

Visualizing Housing Market Trends: An Analysis Of Sale Prices And Features

1. Business Requirements

- Identify trends in housing sale prices over time.
- Analyze how property features (area, bedrooms, bathrooms, location, amenities) influence pricing.
- Compare pricing across different regions and property types.
- Detect seasonal fluctuations and market cycles.
- Enable stakeholders to make data-driven decisions.

2. Functional Requirements

2.1 Data Collection

- Import housing sales dataset (CSV, Excel, Database).
- Required fields: Sale Price, Sale Date, Location, Property Type, Square Footage, Bedrooms, Bathrooms, Lot Size, Year Built, Amenities.

2.2 Data Preprocessing

- Remove duplicates.
- Handle missing values.
- Standardize date formats.
- Convert categorical variables.
- Create calculated fields: Price per Sq Ft, Property Age, Price Growth Rate, Monthly/Quarterly Trends.

2.3 Data Analysis

- Correlation analysis between price and features.
- Time series analysis for trend identification.
- Regional comparison analysis.
- Outlier detection.

2.4 Visualization Requirements

- Time-Series Line Chart (Sale Price Trends).
- Bar Charts (Price by Property Type & Bedrooms).
- Scatter Plots (Price vs Area, Price vs Age).
- Heat Map (Regional Price Comparison).
- Box Plot (Price Distribution).
- KPI Cards (Average Price, Median Price, Total Sales, Growth %).
- Filters (Date, Location, Property Type, Price Range, Bedrooms).

3. Non-Functional Requirements

- Performance: Load within 5 seconds for 100k records.
- Scalability: Support large datasets and cloud integration.
- Security: Role-based access, secure connections.
- Usability: Interactive, responsive, user-friendly.

4. Technical Requirements

- Visualization: Tableau / Power BI.
- Processing: Python (Pandas, NumPy).

- Database: MySQL / PostgreSQL.
- Optional ML: Scikit-learn.
- Hardware: 8GB RAM minimum, multi-core processor.

5. Deliverables

- Cleaned dataset.
- Interactive dashboard.
- Analytical report (PDF).
- Insights summary.
- Optional predictive model.

6. Expected Outcomes

- Clear understanding of price determinants.
- Identification of high-value features.
- Regional comparisons.
- Seasonal and long-term trend insights.
- Strategic recommendations for stakeholders.