

## ASSIGNMENT 4

Assignment Date	27 OCT 2022
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Team ID	TNT2022TMID46761
Project Title	Real-Time River Water Quality Monitoring and Control System
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 "1omy19"
#define DEVICE_TYPE "Renuka"
#define DEVICE_ID "Renuka123"
#define TOKEN "123456789"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Renuka/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);

    }
}

```

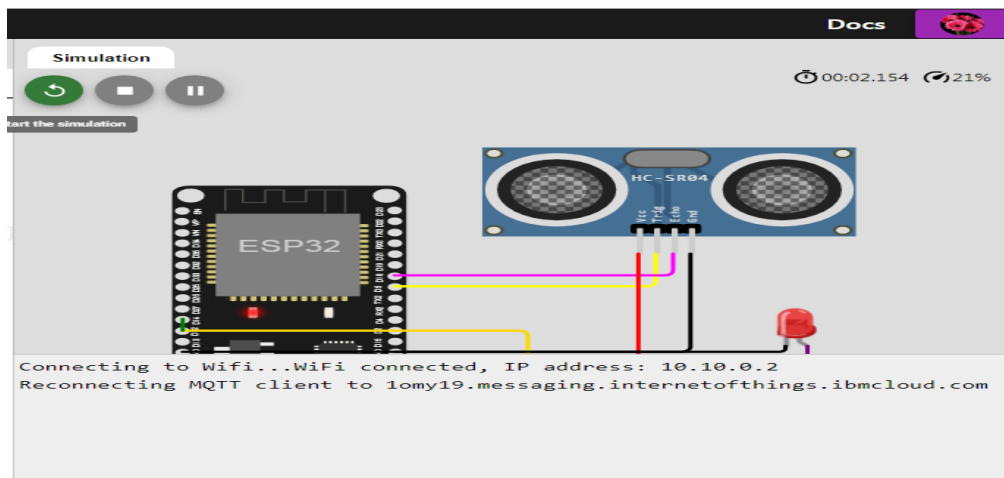
```

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);
    }
}

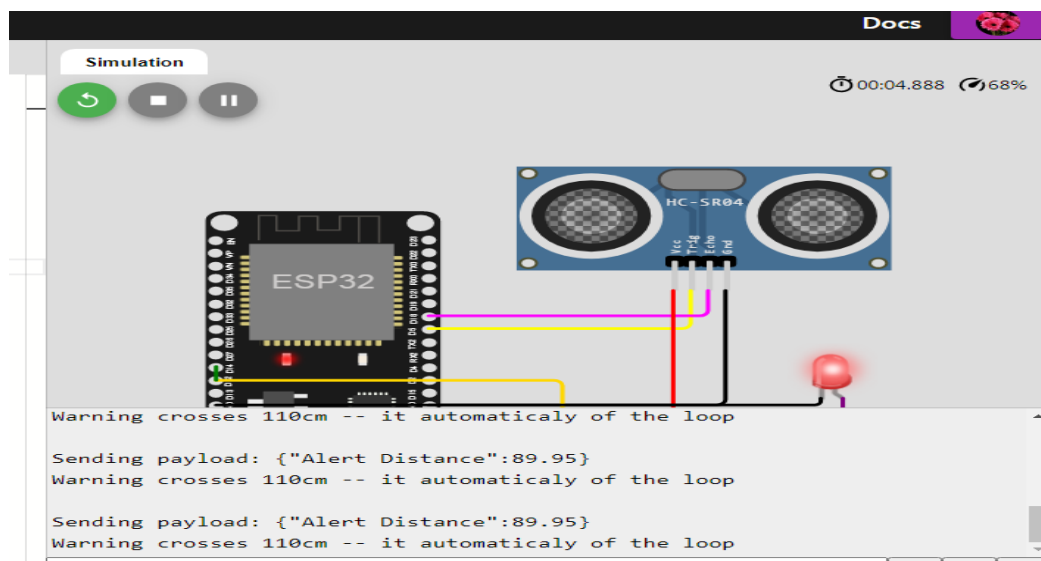
```

```
data3="";  
}
```

## OUTPUT:



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



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

IBM Watson IoT Platform

renukarenuce275@gmail.com  
ID: 1omy19

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## Device Drilldown - Renuka123

Connection Information

Recent Events

State

Device Information

Metadata

Diagnostics

Connection Logs

Device Actions

### Connection Information

Basic connection information about this device.

Device ID	Renuka123
Device Type	Renuka
Date Added	Oct 29, 2022 12:08 PM
Added By	renukarenuce275@gmail.com
Connection Status	Connected
Connection Time: Oct 29, 2022 3:48 PM	
Client Address: 145.40.94.93 Insecure	

## IBM CLOUD OUTPUT:

IBM Watson IoT Platform

renukarenuce275@gmail.com  
ID: 1omy19

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## Device Drilldown - Renuka123

Connection Information

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### Recent Events

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Renuka	{"Alert Distance":89.95}	json	a few seconds ago
Renuka	{"Alert Distance":89.95}	json	a few seconds ago
Renuka	{"Alert Distance":89.95}	json	a few seconds ago
Renuka	{"Alert Distance":90.27}	json	a few seconds ago

## WOKWI URL:

<https://wokwi.com/projects/346848003845259859>