Experiment -38

Scenario: You work for a weather data analysis company, and your team is responsible for developing a program to calculate and analyze variability in temperature data for different cities.

Question: Write a python program will take in a dataset containing daily temperature readings for each city over a year and perform the following tasks:

1. Calculate the mean temperature for each city.

2. Calculate the standard deviation of temperature for each city.

3. Determine the city with the highest temperature range (difference between the highest and lowest temperatures).

4. Find the city with the most consistent temperature (the lowest standard deviation).

Code

```
import pandas as pd

file_path = input("Enter your temperature CSV file path: ")

data = pd.read_csv(file_path)

groups = data.groupby("City")["Temperature"]

mean_temp = groups.mean()

std_temp = groups.std()

temp_range = groups.max() - groups.min()

highest_range_city = temp_range.idxmax()

most_consistent_city = std_temp.idxmin()

print("\n--- Temperature Analysis Results ---")

print("Mean Temperature for each city:\n", mean_temp)

print("\nStandard Deviation for each city:\n", std_temp)

print("\nCity with Highest Temperature Range:", highest_range_city)

print("City with Most Consistent Temperature:", most_consistent_city)
```

Output:

```
Enter your temperature CSV file path: /content/temperature_data.csv

--- Temperature Analysis Results ---
Mean Temperature for each city:
 City
Chennai      31.506575
Delhi        32.060274
Hyderabad    30.146301
Kolkata      29.410411
Mumbai       27.885753
Name: Temperature, dtype: float64

Standard Deviation for each city:
 City
Chennai      3.827383
Delhi        5.687154
Hyderabad    3.995880
Kolkata      5.108488
Mumbai       3.055677
Name: Temperature, dtype: float64

City with Highest Temperature Range: Delhi
City with Most Consistent Temperature: Mumbai
```