Assignment Document: Weather Data Visualization

Title: Weather Data Analysis and Visualization with OpenWeatherMap API

Objective:

Utilize the OpenWeatherMap API to fetch historical weather data for the past 7 days for five cities of your choice. Generate graphs to analyze the temperature, pressure, and humidity, and create an additional graph based on a weather parameter of your choice.

Requirements:

Python programming skills

Understanding of API requests

Basic knowledge of data manipulation with pandas

Experience with data visualization (matplotlib or seaborn)

Assignment Tasks:

API Key Registration:

Visit OpenWeatherMap and sign up for an API key if you haven't already. You will need the API key to make requests to the One Call API, which provides historical weather data.

Choosing Cities:

Select five cities for which you would like to analyze the weather data. For ease, you may choose cities based on their availability in the API and the ease of fetching their geographic coordinates.

Fetching Data:

Use the OpenWeatherMap API to fetch historical weather data for the last 7 days for your selected cities. Ensure you handle API parameters correctly to retrieve data for temperature, pressure, and humidity.

Data Cleaning and Preparation:

Clean and prepare the data for analysis. This may include converting timestamps, handling missing values, and structuring the data into a usable format with pandas.

Graphs for Analysis:

Create separate graphs for temperature, pressure, and humidity for each of the five cities using matplotlib or seaborn.

Ensure your graphs are clearly labeled with units, and data points are easily readable.

Additional Graph:

Create an additional graph of your choice that could provide interesting insights into the weather patterns of the selected cities. This could be a comparative graph, a heat map, or any other visualization that demonstrates your analytical skills.

Documentation:

Document your code adequately. Provide comments and explanations on why certain steps or manipulations were necessary.

Prepare a brief report summarizing your findings and insights from the graphs.

Submission:

Submit your Jupyter notebook containing the code, graphs, and documentation.

Ensure that your notebook is runnable without errors and all visualizations are displayed.

Resources:

OpenWeatherMap API Documentation

Python libraries documentation: requests, pandas, and matplotlib

Evaluation Criteria:

Correctness of API usage

Data cleaning and preparation

Clarity and usefulness of visualizations

Creativity in additional graph selection and analysis

Quality of documentation and report