**Smart water management**

**Phase:5**

Introduction:

This project aims to enchance smart water system by installing IOT sensors refers to the use technology and data -driven solutions to efficiently and sustainably manange water resources .It involves monitoring and optimizing water supply,distribution,and consumption to reduce waste and ensure long -term availability.Smart water management systems often use sensors, IoT devices, and data analytics to improve water quality, detect leaks, and enchance overall water infrastructure. This approach is crucial for addressing water scarcity and promoting conservation.

Implementation:

1. IoT Sensors:

Install sensors to monitor water usage, leak detection, and quality in real-time.

1. Data Analytics:

Employ data analytics to understand usage patterns, identify leaks, and optimize water distribution.

1. Automated Systems:

Automated systems to control water flow, detect abnormalities, and adjust consumption based on demand.

1. Water Recycling & Reuse:

The systems for recycling and reusing water in processes where applicable.

1. Smart Irrigation:

Use IoT-based irrigation systems that adjust watering schedules based on weather conditions and oils moisture.

1. Consumer Awareness:

Educate consumers on water conservation practices and encourage responsible usage.

1. Policy and Regulations:

Implement policies to promote water conservation and incentivize efficient water management practices.

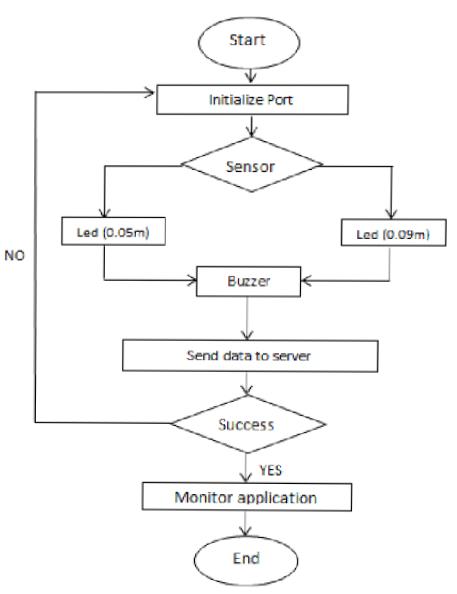
Components required:

\*HC-SR04 Ultrasonic sensor

\* Raspberry Pi

\* Jumper wires

\* Buzzer

Flow chart:

Cloud connected code:

#include <WiFi.h>

#include <ThingSpeak.h>

#define PIN\_TRIG 26

#define PIN\_ECHO 25

#define LOWLED 18

#define MIDLED 19

#define HIGHLED 21

#define MOTOR 27

Unsigned int level = 0;

// ThingSpeak settings

Char ssid[] = “WOKWI GUEST”;

Char password[] = “”;

Unsigned long myChannelNumber =2325279;

Const char \* myWriteAPIKey = “1IHS30WB1QSUX6XK”;

WiFiClient client;

Void setup() {

pinMode(LOWLED, OUTPUT);

pinMode(MIDLED, OUTPUT);

pinMode(HIGHLED, OUTPUT);

pinMode(MOTOR, OUTPUT);

digitalWrite(LOWLED, HIGH);

digitalWrite(MIDLED, HIGH);

digitalWrite(HIGHLED, HIGH);

digitalWrite(MOTOR, LOW);

Serial.begin(115200);

pinMode(PIN\_TRIG, OUTPUT);

pinMode(PIN\_ECHO, INPUT);

// Connect to Wi-Fi

WiFi.begin(ssid, password);

While (WiFi.status() != WL\_CONNECTED) {

Delay(1000);

Serial.println(“Connecting to WiFi…”);

}

Serial.println(“Connected to WiFi”);

// Initialize ThingSpeak

ThingSpeak.begin(client);

}

Void loop() {

// Start a new measurement:

digitalWrite(PIN\_TRIG, HIGH);

delayMicroseconds(10);

digitalWrite(PIN\_TRIG, LOW);

// Read the result:

Int duration = pulseIn(PIN\_ECHO, HIGH);

Serial.print(“Distance in CM: “);

Serial.println(duration / 58);

Serial.print(“Distance in inches: “);

Serial.println(duration / 148);

Level = (duration / 10);

If (level < 100) {

digitalWrite(LOWLED, LOW);

digitalWrite(MOTOR, HIGH);

digitalWrite(HIGHLED, HIGH);

digitalWrite(MIDLED, HIGH);

} else if ((level > 200) && (level < 400)) {

digitalWrite(LOWLED, HIGH);

digitalWrite(HIGHLED, HIGH);

digitalWrite(MIDLED, LOW);

} else if (level >= 400) {

digitalWrite(HIGHLED, LOW);

digitalWrite(MIDLED, HIGH);

digitalWrite(LOWLED, HIGH);

digitalWrite(MOTOR, LOW);

}

// Send data to ThingSpeak

ThingSpeak.setField(1, duration / 58); // Distance in CM

ThingSpeak.setField(2, duration / 148); // Distance in inches

Int httpCode = ThingSpeak.writeFields(myChannelNumber, myWriteAPIKey);

If (httpCode == 200) {

Serial.println(“Data sent to ThingSpeak successfully”);

} else {

Serial.print(“Failed to send data to ThingSpeak, HTTP error code: “);

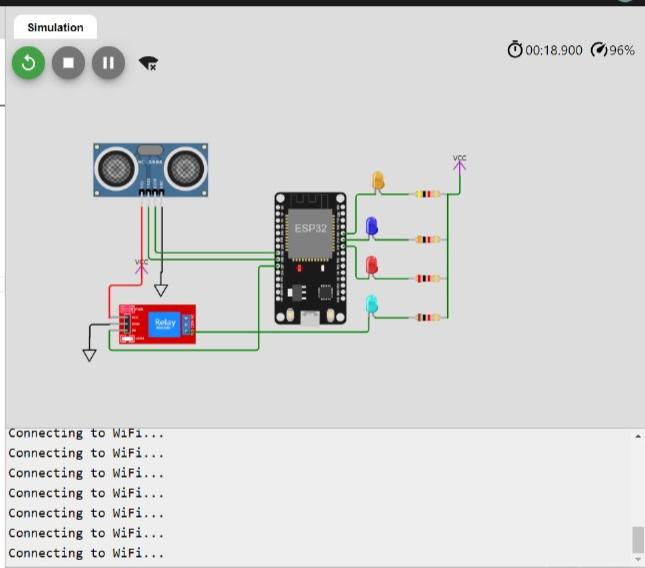
Serial.println(httpCode);

}

Delay(1000); // Delay before the next measurement

}

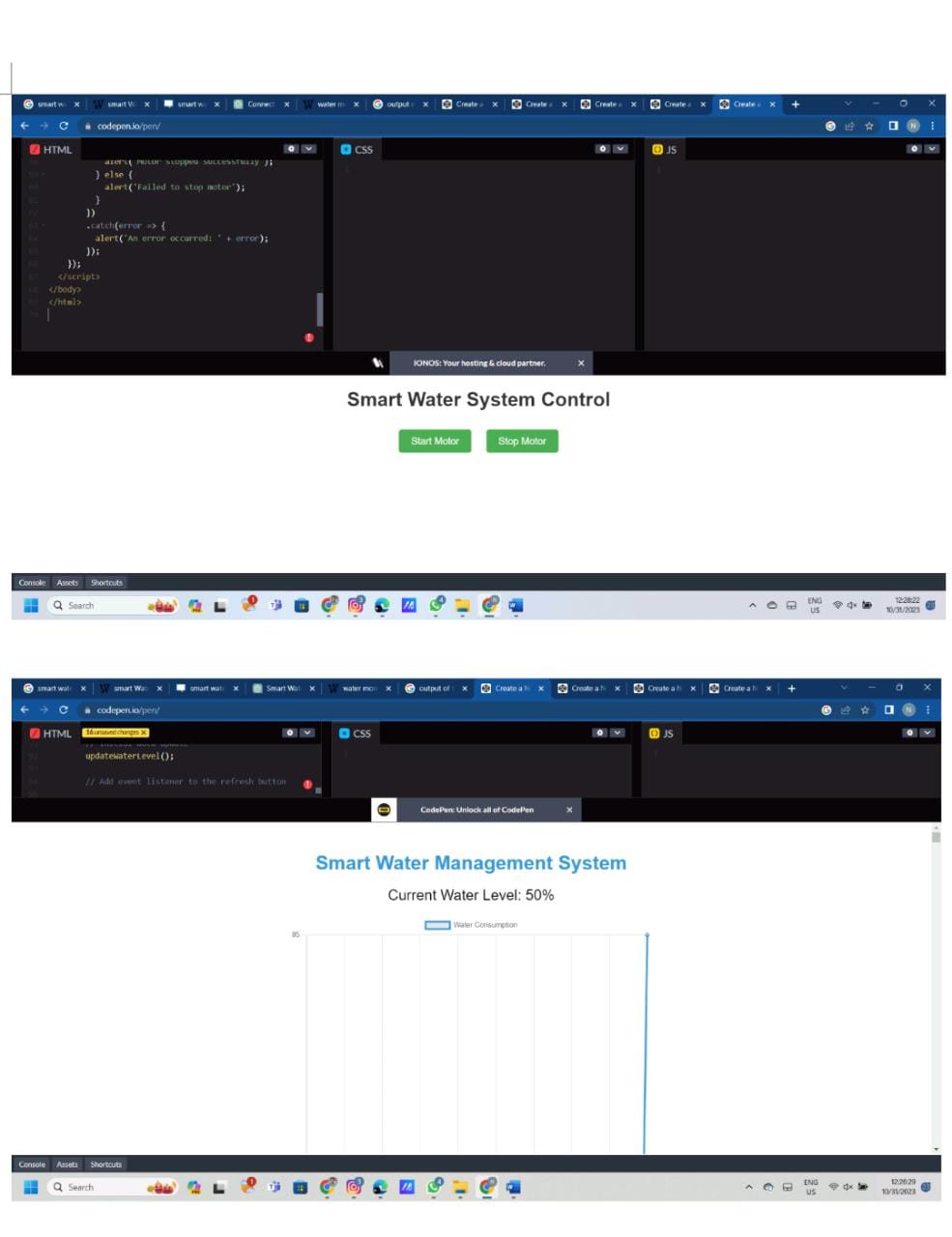
Circuit connected to cloud:



Web development of System:

Web development for smart water management in IoT is a cutting-edge technology that harnesses the power of the Internet of Things to revolutionize water resource monitoring and control. By creating web-based interfaces, this field enables users to remotely access, visualize, and manage water-related devices and systems. It encompasses real-time data visualization, robust security measures, integration with IoT devices, and the potential for automation and data analytics. With a focus on sustainability and efficiency, this technology offers the tools to optimize water resource management while ensuring compliance with regulatory standards.

**Output:**

** Conclusion:**

**Smart water management is crucial for sustainable development, environmental conservation, and ensuring access to clean water for all. Leveraging innovative technologies, data-driven solutions, and community engagement, it presents a promising approach to efficiently monitor, conserve, and distribute water resources. By implementing smart strategies, we can strive to achieve a more resilient, cost-effective, and eco-friendly water management system, essential for the well-being of current and future generations.**