

GOVERNMENT COLLEGE OF ENGINEERING ERODE



அரசினர் பொறியியல் கல்லூரி, ஈரோடு
Government College of Engineering, Erode

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



B.E Electronics and Communication Engineering

FLOOD MONITORING AND EARLY WARNING SYSTEM

Name of the Students:

University Register no:

Team Leader:

Preetha S

731121106036

Team Members:

Sowmiya R

731121106045

Manjari M

731121106030

Shahana V

731121106044

Under the mentor of

Dr.M.Poongothai

Department of Information Technology (IT)

Department of Electronics and Communication Engineering

Government College of Engineering

Erode, PO, near Vasavi College, TamilNadu-63831

Affiliated to Anna University, Chennai.

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“OyOBBJjr5BUFseS6f8Oqnb9wsRfb6pQGWTbvcMB”
#define FIREBASE_HOST “https://flood-monitoring-early-warning-default-
rtadb.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:

The image displays two screenshots of the MIT App Inventor web interface, showing the development of a flood monitoring application.

Top Screenshot (Design View):

- Project Name:** Floodmonitoringiniot
- Palettes:**
 - User Interface:** Includes Layout, Media, Drawing and Animation, Maps, Charts, Data Science, Sensors, Social, Storage, Connectivity, and LEGO® MINDSTORMS®.
 - Extensions:** Includes ChatBot, FirebaseDB, and ImageBot.
- Viewer:** Shows a mobile app preview with a screen titled "Screen1" containing a "Floodmonitoringsystem" label and three horizontal bars labeled "minwaterlevel", "Modwaterlevel", and "Maxwaterlevel".
- Components:** Lists the components used in the app, including Screen1, Label1, Label2, Label3, HorizontalArrangement1, Green, green, Label6, HorizontalArrangement2, Label7, orange, HorizontalArrangement3, Label8, red, and FirebaseDB1.
- Properties:** Shows the properties for the selected component, FirebaseDB1 (FirebaseDB), including FirebaseToken, FirebaseURL, Use Default, Persist, and ProjectBucket.

Bottom Screenshot (Logic View):

- Blocks:** Lists the built-in blocks for the app, including Control, Logic, Math, Text, Lists, Dictionaries, Colors, Variables, and Procedures.
- Logic:** Shows the logic blocks for the app, including a "when FirebaseDB1 . DataChanged" event, a "do" loop, and three "if" statements for "data1", "data2", and "data3". Each "if" statement sets the text of a label (green, orange, red) to the value of the corresponding data.
- Viewer:** Shows the logic blocks in the background, with a "Show Warnings" button at the bottom.

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.