P.PRASANNA SREE

192324309

CSE [DATA SCIENCE]

PYTHON API PROGRAMMING DOCUMENTATION

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**Problem 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 and

displaying 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 display

weather data.

• Explanation of any assumptions made and potential improvements.

FLOW CHART:

Start

Input location

Fetch Weather Data

Check API Response

API Response

(cod == 200)

Parse JSON Data

Extract Weather Information

Display Weather Information

+

END

**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](https://api.openweathermap.org/data/2.5/weather?lat=%7blat%7d&lon=%7blon%7d&appid)

params = {

'q': location,

'appid': api\_key,

'units': 'metric'

}

try:

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

data = response.json()

if data["cod"] == 200:

weather\_info = {

'location':data['name']

'temperature': data['main']['temp'],

'weather': data['weather'][0]['description'],

'humidity': data['main']['humidity'],

'wind\_speed': data['wind']['speed']

}

return weather\_info

else:

return None

except Exception as e:

print (f"Error fetching weather data: {e}")

return None

def display\_weather(weather\_info, location):

if weather\_info:

print (f"Weather in {location}:")

print (f"Temperature: {weather\_info['temperature']} °C")

print (f"Weather: {weather\_info['weather']}")

print (f"Humidity: {weather\_info['humidity']}%")

print (f"Wind Speed: {weather\_info['wind\_speed']} m/s")

else:

print (f"Failed to fetch weather data for {location}")

def main():

api\_key = "ed7c18d0f1024da78bf89f147ccd9bca"

location = input("Enter city name or coordinates (latitude,longitude): ")

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

display\_weather(weather\_info, location)

i

f \_\_name\_\_ == "\_\_main\_\_":

main()

**DISPLAYING THE DATA:**

Enter city name or coordinates (latitude,longitude): Nellore

Weather in Nellore:

Temperature: 30.57 °C

Weather: overcast clouds

Humidity: 58%

Wind Speed: 8.02 m/s

**OUTPUT:**

