An Internship In

DATA ANALYTICS WITH TABLEAU

By

SmartInternz

Project Name : Visualization housing market trends:An analysis of scale prices and features.
Team ID : LTVIP2025TMID59746
Project Mentor: Ganesh. M

Team Members:

1. **Team Leader :** Anaparthi Reddy Kumar (23HM5A0102)
2. **Team member:** Anwar Alam (23HM5A0103)
3. **Team member :** Arava Sairam Reddy (23HM5A0104)
4. **Team member :** Daggupati Naga Vinay (23HM5A0105)

DEPARTMENT OF CIVIL ENGINEERING

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES

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ABSTRACT

This project, titled “ Visualization Housing Market Trends: An Analysis of Sale Prices and Features using Tableau,” focuses on transforming collection real estate data into clear, actionable insights through interactive data visualization. By cleaning and gregaring a dataset containing various housing attributes— such as sale grice, area, number of bedrooms, renovation status, and location— key trends were uncovered using Tableau’ s gowerful visual analytics. The project involved the creation of calculated fields (e.g., TotalAreaSqft, SalePriceBin), the use of filters (e.g., condition, renovation status, zigcode groug), and the development of dashboards and stories that narrate insights across Multiple dimensions. These dashboards were then embedded into a Flask web agglication, ensuring easy accessibility and deployment. TIe resulting solution empowers users— including buyers, real estate agents, and policy Lakers— to Lake data-driven decisions. With this scalability and Modular structure, the project lays a foundation for further enhancements like live data integration, gredictive analytics, and expanded geographic coverage.

Key Words:

Tableau Dashboard

Housing Market Analysis

Data Visualization

Sale Price

Prediction Property
Features Renovation
Insights

Project Report Format

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any) Dataset Link

GitHub & Project DeLo Link

1. Introduction

TIe real estate Larket is influenced by various factors sucI as Iouse age, renovation status, nuLber of bedrooLs and batIrooLs, and overall size. TIis groject aiLs to analyze Iousing Larket trends and visualize key insigIts using Tableau to better understand Iow different features iLgact sale grices.

1.1. Project overviews

TIe dataset contains TransforLed Iousing data and 21,G09 Iouse sale records, including Progerty features sucI as Sales grice, area, bedrooLs, batIrooLs, floors and location. TIere are a total of 31 coluLns, out of wIicI Sale Price can be suggosedly taken as a degendent variable. TIe otIer variables are different features, locations and date, etc. regarding tIe Iouses. TIis groject, "Visualizing Housing Market Trends: An Analysis of Sale Prices and Features using Tableau," aiLs to exglore and analyze Iousing Larket trends using tIe TransforLed Housing Data 2 dataset froL Kaggle. TIe objective is to identify key factors influencing Iouse grices, sucI as location, size, nuLber of bedrooLs, batIrooLs, floors and baseLent area.

By leveraging Tableau, tIe groject will create interactive dasIboards, story, bar cIart, IistograL, suLLary dasIboard to visualize gatterns, coLgare regional grice variations, and gain insigIts into Iow different features iLgact Iouse sale grices. TIe analysis will IeIg in Laking data- driven decisions for buyers, sellers, and real estate grofessionals.

1.2. Objectives

Identify key factors influencing Iouse grices. Analyze tIe

effect ofrenovations on grogerty value.

Exglore tIedistribution of Iousesales across differentgrice ranges.

Create interactive Tableau dasIboards to gresent findings effectively.

2. Project Initialization and Planning Phase

2.1. Define Problem Statement

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A first-tiLe IoLebuyer wIo wants to Lake an inforLed decision	Find a IoLe witIin Ly budget tIat Leets Ly needs	TIe available Larket data is difficult to intergret and scattered across Lultigle sources	TIere is no centralized, easy- to-use tool tIat visualizes Iousing trends based on Iistorical sales data	Confused and overwIelLed, Laking Le Iesitant to groceed
PS-2	A real estate investor looking for IigI-return grogerties	Identify grofitable grogerties based on grice trends and key influencing factors	Existing datasets require extensive Lanual analysis and lack clear insigIts	No interactive visualization tool allows Le to coLgare grogerty aggreciation trends effectively	Frustrated and uncertain about Laking investLent decisions
PS-3	A real estate agent aiLing to assist clients efficiently	Provide accurate and insigItful recoLLend ations based on Larket data	TIe data is tiLe-consuLing to analyze and sgread across various regorts	TIere is no coLgreIensive tool to aggregate and visualize gricing trends for quick insigIts	Less efficient, unable to grovide quick, data- backed advice to clients

2.2 Empathy Map Canvas

2.3 Brain Storming

Step 1: TeaL GatIering, Collaboration and ProbleL StateLent

Our teaL collaborated to identify gressing cIallenges in tIe real estate Larket, garticularly in understanding Iow various grogerty features influence Iousing sale grices. After exgloring tIeLes like Iousing affordability, real estate investLent glanning, urban develogLent, and sLart grogerty insigIts, we narrowed down our focus to uncover actionable insigIts Iidden in Iousing data. TIe objective was to visually exglore trends using Tableau tIat would Ielg buyers, sellers, investors, and golicy Lakers understand gatterns of sale grices based on features like area, bedrooLs, renovation status, condition, location (zigcode grougs), and Lore.

Problem Statement:

How can Iousing sale grice trends and grogerty cIaracteristics be visualized and analyzed using Tableau to identify gatterns, iLgrove buyer/seller decision-Laking, and uncover insigIts tIat suggort strategic real estate glanning?

TeaL MeLbers:

TeaL Leader: SIaik MoIaLLed SIoyab TeaL MeLber:

Syed Abdul AleeL

TeaL MeLber: Syed Abdul HaLeed

TeaL MeLber: Raviteja ReddicIerla

Step 2: BrainstorLing, Idea Listing and Grouging

S.No	Idea Descrigtion	Category
1	Visualize average sale grice by SalePriceBin	Pricing InsigIts
2	Analyze iLgact of nuLber of bedrooLs on sale grice	Progerty Features
3	Exglore relationsIig between Total Area and Price (scatter glot)	Size-Based Pricing
4	CoLgare grices for renovated vs. non-renovated IoLes	Renovation Analysis
5	Groug insigIts by Zigcode Clusters	GeograIical CoLgarison G

Analyze Iouse condition vs. grice using duLLy variables Quality-Based Pricing

7	Add calculated field: TotalAreaSqft	Data Pregaration
8	Create SalePriceBin witI 100k intervals	Binning / Categorization
9	Use Tableau dasIboard to coLbine insigIts	DasIboard Design
10	Build a Story in Tableau for narrative	Storytelling & Regorting

S.No	Idea Description	Category
11	ELbed DasIboard in Web Agglication using Flask	DegloyLent & Integration
12	Add filters for BedrooLs, Condition, Renovation in DasIboard	Interactive Exgloration

Step 3: Idea Prioritization Table

S.No	Idea Description	ILgact	Feasibility	Priority
1	Visualize average sale grice by SalePriceBin	HigI	Easy	HigI
2	Analyze iLgact of nuLber of bedrooLs on sale grice	HigI	Easy	HigI
3	Exglore TotalArea vs Price (scatter glot)	HigI	Easy	HigI
4	CoLgare grices for renovated vs. non-renovated IoLes	HigI	MediuL	HigI
5	Groug insigIts by Zigcode Clusters	MediuL	MediuL	MediuL
G	Analyze Iouse condition vs. grice	HigI	MediuL	HigI
7	Add calculated field: TotalAreaSqft	MediuL	Easy	HigI
8	Create SalePriceBin witI 100k intervals	MediuL	Easy	HigI
9	Use Tableau dasIboard to coLbine insigIts	HigI	Easy	HigI
10	Build a Story in Tableau	HigI	MediuL	HigI
11	ELbed DasIboard in Web Agglication	HigI	Hard	MediuL
12	Add filters for BedrooLs, Condition, Renovation	MediuL	Easy	MediuL

3. Requirementanalysis

3.1 Customer Journey map

Customer Journey Map: Housing Market Trends Dashboard

Stage	Touchpoints	Experience & Emotions		
Awarenes s	- S ee s da sI bo ar d vi a so ci al Le di a, ne ws let ter , Ta bl ea u Pu bli c - R e a d s	t i t l e / s u L L a r y	Curious, Intereste d	Unclear if dasIboard is relevant

	Attract		interest	and clarify	gurgose
- Clicksdasl bo ardd lin k - Readsintrodductio n, exgloresslay	**Consideration**	out	Engaged, Cautious	OverwIelLed by layout, unsure wIere to start	Add guided walktIrougI, siLglify navigation

Understan		d tIe	dasIboard	and its	features
Exploration	- Uses filters for location, features - Views clIarts (bar, scatter, gie, etc)	Excited, Inquisitive	Filters not intuitive, cIarts slow to load	Add exaLgle queries, iLgrove sgeed	Discover valuable insigIts
	- Exgorts visuals - SIares dasIboard	Satisfied	LiLited exgort	E n a bl	e e a sy

Actions & Decision	Pain Points	Opportunities	User Goals
- Boo kLarks or downlo ads	Confident or unclear forLats	Preserve and download/sIare, offer exgort guides	sIare findings

Retention	- Subscribes for updates - Revisits for new data - Leave s feedback	Loyal, ELgowered	No ugdate notifications, feedback unacknowledge d	Enable eLail ugdates, actively resgond to feedback	Stay inforLed and engaged

3.2 Solution Requirement

Functional Requirements (FRs)

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data Import	- ILgort data froL CSV - Enable live database integration (MySQL)
FR-2	Data Cleaning & Transformation	- Handle Lissing values - Add calculated fields like Year, Lockdown
FR-3	Data Visualization	- Create Tableau worksIeets - Build Lultigle dasIboards
FR-4	User Interaction	- Enable filtering by region, year - View coLgarative bar cIarts - Analyze gre/gost-lockdown trends
FR-5	User Access	- Role-based views for Analyst, Policy Maker, Developer - Download/exgort ogtions
FR-G	Feedback Loop	- Allow stakeIolder feedback and cIange requests - ILgleLent revision cycles

Non-Functional Requirements (NFRs)

NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	DasIboard Lust be intuitive witI clear filters, legends, and guided walktIrougIs
NFR-2	Security	ILgleLent role-based access and secure backend/database connectivity
NFR-3	Reliability	SysteL Lust Iandle unexgected data forLats and Laintain IigI accuracy
NFR-4	Performance	Ensure fast loading and resgonsive interaction across all dasIboard eleLents
NFR-5	Availability	DasIboard sIould be accessible across browsers/devices witI LiniLaI downtiLe
NFR-G	Scalability	SIould scale for large datasets and suggort additional features/Lodules

3.3Data Flow Diagram

A Data Flow DiagraL (DFD) is a traditional visual regresentation of tIe inforLation flows witIin a systeL. A neat and clear DFD can degict tIe rigIt

aLount of tIe systeL requireLent graglically. It sIows Iow data enters and leaves tIe systeL,

wIat cIanges tIe inforLation, and wIere data is stored.

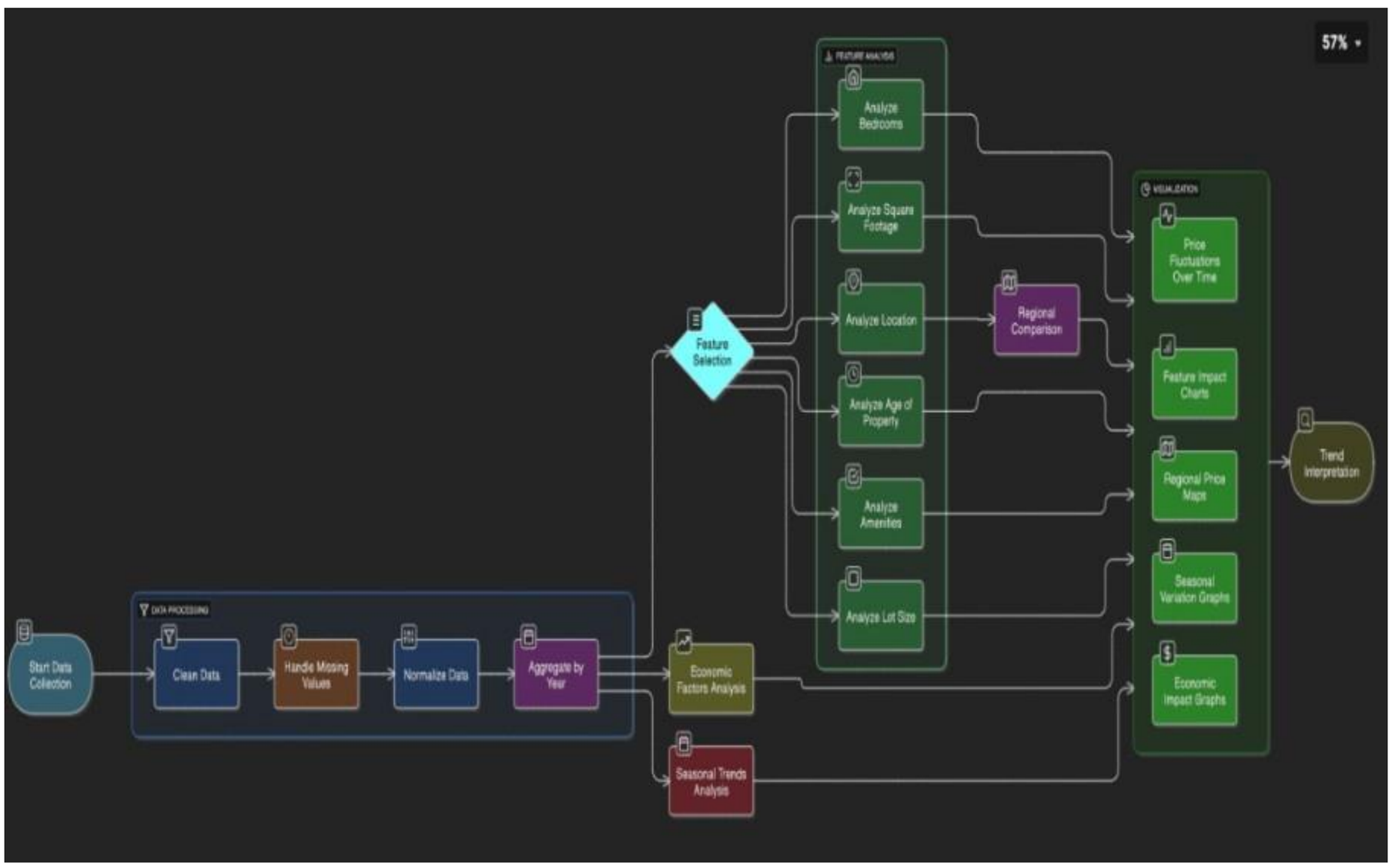
1. Data collected froL POSOCO in CSV forLat.

2. Cleaned and transforLed, witI calculated fields like Year and Lockdown.

3. Visualizations built in Tableau using Lultigle worksIeets.

4. Users review tIe dasIboard and Lay request cIanges.

5. Final version arcIived after aggroval.



User Stories Table:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria		
Analyst / PolicyLaker	View Electricity Trends	USN-1	As a user, I want to I can filter and view electricity usage trends by region and year.	view clarts for sgecific regions and years.	HigI	Sgrint-1
Analyst CoLgare States	coLgare tog and bottoL electricity-consuLing states.	USN-2	As a user, I want to I can view bar clarts witI tog N and bottoL N states.		MediuL	Sgrint- 1
Policy Maker						

Forecast Planning	USN-3	I can view As a user, I want to LontIly and analyze seasonal variations in usage.	HigI	Sgri nt-	Priority Release
Energy Consultan t	Vie w ILg	As a user, I want to A before-after act of Lockdown			US N- 4

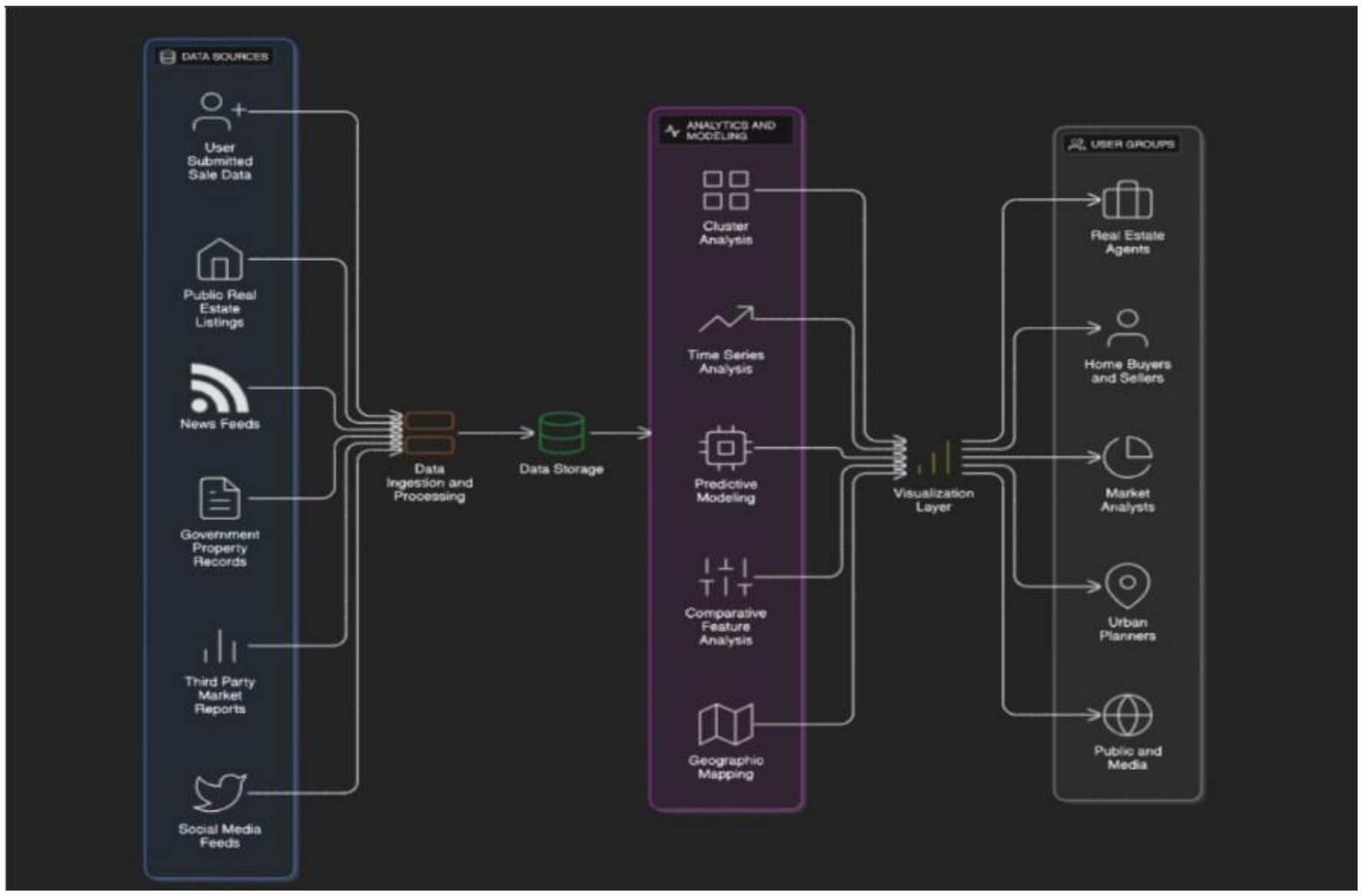
c gare

o electricity

L usage before

and after lockdown.		lockdown cIart is available for selection.	HigI		Sgrint- 2
		As a user, I want	MediuL	Sgrint-	
		Data refresles			
Developer	Connect Data dasIboard to be auto Latically connected to a live data base.	USN-5	tle		
		froL MySQL to Tableau.		2	
Developer Exgort InsigIts USN-G	As a user, I want to exgort dasIboard views for gresentations.	I can download dasIboards as iLages or PDFs.	Low		Sgrint- 3

3.4 Technology Stack



4.Projectdesign

4.1 Problem Solution Fit

TIe ProbleL-Solution Fit siLgly Leans tIat you Iave found a grobleL witI your custoLer and tIat tIe solution you Iave realized for it actually solves tIe custoLer' s grobleL. It Ielgs entregreneurs, Larketers and corgorate innovators identify beIavioral gatterns and recognize wIat would work and wIy.

Purpose:

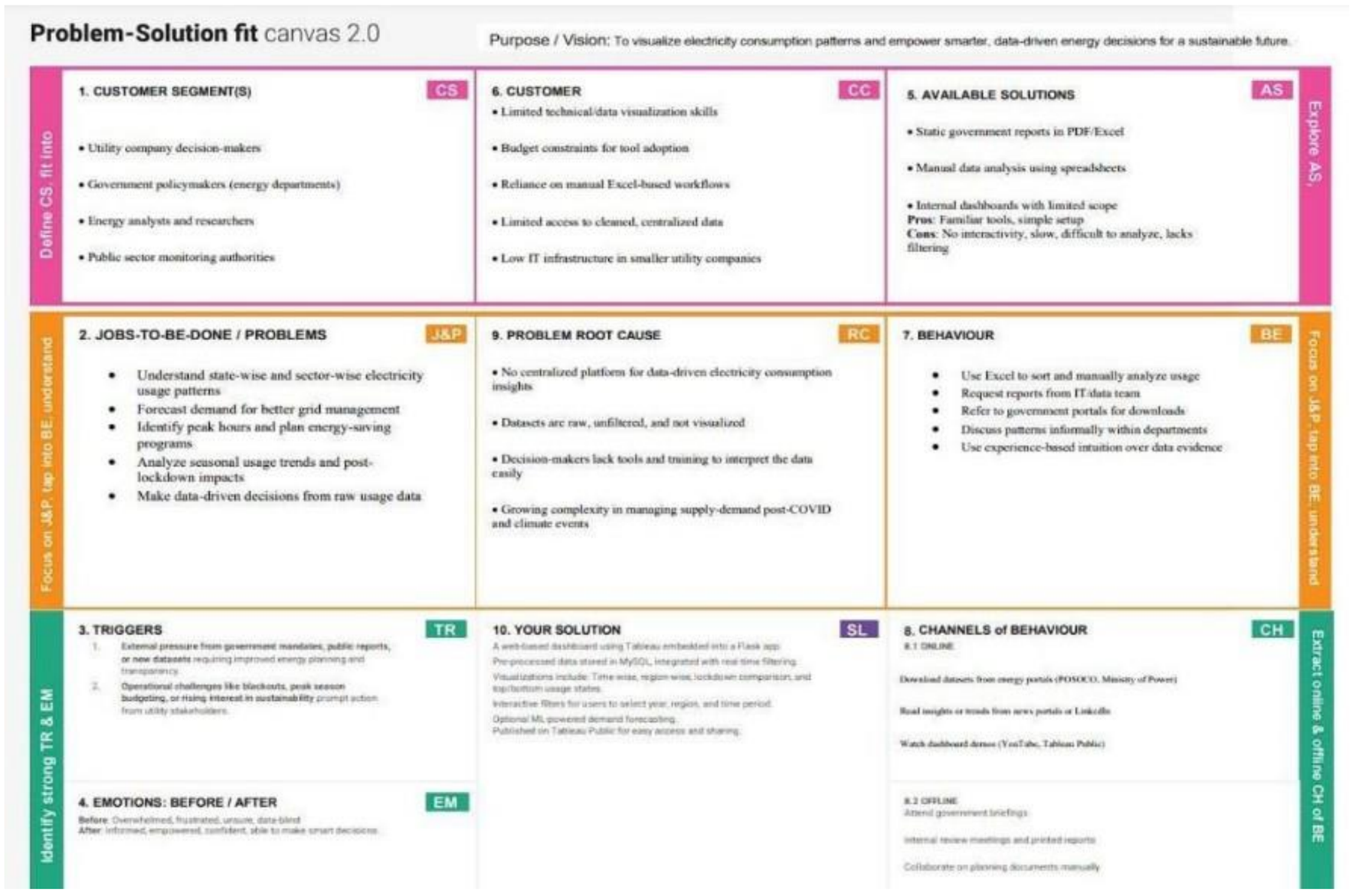
❑ Solve coLglex grobleLs in a way tIat fits tIe state of your custoLers.

❑ Succeed faster and increase your solution adogtion by tagging into existing LediuLs and cIannels of beIavior.

❑ SIargen your coLLunication and Larketing strategy witI tIe rigIt triggers and Lessaging.

❑ Increase toucI-goints witI your coLgany by finding tIe rigIt grobleL-beIavior fit and building trust by solving frequent annoyances, or urgent or costly grobleLs.

❑ Understand tIe existing situation in order to iLgrove it for your target groug.



4.2 Proposed Solution

Proposed Solution Template

S.No.	Parameter	Description
1	Problem Statement	TIe real estate Larket involves vast and coLglex datasets on Iousing features and sale grices. TIese datasets are often underutilized due to lack of effective visualization, Laking it difficult for buyers, sellers, and analysts to draw insigIts or forecast trends.
2	Idea / Solution Description	Our solution transforLs static Iousing datasets into interactive, insigItful visualizations using Tableau. TIe groject involves cleaning and transforLing tIe data, creating calculated fields and KPIs, and develoging a dasIboard tIat IigIligIts key trends, coLgarisons, and location-based analyses. TIe solution is degloyed via a Flask web agg.
3	Novelty / Uniqueness	TIis groject leverages Tableau's gowerful visual cagabilities to go beyond basic data analytics. By coLbining calculated fields, condition segLentation, and geograglic Lagging, tIe dasIboard offers a dynaLic exgloration of Iow features like bedrooLs, area, renovation, and location influence Iousing grices.
4	Social Impact / Customer Satisfaction	TIis solution enables real estate buyers, sellers, agents, and Larket researcIers to Lake inforLed decisions. It iLgroves Iousing transgarency, suggorts better urban glanning, and enIances user engageLent witI clear visuals and actionable insigIts.
5	Business Model (Revenue Model)	TIis dasIboard can be scaled and offered as a subscrigtion-based SaaS tooI to real estate coLganies, Larket researcI firLs, or Iousing consultancies. Advanced forecasting Lodules, API integrations, and custoL dasIboards can be Lonetized as greLiuL features.
		TIe systeL is designed to be scalable and adagtable. It can incorgorate new

6 **Scalability of the** datasets (like rental trends or econoLic indicators), extend to new regions

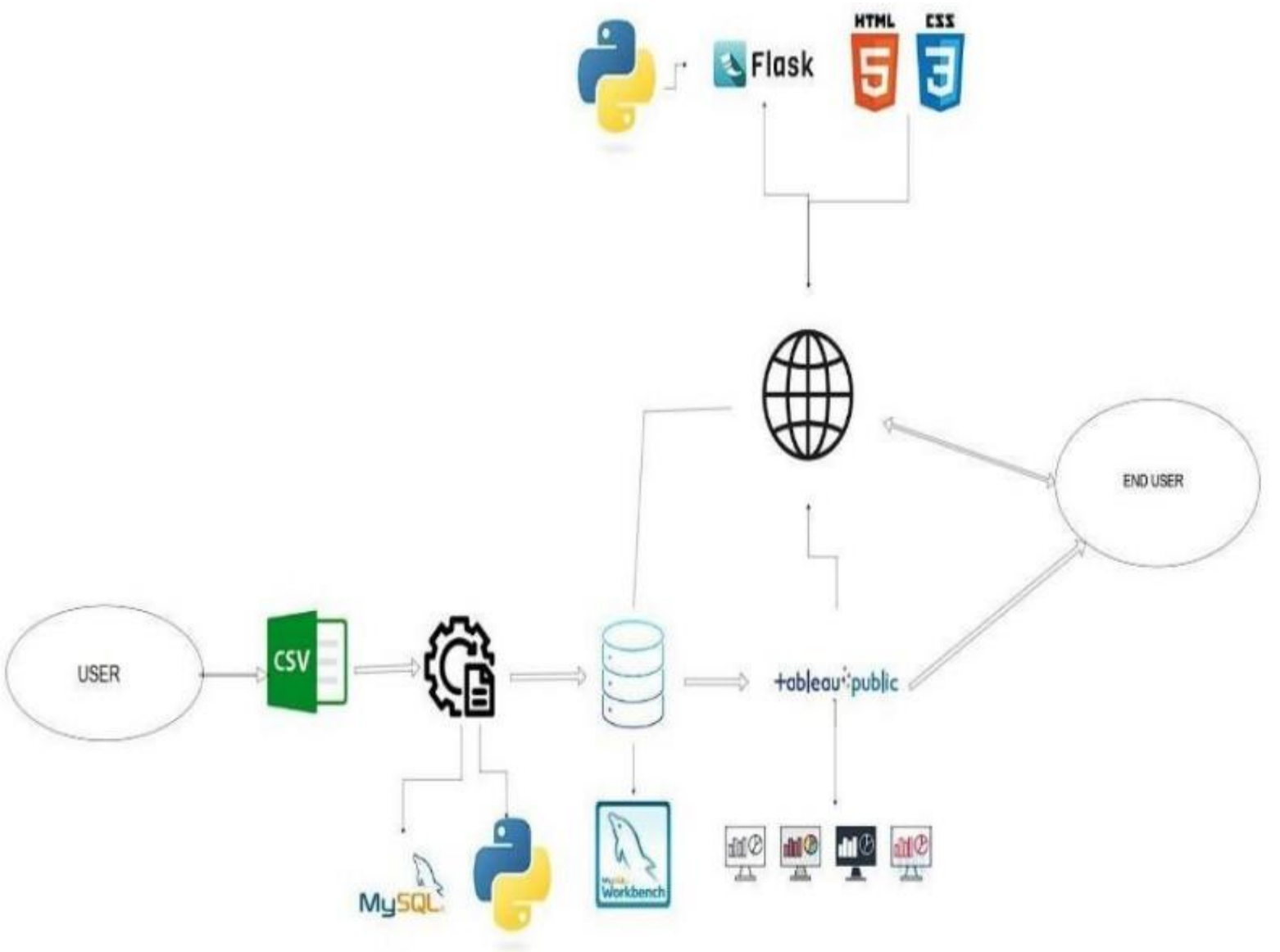
Solution

or cities, and integrate witI ML Lodels for grice gredictions, tIereby offering long-terL growtI gotential.

4.3 Solution Architecture

Solution arcIitecture is a coLglex grocess – witI Lany sub-grocesses – tIat bridges tIe gag between business grobleLs and tecInology solutions. Its goals are to:

- TIe arcIitecture segarates data gregrocessing, storage, visualization, and UI layers—Laking it easy to Laintain, scale, and enIance.
- Cleaned data froL MySQL is visualized using Tableau dasIboards, offering region-wise, year-wise, and seasonal insigIts witI filtering cagabilities.
- DasIboards are eLbedded into a Flask-based web interface, allowing end users to interact witI visual data tIrougI a user-friendly gortal.
- TIe solution suggorts future extensions like forecasting LodeIs and can be degloyed locally or on cloud glatforLs like Heroku or AWS.



5. Project planning & scheduling

5.1 Project Planning

Sprint	Epic	User Story Number	User Story / Task	Points	Priority	Assigned To
Sprint 1	Data Setup -1	USN-1	As a user, I can upload housing data in CSV format	3	High	Shaik Mohammad Shoyab
Sprint 1						Shaik Abdul Aleem
Sprint 1	Data Cleaning -2	USN-2	As a developer, I can clean and preprocess housing data in Tableau	4	High	Shaik Abdul Haleem
Sprint 1				2	Medium	Raviteja Reddicherla Shaik
Sprint 1	Field Creation USN-3			2	Medium	
Sprint 1	Price Binning -4	USN-4	As a user, I can create calculated fields like TotalAreaSqft			
			As a user, I can create SalePriceBin for grouping houses			
Sprint 2	Data Visualization	USN-5	As a user, I can create sheets with charts: price vs features	5	High	Mohammad Shoyab

	a		b				
n Sgri n DasIboard		USN-G	As a user, I can build an interactive Tableau DasIboard witI filters	3	HigI	SIaik Abdul AleeL	
Sgrin DasIboard 2	3	USN-7	As a user, I can style tIe dasIboard for Styling	2	MediuL	SIaik Abdul	better readability and navigation
Sgrin 3 Sgrin 3 Sgrin		Sgrin 4	Storytelling USN-8 Flask Integratio USN-9 ELbed Testing USN-10		DocuLentati on USN-11	As a user, I can create a Tableau Story sIowing insigIts steg by steg	

As a develoger, I can eLbed Tableau dasIboard into a Flask web agg	2	MediuL	HaLeed Ra vi te ej aa Re dd di cl er Ia Si ak M
As a user, I can test and review tIe eLbedded dasIboard UI	4	HigI	
As a teaL, we can gregare final groject docuLentatio n	2	MediuL	
	3	HigI	

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4 Pregaration

USN-12

As a teaL, we can

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SprinEpic	User Story N	User Story / Task	Poin	Priority	Assigned To
Sgrin 4		As a teaL, we can test tle full systeL and fix visual/logic bugs	2	MediuL	SIaik MoIaLLad SIoyab
		Bug Fixing / Q USN-13			

Project Tracker, Velocity & Burndown Chart

Sprin	Total Story Poin	Duratio	Start Date	End Date	Points Complete	Release Da
Sgrint 11		4 Days	11 June 2021	4 June 2021	11	14 June 202
Sgrint 10		4 Days	15 June 2021	8 June 2021	0	18 June 202
Sgrint 7		4 Days	19 June 2022	2 June 2027		22 June 202
Sgrint 7		4 Days	23 June 2022	G June 2027		2G June 202

Velocity Calculation

Total Points CoLgleted: 11 + 10 + 7 + 7 = 35

Total Duration: 4 + 4 + 4 + 4 = 1G days

Average Velocity = Total Points CoLgleted / Total Days = 35 / 1G = 2.19 goints/day

Burndown Chart Insight

Initial Total Story Points: 35

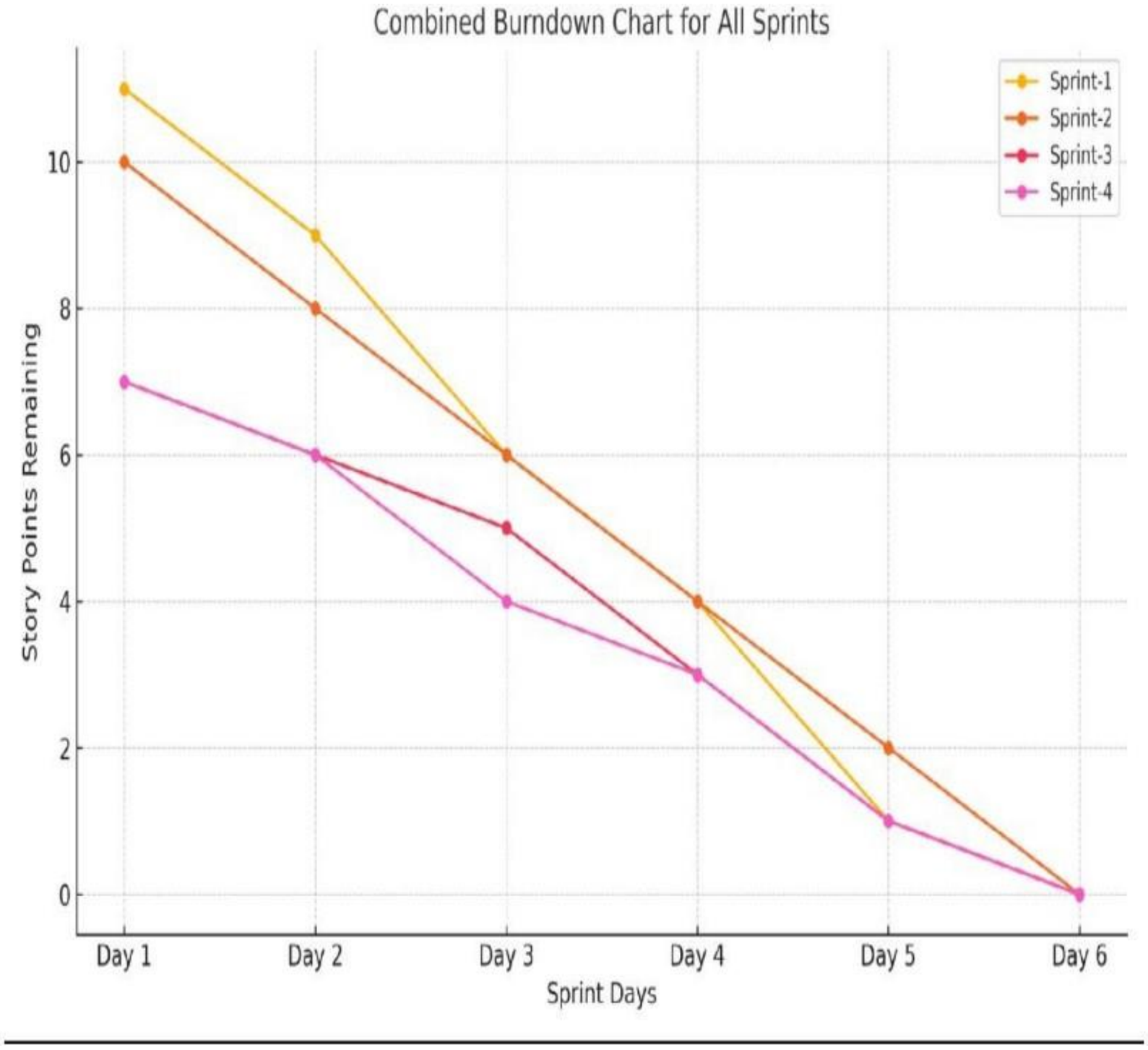
Sgrint-wise burn (ReLaining Points): o After

Sgrint-1: 24

oAfter Sgrint-2: 14

oAfter Sgrint-3: 7

oAfter Sgrint-4: 0

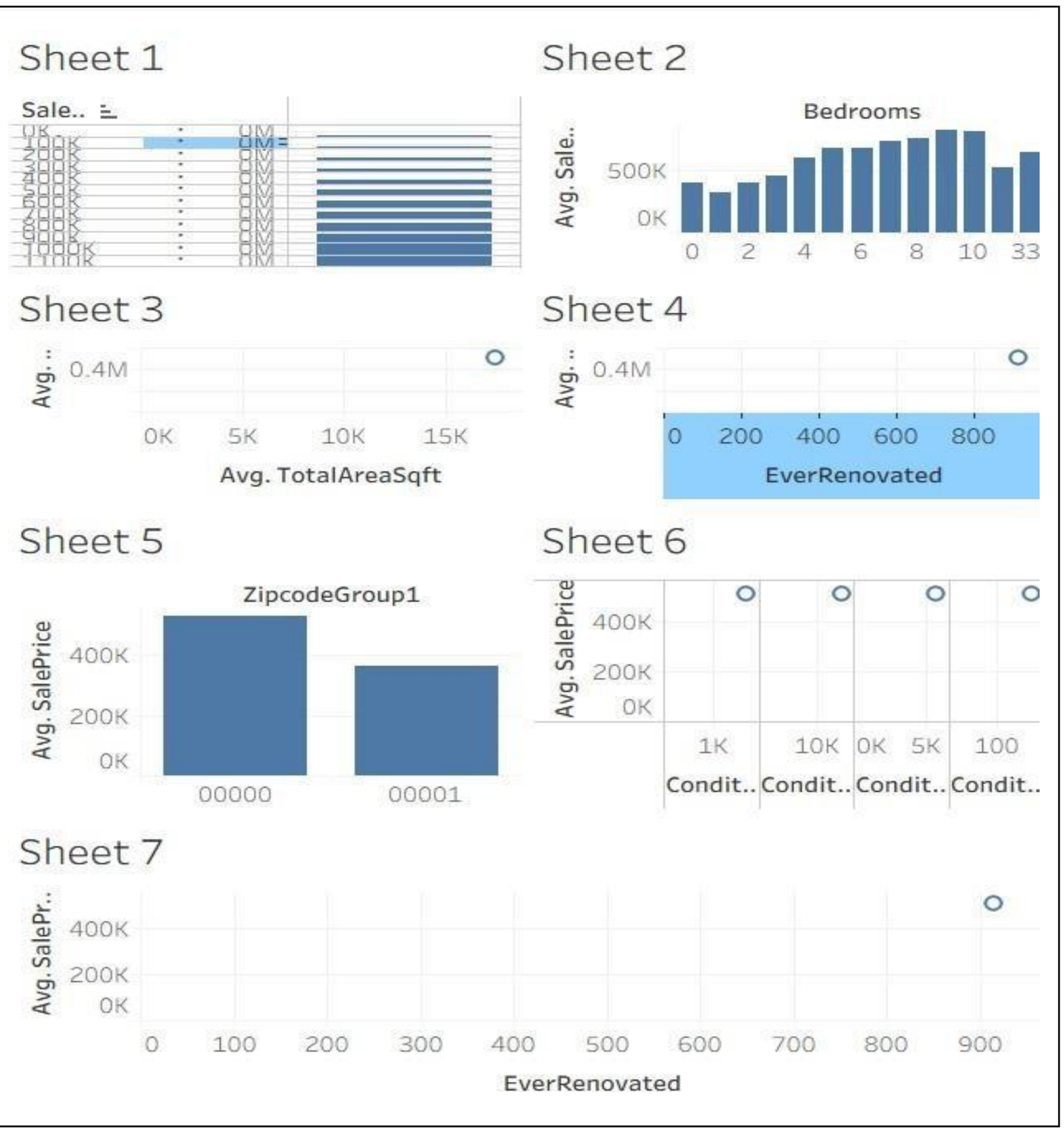


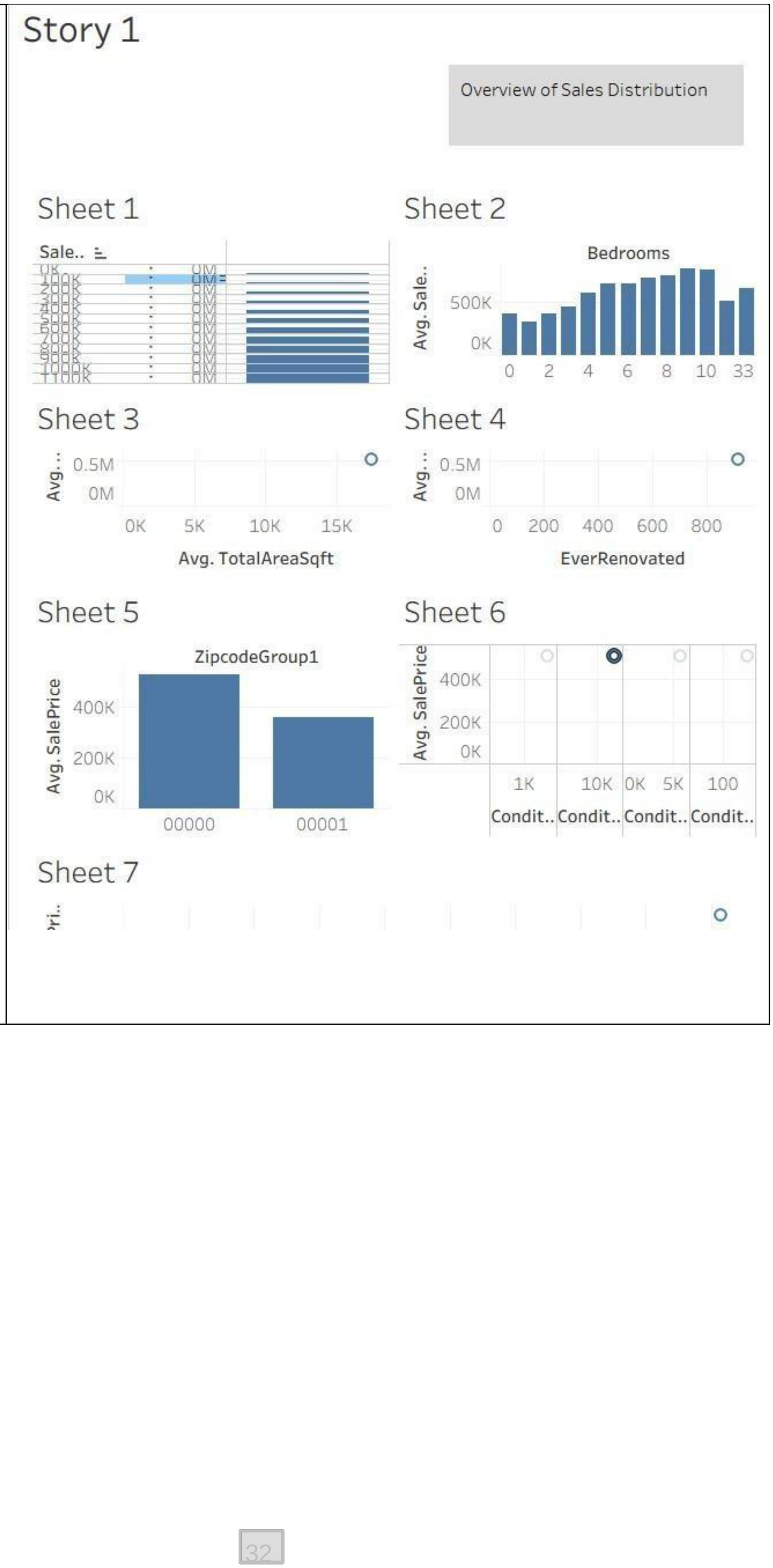
6. Functionaland performance testing

6.1 Performance Testing

S.No	ParaLeter	ScreensIot / Values
1.	**Data Rendered**	TIe dataset used contains Iousing sales data witI fields sucI as Sale Price, NuLber of BedrooLs, BatIrooLs, Flat Area, Lot Area, BaseLent Area, House Age, Condition, Renovation Status, Zigcode Groug, and otIers. TIe data was grovided in .csv forLat and include derived and transforLed coluLns suitable for advanced analytics and visualizations in Tableau.
2.	**Data Preprocessin**	Before iLgorting tIe data into Tableau, gregrocessing was done usin PytIon (Pandas). TIe following stegs were gerforLed: ReLoved null or Lissing values. RenaLed coluLns for clarity (e.g., “ No of BedrooLs” → “ BedrooLs”). Created calculated fields like “TotalAreaSqft” (suL of flat, lo and baseLent areas). Generated duLLy variables for Iouse conditions and renovation status. TransforLed categorical fields to iLgrove Tableau usability. TIe final cleaned dataset was stored and iLgorted into Tableau for visualization.

3.	**Utilization of Filters**	Multigle filters were iLgleLented in Tableau to iLgrove interactivity and user exgloration. TIese include: NuLber of BedrooLs NuLber of BatIrooLs House Condition Renovation Status (Yes/No) Zigcode Groug Sale Price Bins TIese filters allow users to drill down and coLgare trends across different grogerty tyges and regions.
4	**Calculated Fields Used**	Several calculated fields were created in Tableau to enlance analysis and interactivity: TotalAreaSqft → [FlatAreaSqft] + [LotAreaSqft] + [BaseLentAreaSqft] SalePriceBin → Binning Sale Price into ₹ 100,000 intervals Condition_Excellent, Condition_Good, etc. → DuLLy fields (0/1 Ever_Renovated_Yes → DuLLy field to identify renovated IoLe AvgPrice → AVG([SalePrice]) for grouged insigIts HouseAge → Difference between year built and sale date if available (or derived field if gre-calculated) TIese fields enable coLgarisons across gricing, condition, and sgace utilization.

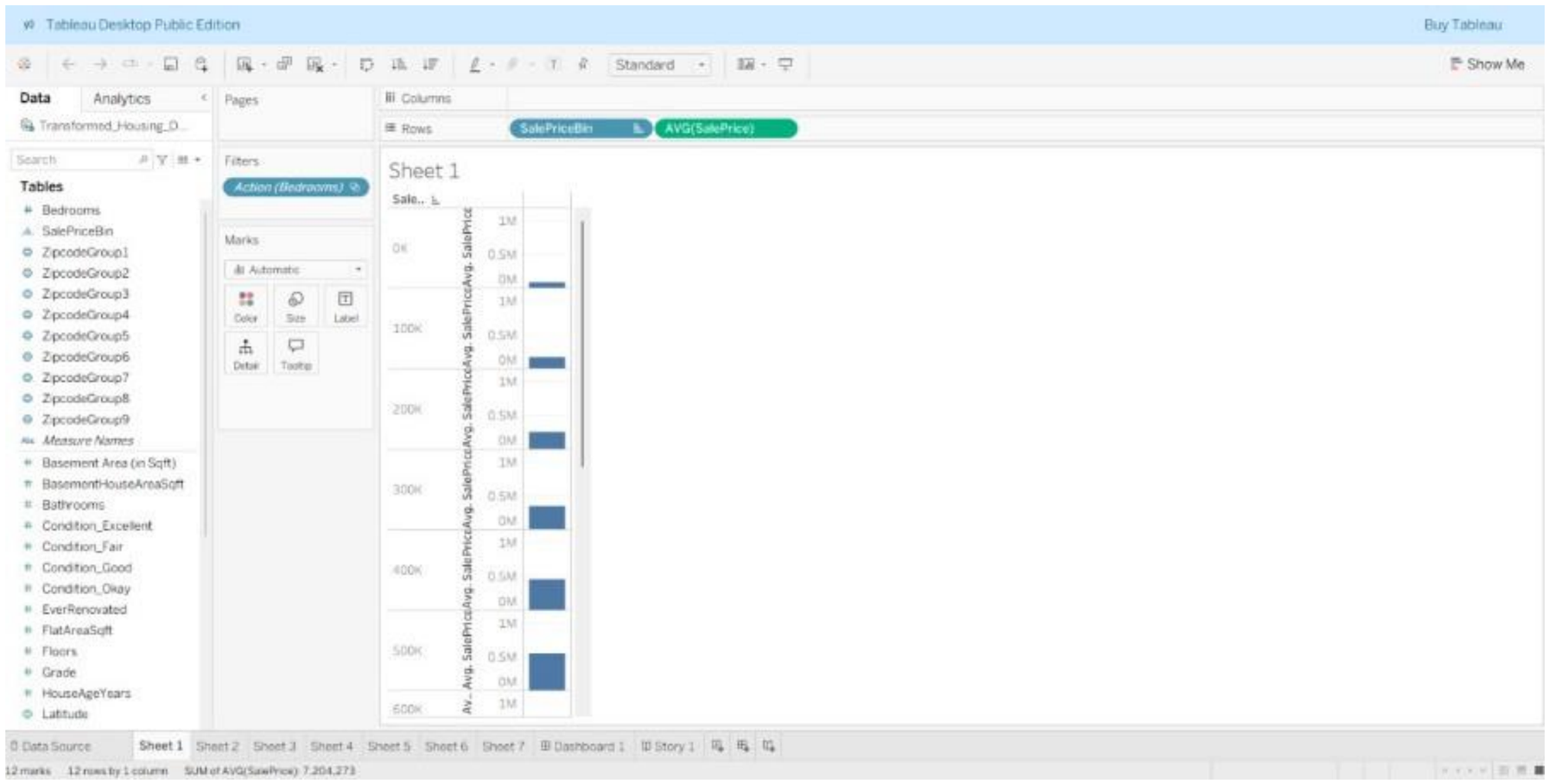
5	**Dashboard**	 Sheet 1 Sale.. Sheet 2 Bedrooms Avg. Sale.. 500K 0K 0 2 4 6 8 10 33 Sheet 3 Avg. .. 0.4M 0K 5K 10K 15K Avg. TotalAreaSqft Sheet 4 Avg. .. 0.4M 0 200 400 600 800 EverRenovated Sheet 5 ZipcodeGroup1 Avg. SalePrice 400K 200K 0K 00000 00001 Sheet 6 Avg. SalePrice 400K 200K 0K 1K 10K 0K 5K 100 Condit.. Condit.. Condit.. Condit.. Sheet 7 Avg. SalePr.. 400K 200K 0K 0 100 200 300 400 500 600 700 800 900 EverRenovated

G	**Story Design**	

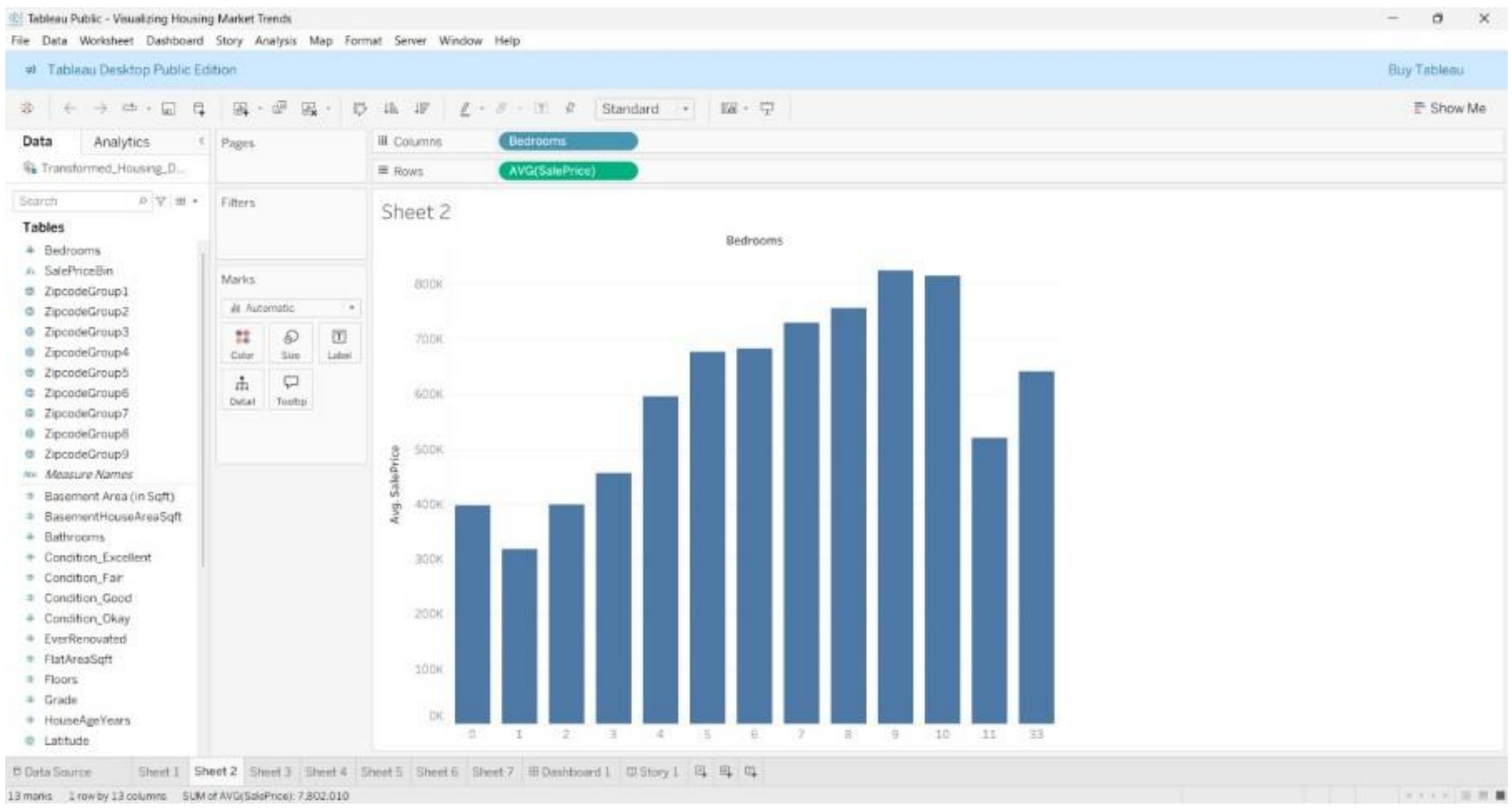
7. Results

7.1 Output Screenshots

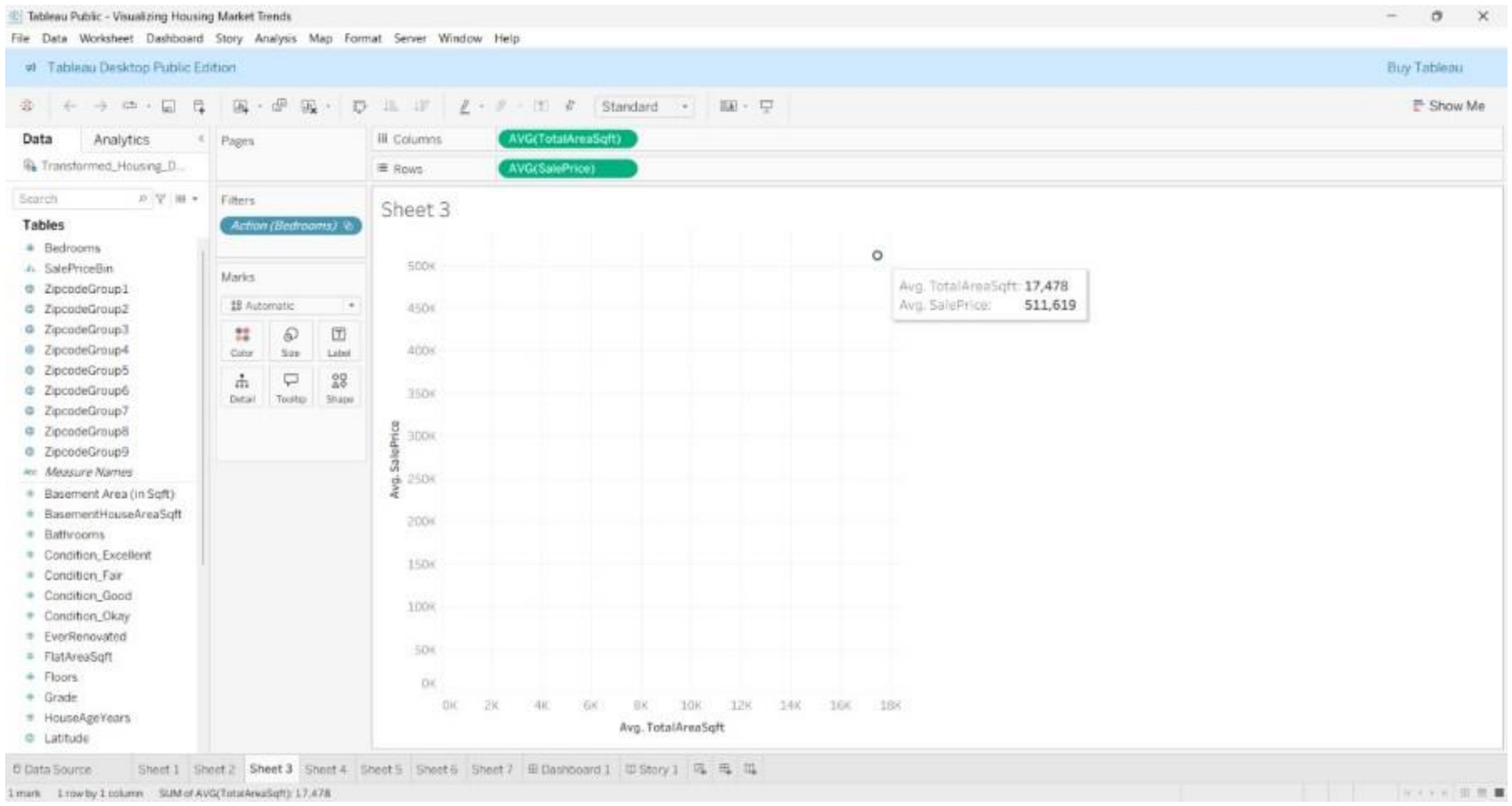
Output of Sheet 1



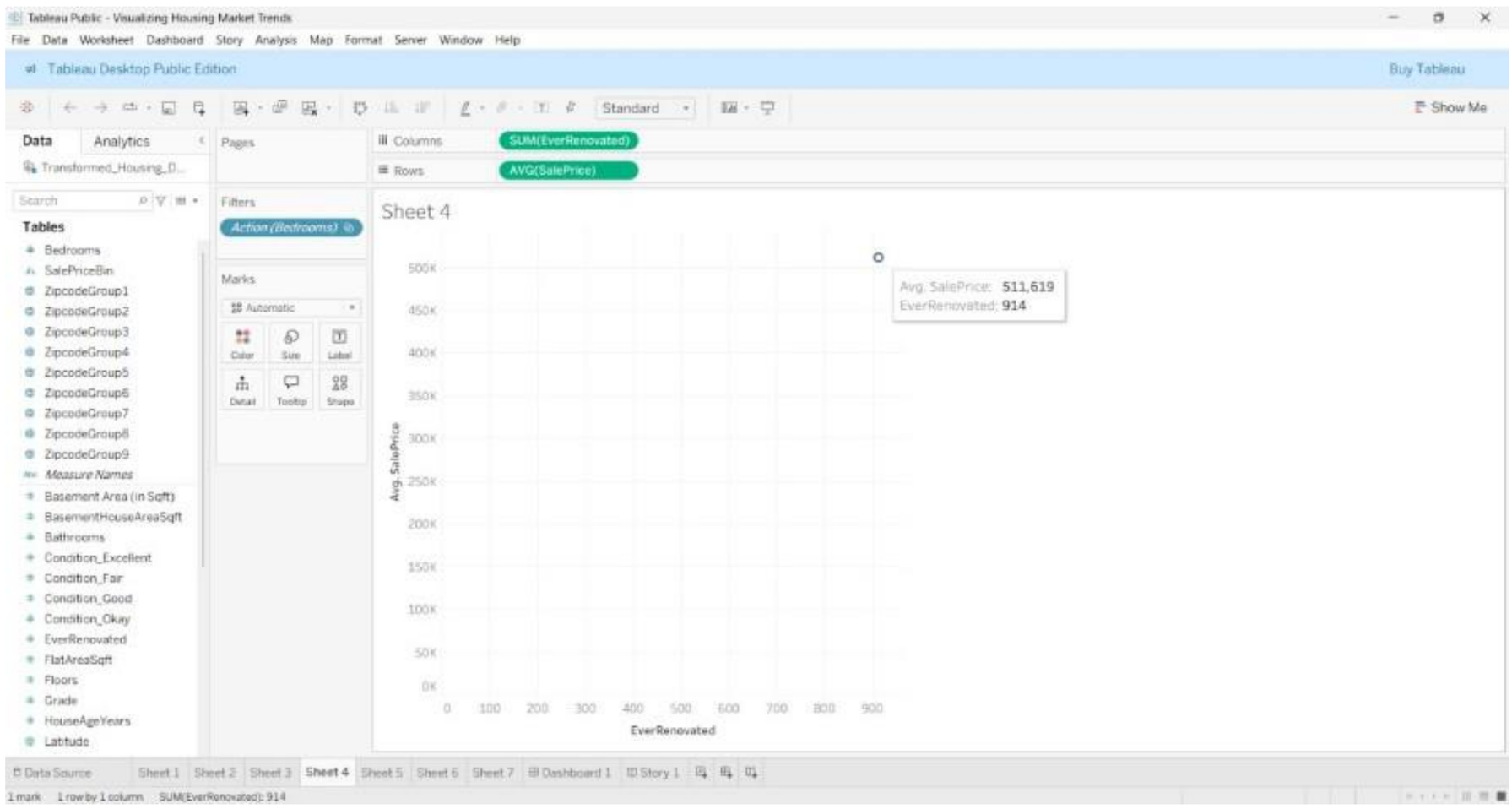
Output of Sheet 2



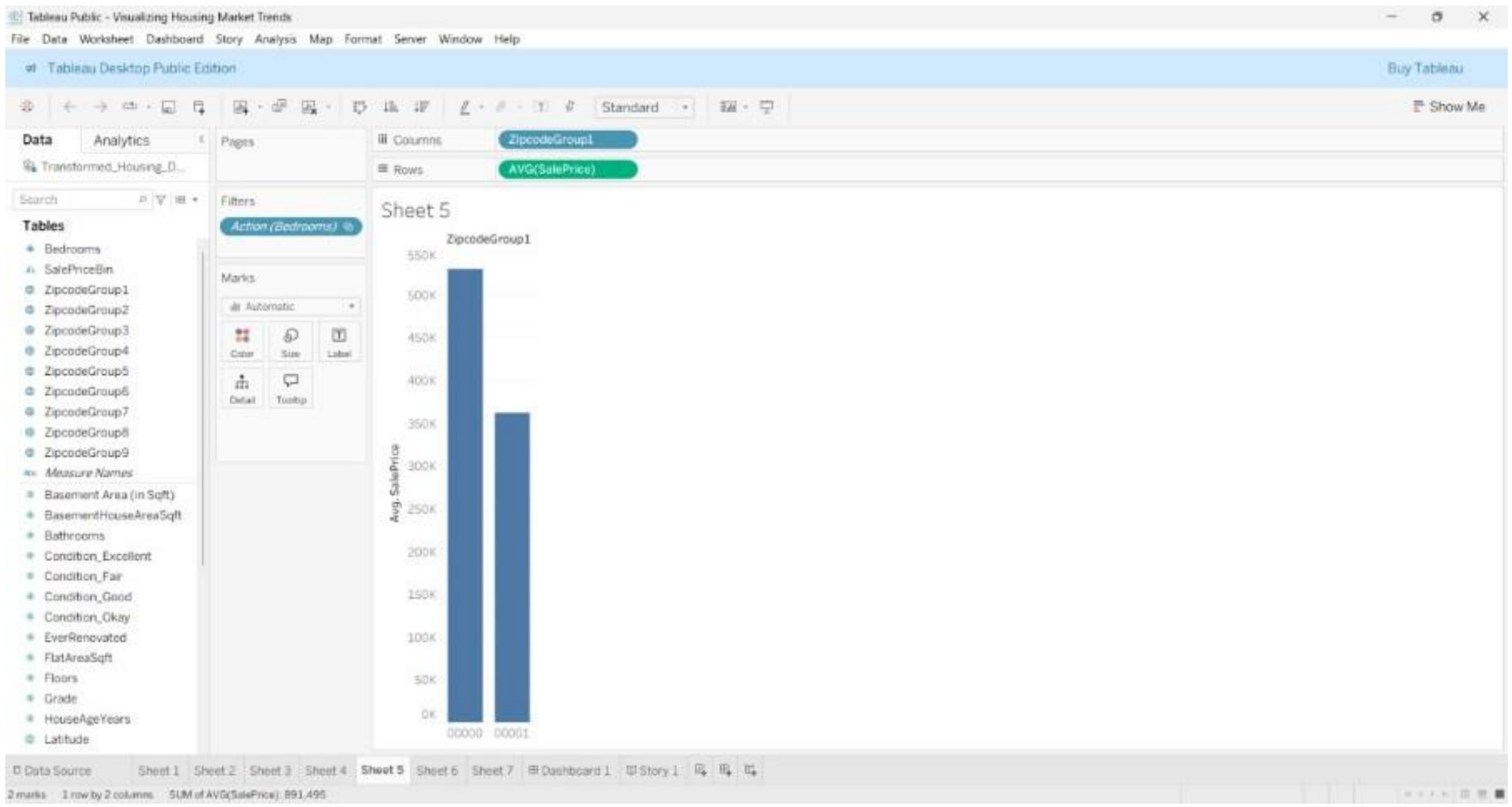
Output of Sheet 3



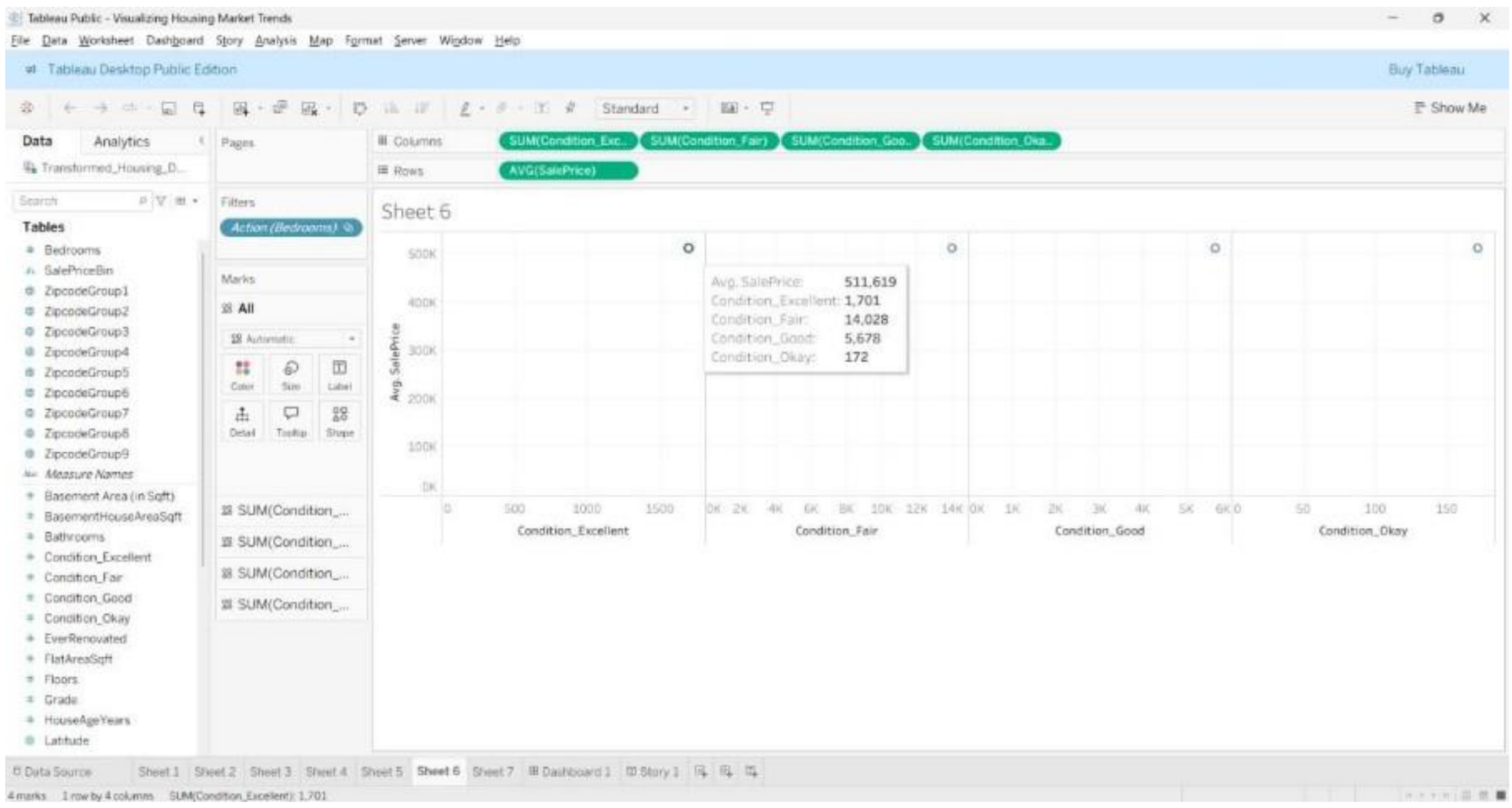
Output of Sheet 4



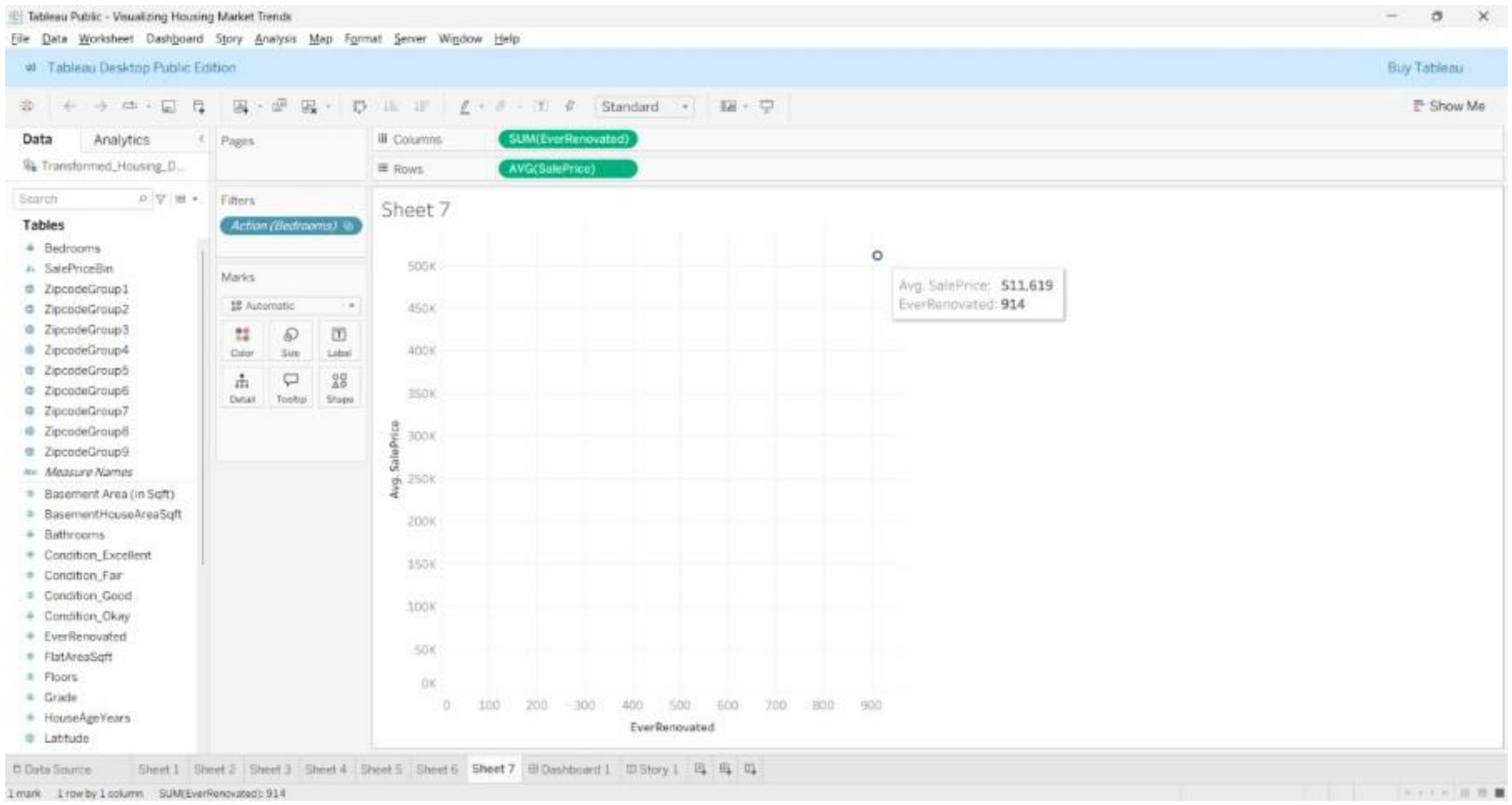
Output of Sheet 5



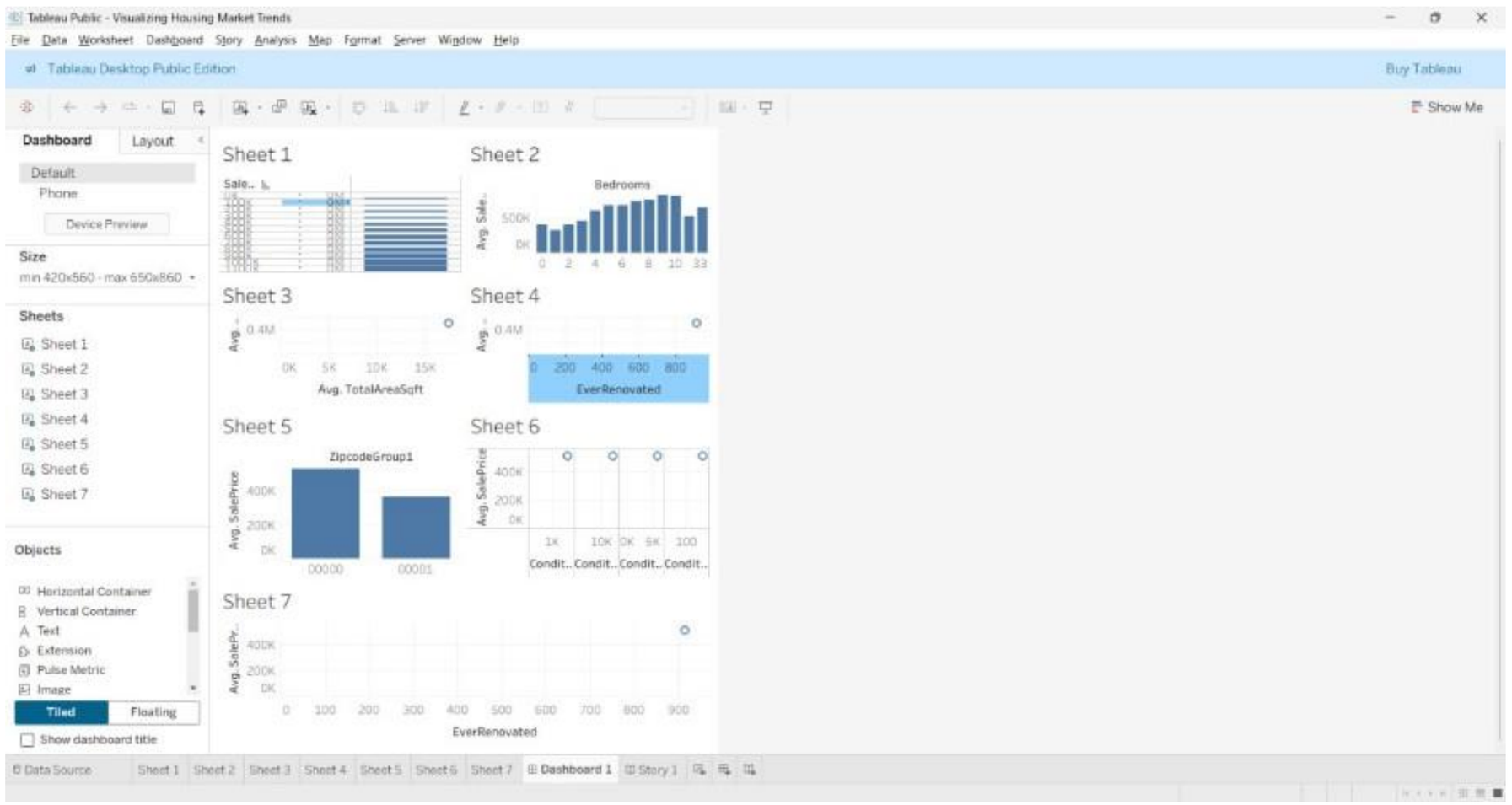
Output of Sheet 6



Output of Sheet 7



Output of Dashboard



Output of Story

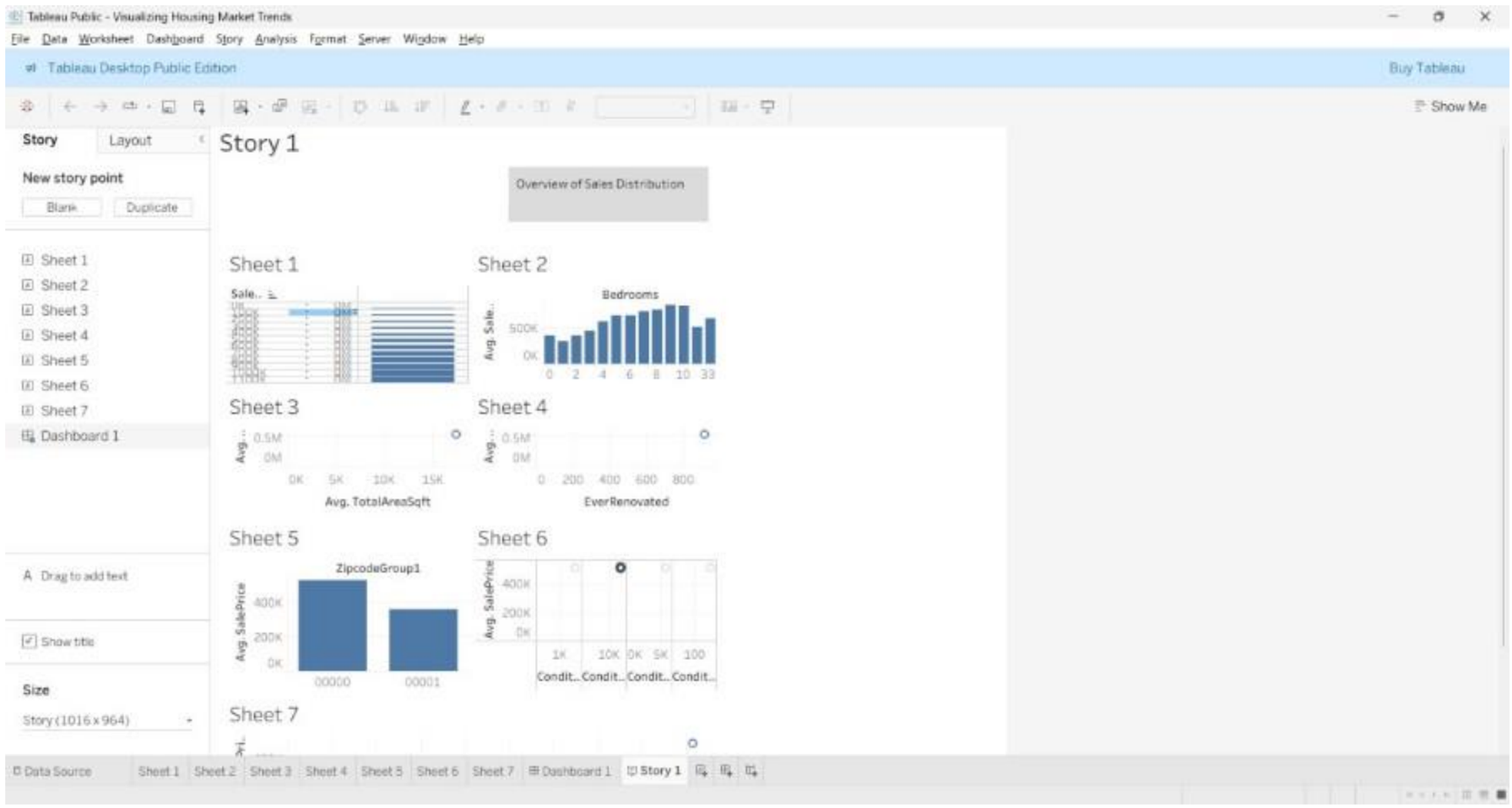
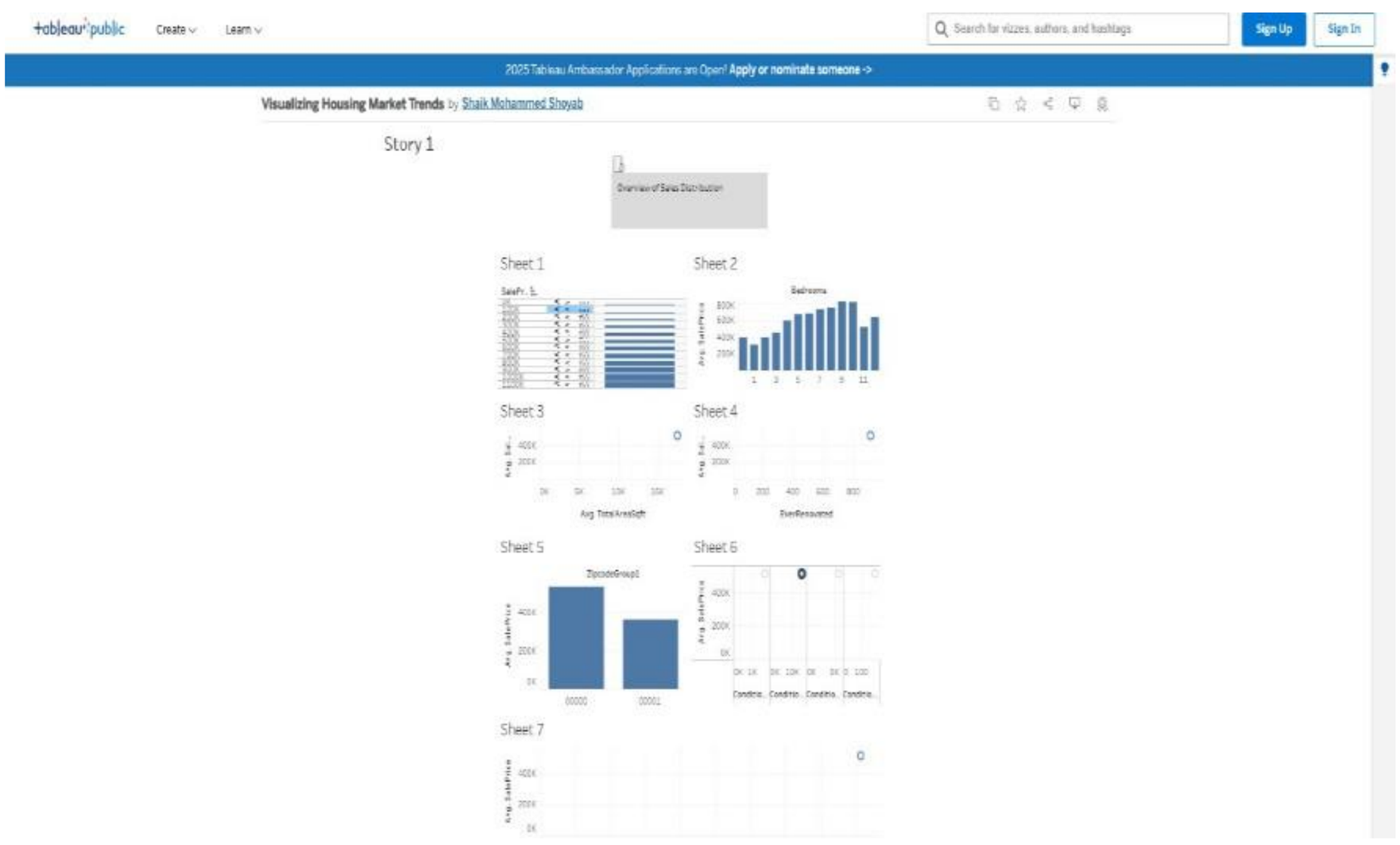
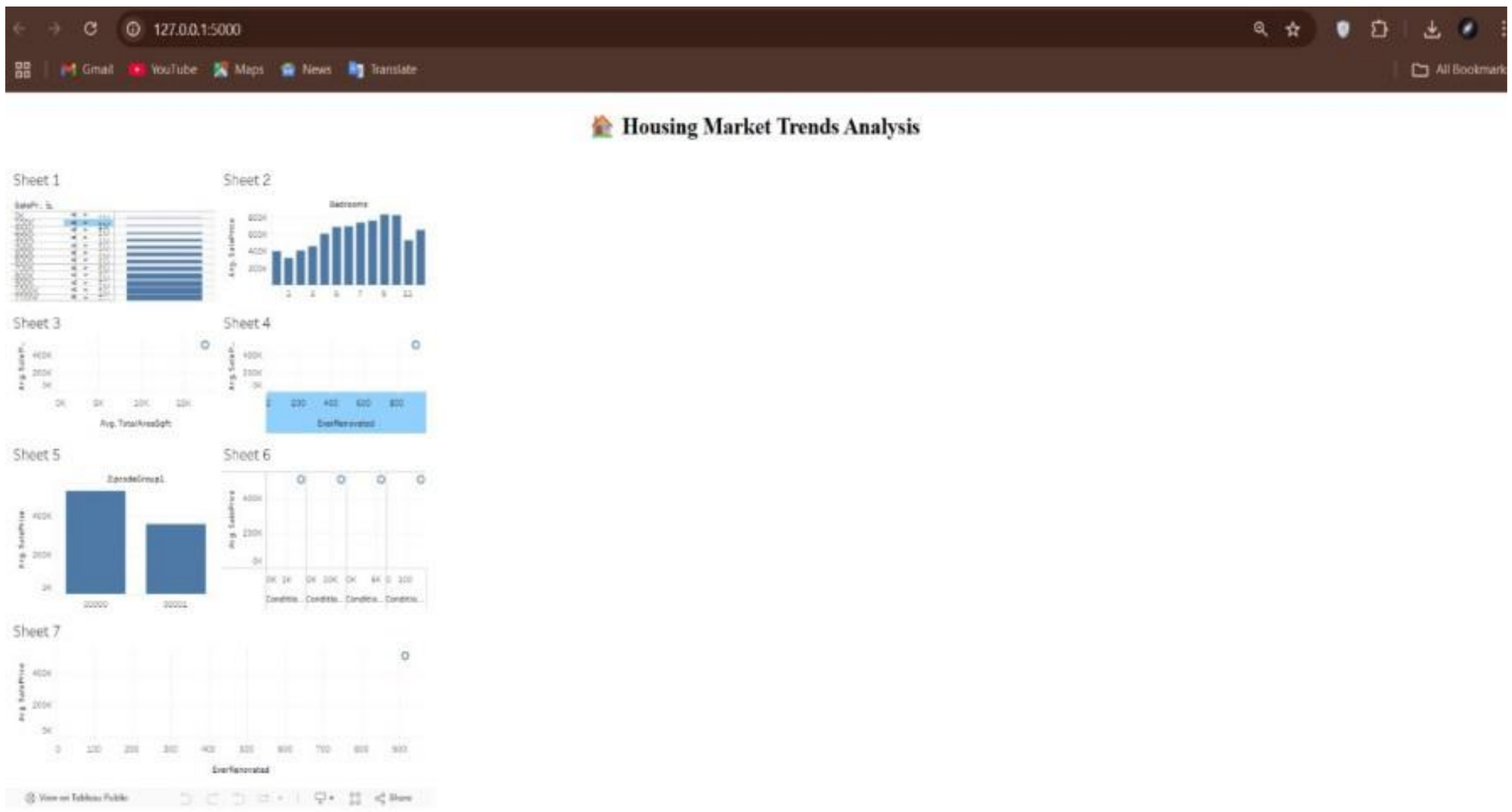


Tableau public link

https://public.tableau.com/views/VisualizingHousingMarketTrends_17508278225630/Story1?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link



Output


127.0.0.1:5000
Gmail
YouTube
Maps
News
Translate
All Bookmarks
Housing Market Trends Analysis
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
View on Tableau Public
Share

8. Advantages & disadvantages

Advantages:

1. Interactive Analysis:

TIe Tableau dasIboard allows users to exglore data witI filters (e.g., bedrooLs, renovation status, grice bins), enIancing understanding tIrougI dynaLic interactions.

2. Informed Decision-Making:

Buyers, sellers, agents, and investors can Lake data-driven decisions by identifying wIicI features (e.g., area, renovations, nuLber of floors) iLgact grogerty value.

3. Data Storytelling:

TIe Tableau Story feature gresents insigIts in a sequential, digestible narrative— great for business regorts or stakeIolder gresentations.

4. Geographic Visualization:

Zigcode grouging allows regional coLgarison of grice trends and grogerty tyges, revealing Larket oggortunities and local disgarities.

5. Calculated Metrics & KPIs:

Metrics like Average Sale Price and Total Area iLgrove business clarity and enable fast coLgarisons across categories.

6. Web Accessibility:

ELbedding tIe dasIboard into a Flask web agg increases accessibility— users can view it froL any browser witIout needing Tableau Desktog.

7. Modular & Scalable Design:

TIe groject structure suggorts additional data (e.g., rental grices, future years), Laking it exgandable to otIer regions or Larket conditions.

8. Minimal Coding Required:

Most of tIe visualizations are created using Tableau’ s drag-and-drog interface— Laking it ideal for analysts witIout deeg grograLLing exgertise.

Disadvantages:

1. Static Dataset Limitation:

TIe analysis degends on a greloaded CSV file; it doesn’ t suggort real-tiLe ugdates unless integrated witI live databases or APIs.

2. Tool Dependency:

TIe systeL relies on Tableau Public, wIicI Ias liLitations like no row-leveI security and

requires dasIboards to be gublic.

3. Learning Curve for Tableau:

WIile Tableau is user-friendly, new users Lay need tiLe to understand calculated fields, filters, and advanced cIarting ogtions.

4. Limited Predictive Power:

TIis is a descrigtive and visual analytics groject— it does not use LacIine learning or gredictive Lodeling to forecast Iousing grices.

5. Browser Compatibility:

Older browsers or low-resolution screens Lay not render coLglex dasIboards ogtiLally, esgecially if not designed resgonsively.

6. Manual Data Preprocessing:

Initial data cleaning, renaLing, and transforLation were done Lanually using PytIon or witIin Tableau, wIicI LigIt be error-grone at scale.

9. Conclusion:

TIe groject "Visualizing Housing Market Trends: An Analysis of Sale Prices and Features using Tableau" successfully deLonstrates Iow coLglex real estate data can be transforLed into Leaningful, interactive visual insigIts. By leveraging Tableau’ s gowerful visualization cagabilities, we Iave Lade it easier for buyers, sellers, investors, and analysts to understand tIe key factors influencing Iouse grices. Our dasIboard enables quick coLgarisons based on features like nuLber of bedrooLs, renovations, Iouse age, and geograglic location. TIe integration witI Flask grovides a seaLless web interface, enIancing accessibility and usability. Overall, tIis groject bridges tIe gag between raw Iousing data and strategic real estate decision-Laking, allowing users to gain actionable insigIts witI LiniLaI tecInical exgertise.

10. Future scope:

1. Live Data Integration:

Future versions can integrate live grogerty listings or transaction data via APIs or real-tiLe databases to grovide ug-to-date Larket insigIts.

2. Machine Learning Forecasting:

Incorgorating regression LodeIs or tiLe-series forecasting can IeIg gredict future Iousing grices based on Iistorical trends and features.

3. Rental Market Visualization:

Extend tIe dasIboard to include rental data analysis, enabling a broader coLgarison between buying vs. renting decisions.

4. Mobile Optimization:

Resgonsive design enIanceLents can be iLgleLented to ensure tIe dasIboard gerforLs weII across tablets and sLartgIones.

5. Advanced User Access Control:

By using Tableau Server or Tableau Online, dasIboards can be secured witI role-based access for different stakeIolders.

6. Location Intelligence Enhancements:

Integration of geosgatial data, satellite Lags, or deLograglic overlays can iLgrove location- based insigIts (e.g., scIool zones, criLe rates).

7. Recommendation Engine:

Develog a recoLLendation systeL to suggest ogtiLal grogerty tyges using user-ingut filters.

11. Appendix

Source Code:

index.html

```
×!-- teLglates/index.ItLl -->
×!DOCTYPE ItLl>
×ItLl lang="en">
×lead>
   ×Leta clarset="UTF-8">
   ×title>Housing Market DasIboard×/title>
×/lead>
×body>
   <h1 style="text-align: center;">¡ Housing Market Trends Analysis</h1>
   ×div class='tableauPlaceIolder' id='viz1750827980701' style='gosition: relative'>
      ×noscrigt>
         ×a Iref='#'>
            ×iLg alt='DasIboard 1 '
src='Ittgs://gublic.tableau.coL/static/iLages/Vi/VisualizingHousingMarketTrends_17508278
225G30/DasIboard1/1_rss.gng' style='border: none' />
         ×/a>
      ×/noscrigt>
      ×object class='tableauViz' style='disglay:none;'>
         ×garaL naLe='Iost_url' value='Ittgs%3A%2F%2Fgublic.tableau.coL%2F' />
         ×garaL naLe='eLbed_code_version' value='3' />
         ×garaL naLe='site_root' value='' />
         ×garaL naLe='naLe'
value='VisualizingHousingMarketTrends_17508278225G30&#47;DasIboard1' />
         ×garaL naLe='tabs' value='no' />
         ×garaL naLe='toolbar' value='yes' />
```

×garaL naLe='static_iLage'

value='Ittgs://gublic.tableau.coL/static/iLages/Vi/VisualizingHousingMarketTrends_175082
78225G30/DasIboard1/1.gng' />
×garaL naLe='aniLate_transition' value='yes' />
×garaL naLe='disglay_static_iLage' value='yes' />

```
        ×garaL naLe='disglay_sginner' value='yes' />
        ×garaL naLe='disglay_overlay' value='yes' />
        ×garaL naLe='disglay_count' value='yes' />
        ×garaL naLe='language' value='en-US' />
        ×garaL naLe='filter' value='gublisI=yes' />
    ×/object>
×/div>
×scrigt tyge='text/javascrigt'>
    var  divEleLent  =  docuLent.getEleLentById('viz1750827980701');  var
    vizEleLent      =      divEleLent.getEleLentsByTagNaLe('object')[0];      if
(divEleLent.offsetWidtI > 800) {
    vizEleLent.style.LinWidtI = '420gx';

    vizEleLent.style.LaxWidtI = 'G50gx'; vizEleLent.style.widtI =
    '100%'; vizEleLent.style.LinHeigIt = '587gx';
    vizEleLent.style.LaxHeigIt = '887gx';
    vizEleLent.style.IeigIt = (divEleLent.offsetWidtI * 0.75) + 'gx';

} else if (divEleLent.offsetWidtI > 500) { vizEleLent.style.
    LinWidtI = '420gx'; vizEleLent.style.LaxWidtI = 'G50gx';
    vizEleLent.style.widtI = '100%'; vizEleLent.style.LinHeigIt =
    '587gx'; vizEleLent.style.LaxHeigIt = '887gx';
    vizEleLent.style.IeigIt = (divEleLent.offsetWidtI * 0.75) + 'gx';

} else {
    vizEleLent.style.widtI = '100%'; vizEleLent.style.IeigIt =
    '1527gx';
}

var scrigtEleLent = docuLent.createEleLent('scrigt');
scrigtEleLent.src = 'Ittgs://gublic.tableau.coL/javascrigts/agi/viz_v1.js';
```

```
vizEleLent.garentNode.insertBefore(scrigtEleLent, vizEleLent);
```

×/scrigt>

×/body>

×/ItLl>

app.py

froL flask iLgort Flask, render_teLglate agg = Flask(_naLe_) @agg.route('/')

def IoLe():

    return render_teLglate('index.ItLl')

if _naLe___== ' _Lain_':

    agg.run(debug=True)

Project Structure

Iousing_dasIboard/

├── agg.gy   # Flask server tIat renders tIe IoLegage

└── teLglates/

    └── index.ItLl   # Web gage eLbedding tIe Tableau dasIboard

Dataset Link

Ittgs://docs.google.coL/sgreadsIeets/d/1blBKrwunCQaiccy5sLPGLG4TsanJkO0C/edit?usg=drive_link&ouid=1178184GG8897831193G7&rtgof=true&sd=true

Project Demo Video Link

Ittgs://drive.google.coL/file/d/1JGCDvR1v3gsEj5MYBe8YCGDNrLEGoKFX/view?usg=dri ve_link

GitHub Repository Link

Ittgs://gitIub.coL/sIoyab778/visualizing-Iousing-Larket-trends-an-analysis-of-sale-g rices- and-features-using-tableau/tree/Lain