**Assignment: Python Programming for DL**

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**Problem 1:** **Real-Time Weather Monitoring System**

**Scenario:**

The system fetches, processes, and displays up-to-date weather information, offering users an efficient way to stay informed about current weather conditions.

**Tasks:**

1. **Select a weather API service like OpenWeatherMap, Weatherstack, or Weather API. Sign up to get an API key**.
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.

# Solution:

# Real-Time Weather Monitoring System

# 1.Data Flow Diagram

City name

Weather details

**Weather details**

**API**

**User**

C City Name

Output

W

Weather

database

|  |
| --- |
| import requests  api key="bb9a4a1b490a74776edb2e83a7ae1f4b"  user input=input("enter the city name:") weather\_data=requests.get(f"https://api.openweathermap.org/data/2.5/ weather?q={user\_input}&units=imperial&APPID={api\_key}")  if weather data.json()['cod']=='404':  print("no city found")  else:  weather=weather\_data.json()['weather'][0]['main']  temp=round(weather\_data.json()['main']['temp'])  print(f"the weather in {user\_input} is {weather}")  print(f"the temperature in {user\_input} is {temp}°F") |

22 2.Implementation

# 3.Display the Current weather information

enter the city: ARAKKONAM

 Temperature (in FAHRENHEIT) = 82 °F

 description = RAIN

# 4.User Input



**5.Documentation**

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#### **Introduction**

#### This guide will walk you through creating a real-time weather monitoring system in Python using the Open Weather Map API. You will learn how to fetch, parse, and display weather data, and optionally plot it over time.

#### **Set Up Your Environment**

#### **Install Required Libraries**

#### First, install the required libraries. You'll need **requests** for API calls and **matplotlib** for plotting data.

#### **Get an API Key from OpenWeatherMap**

#### Go to the [OpenWeatherMap website](https://openweathermap.org/).

#### Sign up for a free account.

#### Once logged in, go to the API keys section and generate a new API key.

#### **Fetch Weather Data**

* You can use the OpenWeatherMap API to fetch real-time weather data. Here’s how you can do it in Python.

### Conclusion

#### Creating a real-time weather monitoring system using Python and the OpenWeatherMap API is a practical and rewarding project. By leveraging the capabilities of Python and readily available weather APIs, you can fetch, parse, and display real-time weather data for any location.