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import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestRegressor
from sklearn.metrics import mean_absolute_error

# 1. Load dataset
df = pd.read_csv("london_hotels_structured.csv")

# 2. Define features (X) and target (y)
X = df.drop("price", axis=1)
y = df["price"]

# 3. Split the dataset
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

# 4. Create and train the Random Forest model
model = RandomForestRegressor(n_estimators=100, random_state=42)
model.fit(X_train, y_train)

# 5. Make predictions and evaluate the model
y_pred = model.predict(X_test)
mae = mean_absolute_error(y_test, y_pred)
print(f"📊 Mean Absolute Error: {mae:.2f} GBP")

# 6. Predict price from user input
print("\nPlease enter the hotel features:")
star = int(input("★ Star Rating (1-5): "))
score = float(input("📝 Review Score (0.0 - 10.0): "))
distance = float(input("📍 Distance to City Center (km): "))
tube = int(input("🚇 Is Near Tube? (1: Yes, 0: No): "))
breakfast = int(input("🍳 Breakfast Included? (1: Yes, 0: No): "))
weekend = int(input("🗓️ Is it a Weekend? (1: Yes, 0: No): "))

# 7. Make prediction
new_input = [[star, score, distance, tube, breakfast, weekend]]
predicted_price = model.predict(new_input)[0]
print(f"💰 Estimated Hotel Price: £{predicted_price:.2f}")

```

🔄 📊 Mean Absolute Error: 8.40 GBP

Please enter the hotel features:

★ Star Rating (1-5): 3  
 📝 Review Score (0.0 - 10.0): 8.5  
 📍 Distance to City Center (km): 1.2  
 🚇 Is Near Tube? (1: Yes, 0: No): 1  
 🍳 Breakfast Included? (1: Yes, 0: No): 1  
 🗓️ Is it a Weekend? (1: Yes, 0: No): 0

💰 Estimated Hotel Price: £265.19

/usr/local/lib/python3.11/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names. A warning was raised.

★ Star Rating: 3  
 📝 Review Score: 8.5  
 📍 Distance to City Center (km): 1.2  
 🚇 Is Near Tube?: 1  
 🍳 Breakfast Included?: 1  
 🗓️ Is it a Weekend?: 0  
 💰 Estimated Hotel Price: ~£260.75

★ Star Rating: 5  
 📝 Review Score: 9.0  
 📍 Distance to City Center (km): 2.0  
 🚇 Is Near Tube?: 1  
 🍳 Breakfast Included?: 1  
 🗓️ Is it a Weekend?: 1  
 💰 Estimated Hotel Price: ~£380.20

★ Star Rating: 2  
 📝 Review Score: 6.0  
 📍 Distance to City Center (km): 8.5  
 🚇 Is Near Tube?: 0

☕ Breakfast Included?: 0

📅 Is it a Weekend?: 0

💰 Estimated Hotel Price: ~£150.30

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