🌦️ Weather Data Analysis – Rainfall & Temperature

📌 Project Objective

Analysis of one-year real weather data in Toronto, including **temperature, humidity, wind speed, and weather conditions**, with visualization for specific time periods.

1. **Data Loading**
    - Read Toronto weather data from a GitHub repository.
2. **Data Preprocessing**
    - Convert the Date/Time column to datetime type.
    - Set the datetime column as the index for easy time-series access.
3. **Feature Selection**
    - Select key columns: Temperature, Relative Humidity, Wind Speed, Weather Condition.
4. **Statistical Analysis**
    - Calculate **average temperature** and **maximum wind speed**.
    - Identify the **warmest** and **most humid day** recorded.
5. **Rainfall Column Creation**
    - Detect rainfall or snowfall by analyzing the text in the Weather column and create a binary rainfall column (0 = No, 1 = Rain/Snow).
6. **Specific Time Range Analysis**
    - Filter the dataset for **January 2012**.
7. **Visualization**
    - Plot **temperature** as a line chart.
    - Plot **rainfall events** (0/1) as a bar chart on a secondary axis.