GOVERNMENT COLLEGE OF ENGINEERING ERODE

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(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

B.E Electronics and Communication Engineering

FLOOD MONITORING AND EARLY WARNING SYSTEM

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FLOOD MONITORING AND EARLY WARNING SYSTEM USING IOT

INTRODUCTION:

6 A flood monitoring and early warning project aims to mitigate the impact of floods by implementing a comprehensive system. It focuses only on the water level detection and early warning system (via website and/or SMS) that alerts concern agencies and individuals for a potential flood event. The study aims in helping citizens to be prepared and knowledgeable whenever there is a flood.

WEB DEVELOPMENT IN FLOOD MONITORING SYSTEM:

Web development is the work involved in developing a website for the Internet (World Wide Web) or an intranet (a private network). Web development can range from developing a simple single static page of plain text to complex web applications, electronic businesses, and social network services.

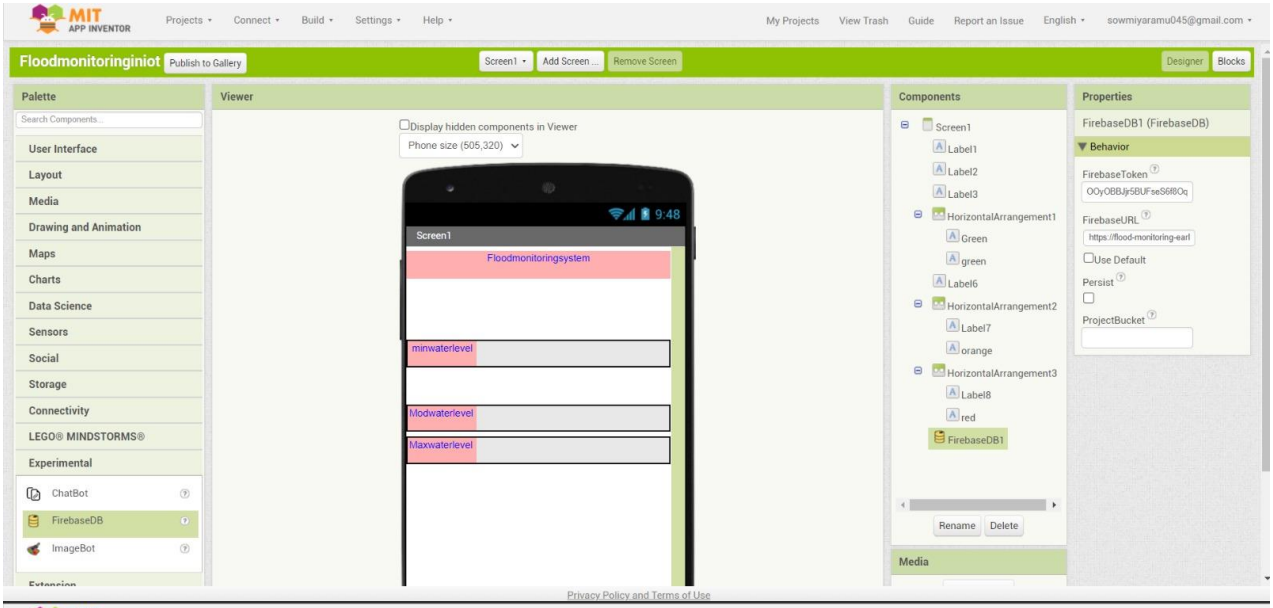
CODE IMPLEMENTATION:

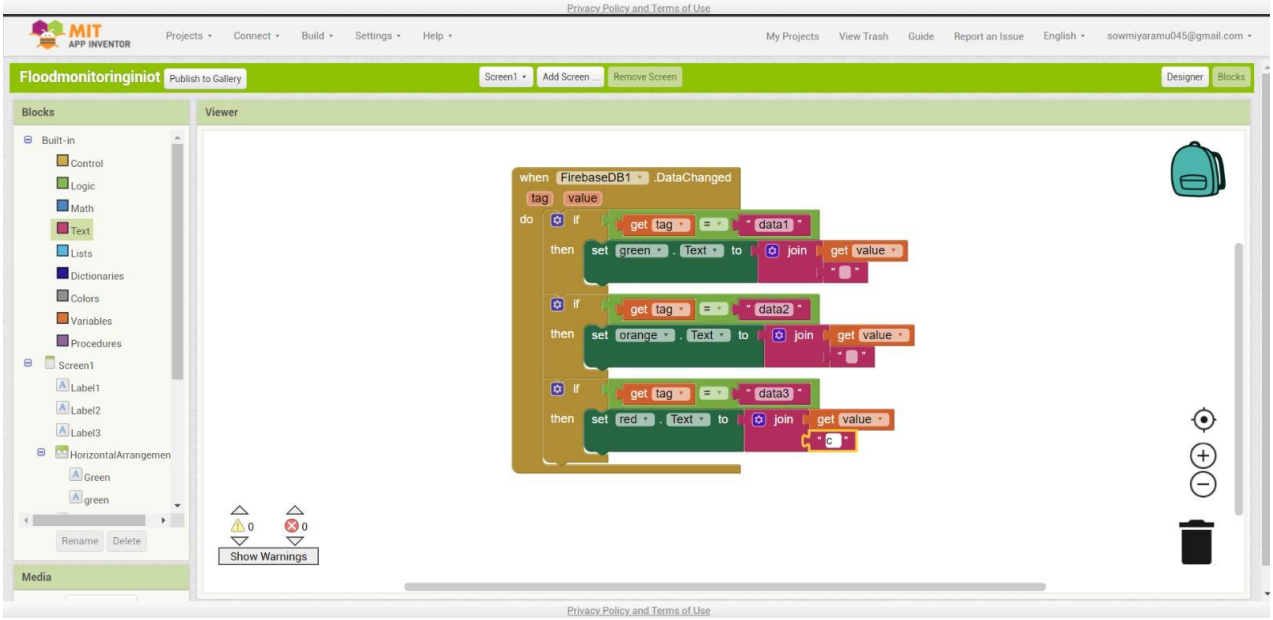
```
//Early Flood Detection Using IOT
//<LiquidCrystal.h> is the library for using the LCD 16x2
#define FIREBASE_TOKEN“OyOBBJjr5BUFseS6f8Oqnb9wsRfb6pQGWThvcMB”
#define FIREBASE_HOST “https://flood-monitoring-early-warning-default-
rtdb.firebaseio.com/”
#include <LiquidCrystal.h>
LiquidCrystal lcd(2, 3, 4, 5, 6, 7); // Create an instance of the Liquid Crystal
const int in = 8;                    // This is the ECHO pin of The Ultrasonic sensor
HC-SR04
const int out = 9;                    // This is the TRIG pin of the ultrasonic Sensor
HC-SR04
// Define pin numbers for various components
const int green = 10;
const int orange = 11;
const int red = 12;
const int buzz = 13;

void setup()
{
  // Start serial communication with a baud rate of 9600
  Serial.begin(9600);
  // Initialize the LCD with 16 columns and 2 rows
  lcd.begin(16, 2);
  // Set pin modes for various components
  pinMode(in, INPUT);
  pinMode(out, OUTPUT);
```

```
  pinMode(green, OUTPUT);
  pinMode(orange, OUTPUT);
  pinMode(red, OUTPUT);
  pinMode(buzz, OUTPUT);
  // Display a startup message on the LCD
  lcd.setCursor(0, 0);
  lcd.print("Flood Monitoring");
  lcd.setCursor(0, 1);
  lcd.print("Alerting System");
  // Wait for 5 seconds and then clear the LCD
  delay(5000);
  lcd.clear();
}

void loop()
{
  // Read distance from the ultrasonic sensor (HC-SR04)
  long dur;
  long dist;
  long per;
  digitalWrite(out, LOW);
  delayMicroseconds(2);
  digitalWrite(out, HIGH);
  delayMicroseconds(10);
  digitalWrite(out, LOW);
  dur = pulseIn(in, HIGH);
  dist = (dur * 0.034) / 2;
  // Map the distance value to a percentage value
  per = map(dist, 10.5, 2, 0, 100);
  // Ensure that the percentage value is within bounds
  if (per < 0)
  {
    per = 0;
  }
  if (per > 100)
  {
    per = 100;
  }
  // Print water level data to serial
  Serial.print("Water Level:");
  Serial.println(String(per));
  lcd.setCursor(0, 0);
  lcd.print("Water Level:");
  lcd.print(String(per));
  lcd.print("%  ");
  // Check water level and set alert levels
```

```
  if (dist <= 3)
  {
    lcd.setCursor(0, 1);
    lcd.print("Red Alert!   ");
    digitalWrite(red, HIGH);
    digitalWrite(green, LOW);
    digitalWrite(orange, LOW);
    digitalWrite(buzz, HIGH);
    delay(2000);
    digitalWrite(buzz, LOW);
    delay(2000);
    digitalWrite(buzz, HIGH);
    delay(2000);
    digitalWrite(buzz, LOW);
    delay(2000);
  }
  else if (dist <= 10)
  {
    lcd.setCursor(0, 1);
    lcd.print("Orange Alert!  ");
    digitalWrite(orange, HIGH);
    digitalWrite(red, LOW);
    digitalWrite(green, LOW);
    digitalWrite(buzz, HIGH);
    delay(3000);
    digitalWrite(buzz, LOW);
    delay(3000);
  }
  else
  {
    lcd.setCursor(0, 1);
    lcd.print("Green Alert!  ");
    digitalWrite(green, HIGH);
    digitalWrite(orange, LOW);
    digitalWrite(red, LOW);
    digitalWrite(buzz, LOW);
  }
}
```

FIRE BASE SETUP AND APP DEVELOPMENT:





CONCLUSION:

By integrating sensor data collection into flood monitoring and early warning systems, it is possible to provide timely and accurate information to help mitigate the impact of floods and protect lives and property.