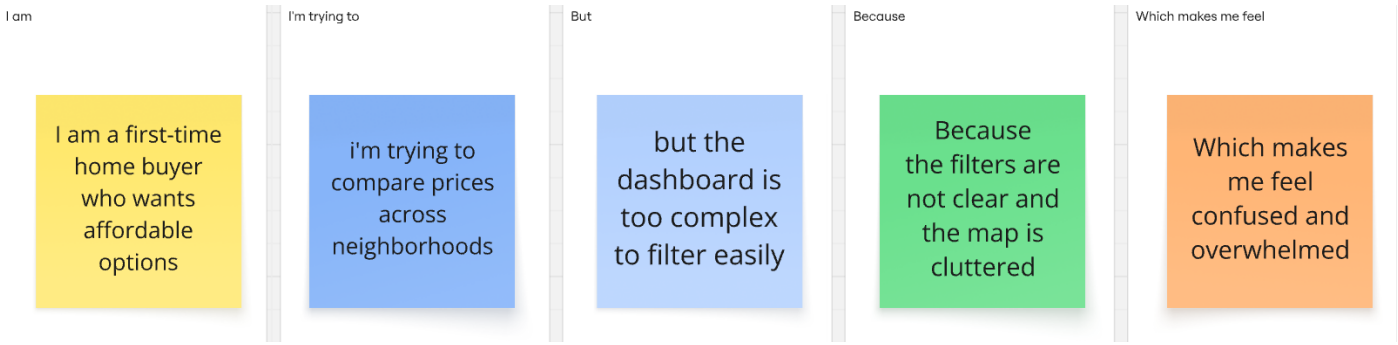
To solve this, our student team:

- Explored the housing dataset to identify the most relevant factors.
- Defined clear calculated fields (e.g., *Years Since Renovation*).
- Designed easy-to-read visuals for different scenarios.
- Combined all visuals into a single, interactive dashboard that tells a complete story.

Problem Statement Template:

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

- **Example:**
- **Ps-1**



Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	a first-time home buyer who wants affordable options	compare prices across neighborhoods	the dashboard is too complex to filter easily	the filters are not clear and the map is cluttered	confused and overwhelmed
PS-2	a busy real estate agent who needs quick insights	show clients updated market trends	the data is outdated and not refreshed often	the data source only updates monthly	worried about giving wrong advice

- Ps-2

2.2 Empathy Map Canvas

To design a solution that truly fits the users' needs, we created an **Empathy Map**.
We considered the perspectives of real estate analysts, marketing teams, and company executives.

- **They want** insights that are clear and easy to understand.
- **They hear** about the importance of renovation but lack visual proof.
- **They see** scattered data without context.
- **They do** manual analysis and outdated reporting.
- **Their pains** are confusion, lack of time, and unclear trends.
- **Their gains** are simplified visuals, faster decision-making, and reliable insights for pricing and investment.

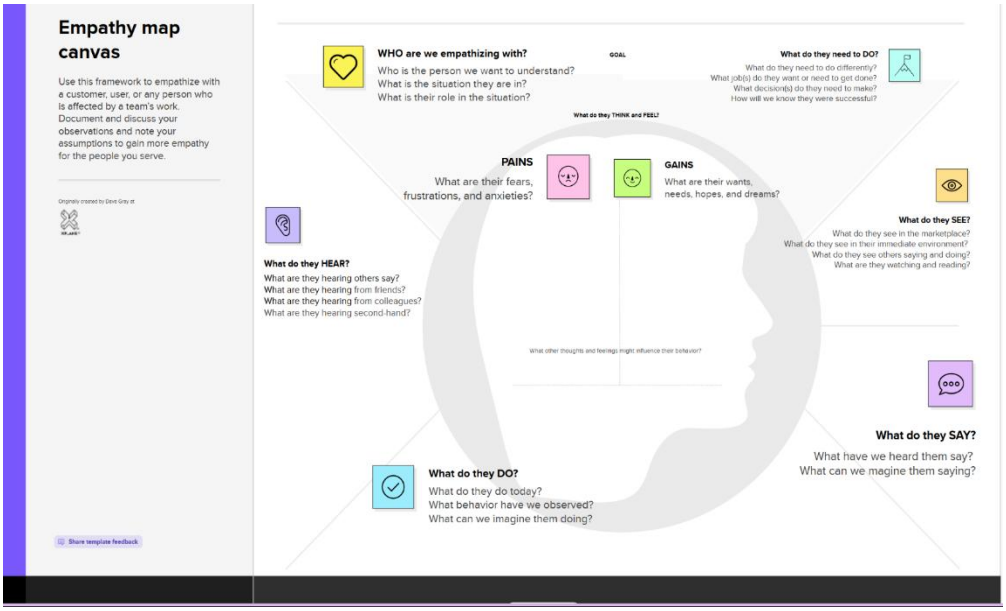
An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.

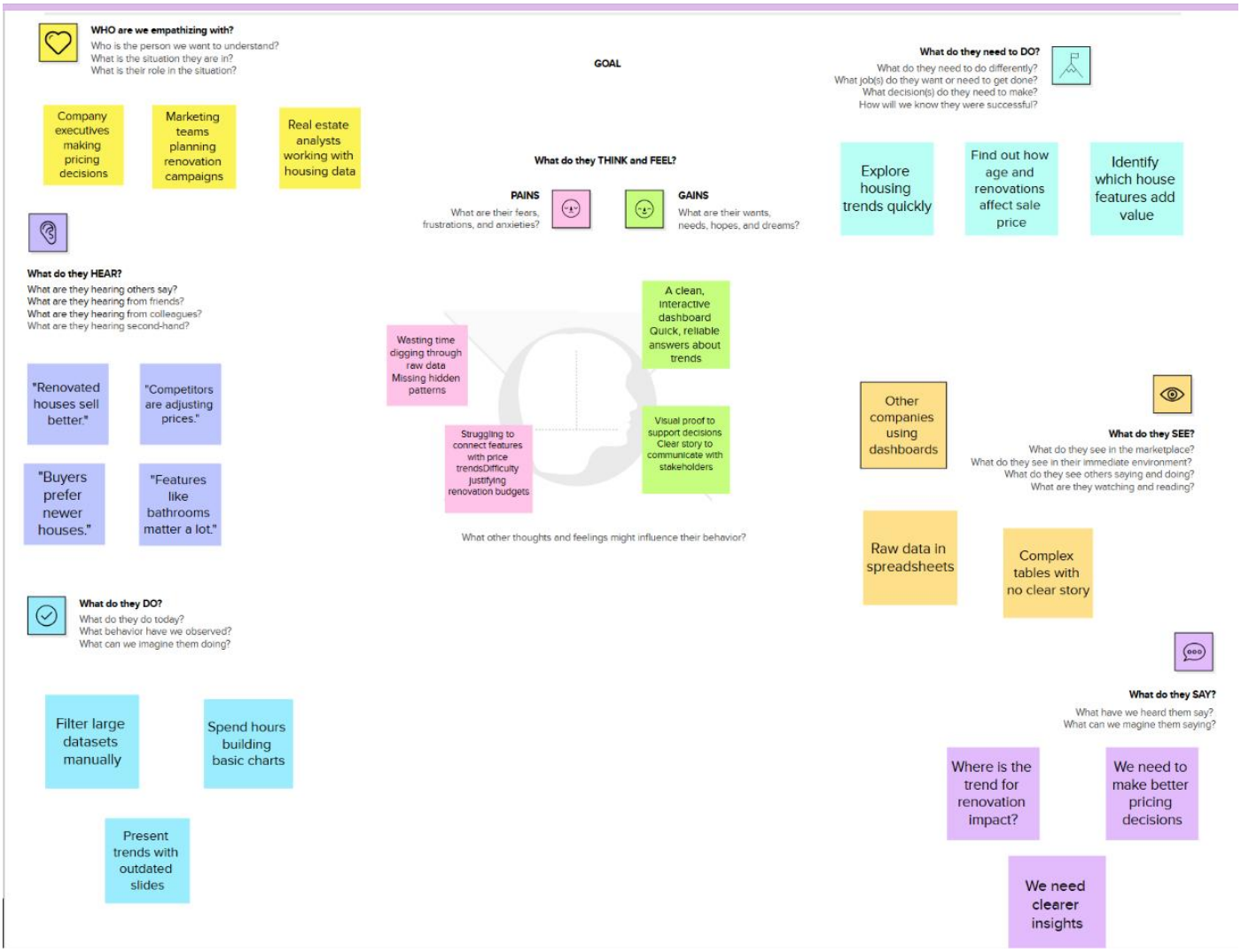
- It is a useful tool to helps teams better understand their users.

- Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.

Empathy map:

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





2.3 Brainstorming

During the ideation phase of this project, our team of student interns worked together to brainstorm different ways to solve the main problem: How can we make complex housing market data easy to understand and useful for decision-making?

We listed out all possible ideas that could help stakeholders like real estate analysts and company executives gain better insights from the raw housing dataset.

- Create calculated fields for House Age, Years Since Renovation, and Age Groups.
- Use KPI cards for overall sales, average price, and basement area.
- Design a histogram for sales by years since renovation.
- Build a pie chart showing age groups vs renovation status.
- Develop grouped bar charts to show house age by number of bedrooms, bathrooms, and floors.
- Add clear filters and color coding for easy analysis.
- Combine everything into one interactive dashboard.

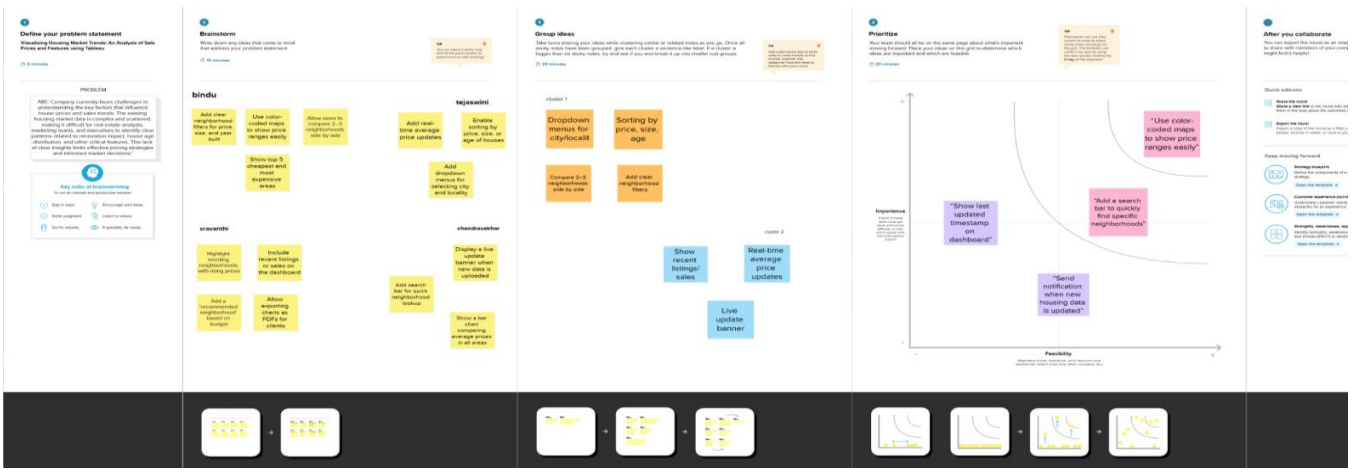
We grouped these ideas into three focus areas:

- Data Overview
- Renovation Impact
- House Features Analysis

Idea Prioritization

After brainstorming, we prioritized visuals that would best help stakeholders understand what drives housing prices and trends. We finalized:

- KPI cards for quick summaries.
- A histogram to show the distribution of sales by renovation age.
- A pie chart to explain house age and renovation patterns.
- Grouped bar charts for clear feature comparison.
- An integrated dashboard to link all visuals.



3. REQUIREMENT ANALYSIS

3.1 Customer Journey map

The Customer Journey Map for *Visualizing Housing Market Trends* describes how a real estate analyst or business user interacts with the solution — from finding the dataset to making better pricing decisions. It shows how the project moves from raw data to a final dashboard that helps stakeholders see clear patterns and trends.

Journey Stages:

- **Step 1**: The analyst searches for a suitable housing dataset, for example on Kaggle. This stage is exciting because they see the potential to uncover useful insights.
- **Step 2**: The dataset is uploaded to Tableau Public. The analyst feels neutral here but needs an easy, smooth upload process.
- **Step 3**: The data is cleaned to remove missing or irrelevant values. At this point, the analyst may feel frustrated, so having automated checks or clear cleaning steps helps.
- **Step 4:** Sales and feature charts are created using Tableau. The analyst feels satisfied as patterns start to appear. Tooltips or explanations can be added for clarity.
- **Step 5**: Multiple charts are combined into an interactive dashboard with filters. The team works together here and may have mixed feelings if the design is not unified — design templates can help.
- **Step 6:** Storyboards are added to guide the viewer through the insights step by step. Narration or audio walkthroughs can make the experience even clearer.
- **Step 7**: The dashboards and stories are saved to Google Drive for sharing with the client or team. Shared folders keep the work secure and organized.
- **Step 8**: Clients and stakeholders view the dashboards on Tableau Public. They may feel curious and engaged — walkthrough links can help them understand the visuals better.
- **Step 9:** Finally, business users review the insights and make informed decisions about pricing, renovation budgets, or marketing plans. This builds confidence and trust in data-backed strategies.

Step	Action	Tools	Places & People	Emotions	Opportunities
Find Dataset	Analyst finds Kaggle dataset	Kaggle	Analyst (Home/College)	Excited	Explore more data sources
Upload	Upload to Tableau Public	Tableau Public	Analyst	Neutral	Streamline upload steps
Clean Data	Clean missing & irrelevant data	Tableau Public	Analyst	Frustrated	Automate cleaning checks
Visualize	Create sales/feature charts	Tableau Public	Analyst	Satisfied	Add tooltips/explanations
Build Dashboard	Build dashboards with filters	Tableau Public	Analyst + Team	Mixed	Unify design standards
Storyboard	Create storyboards for context	Tableau Public	Analyst + Team	Creative	Use narration or audio guides
Save & Share	Save to google Drive	Google Drive	Google Drive	Productive	Use shared folders/templates
View	Client views on Tableau public	Tableau Public	Client/Stake holder	Impressed	Add Walk through links
Decision	Business user makes decisions	Internal Business	Business User	Confident	Show summary KPIs clearly

3.2 Solution Requirement

Functional Requirements

- **FR-1:** The project must allow uploading the Kaggle housing dataset into Tableau for analysis.
- **FR-2:** The data must be cleaned by removing null values, dropping irrelevant fields, and renaming columns for clarity.
- **FR-3:** The solution must create clear visualizations, including sales trend charts and graphs that show how renovation and house features affect prices.
- **FR-4:** The solution must build a dashboard that combines multiple charts and applies filters or slicers for house age, renovation year, and other key attributes.

- **FR-5:** A story feature must be developed to present the visual insights in a clear, step-by-step narrative.
- **FR-6:** Business users and stakeholders must be able to view the final dashboards on Tableau Public.
- **FR-7:** The final Tableau workbook must be saved and uploaded to Google Drive for backup and easy sharing.

Non-Functional Requirements

- **NFR-1:** The dashboards must be user-friendly, easy to navigate, and include clear labels, filters, and tooltips.
- **NFR-2:** Access to the Tableau files must be secure, with restricted permissions and safe storage on Google Drive.
- **NFR-3:** All visualizations must render reliably across different systems and browsers using Tableau Public.
- **NFR-4:** The dashboards must be optimized for quick loading and efficient use of calculated fields.
- **NFR-5:** The solution must be available online at all times through Tableau Public, with backups maintained on Google Drive.
- **NFR-6:** The project must be scalable so that larger datasets or additional charts can be added in the future without major rework.

3.3 Data Flow Diagram

Key Data Flow Steps:

1) **Data Source:**
The housing dataset is collected from Kaggle. It includes details like sale price, house age, renovation year, number of bedrooms, bathrooms, floors, and basement area.

2)**Data Upload:**
The dataset is uploaded into **Tableau Public**, which serves as the main tool for data processing and visualization.

3) **Data Cleaning & Preparation:**
Inside Tableau, the dataset is checked for missing or irrelevant values. Calculated fields like *House Age* and *Years Since Renovation* are created to add new insights.

4) **Visualization Creation:**
The cleaned data is used to design multiple charts — including KPI cards, histograms, pie charts, and grouped bar charts — that highlight trends and patterns.

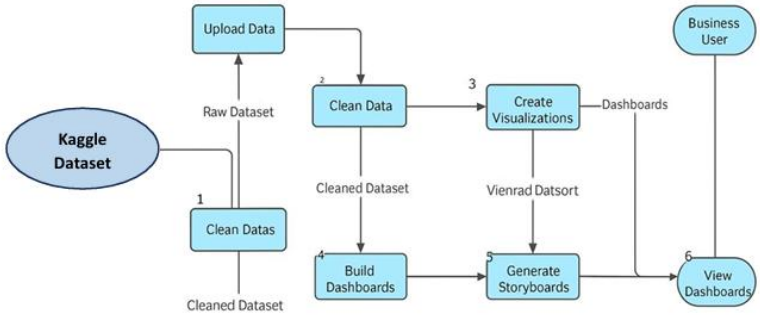
5) **Dashboard & Story Building:**
All charts are combined into an **interactive dashboard** with filters, and a **story** is created to guide users through the insights step by step.

6)**Output & Sharing:**
The final dashboards and stories are published to Tableau Public and backed up on Google Drive. Stakeholders and business users can view the visuals online and use the insights to make informed pricing and renovation decisions.

Data Flow Diagrams:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

Visualizing Housing Market Trends: DFD Level 0



3.4 Technology Stack

The *Visualizing Housing Market Trends* project uses a simple yet effective technology stack to transform raw housing data into interactive insights. The architecture relies mainly on Tableau's built-in tools and publicly available cloud storage for easy sharing and collaboration.

Key Components & Technologies Used:

- **User Interface:**
  The interactive dashboard and story interface are created and accessed through **Tableau Public**, which is free and widely used for data visualization.
- **Application Logic:**
  - *Data Upload & Cleaning:* The dataset (CSV file from Kaggle) is uploaded and cleaned using Tableau's built-in tools.
  - *Visualization & Chart Logic:* Tableau Worksheets are used to design KPI cards, histograms, pie charts, and grouped bar charts.
  - *Storyboarding & Filtering:* Tableau Dashboard features are used to combine visuals, add filters, and build a story to guide users through the insights.
- **Database:**
  The source data is a structured **CSV file** from Kaggle.

- **Cloud Storage:**
  The final Tableau packaged files are uploaded to **Google Drive** for backup and easy sharing.
- **File Storage:**
  Local storage is used for working files (.twbx or .twb).
- **Infrastructure:**
  The entire project was developed and tested using a **local computer**, with Tableau Public providing the hosting for the published dashboards.
- **APIs & Machine Learning:**
  No external APIs or machine learning models were used in this version of the project.

Application Characteristics:

- **Open-Source Friendly:** Tableau Public is free to use for students and businesses.
- **Secure Access:** Dashboards are published under a controlled user account, with private access managed through Tableau and Google Drive.
- **Scalable:** The dashboard structure can handle more charts and filters as needed.
- **Available Anywhere:** The final project can be accessed online through Tableau Public or shared via Google Drive.
- **Optimized Performance:** Data is pre-processed and filtered within Tableau for fast, smooth rendering of visuals.

4. PROJECT DESIGN

4.1 Problem Solution Fit

Problem Statement:
ABC Company struggles to clearly understand which factors influence housing prices. Important details — like the age of the house, whether it has been renovated, and features such as the number of bedrooms, bathrooms, and floors — are hidden inside raw data and spreadsheets. Because of this, pricing decisions are often based on guesswork, which can lead to sudden drops in sales of older or unrenovated houses, mispricing, and poor planning for renovation investments.

Proposed Solution:
Our proposed solution is to analyze the housing dataset using **Tableau** to build clear, interactive dashboards and stories. These visuals show patterns in sale prices, renovation impact, and feature-based trends. By using calculated fields like *House Age* and *Years Since Renovation*, stakeholders can easily compare houses, identify which features add value, and plan pricing and renovations more confidently. This solution replaces static Excel sheets with smart visuals that help real estate analysts, executives, and marketing teams make data-driven decisions to improve sales and market strategy.

Purpose:

- Solve complex pricing pattern problems with clear visuals.
- Make it easier to see how renovations and house features affect prices.
- Support better pricing strategies and marketing campaigns.
- Build trust in renovation investments with transparent data.
- Help teams make faster, more informed decisions using interactive dashboards.

Problem-Solution fit canvas 2.0

AMALTAMA

1. CUSTOMER SEGMENT(S) (CS)

Who is your customer?
i.e. working parents of 0-5 y.o. kids

- Real estate analysts
- Real estate companies (like ABC)
- Sales & marketing teams
- Urban planners & pricing strategists

Define CS, fit into CC

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.

- Lack of technical tools for real-time data visualization
- No access to integrated dashboards combining renovation, pricing & house age
- Difficulty in comparing multiple house features without visual guidance
- Data overload without smart filtering

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 pros & cons do these solutions have? i.e. pen and paper is an alternative to digital notetaking

- Excel reports
- Static pie/bar graphs
- Manual market trend notes
- Experience-based guessing

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.

- Understand what drives house sale price
- Compare renovated vs non-renovated home value
- Identify trends across house age, bedrooms, floors
- Improve pricing strategies

Focus on J&P, tap into BE, understand RC

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.

- No centralized visualization of housing features and sales data
- No renovation-specific sale trend analysis
- Lack of smart tools to understand historical patterns

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)

- Relying heavily on experience instead of data
- No use of filters/stories in visual tools
- Poor communication between pricing & marketing teams

Focus on J&P, tap into BE, understand RC

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.

Sudden drop in sales of older homes . Mispricing of unrenovated properties Inconsistent renovation investment results. Lack of data-driven selling strategies

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 about pricing ,Missed sales opportunities ,No visibility on what features matter most. After: Confident, data-backed decisions ,Clarity on renovation impact,Improved campaign targeting

Define CS, fit into CL

10. YOUR SOLUTION (SL)

What kind of solution suits Customer scenario the best? Adjust your solution to fit Customer behaviour, use Triggers, Channels & Emotions for marketing and communication.

Created interactive dashboards using Tableau
Used various visulizations for insights
Built 3 stories showing renovation impact, house age trends, and feature analysis
Designed for real-world decision makers to price and sell better

If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality.
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.

8.1 ONLINE CHANNELS (CH)

What kind of actions do customers take online? Extract online channels from box #7 Behaviour

- Tableau Public dashboard
- GitHub project repository
- Project report PDFs
- Video explanation(youtube)

8.2 OFFLINE CHANNELS (CH)

What kind of actions do customers take offline? Extract offline channels from box #7 Behaviour and use them for customer development.

- College/mentor review presentation
- Printed report submission
- Group meetings
- Poster presentation (if applicable)

Explore AS, differentiate

4.2 Proposed Solution

Our proposed solution is to build an **interactive, Tableau-based dashboard** that transforms a raw housing dataset into clear, meaningful visual insights. The solution focuses on showing how **renovation status, house age, and physical features** — such as the number of bathrooms, bedrooms, and floors — impact housing sale prices and trends.

The dashboard includes:

- **Key Performance Indicators (KPIs)** that summarize essential metrics like average sale price, total records, and basement area.
- **Creative charts**, including histograms, pie charts, and grouped bar charts, that break down sales by years since renovation and house features.
- **Storytelling features** that guide stakeholders through the data step by step, highlighting important patterns.
- **Filters and interactivity** to allow custom exploration so that analysts and executives can drill down into specific scenarios.

4.3 Solution Architecture

The solution uses **Tableau** to turn a raw housing dataset into clear, interactive visuals.

- **Data:** CSV file with house age, renovations, features, and sale prices.
- **Preparation:** Data cleaned, checked for missing or zero values. Calculated fields like *House Age* and *Years Since Renovation* created.
- **Visuals:** KPI cards, histograms, pie charts, and grouped bar charts built in Tableau.
- **Dashboard:** All charts combined into one interactive dashboard with filters.
- **End Users:** Real estate analysts, executives, and marketing teams use it to make data-based pricing and renovation decisions.

User → Tableau Dashboard → Data Filters & Views → Visual Insights → Export/Download

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Project Planning for the *Visualizing Housing Market Trends* project.
It covers the **Product Backlog**, **Sprint Schedule**, **Story Points**, **Team Members**, and **Sprint Velocity**, showing how the team planned and tracked tasks.

Project Product Backlog & Sprint Planning

The project was divided into **two sprints**, each focusing on specific functional requirements and user stories:

Sprint-1 Tasks:

- **Dataset Upload (USN-1)**: Upload the Kaggle housing dataset into Tableau Public (2 story points).
  Assigned to: Sravanthi, Bindu Bhargavi, Tejaswini, Chandra Sekhar.
- **Data Cleaning (USN-2)**: Clean the dataset by removing null values and dropping irrelevant fields (3 story points).
  Assigned to: Sravanthi, Bindu Bhargavi, Tejaswini.
- **Visualization Creation (USN-3)**: Create visualizations for sales trends and renovation impact (2 story points).
  Assigned to: Sravanthi, Bindu Bhargavi, Tejaswini.

Sprint-1 Total Story Points: 7
Duration: 10 days

Sprint-2 Tasks:

- **Dashboard Building (USN-4)**: Build interactive dashboards with filters and calculated fields (3 story points).
  Assigned to: Bhargavi, Tejaswini.
- **Storyboarding (USN-5)**: Create storyboards to narrate insights from the dashboards (2 story points).
  Assigned to: Bhargavi, Tejaswini.
- **Dashboard Review (USN-6)**: View dashboards and ensure insights are clear and user-friendly (2 story points).
  Assigned to: Sravanthi, Bindu Bhargavi, Tejaswini, Chandra Sekhar.
- **Save & Share Output (USN-7)**: Save the final Tableau files and upload to Google Drive for submission (1 story point).
  Assigned to: Sravanthi, Bindu Bhargavi, Tejaswini, Chandra Sekhar.

Sprint-2 Total Story Points: 8
Duration: 10 days

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

Model Performance Testing Details:
To ensure the project meets quality and functional standards, the following performance checks were done during the development phase:

1) **Data Rendered:**
The Tableau dashboards successfully handled **10,000 rows and 36 fields** from the housing dataset without any loading or rendering issues.

2) **Data Preprocessing:**
The dataset was verified to have **no missing or null values**. Calculated fields such as *House Age*, *Years Since Renovation*, and *Renovation Status* were created to enhance the clarity of visual analysis.

3)**Utilization of Filters:**
Relevant filters were added to improve interactivity and user experience. Filters include:

- Sale Price
- House Age (in years)
- Basement Area (in Sqft)
- Renovation Status
- Years Since Renovation
- Number of Bathrooms
- Number of Bedrooms
- Number of Floors
- Number of Records
- Measure Names

4) **Calculated Fields:**
Key calculated fields were created and tested to ensure accurate analysis:

- Average Sale Price
- Number of Records
- Sale Price Category (bins)
- House Age Group
- Renovation Status (derived field)

5) **Dashboard Design:**
A clean, user-friendly dashboard was developed, containing:

- KPI Cards
- Total Sales by Years Since Renovation

- Distribution of House Age by Renovation Status
- House Age Distribution by Number of Bathrooms, Bedrooms, and Floors

6) **Story Design:**

A **3-scene story** was designed to guide stakeholders through the insights step by step:

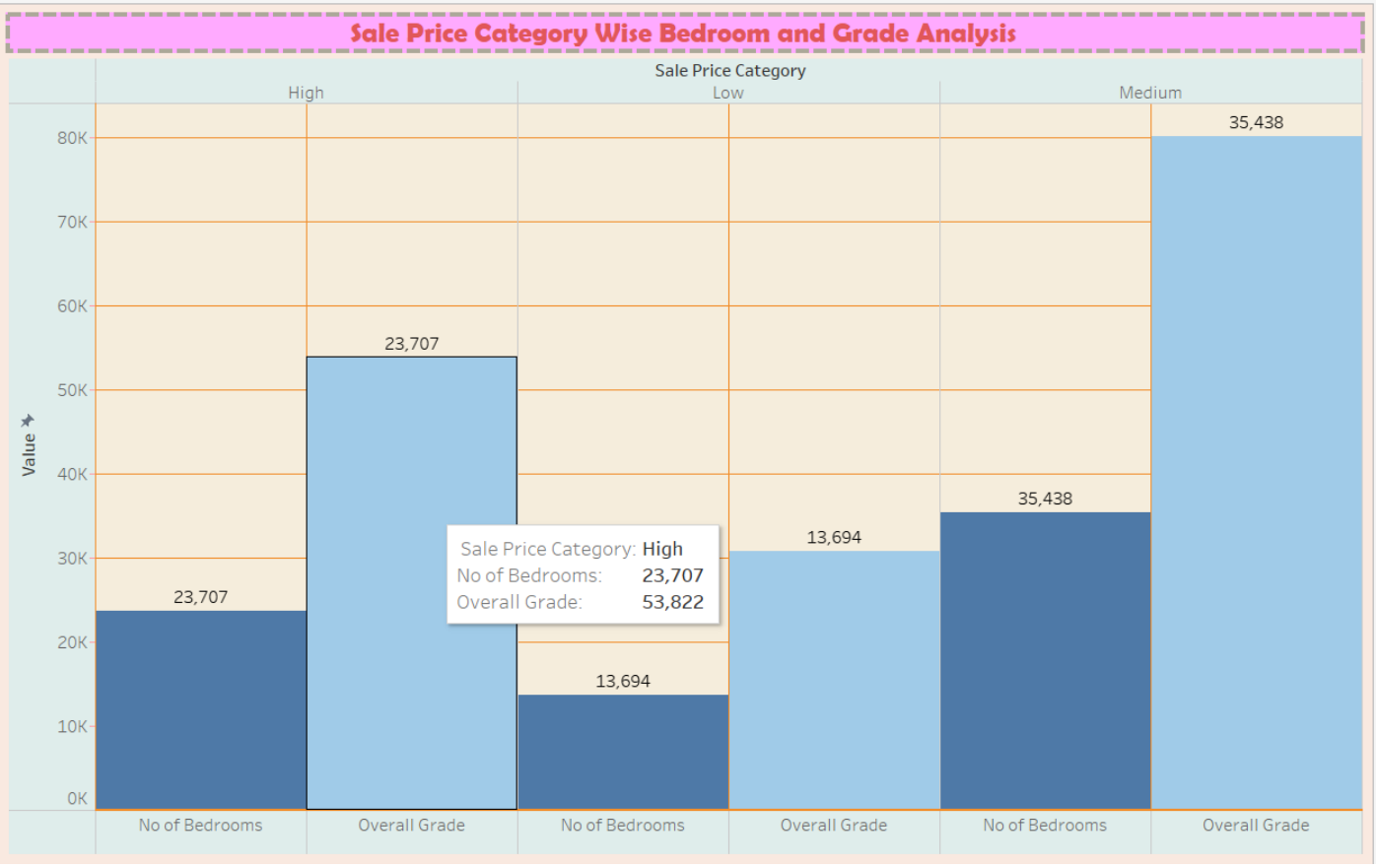
- **Story 1:** Impact of Renovation on Sale Price Trends
- **Story 2:** House Age Patterns and Renovation Influence
- **Story 3:** How House Features Shape Age Distribution

7. RESULTS

7.1 Output Screenshots

7.1.1 NO .of unique visualizations

1)



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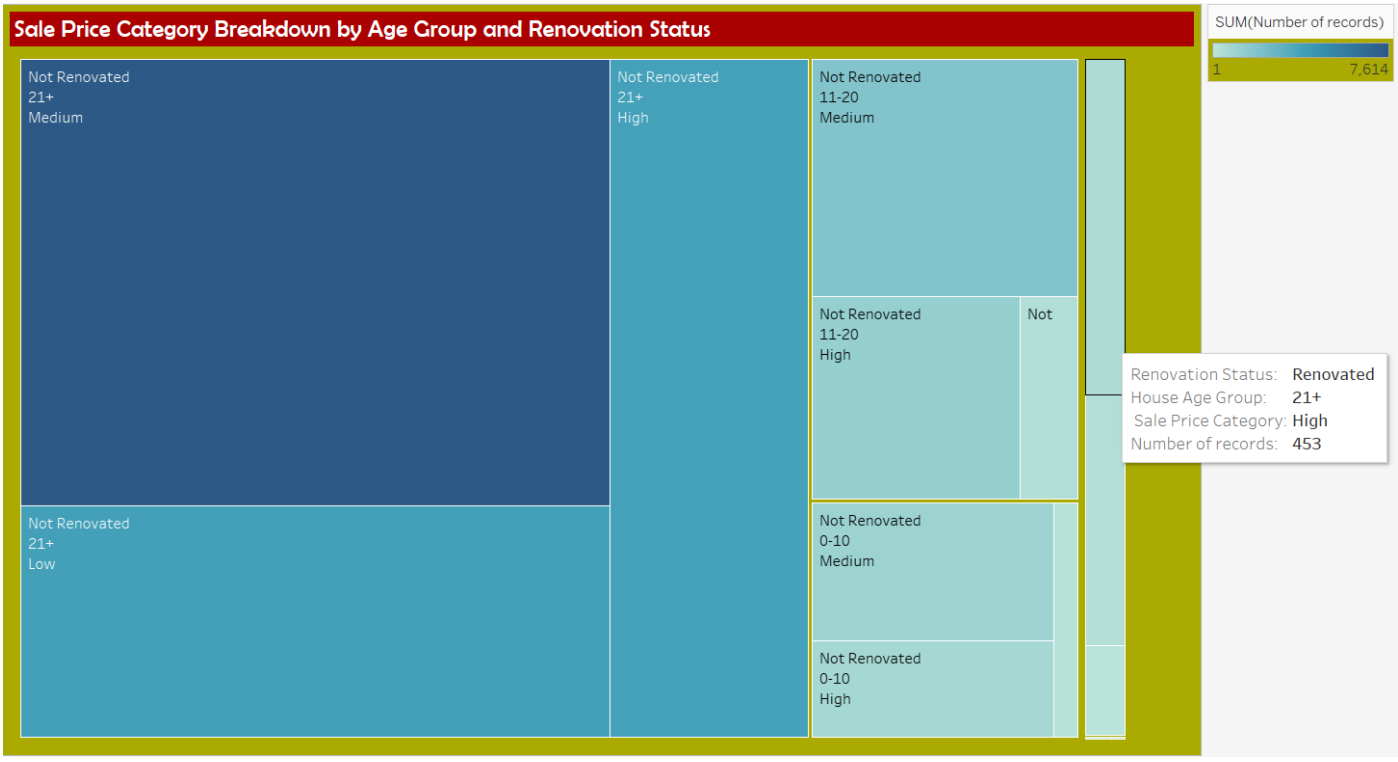
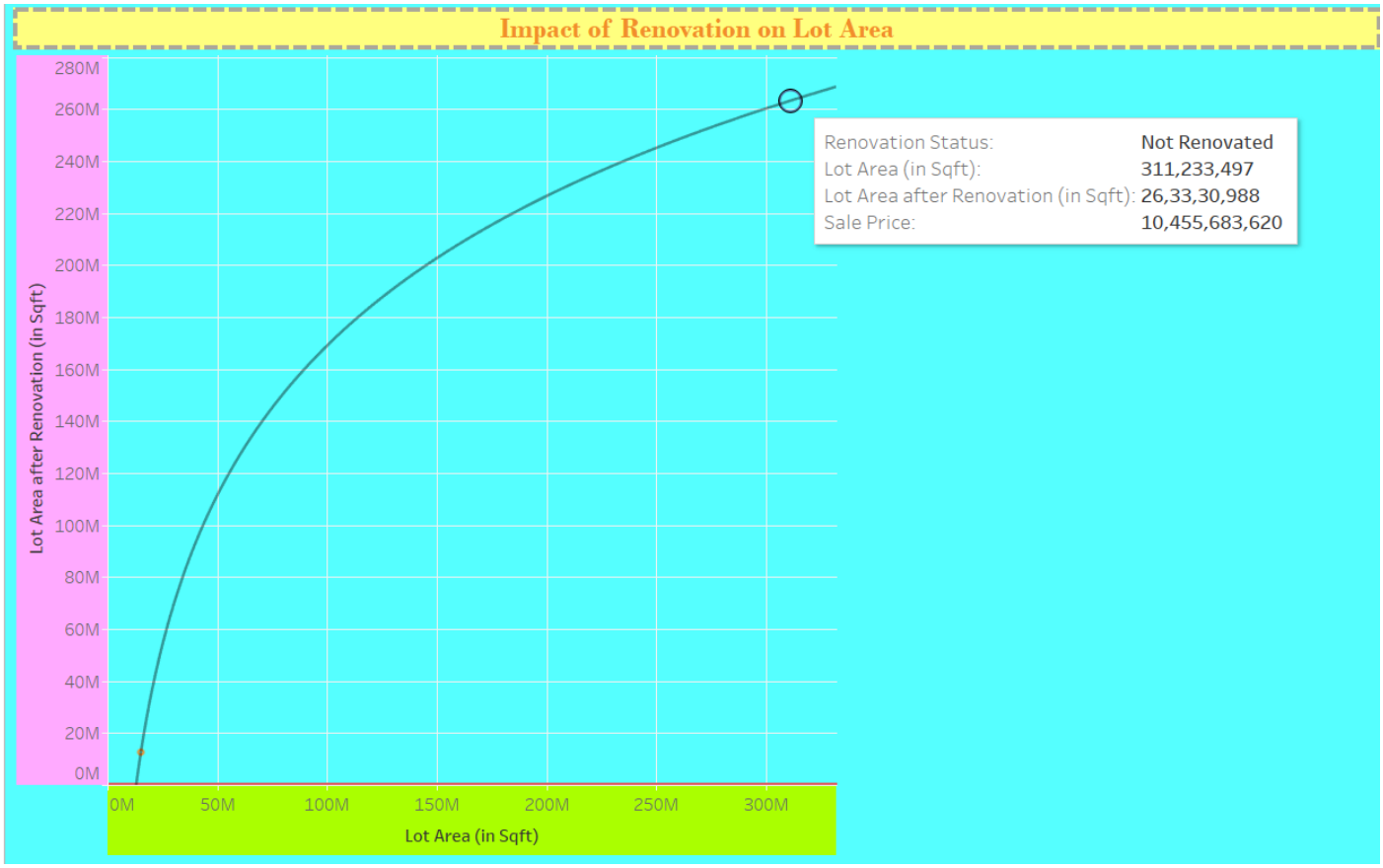
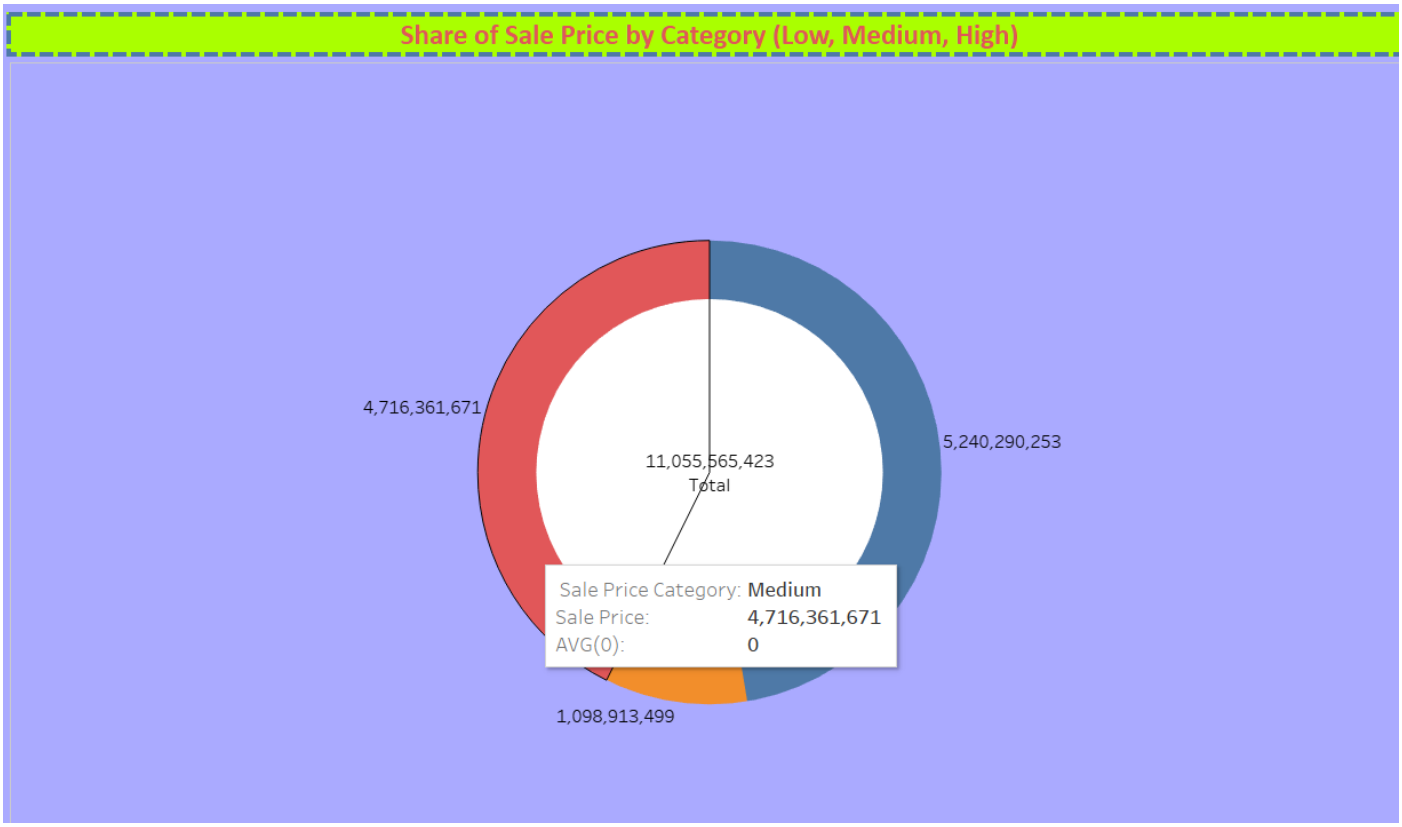


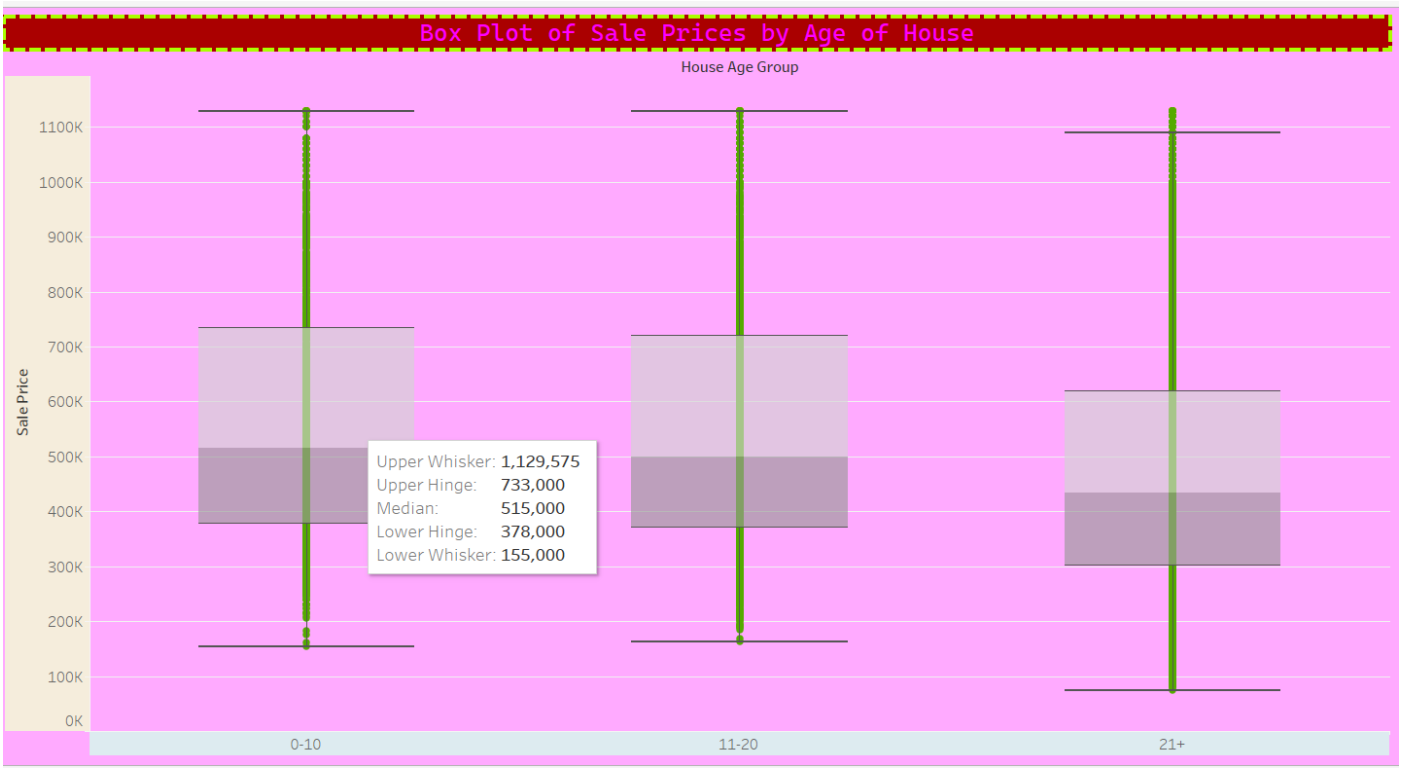
3)


Impact of Renovation on Lot Area
280M
260M
240M
220M
200M
180M
160M
140M
120M
100M
80M
60M
40M
20M
0M
Lot Area after Renovation (in Sqft)
0M
50M
100M
150M
200M
250M
300M
Lot Area (in Sqft)
Renovation Status: Not Renovated
Lot Area (in Sqft): 311,233,497
Lot Area after Renovation (in Sqft): 26,33,30,988
Sale Price: 10,455,683,620

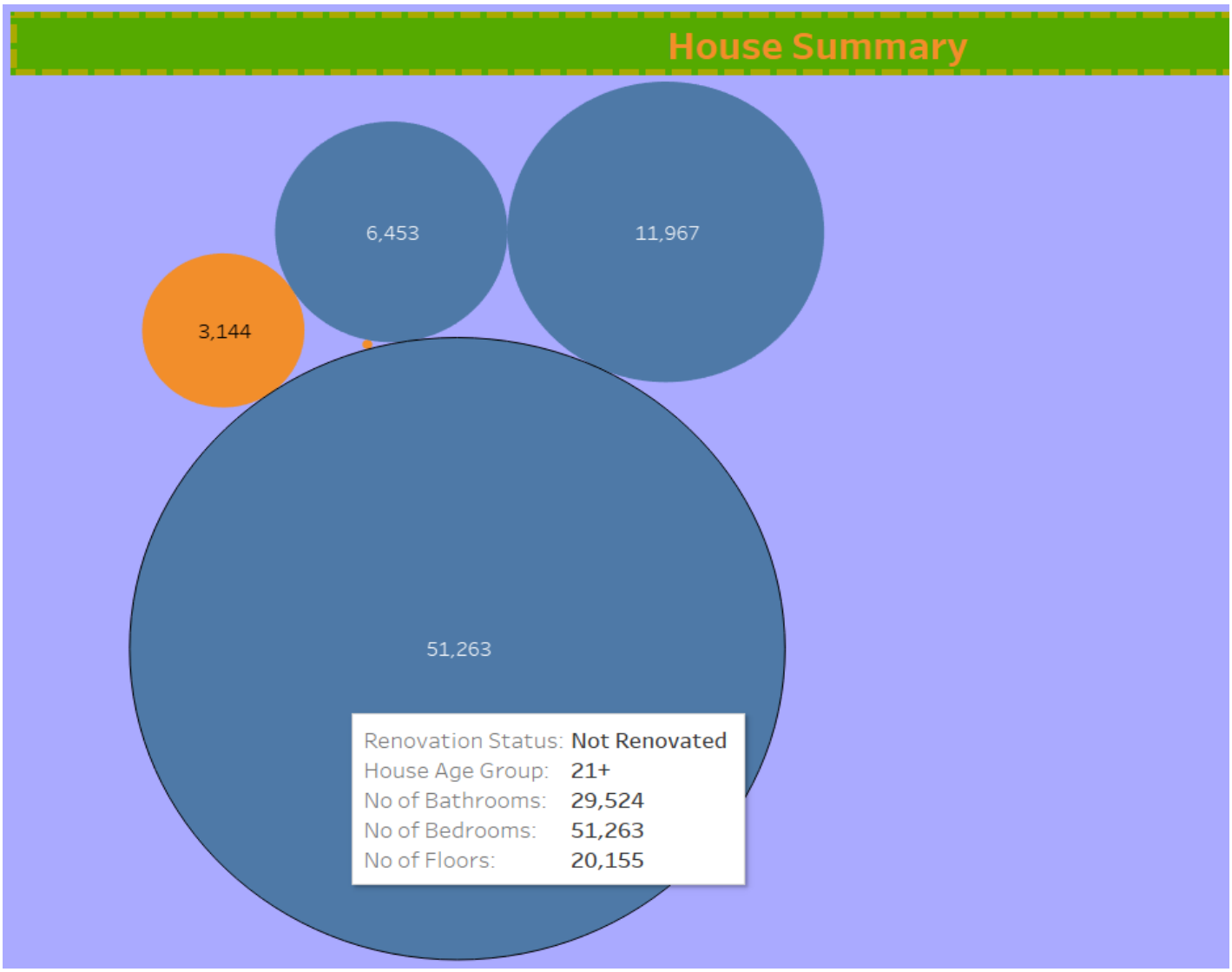
4)


Share of Sale Price by Category (Low, Medium, High)
4,716,361,671
5,240,290,253
11,055,565,423
Total
1,098,913,499
Sale Price Category: Medium
Sale Price: 4,716,361,671
AVG(0): 0

5)

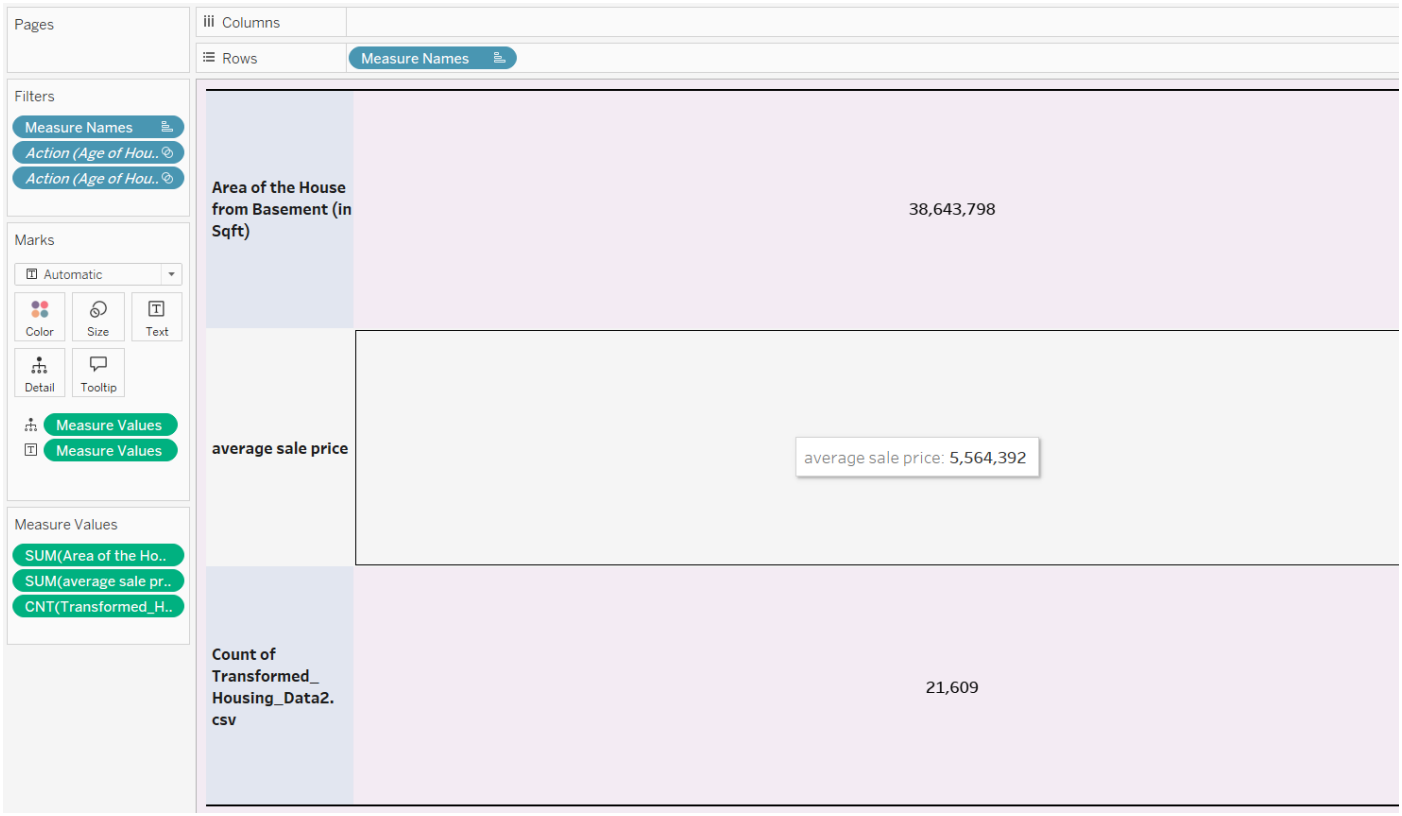

Box Plot of Sale Prices by Age of House
House Age Group
Sale Price
1100K
1000K
900K
800K
700K
600K
500K
400K
300K
200K
100K
0K
Upper Whisker: 1,129,575
Upper Hinge: 733,000
Median: 515,000
Lower Hinge: 378,000
Lower Whisker: 155,000
0-10
11-20
21+

6)


House Summary
6,453
11,967
3,144
51,263
Renovation Status: Not Renovated
House Age Group: 21+
No of Bathrooms: 29,524
No of Bedrooms: 51,263
No of Floors: 20,155

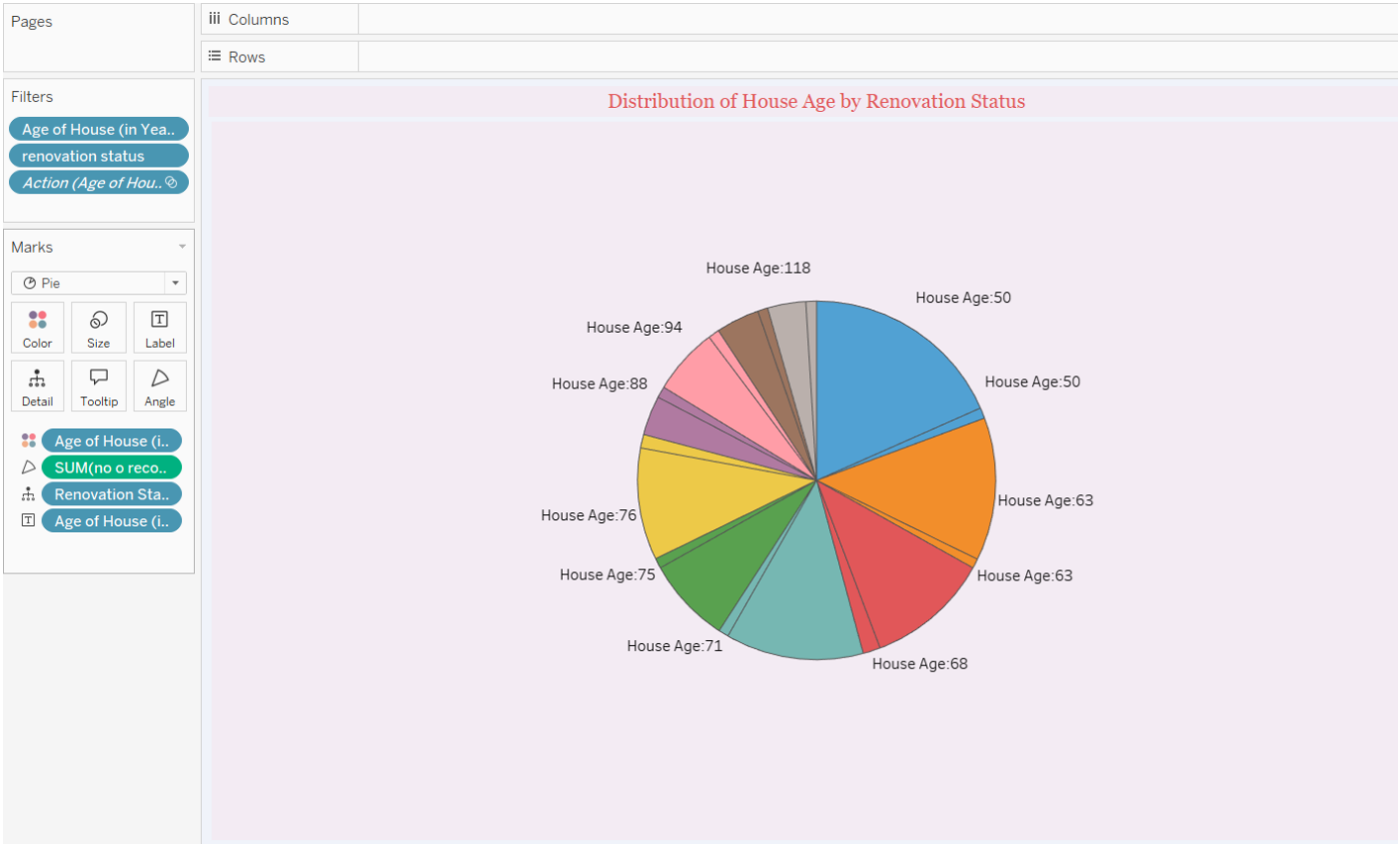
7.1.2 visualizations

1)

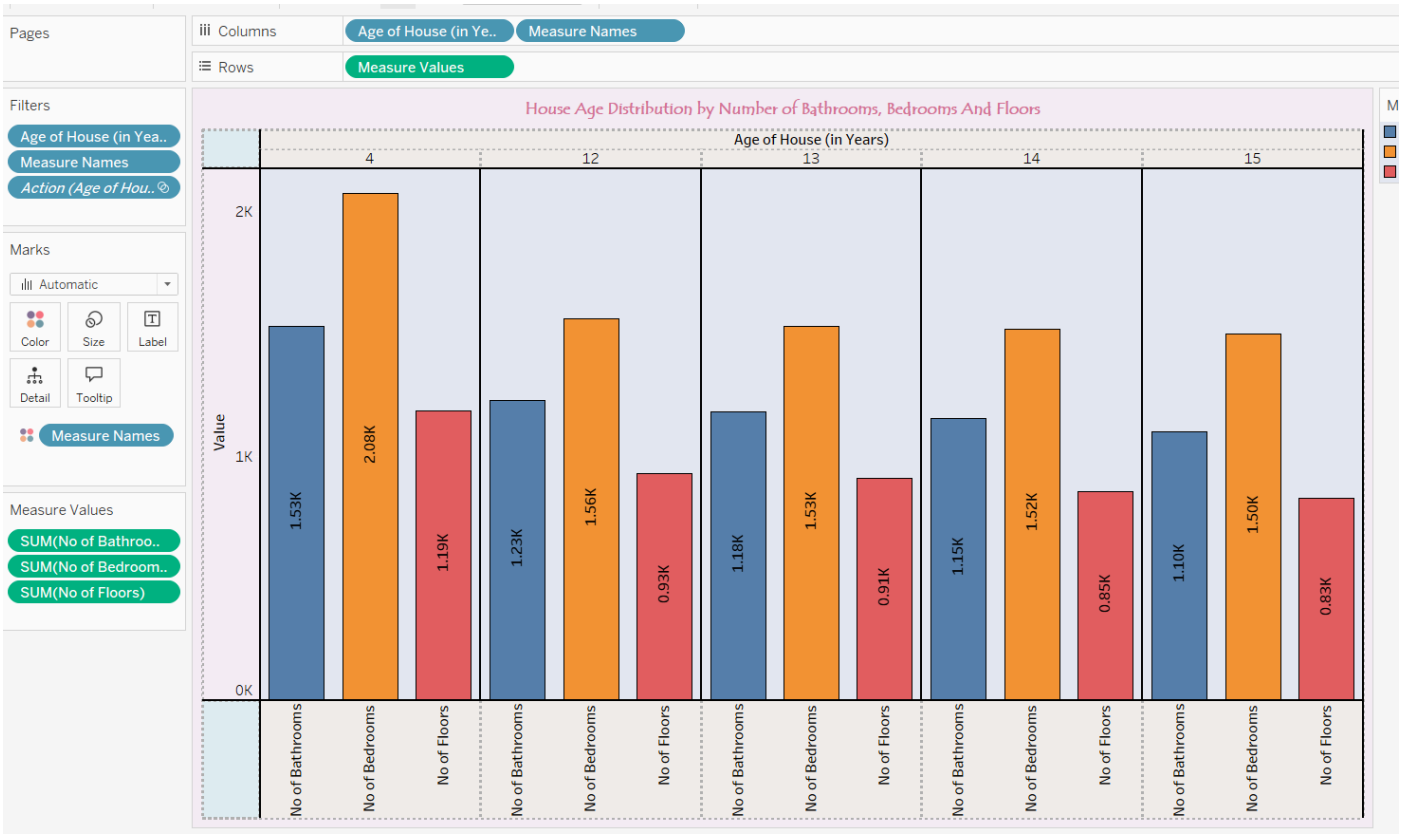


2)

3)


Pages
Columns
Rows
Filters
Age of House (in Yea..
renovation status
Action (Age of Hou..
Marks
Pie
Color
Size
Label
Detail
Tooltip
Angle
Age of House (i..
SUM(no o reco..
Renovation Sta..
Age of House (i..
Distribution of House Age by Renovation Status
House Age:118
House Age:50
House Age:94
House Age:50
House Age:88
House Age:63
House Age:76
House Age:63
House Age:75
House Age:71
House Age:68

4)

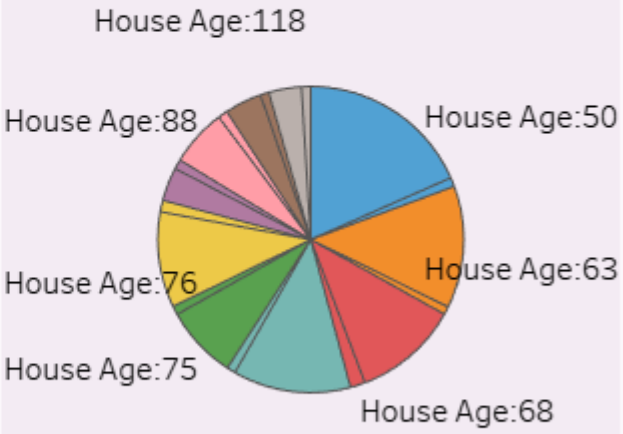

Pages
Columns
Age of House (in Ye..
Measure Names
Rows
Measure Values
Filters
Age of House (in Yea..
Measure Names
Action (Age of Hou..
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Measure Names
Measure Values
SUM(No of Bathroo..
SUM(No of Bedroom..
SUM(No of Floors)
House Age Distribution by Number of Bathrooms, Bedrooms And Floors
Age of House (in Years)
4
12
13
14
15
Value
2K
1K
0K
1.53K
2.08K
1.19K
1.23K
1.56K
0.93K
1.18K
1.53K
0.91K
1.15K
1.52K
0.85K
1.10K
1.50K
0.83K
No of Bathrooms
No of Bedrooms
No of Floors

Dashboard

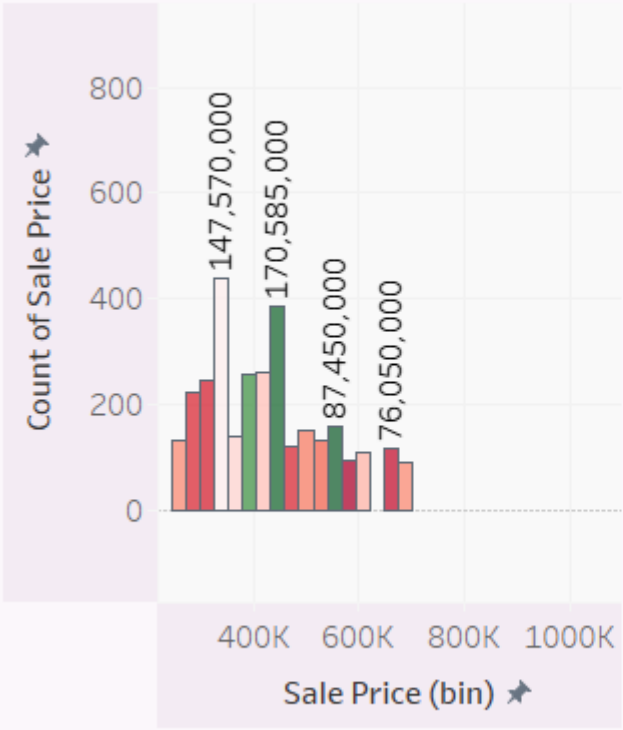
Comprehensive house price analysis

Area of the House from Basement (in Sqft)	38,643,798
average sale price	5,564,392
Count of Transformed_ Housing_Data2. csv	21,609

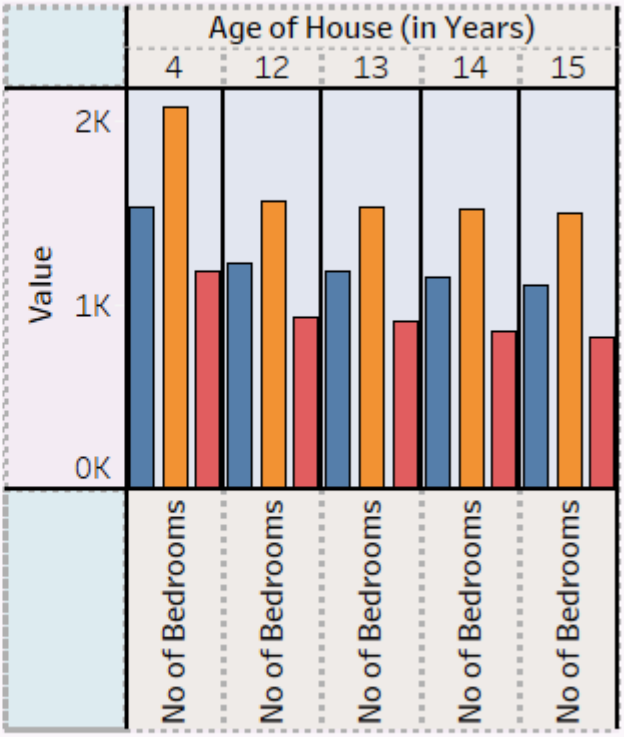
Distribution of House Age by Renovation Status



Total sales by years since renovation



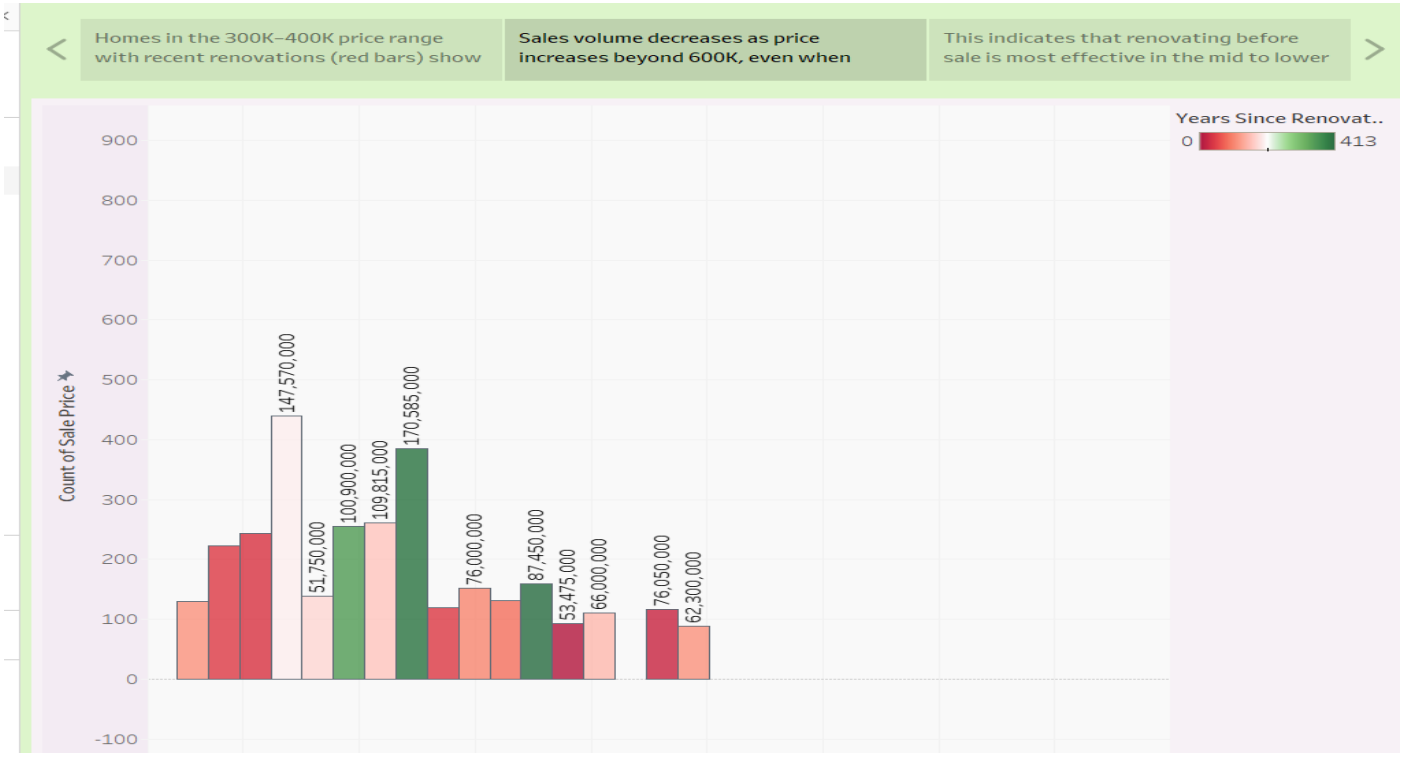
House Age Distribution by Number of Bathrooms, Bedrooms And Floors



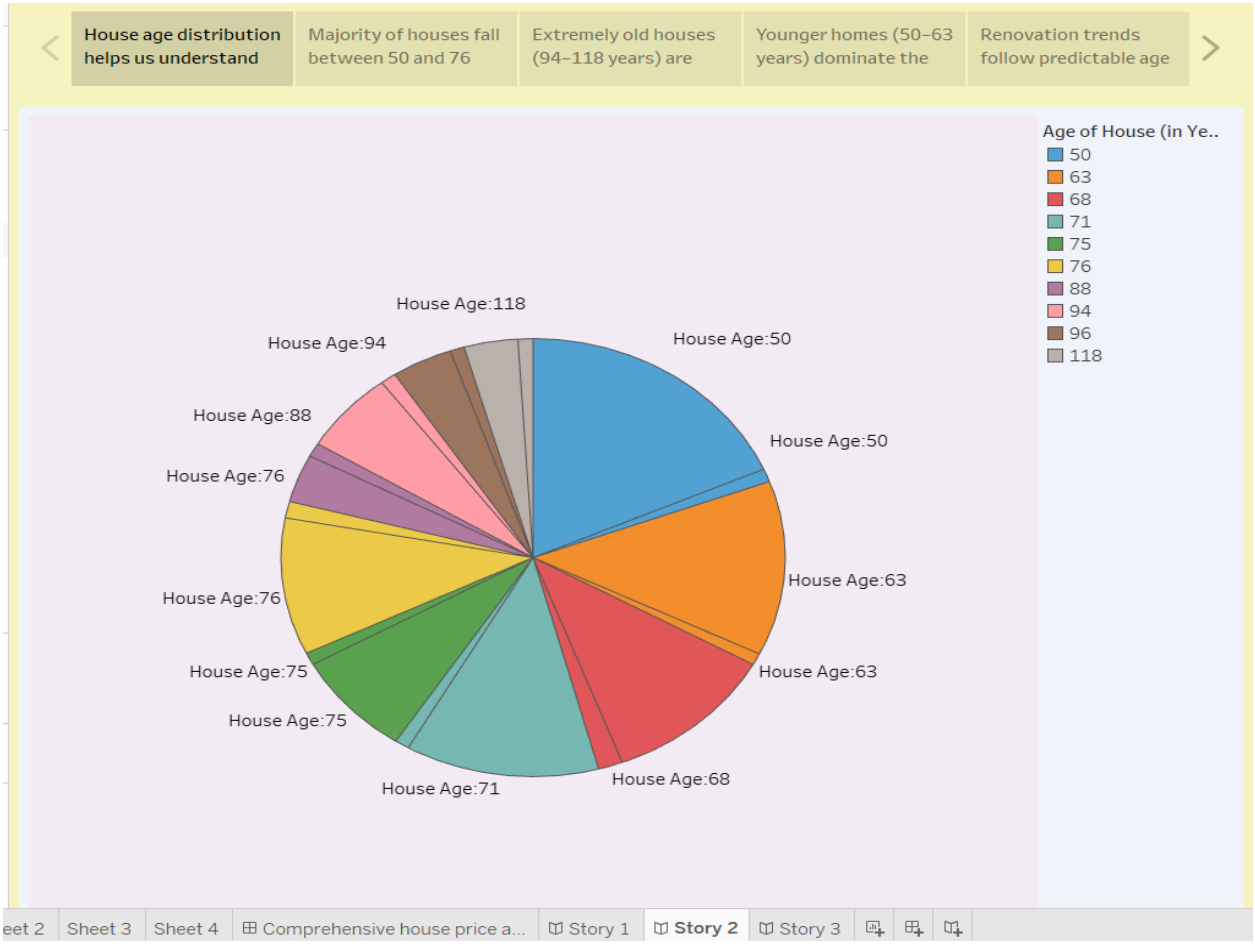
Sheet 2 | Sheet 3 | Sheet 4 | Comprehensive house price ...

Stories:

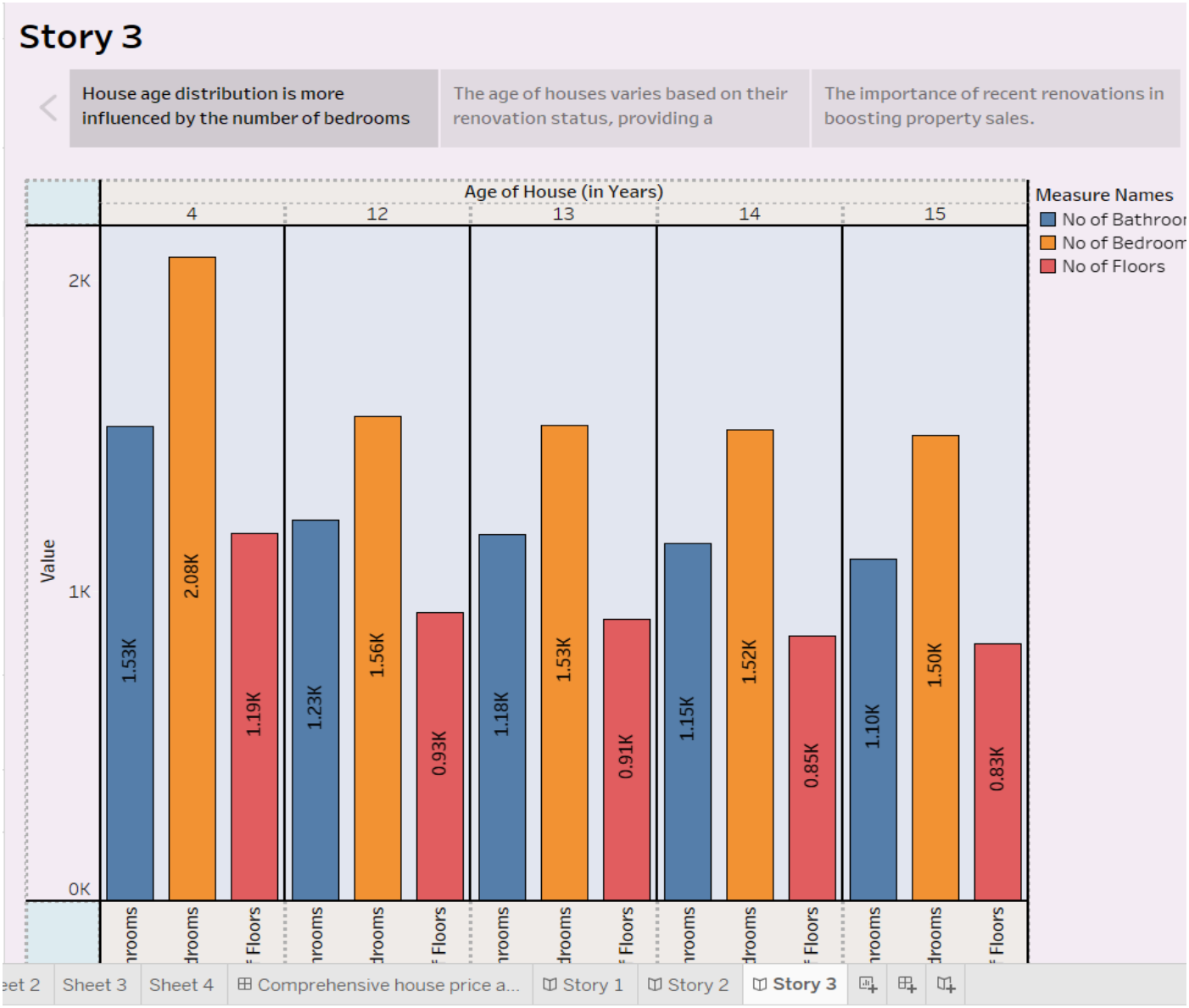
1)


Homes in the 300K–400K price range with recent renovations (red bars) show
Sales volume decreases as price increases beyond 600K, even when
This indicates that renovating before sale is most effective in the mid to lower
Years Since Renovat..
0
413
Count of Sale Price
900
800
700
600
500
400
300
200
100
0
-100
147,570,000
51,750,000
100,900,000
109,815,000
170,585,000
76,000,000
87,450,000
53,475,000
66,000,000
76,050,000
62,300,000

2)


House age distribution helps us understand
Majority of houses fall between 50 and 76
Extremely old houses (94–118 years) are
Younger homes (50–63 years) dominate the
Renovation trends follow predictable age
Age of House (in Ye..
50
63
68
71
75
76
88
94
96
118
House Age:118
House Age:94
House Age:88
House Age:76
House Age:76
House Age:75
House Age:75
House Age:71
House Age:68
House Age:63
House Age:63
House Age:50
House Age:50
eet 2
Sheet 3
Sheet 4
Comprehensive house price a...
Story 1
Story 2
Story 3

3)


Story 3
House age distribution is more influenced by the number of bedrooms
The age of houses varies based on their renovation status, providing a
The importance of recent renovations in boosting property sales.
Age of House (in Years)
4
12
13
14
15
Measure Names
No of Bathroo
No of Bedroom
No of Floors
Value
2K
1K
0K
1.53K
2.08K
1.19K
1.23K
1.56K
0.93K
1.18K
1.53K
0.91K
1.15K
1.52K
0.85K
1.10K
1.50K
0.83K
Sheet 3
Sheet 4
Comprehensive house price a...
Story 1
Story 2
Story 3

8. ADVANTAGES & DISADVANTAGES

Advantages

- Easy to Understand:
  The dashboards present complex housing market data in a clear, visual way that is easy for non-technical stakeholders to interpret.
- Supports Better Decisions:
  By visualizing the impact of house age, renovations, and features, stakeholders can make informed pricing and renovation strategies.
- Time-Saving:
  Filters and calculated fields make it faster to explore trends compared to manual spreadsheet analysis.
- Interactive:
  Users can drill down into specific age groups, renovation statuses, or house features, making the solution flexible for different use cases.
- Scalable:
  The solution can easily be extended to include larger datasets or live data connections in the future.
- Practical Learning:
  For student teams, this project builds strong skills in data cleaning, visualization, and business storytelling.

Disadvantages

- Static Dataset:
  The current project uses a static CSV file. It does not connect to real-time data feeds, so updates must be done manually.
- Tool Dependency:
  Stakeholders need access to Tableau Public or Tableau Reader to view the interactive dashboards if not published online.
- Limited Predictive Power:
  The solution focuses on visualization — it does not include predictive modeling for future prices or trends.
- Requires Basic Tableau Knowledge:
  Some users may need a short walkthrough to understand how to use filters or navigate the dashboard effectively.
- May Miss Hidden Data Issues:
  If the original dataset has errors or unrealistic zero values, these can still affect visuals unless thoroughly checked.

9. CONCLUSION

The *Visualizing Housing Market Trends* project demonstrates how a large, complex housing dataset can be transformed into meaningful, easy-to-understand insights using Tableau. By creating calculated fields, designing multiple chart types, and combining them into an interactive dashboard and story, we successfully highlighted how house age, renovation status, and key features like bedrooms, bathrooms, and floors impact sale prices and market trends.

This project not only helps real estate analysts, company executives, and marketing teams make better pricing and renovation decisions, but also shows the power of clear data storytelling in solving real business problems. The final dashboard saves time, reduces guesswork, and supports transparent, data-backed decisions for the housing market.

As student interns, we learned how to handle data cleaning, visual design, user-focused storytelling, and interactive dashboard creation, preparing us for future roles in data analytics and business intelligence

10. FUTURE SCOPE

- Connect dashboards to **live data sources** for real-time housing updates.
- Add **predictive analytics** to forecast future price and renovation trends.
- Expand the solution for **larger datasets** covering cities, states, or national markets.
- Apply the same framework to **rental or commercial property analysis**.
- **Embed dashboards** in websites or mobile apps for easy access.
- Enable **collaboration** by sharing dashboards online for team use.
- Add **location-based visuals** like maps for deeper geospatial insights

11. APPENDIX

Dataset Link:

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

GitHub & Project Demo Link

Github link:

https://github.com/bindubha/Visualizing-housing-markets

Demo link:

https://drive.google.com/file/d/1NaNQFvTAbISl8a3XaZ9EX0WqIbdPcYTk/view?usp=drivesdk