FLOOD MONITORING AND EARLY WARNING

CODE:

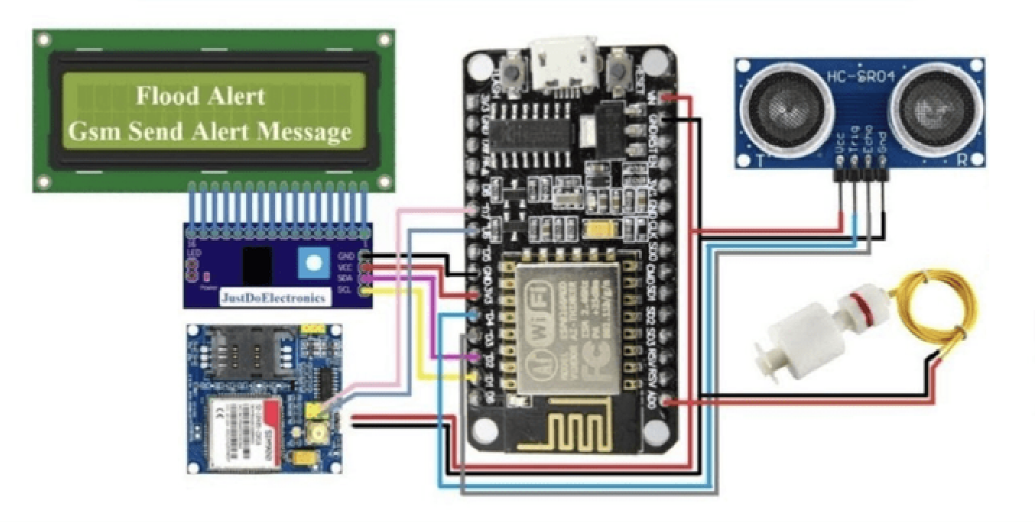
```
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
#include <NewPing.h>
#include <SoftwareSerial.h>

// LCD Display
LiquidCrystal_I2C lcd(0x27, 16, 2);

// Ultrasonic Sensor
#define TRIGGER_PIN 12
#define ECHO_PIN 11
#define MAX_DISTANCE 200
NewPing sonar(TRIGGER_PIN, ECHO_PIN,
MAX_DISTANCE);

// Float Sensor
#define FLOAT_SENSOR_PIN 10

// GSM Module
SoftwareSerial gsmSerial(8, 9);  // RX, TX
#define GSM_BAUDRATE 9600
```

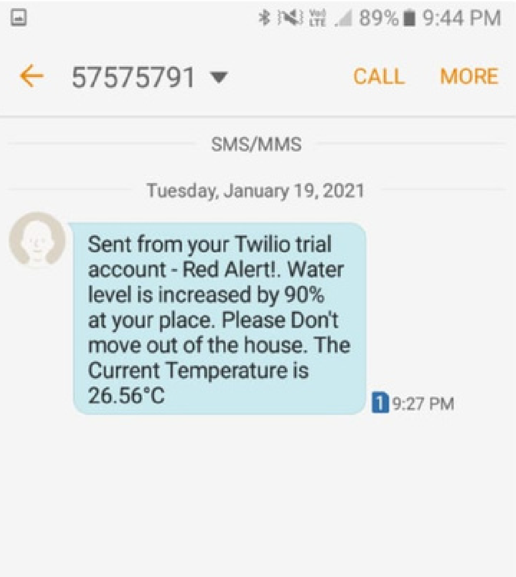
```
// Thresholds
#define FLOOD_THRESHOLD 50  // Example threshold
in cm

// Phone Numbers
String phoneNumbers[] = { "+9188305848xx",
"+9188305848xx" };  // Example phone numbers

void setup() {
  // Initialize LCD Display
  lcd.begin(16, 2);
  lcd.backlight();

  // Initialize GSM Module
  gsmSerial.begin(GSM_BAUDRATE);
  delay(2000);              // Give GSM module time to
initialize
  sendCommand("AT");        // Check communication
  sendCommand("AT+CMGF=1");  // Set SMS text mode

  // Display Initialization Message
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Flood Monitoring");
  lcd.setCursor(0, 1);
  lcd.print("System");
```

```
 delay(3000);  // Display initialization message for 3
seconds
}
void loop() {
  // Read Ultrasonic Sensor
  unsigned int distance = sonar.ping_cm();
  // Read Float Sensor
  int floatSensorValue =
digitalRead(FLOAT_SENSOR_PIN);

  // Calculate Flood Level
  int floodLevel = distance;

  // Update LCD Display
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Water Level: ");
  lcd.print(floodLevel);
  lcd.print("cm");

  // Check Flood Threshold
  if (floodLevel > FLOOD_THRESHOLD &&
floatSensorValue == HIGH) {
    // Send Alert SMS
    sendAlertSMS(floodLevel);
  }
```

```
delay(500);  // Delay for stability
}
void sendAlertSMS(int floodLevel) {
  String message = "Flood Alert! Water level is ";
  message += floodLevel;
  message += "cm. Take necessary actions.";

  for (int i = 0; i < sizeof(phoneNumbers) /
sizeof(phoneNumbers[0]); i++) {
    sendCommand("AT+CMGS=\"" + phoneNumbers[i] +
"\"");
    delay(1000);
    sendCommand(message);
    delay(100);
    sendCommand((String) char(26));
    delay(1000);
  }
}

void sendCommand(String command) {
  gsmSerial.println(command);
  delay(1000);
  while (gsmSerial.available()) {
    gsmSerial.read();
  }
}
```

OUTPUT

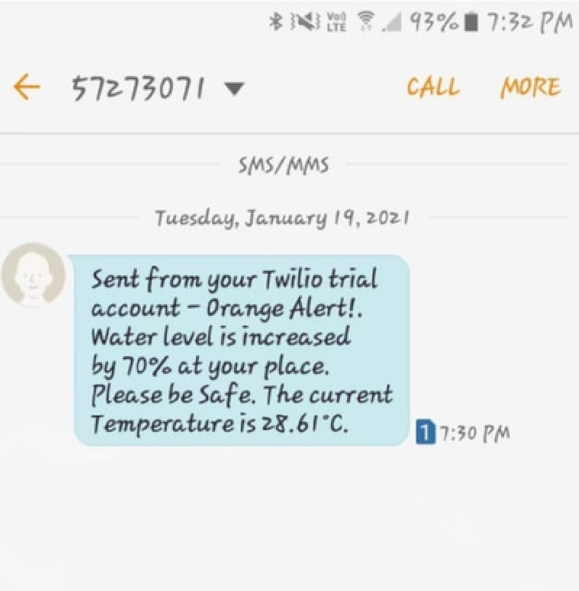




Tuesday, January 19, 2021

Sent from your Twilio trial account - Red Alert!. Water level is increased by 90% at your place. Please Don't move out of the house. The Current Temperature is 26.56°C

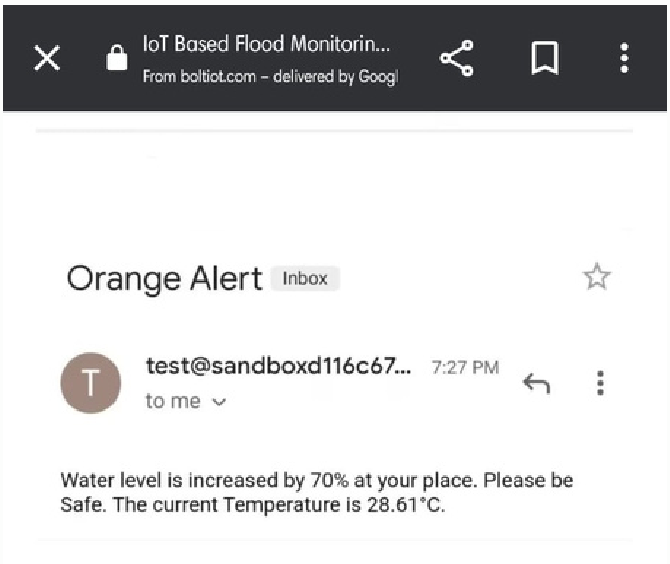
9:27 PM



Tuesday, January 19, 2021

Sent from your Twilio trial account - Orange Alert!. Water level is increased by 70% at your place. Please be Safe. The current Temperature is 28.61°C.

7:30 PM


IoT Based Flood Monitorin...
From boltiot.com – delivered by Googl

Orange Alert

test@sandboxd116c67... 7:27 PM
to me

Water level is increased by 70% at your place. Please be Safe. The current Temperature is 28.61°C.