MACHINE LEARNING PROJECT

Scenario

Hotel Room Price Prediction using Multiple Linear Regression

1️⃣ Short Description

This project focuses on predicting the **total hotel room price** using machine learning techniques.
The final room price depends on **multiple factors** such as room type, number of guests, duration of stay, season, and discount.
Since many independent variables affect a single output, **Multiple Linear Regression** is used.

2️⃣ Objective of the Project

The main objective of this project is to **predict hotel room prices accurately** based on various booking details using a supervised machine learning regression model.

3️⃣ Problem Type

This is a **Regression Problem** because the output (hotel price) is a **continuous numerical value**.

4️⃣ Prediction Type

- Supervised Learning
- Continuous Value Prediction

5️⃣ Model Used

Multiple Linear Regression

Multiple Linear Regression is used when **more than one independent variable influences a dependent variable**.
In this project, hotel price depends on several booking factors, making this model suitable.

6️⃣ Dataset Used (Excel)

The dataset is created in **Excel format (.xlsx)** and contains the following columns:

Column Name	Description
Room_Type	Type of room (1–Standard, 2–Deluxe, 3–Suite)
Number_of_Guests	Total guests staying
Stay_Duration_Days	Number of days stayed
Season_Peak(1/0)	1 = Peak season, 0 = Normal season
Discount_Amount	Discount applied (₹)
Total_Price	Final hotel bill amount (Target)

📥 **Download the Excel Dataset:**
Download Hotel Price Prediction Dataset

7️⃣ Workflow of the Project

1. Import required libraries
2. Load dataset from Excel file
3. Separate input features and output
4. Train Multiple Linear Regression model
5. Predict hotel price
6. Compare actual and predicted values

7. Visualize results using a graph

8 Sample Code Snippet (Short)

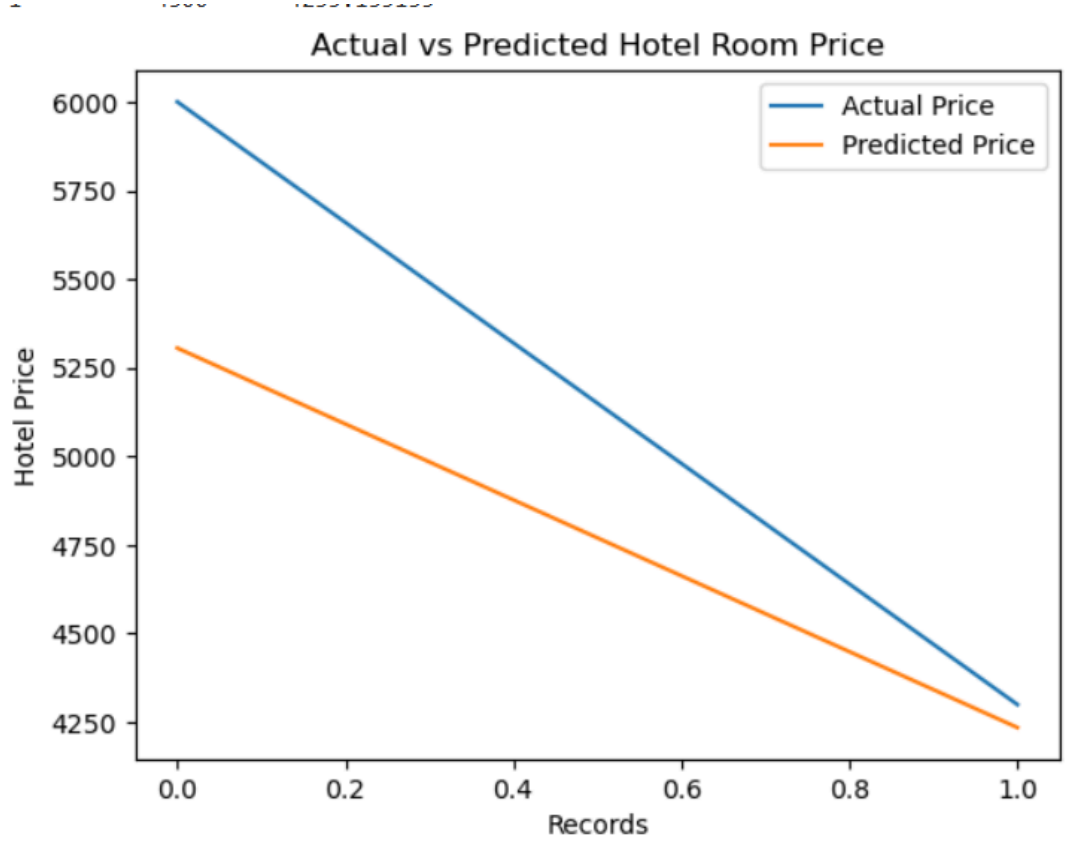
```
import pandas as pd
from sklearn.linear_model import LinearRegression

data = pd.read_excel("Hotel_Price_Prediction_Dataset.xlsx")

X = data[['Room_Type', 'Number_of_Guests', 'Stay_Duration_Days',
          'Season_Peak(1/0)', 'Discount_Amount']]
y = data['Total_Price']

model = LinearRegression()
model.fit(X, y)

predicted_price = model.predict(X)
```



9️⃣ Output Expected

- The model predicts hotel room prices
- Predicted values are close to actual values
- Graph shows strong similarity between actual and predicted prices

Graph Explanation

This graph shows the comparison between **actual hotel room prices** and **predicted prices** using Multiple Linear Regression.
The **blue line** represents actual prices, and the **orange line** represents predicted prices.
Since both lines are **very close to each other**, it indicates that the model predicts hotel prices **accurately**.
The small difference between the lines shows that the model performance is **good and reliable**.

🔟 Conclusion

Thus, the **Hotel Room Price Prediction System** was successfully implemented using **Multiple Linear Regression**.
The model efficiently predicts prices based on multiple booking factors and produces accurate results.