

ABC Real Estate, a prestigious real estate agency that has been helping clients find their dream homes for over 30 years. The company has a large dataset of house sales over the past decade, including various features about the houses and the final sale prices. The management of ABC Real Estate wants to leverage this data to build predictive models that can estimate the selling price of houses based on their characteristics. These predictions will help the company provide better pricing recommendations to sellers and buyers, enhancing their competitive edge in the market.

Task:

As a data analyst at ABC Real Estate, your task is to develop predictive models to estimate the house prices using historical data. You will employ both multiple linear regression and polynomial regression techniques. The dataset contains the following features:

Size (in square feet)

Number of Bedrooms

Number of Bathrooms

Location (encoded as a categorical variable)

Age of the House (in years)

Garage Size (number of cars)

You will use these features to predict the target variable:

Sale Price (in USD)

Steps to Follow:

Handle any missing values in the dataset.

Encode the categorical variable (Location) appropriately.

Scale the features if necessary.

Visualize the relationships between each feature and the target variable.

Multiple Linear Regression:

Split the dataset into training and testing sets.

Build a multiple linear regression model using the training data.

Evaluate the model's performance using appropriate metrics (e.g., R^2).

Interpret the coefficients of the regression model.

Polynomial Regression:

Experiment with polynomial features of different degrees (e.g., degree 2, degree 3).

Build polynomial regression models using these features.

Evaluate and compare the performance of these models with the multiple linear regression model.

Determine the optimal degree of the polynomial that provides the best predictive performance.

Model Selection and Recommendations:

Compare the results from both regression techniques.

Provide insights into which model performs better and under what circumstances.

Make recommendations on how ABC Real Estate can use these models to improve their pricing strategies.