**House Sales Price Prediction: Summary Document**

**Overview:** The House Sales Price Prediction project involves predicting house sales prices based on various features using machine learning models. This document provides a summary of the code and its functionality for users to understand and utilize effectively.

**Key Components:**

1. **Data Loading and Preprocessing:**
   * The code loads training and test data from CSV files and handles missing values by imputing them with the mean of the respective columns.
   * It separates the target variable (SalePrice) from the predictors (features) and selects only numerical columns for analysis, excluding object type columns.
2. **Model Training:**
   * Two models are trained: Linear Regression and Random Forest Regression.
   * The data is split into training and validation sets for model training and evaluation using the **train\_test\_split** function from scikit-learn.
3. **Model Evaluation:**
   * The performance of the Linear Regression model is evaluated using Relative Absolute Error (RAE), calculated based on the mean absolute error and mean target value.
   * RAE provides insights into the model's accuracy relative to the mean target value.
4. **Model Deployment:**
   * The final trained Linear Regression model is saved using the joblib library for future use.
   * Predictions are made on the test data using the trained model, and the results are saved to a CSV file for further analysis.
5. **Data Visualization:**
   * Regression plots are generated for each numeric column against SalePrice using Matplotlib and Seaborn libraries.
   * These plots help visualize the relationship between the features and the target variable.

**Usage:** Users can utilize this code to predict house sales prices based on provided features. They can follow these steps:

1. Clone the repository to their local environment.
2. Install the required dependencies listed in the **requirements.txt** file.
3. Run the provided Jupyter notebook or Python script.
4. Analyze the model performance, evaluate predictions, and explore visualizations to gain insights into the data.

**Contributions:** Contributions to this project are welcome. Users can contribute by:

* Opening issues for bugs or suggesting improvements.
* Submitting pull requests with enhancements or fixes.
* Providing feedback on the code or documentation.

**Conclusion:** The House Sales Price Prediction project offers a comprehensive solution for predicting house sales prices using machine learning techniques. By following the provided code and guidelines, users can gain valuable insights into the housing market and make informed decisions based on predictive modeling.