**README File for House Price Prediction**

**House Price Prediction Model**

**Overview**

This project uses a **Random Forest Regressor** to predict house prices based on various features like area, number of bedrooms, bathrooms, and more. The model is trained on a dataset of housing features, and hyperparameters are optimized using **RandomizedSearchCV** to improve prediction accuracy.

**Requirements**

* Python 3.x
* Required Libraries:
  + pandas
  + scikit-learn

**How to Run the Project**

1. **Install Required Libraries**: You can install the necessary libraries using pip.
2. **Dataset**: Ensure the dataset file (housing.csv) is placed in your project folder. You can load it from the Downloads folder as per the provided code.
3. **Run the Jupyter Notebook**: Open the Jupyter Notebook file in your Jupyter environment or an IDE like **VS Code** that supports notebooks.
4. **File Loading**: The dataset will be loaded from the Downloads folder, so ensure the file path is correctly set in the notebook.
5. **Run All Cells**: Run all the cells in the notebook to:
   * Load the dataset.
   * Prepare the data by encoding categorical variables.
   * Train the model.
   * Optimize the model using RandomizedSearchCV.
   * Evaluate the model's performance.

**Project Structure**

* **Notebook**: House\_Price\_Prediction.ipynb - The main notebook file containing all the code for data preparation, model training, and evaluation.
* **Dataset**: housing.csv - The dataset containing house features and prices.
* **Model Card**: A document explaining the model, including the features used, hyperparameters tuned, and model performance.
* **Datasheet**: A document providing information about the dataset, such as where it was sourced and what pre-processing steps were applied.

**Evaluation Metrics**

* **Mean Squared Error (MSE)**: Measures the average squared difference between predicted and actual prices.
* **R² Score**: Measures the proportion of variance in the target variable that is predictable from the features.

**Results**

After running the notebook, you will see the predicted prices and evaluation metrics, such as **MSE** and **R² score**. The model performance will be displayed for both the baseline and optimized models.

**License**

This project is open-source and free to use.