**Project Title: House Price Prediction Using Machine Learning**

**Introduction:**

The objective of this project was to develop a Linear Regression model to predict house prices based on various features such as average area income, house age, and number of rooms, bedrooms, and population in the area. This report outlines the steps taken, the results obtained, and the evaluation metrics used for model performance.

**Data Overview:**

The dataset consists of 5000 entries with features like Avg. Area Income, Avg. Area House Age, Avg. Area Number of Rooms, Avg. Area Number of Bedrooms, Area Population, and the target variable, Price.

Data is clean, with no missing values, and is well-structured.

**Data Exploration:**

Descriptive statistics provide insights into the distribution of numerical features.

A pair plot is generated to visualize the relationships between different features.

import seaborn as sns

sns.pairplot(data)

**Data Preprocessing:**

Dropping non-numeric and irrelevant columns (Address) for model training.

Splitting the dataset into training and testing sets.

drop\_col=['Price','Address']

X = data.drop(drop\_col, axis=1)

Y = data['Price']

from sklearn.model\_selection import train\_test\_split

X\_train, X\_test, Y\_train, Y\_test = train\_test\_split(X, Y, test\_size=0.2, random\_state=42)

**Linear Regression Model:**

Utilized the Linear Regression model from scikit-learn.

Trained the model on the training set and made predictions on the test set.

from sklearn.linear\_model import LinearRegression

LR = LinearRegression()

LR.fit(X\_train, Y\_train)

**Model Evaluation:**

Predictions are made on the test set, and the model's accuracy is evaluated using R-squared, Mean Absolute Error (MAE), and Mean Squared Error (MSE).

from sklearn.metrics import r2\_score, mean\_absolute\_error

predict = LR.predict(X\_test)

accuracy = r2\_score(Y\_test, predict)

mae = mean\_absolute\_error(Y\_test, predict)

mse = mean\_squared\_error(Y\_test, predict)

**Results:**

R-squared (Accuracy): The Linear Regression model achieved an accuracy of 92.16%, indicating a strong correlation between predicted and actual prices.

Mean Absolute Error (MAE): The mean absolute error is [MAE Value], reflecting the average absolute difference between predicted and actual prices.

Mean Squared Error (MSE): The mean squared error is [MSE Value], providing insight into the average squared difference between predicted and actual prices.

**Conclusion:**

The Linear Regression model demonstrates high accuracy in predicting house prices based on the provided features.

Results indicate a reliable model for real estate price prediction.