House Price Prediction Project

Initial House Price Data Analysis

Objective: Analyze basic patterns and relationships in housing data.

Instructions:

Load the house_prices.csv and display the first 5 rows.

Calculate basic statistics for size_sqft, bedrooms, bathrooms, price.

Compare prices across different neighborhoods.

List 3 key observations about housing patterns.

Expected Outcome: Basic statistical summary and initial insights about housing market.

Price Factor Visualization

Objective: Visualize how different features impact house prices.

Instructions:

Create scatter plots of size_sqft vs price, colored by neighborhood.

Plot average prices for different bedroom counts.

Generate correlation heatmap for numerical features.

Write interpretations of each visualization.

Expected Outcome: Three visualizations with written analysis of price factors.

Custom Metrics Creation

Objective: Develop metrics for house value analysis.

Instructions:

Calculate price_per_sqft.

Create location_value_score combining school_rating and crime_rate.

Identify top 10 value-for-money properties.

Expected Outcome: New metrics and analysis of best-value properties.

Price Prediction Baseline

Objective: Create basic model to predict house prices.

Instructions:

Use size_sqft and location features to predict price.

Split data 80/20 train/test.

Calculate R-squared and MAE.

Expected Outcome: Basic predictive model with performance metrics.

Model Comparison

Objective: Compare different regression models.

Instructions:

Train Linear, Ridge, Lasso models.

Perform 5-fold cross-validation.

Compare model performances.

Expected Outcome: Model comparison and recommendation.

Neighborhood Analysis

Objective: Analyze price variations across neighborhoods.

Instructions:

Calculate neighborhood price statistics.

Create separate models per neighborhood.

Compare feature importance across areas.

Expected Outcome: Neighborhood-specific insights.

Age Impact Study

Objective: Analyze how house age affects price.

Instructions:

Create age brackets and analyze prices.

Build age-specific price models.

Compare new vs old house features.

Expected Outcome: Age impact analysis.

Amenity Value Analysis

Objective: Measure impact of various amenities.

Instructions:

Compare prices with/without pool, garden, parking.

Calculate value added by each feature.

Analyze ROI of different amenities.

Expected Outcome: Amenity value assessment.

Location Quality Analysis

Objective: Analyze impact of location features.

Instructions:

Study effect of distance_downtown and school_rating.

Build location quality score model.

Find optimal location factors.

Expected Outcome: Location impact analysis.

Market Segment Analysis

Objective: Analyze different market segments.

Instructions:

Define luxury vs standard segments.

Create segment-specific models.

Compare feature importance by segment.

Expected Outcome: Market segment insights.