FLOOD MONITORING AND EARLY WARNING

TEAM MEMBERS:

1.N. Deepitha

2.K.S. Eniya Varshini

3.M. Srinithi

4.S. Menaka

5.S. Elakkiya

INTRODUCTION

Flood monitoring and early warning systems play a pivotal role in safeguarding lives, property, and the environment in regions prone to flooding. This introduction provides an overview of the significance and necessity of these systems, which are instrumental in reducing the devastating impact of flooding events.

PROGRAM

```
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>
#include <Adafruit_Sensor.h>
#include <Adafruit_BME280.h>

#define BLYNK_PRINT Serial
#define BLYNK_AUTH "YourAuthToken"
#define WIFI_SSID "YourSSID"
#define WIFI_PASS "YourPassword"

Adafruit_BME280 bme;

void setup() {
  Serial.begin(9600);
  Blynk.begin(BLYNK_AUTH, WIFI_SSID, WIFI_PASS);

  if (!bme.begin(0x76)) {
    Serial.println("Could not find a valid BME280 sensor, check wiring!");
    while (1);
  }
}

void loop() {
  Blynk.run();

  float temperature = bme.readTemperature();
  float humidity = bme.readHumidity();

  if (temperature > 30.0 || humidity > 80.0) {
    sendAlert("Flood Warning: Temperature or Humidity Abnormal!");
  }

  delay(60000); // Delay for 1 minute
}

void sendAlert(const char* message) {
  Blynk.notify(message);
}
```

OUTPUT

```
import random
import time

# Simulate water level data
def get_water_level():
    return random.uniform(0, 10)  # Replace with actual sensor data

# Define a threshold for flood warning
threshold = 7.0

# Function to check water level and send alerts
def check_water_level():
    water_level = get_water_level()
    if water_level > threshold:
        alert_authorities()
        print(f"Flood warning! Water level is {water_level} meters.")

# Function to send alerts (Replace with your preferred alert mechanism)
def alert_authorities():
    # Implement your alerting mechanism here (e.g., send SMS, email, etc.)
    print("Alert sent to authorities!")

# Main loop for continuous monitoring
while True:
    check_water_level()
    time.sleep(10)  # Check every 10 seconds
```

DATA SET

Date	Time	Location	River Water Level (m)	Rainfall (mm)	Temperature (°C)	Relative Humidity (%)	Flood Warning Level
2023-10-01	08:00 AM	River A, City1	2.5	5.2	20.5	75	No Warning
2023-10-01	12:00 PM	River A, City1	3.2	7.8	21.0	78	Advisory
2023-10-01	04:00 PM	River A, City1	4.0	15.6	20.8	82	Warning
2023-10-01	08:00 PM	River A, City1	4.8	25.1	20.0	85	Evacuation
2023-10-02	08:00 AM	River A, City1	2.7	2.5	21.2	72	No Warning
2023-10-02	12:00 PM	River A, City1	3.1	4.3	22.1	76	Advisory
2023-10-02	04:00 PM	River A, City1	3.8	10.2	21.8	79	Warning

Date	Time	Location	River Water Level (m)	Rainfall (mm)	Temperature (°C)	Relative Humidity (%)	Flood Warning Level
2023-10-02	08:00 PM	River A, City1	4.2	18.5	21.5	83	Evacuation

IN THIS TABLE:

- "Date" represents the date of the observations.
- "Time" represents the time of the observations.
- "Location" specifies the monitoring location, such as a specific river in a city.
- "River Water Level (m)" indicates the water level of the river at the given time.
- "Rainfall (mm)" represents the amount of rainfall in milli meter in the vicinity of the monitoring location.
- "Temperature (°C)" provides the air temperature in degrees Celsius.
- "Relative Humidity (%)" represents the relative humidity of the air.
- "Flood Warning Level" indicates the flood warning level issued by authorities. This could include categories like "No Warning," "Advisory," "Warning," and "Evacuation."

CONCLUSION

Creating and maintaining an effective flood monitoring and early warning dataset is an ongoing process that requires coordination among government agencies, meteorological services, and environmental monitoring organizations. Additionally, advancements in technology, such as remote sensing and sensor networks, continue to improve the accuracy and coverage of such datasets, ultimately enhancing flood preparedness and response efforts.