

Assignment-4

Date	24 October 2022
Name	Sujithraa S
Roll Number	620119106098
Team ID	PNT2022TMID30932
Project Name	IoT Based Smart Crop Protection System for Agriculture

Question :

Write code and connections in wokwi for ultrasonic sensors. That whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events.

Upload document with wokwi share link and images.

Wokwi:

<https://wokwi.com/projects/347957641491776082>

Code:

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

WiFiClient wifiClient;

#define ORG "tw9ckq"
#define DEVICE_TYPE "jade"
#define DEVICE_ID "7010"
#define TOKEN "9944893843"
#define speed 0.034

char server[] = ORG".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/status1/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(trigpin, OUTPUT);
    pinMode(echopin, INPUT);
```

```

        wifiConnect();
        mqttConnect();
    }
    void loop() {
        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("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");

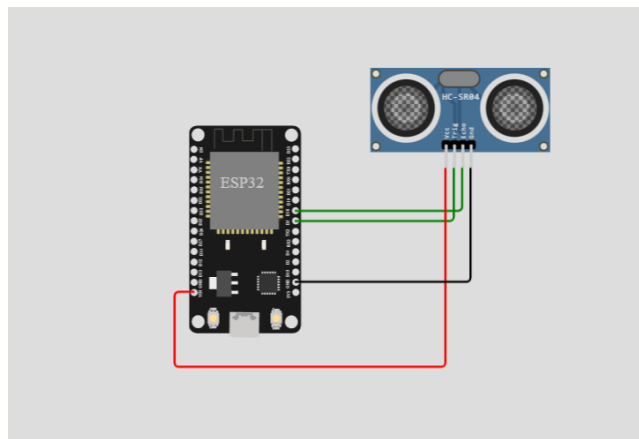
```

```

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

```

Diagram:



Wokwi Output:

WOKWI

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3
4 WiFiClient wifiClient;
5
6 #define ORG "twckq"
7 #define DEVICE_TYPE "jade"
8 #define DEVICE_ID "7010"
9 #define TOKEN "9944899843"
10 #define speed 0.034
11
12 char server[] = ORG".messaging.internetofthings.ibmcloud.com";
13 char publishTopic[] = "iot-2/evt/status1/fmt/json";
14 char topic[] = "iot-2/cmd/home/fmt/String";
15 char authMethod[] = "use-token-auth";
16 char token[] = TOKEN;
17 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
18 PubSubClient client(server, 1883, wifiClient);
19 void publishData();
20 const int trigPin=18;
21 const int echopin=19;
22 String command;
23 String data="";
24 long duration;
25 float dist;
26 void setup()
27 {
28   Serial.begin(115200);
29   pinMode(trigPin, OUTPUT);
30   pinMode(echopin, INPUT);
31   wifiConnect();
32   mqttConnect();
33 }
34 void loop() {
35   publishData();
36   delay(500);
37   if (!client.loop()) {
38     mqttConnect();

```

Simulation

Connecting to Wifi..Wifi connected, IP address: 10.10.0.2
 Reconnecting MQTT client to tw9ckq.messaging.internetofthings.ibmcloud.com
 subscribe to cmd OK

Sending payload: {"Alert distance":99.94}
 Publish OK

Wokwi simulation interface showing the code and a simulated circuit diagram.

```

40 }
41 void wifiConnect() {
42   Serial.print("Connecting to "); Serial.print("wifi");
43   WiFi.begin("wokwi-GUEST", "", 6);
44   while (WiFi.status() != WL_CONNECTED) {
45     delay(500);
46     Serial.print(".");
47   }
48   Serial.print("WiFi connected, IP address: ");
49   Serial.println(WiFi.localIP());
50   void mqttConnect() {
51     if (!client.connected()) {
52       Serial.print("Reconnecting MQTT client to ");
53       Serial.println(server);
54       while (!client.connect(clientId, authMethod, token)) {
55         Serial.print(".");
56         delay(500);
57       }
58       initManagedDevice();
59       Serial.println();
60     }
61   }
62   void initManagedDevice() {
63     if (client.subscribe(topic)) {
64       // Serial.println(client.subscribe(topic));
65       Serial.println("subscribe to cmd OK");
66     }
67     else {
68       Serial.println("subscribe to cmd FAILED");
69     }
70   }
71   void publishData() {
72     {
73       digitalWrite(trigpin, LOW);
74       digitalWrite(trigpin, HIGH);
75       delayMicroseconds(10);
76       digitalWrite(trigpin, LOW);
77       duration=pulseIn(echopin, HIGH);
78       dist=duration*speed/2;

```

Simulation output:

```

Publish OK
Sending payload: {"Alert distance":99.98}
Publish OK
Sending payload: {"Alert distance":99.98}
Publish OK

```

IBM cloud output:

IBM Watson IoT Platform dashboard showing device details and recent events.

Device ID: 7010, Status: Connected, Device Type: jade, Class ID: Device, Date Added: Oct 22, 2022 6:29 PM, Added By: sujithraa24@gmail.com

Recent Events:

Event	Value	Format	Last Received
status1	{"Alert distance":99.98}	json	a few seconds ago
status1	{"Alert distance":99.98}	json	a few seconds ago
status1	{"Alert distance":99.98}	json	a few seconds ago
status1	{"Alert distance":99.98}	json	a few seconds ago
status1	{"Alert distance":99.98}	json	a few seconds ago

0 Simulations running