MACHINE LEARNING PROJECT

UNIT – 2

Hotel Room Price Prediction System using Multiple Linear Regression.

CODE:

```python
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
from sklearn.linear_model import LinearRegression
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_absolute_error, mean_squared_error, r2_score

# Load the dataset
data = pd.read_excel(
    r"C:\Users\G FATHIMA\OneDrive\Desktop\jupyter folder\Hotel_Price_Prediction_Dataset.xlsx"
)

# Display first 5 rows
print(data.head())

# Independent variables
X = data[['Room_Type', 'Number_of_Guests', 'Stay_Duration_Days',
          'Season_Peak(1/0)', 'Discount_Amount']]

# Dependent variable
y = data['Total_Price']

# Split dataset into training and testing
X_train, X_test, y_train, y_test = train_test_split(
    X, y, test_size=0.2, random_state=42
)

# Train the model
model = LinearRegression()
model.fit(X_train, y_train)
```

```python
# Train the model
model = LinearRegression()
model.fit(X_train, y_train)

# Make predictions
y_pred = model.predict(X_test)

# Model evaluation
mae = mean_absolute_error(y_test, y_pred)
mse = mean_squared_error(y_test, y_pred)
rmse = np.sqrt(mse)
r2 = r2_score(y_test, y_pred)

print("Mean Absolute Error (MAE):", mae)
print("Mean Squared Error (MSE):", mse)
print("Root Mean Squared Error (RMSE):", rmse)
print("R² Score:", r2)

# Compare actual vs predicted values
comparison = pd.DataFrame({
    'Actual Price': y_test.values,
    'Predicted Price': y_pred
})

print(comparison)

# Graph visualization
plt.figure()
plt.plot(comparison['Actual Price'].values, label='Actual Price')
plt.plot(comparison['Predicted Price'].values, label='Predicted Price')
plt.xlabel("Records")
plt.ylabel("Hotel Price")
```

```
plt.title("Actual vs Predicted Hotel Room Price")
plt.legend()
plt.show()
```

	Room_Type	Number_of_Guests	Stay_Duration_Days	Season_Peak(1/0)	\
0	1	2	2	1	
1	2	3	3	0	
2	1	1	1	0	
3	3	4	5	1	
4	2	2	2	1	

	Discount_Amount	Total_Price
0	500	4500
1	0	6000
2	0	2000
3	1000	12000
4	300	5200

Mean Absolute Error (MAE): 379.72972972975094
Mean Squared Error (MSE): 243334.55076700685
Root Mean Squared Error (RMSE): 493.28952022823967
R² Score: 0.6632047740249041

	Actual Price	Predicted Price
0	6000	5305.405405
1	4300	4235.135135

OUTPUT:

Actual vs Predicted Hotel Room Price