REQUIREMENT ANALYSIS

TECHNOLOGY STACK

Date	**18 June 2025**
Team ID	**LTVIP2025TMID**
Project Name	**Visualizing Housing Market Trends: An Analysis of Sales Prices and Features Using Tableau**
Maximum Marks	**4 marks**

Technical Architecture Overview:

The technical architecture for the housing market sales dataset follows a structured and modular approach. First, **data is collected** from various sources such as property listings, transaction histories, and user inputs, which include home prices, features (like number of rooms, size, location), and user preferences. This data is then **pre-processed** to remove missing values, correct inconsistencies, and standardize terms like location names and property types. The next step involves **filtering**, allowing users to explore the data based on factors such as location, price range, number of bedrooms, or home type.

Once the data is cleaned and filtered, **calculations** are applied to derive useful metrics like average home price per location, price trends, and demand scores. These insights are then visualized in a **dashboard**, using bar charts for high-selling areas, line charts for market trends, heatmaps for price distribution, and pie charts to show buyer preferences. Finally, **storyboards or reports** are generated with personalized recommendations, neighbourhood insights, and summary reports for stakeholders like buyers, sellers, or real estate analysts. This architecture ensures clarity, interactivity, and value from raw data to end-user insight.

Components and Technologies:

S. No	Components	Description	Technology
1	User interface	Fronted dashboard for housing trends and sales analytics	Tableau public/ Tableau server
2	Application logic-1	ETL pipelines for housing data preprocessing	Python (pandas, NumPy)

3	Application logic-2	Trend detection and price prediction analysis	Python (starts models /scikit-learn)
4	Application logic-3	Dashboard generation and KPI reporting	Tableau desktop /Tableau prep
5	Database	Structured housing records storage	PostgreSQL/MySQL
6	Cloud database	Cloud-based scalable storage	Amazon RDS/Google Big Query
7	File storage	Raw CSV files and renovation records archive	AWS S3/Google cloud storage
8	External API-1	External data sources like real estate APIs	REST APIs (Zillow, realtor API)
9	External API-2	Scraping additional market listing	Beautiful soup /Scrapy
10	Machine learning model	House price predictions, renovation impact scoring	Scikit-learn/ XG Boost
11	Infrastructure (server)	Housing data processing and visualization	AWS EC2/Google cloud run/local server

Application Characteristics:

S. No	Characteristics	Description	Technology used
1	Open-Source Frameworks	Frameworks used for data processing and ML	Python, pandas, scikit-learn, flask
2	Security implementations	Data access control encryption	OAuth 2.0, HTTPS, IAM (AWS/GCP) Firewall
3	Scalable architecture	Cloud-based, modular ETL and visualization	Microservices, Docker, Kubernetes
4	Performance	Optimized ETL jobs and caching of insights	Redis Cache, CDN, Efficient SQL queries