

ASSIGNMENT- 4

Assignment Date	27 OCT 2022
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Team ID	TNT2022TMID46736
Project Title	IoT Based Smart Crop Protection System for Agriculture
Maximum Marks	2 Marks

Question:

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events. Upload document with wokwi share link and images of IBM cloud.

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "5kqdnP"
#define DEVICE_TYPE "Jothika"
#define DEVICE_ID "jothika123"
#define TOKEN "123456789"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Jothika/fmt/json";
char topic[] = "iot-2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
void publishData();

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("Warning crosses 110cm -- it automatically of the loop");
            digitalWrite(led, HIGH);
        }
    }

    if(dist>101 && dist<111){
        String payload = "{\"Normal Distance\":\"";
        payload += dist;
        payload += "\"}";

        Serial.print("\n");
        Serial.print("Sending payload: ");
        Serial.println(payload);

    }

}

void callback(char* subscribeTopic, byte* payload, unsigned int
payloadLength){
    Serial.print("callback invoked for topic:");
    Serial.println(subscribeTopic);
    for(int i=0; i<payloadLength; i++){
        dist += (char)payload[i];
    }
}

```

```

Serial.println("data:" + data3);

if(data3=="lighton"){
    Serial.println(data3);
    digitalWrite(led,HIGH);
}
data3="";
}

```

OUTPUT:

Simulation

17:25.093 92%

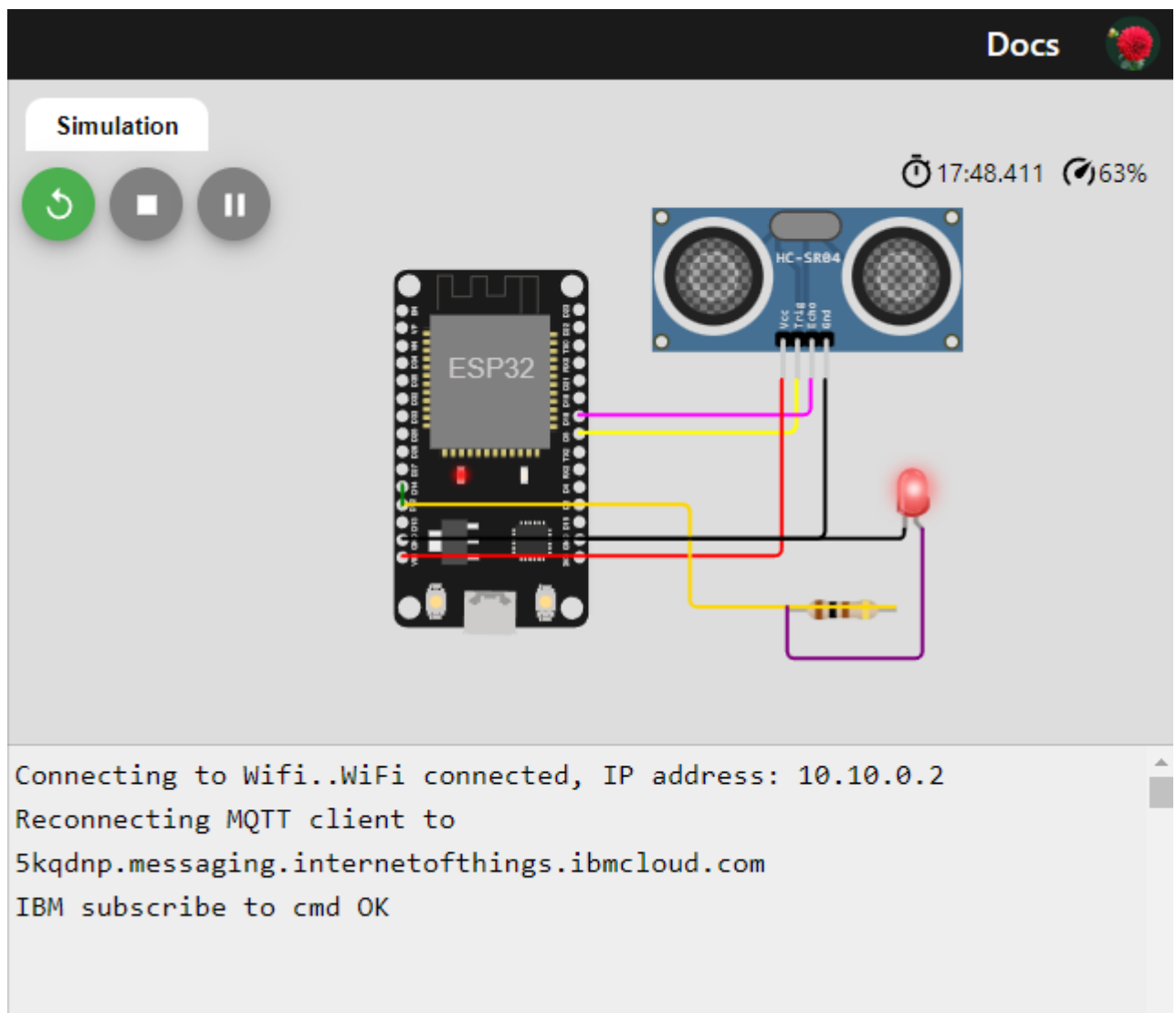
Sending payload: {"Alert Distance":89.96}
Warning crosses 110cm -- it automatically of the loop

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Warning crosses 110cm -- it automatically of the loop

Sending payload: {"Alert Distance":89.95}

Activate Windows
Go to Settings to activate Windows.

When the distance is less than 100cm alertmessage will appear in the IBM cloud.



While Distance is greater than 100cm there is no alert message in the IBM cloud.

🔍 Search by Device ID

<input type="checkbox"/>	Device ID	Status	Device Type
▼ <input type="checkbox"/>	jothika123	● Connected	Jothika
Identity	Device Information	Recent Events	State
Device ID	jothika123		
Device Type	Jothika		
Date Added	Oct 29, 2022 3:42 AM		
Added By	jothikar462002@gmail.com		
Connection Status	Connected Connection Time: Oct 29, 2022 10:08 AM Client Address: 145.40.94.93 Insecure		

IBM CLOUD OUTPUT:

<input type="checkbox"/>	Device ID	Status	Device Type	Class ID	Date Added
▼ <input type="checkbox"/>	jothika123	● Connected	Jothika	Device	Oct 29, 2022 3:42 AM
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	
Jothika		{"Alert Distance":89.95}	json	a few seconds ago	
Jothika		{"Alert Distance":89.96}	json	a few seconds ago	
Jothika		{"Alert Distance":89.95}	json	a few seconds ago	

WOKWI URL:

<https://wokwi.com/projects/346868850696913492>