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import pandas as pd
from sklearn.linear_model import LinearRegression
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_squared_error
import seaborn as sns
import matplotlib.pyplot as plt

# Load cleaned CSV
df = pd.read_csv("listings.csv")

# Drop rows where price is missing
df = df.dropna(subset=['price'])

# Select relevant features
df = df[['price', 'neighbourhood_group', 'room_type', 'number_of_reviews',
        'reviews_per_month', 'availability_365']]

# Fill missing values
df['reviews_per_month'] = df['reviews_per_month'].fillna(0)

# Convert categorical columns to dummies
df = pd.get_dummies(df, columns=['neighbourhood_group', 'room_type'], drop_first=True)

# Train model
X = df.drop('price', axis=1)
y = df['price']
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
random_state=42)
model = LinearRegression()
model.fit(X_train, y_train)
y_pred = model.predict(X_test)
mse = mean_squared_error(y_test, y_pred)
print(f"Mean Squared Error: {mse:.2f}")

# Predict function
def suggest_price(number_of_reviews, reviews_per_month, availability_365,
                  neighbourhood_group, room_type):
    input_data = {col: [0] for col in X.columns}
    input_data['number_of_reviews'] = [number_of_reviews]
    input_data['reviews_per_month'] = [reviews_per_month]
    input_data['availability_365'] = [availability_365]
    if f'neighbourhood_group_{neighbourhood_group}' in input_data:
        input_data[f'neighbourhood_group_{neighbourhood_group}'] = [1]
    if f'room_type_{room_type}' in input_data:
        input_data[f'room_type_{room_type}'] = [1]
    input_df = pd.DataFrame(input_data)
    return round(model.predict(input_df)[0], 2)

# Example
suggest_price(50, 1.5, 180, 'Brooklyn', 'Entire home/apt')

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