

# **PROBLEM STATEMENT:**

IOT BASED - REAL TIME RIVER WATER  
QUALITY MONITORING AND CONTROL SYSTEM

## **DOMAIN:**

INTERNET OF THINGS

## **ASSIGNMENT 4:**

DISTANCE DETECTION USING ULTRASONIC SENSOR

**BY**

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## **QUESTION-1:**

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cms send "alert" to IBM cloud and display in device recent events.

## **WOKWI LINK:**

<https://wokwi.com/projects/347923162518782547>

```
#include <WiFi.h>  
#include <PubSubClient.h>
```

```
WiFiClient wifiClient;
String data3;
#define ORG "ttkiqy"
#define DEVICE_TYPE "Esp-32"
#define DEVICE_ID "keerthi"
#define TOKEN "8870489279"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/manimd/fmt/json";
char topic[] = "iot-2/cmd/led/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
```

```
const int trigpin=5;
const int echopin=18;
String command;
String data="";
```

```
long duration;
float dist;
```

```
void setup()
{
    Serial.begin(115200);
    pinMode(led, OUTPUT);
    pinMode(trigpin, OUTPUT);
    pinMode(echopin, INPUT);
    wifiConnect();
    mqttConnect();
}

void loop() {
    bool isNearby = dist < 100;
    digitalWrite(led, isNearby);

    publishData();
    delay(500);
}
```

```

    if (!client.loop()) {
        mqttConnect();
    }
}

void wifiConnect() {
    Serial.print("Connecting to "); Serial.print("Wifi");
    WiFi.begin("Wokwi-GUEST", "", 6);
    while (WiFi.status() != WL_CONNECTED) {
        delay(500);
        Serial.print(".");
    }
    Serial.print("WiFi connected, IP address: "); Serial.println(WiFi.localIP());
}

void mqttConnect() {
    if (!client.connected()) {
        Serial.print("Reconnecting MQTT client to "); Serial.println(server);
        while (!client.connect(clientId, authMethod, token)) {
            Serial.print(".");
            delay(500);
        }
        initManagedDevice();
        Serial.println();
    }
}

void initManagedDevice() {
    if (client.subscribe(topic)) {
        // Serial.println(client.subscribe(topic));
        Serial.println("IBM subscribe to cmd OK");
    } else {
        Serial.println("subscribe to cmd FAILED");
    }
}

void publishData()
{
    digitalWrite(trigpin, LOW);
    digitalWrite(trigpin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigpin, LOW);
    duration=pulseIn(echopin, HIGH);
    dist=duration*speed/2;
    if(dist<100){
        String payload = "{\"Alert Distance\":";

```

```

payload += dist;
payload += "}";

Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish OK");
}
}

if(dist>100){
String payload = "{\"Distance\":";
payload += dist;
payload += "}";

Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if(client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish OK");
}else {
    Serial.println("Publish FAILED");
}
}

}

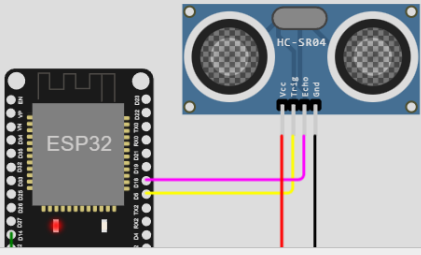
```

sketch.ino • diagram.json libraries.txt Library Manager

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wificlient;
4 String data3;
5 #define ORG "ttkiqy"
6 #define DEVICE_TYPE "Esp-32"
7 #define DEVICE_ID "keerthi"
8 #define TOKEN "8870489279"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/manimd/fmt/json";
13 char topic[] = "iot-2/cmd/led/fmt/String";
14 char authMethod[] = "use-token-auth";
15 char token[] = TOKEN;
16 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
17 PubSubClient client(server, 1883, wificlient);
18
19
20
21 const int trigpin=5;
22 const int echopin=18;
23 String command;
24 String data="";
25
26 long duration;
27 float dist;
```

Simulation

00:13.270 72%



Publish OK

Sending payload: {"Distance":138.96}

Publish OK

Sending payload: {"Distance":138.96}

Publish OK

<input type="checkbox"/>	Device ID	Status	Device Type	Class ID	Date Added	
<input checked="" type="checkbox"/>	keerthi	Connected	Esp-32	Device	10 Nov 2022 12:09	→ ...
Identity    Device Information    Recent Events    State    Logs						
The recent events listed show the live stream of data that is coming and going from this device.						
Event	Value	Format	Last Received			
manimd	{"Distance":138.96}	json	a few seconds ago			
manimd	{"Distance":138.96}	json	a few seconds ago			
manimd	{"Distance":138.96}	json	a few seconds ago			
manimd	{"Distance":138.98}	json	a few seconds ago			
manimd	{"Distance":138.65}	json	a few seconds ago			