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**PYTHON API PROGRAMS DOCUMENTATION**

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**1.Real-Time Weather Monitoring System**

**Scenario:**

You are developing a real-time weather monitoring system for a weather forecasting company.The system needs to fetch and display weather data for a specified location.

**Tasks:**

1. Model the data flow for fetching weather information from an external API anddisplaying it to the user.

2. Implement a Python application that integrates with a weather API (e.g.,

OpenWeatherMap) to fetch real-time weather data.

3. Display the current weather information, including temperature, weather conditions,humidity, and wind speed.

4. Allow users to input the location (city name or coordinates) and display the

corresponding weather data.

**Deliverables:**

• Data flow diagram illustrating the interaction between the application and the API.

• Pseudocode and implementation of the weather monitoring system.

• Documentation of the API integration and the methods used to fetch and displayweather data.

• Explanation of any assumptions made and potential improvements.

**Data flow diagram:**

**Fetch Weather Data**

**Enter Location**

**Start Program**

**Temperature**

**Display Weather**

**Process Data**

**Humidity**

**Wind Speed**

**Weather Conditions**

**Implementation:**

import requests

def fetch\_weather\_data(api\_key, location):

    base\_url = "https://api.openweathermap.org/data/2.5/weather?lat={lat}&lon={lon}&appid"

   params = {

        "q": location,

        "appid": api\_key,

        "units": "metric"

    }

    response = requests.get(base\_url, params=params)

    return response.json()

def display\_weather\_data(data):

    if data.get("cod") != 200:

        print("Error fetching weather data:", data.get("message", "Unknown error"))

        return

    city = data["name"]

    country = data["sys"]["country"]

    temperature = data["main"]["temp"]

    weather\_conditions = data["weather"][0]["description"]

    humidity = data["main"]["humidity"]

    wind\_speed = data["wind"]["speed"]

    print(f"Weather in {city}, {country}:")

    print(f"Temperature: {temperature}°C")

    print(f"Conditions: {weather\_conditions.capitalize()}")

    print(f"Humidity: {humidity}%")

    print(f"Wind Speed: {wind\_speed} m/s")

def main():

    api\_key = "c6013d68dd392768ba3d103684c8fef9"

    location = input("Enter location (city name): ")

    weather\_data = fetch\_weather\_data(api\_key, location)

    display\_weather\_data(weather\_data)

if \_\_name\_\_ == "\_\_main\_\_":

    main()

**Displaying Data:**

**Input :**

Enter location(city name):

Chennai

**Output:**

Weather in Ongole, IN:

Temperature: 31.68°C

Conditions: Light rain

Humidity: 56%

Wind Speed: 10.03 m/s

