

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

Performance Testing

1. Objectives of Performance Testing

- Ensure fast data processing and visualization generation
- Validate model prediction accuracy and response time
- Test system scalability with increasing dataset size
- Ensure dashboard loads without delay

2. Load Testing

- Tested with 10,000, 50,000, and 100,000+ records
- Measured data loading, processing, and dashboard rendering time
- System performed efficiently up to 100K records

3. Stress Testing

- Simulated larger datasets (200K+ records)
- Tested multiple dashboard users
- System remained stable with slight performance degradation

4. Model Performance Testing

- Models: Linear Regression, Random Forest, XGBoost
- Metrics: MAE, RMSE, R2 Score
- Random Forest and XGBoost showed higher accuracy

5. Resource Utilization

- Moderate CPU usage during training
- RAM usage increases with dataset size
- Minimal Disk I/O operations

6. Optimization Techniques

- Feature reduction and scaling
- Efficient Pandas operations
- Data caching
- Limited dashboard queries

7. Conclusion

- Stable under normal load
- Scalable architecture
- Accurate predictions
- Efficient visualization rendering

Response Time Analysis

Component	Average Response Time
Data Loading	1–3 seconds
Data Cleaning	2–5 seconds
Model Training	5–20 seconds
Prediction	< 1 second
Dashboard Load	2–4 seconds