

Assignment-4

Date	24 October 2022
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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/348217007075754578>

Code:

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

WiFiClient wifiClient;

#define ORG "h1cxdu"
#define DEVICE_TYPE "ESP32_Controller"
#define DEVICE_ID "BME280_Sensor"
#define TOKEN "-SV-VwwW-i7+DvKunJ"
#define speed 0.034

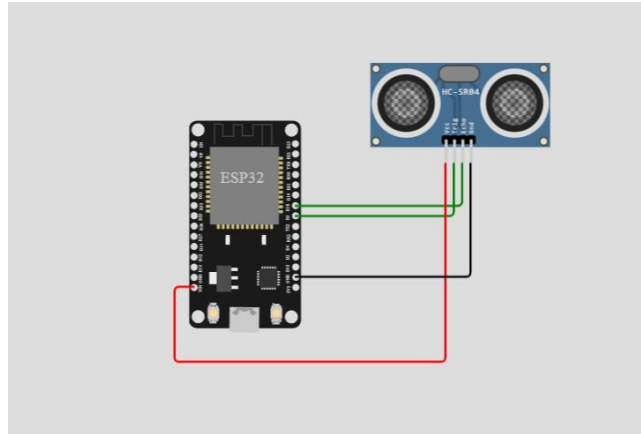
char server[] = ORG".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/event_1/fmt/json"; char
topic[] = "iot-2/cmd/home/fmt/String"; char authMethod[] =
"use-token-auth"; char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 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:

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3
4 WiFiClient wificlient;
5
6 #define ORG "h1cxdx"
7 #define DEVICE_TYPE "ESP32_Controller"
8 #define DEVICE_ID "BME280_Sensor"
9 #define TOKEN "-SV-VvWwR-17+DvKunJ"
10 #define speed 0.034
11
12 char server[] = ORG".messaging.internetofthings.ibmcloud.com";
13 char publishTopic[] = "iot-2/evt/event_1/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
21 const int trigpin=5;
22 const int echopin=18;
23 String command;
24 String data="";
25 long duration;
26 float dist;
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(trigpin, OUTPUT);

```

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

Device ID: BME280_Sensor, Status: Connected, Device Type: ESP32_Controller, Class ID: Device, Date Added: 13 Nov 2022 18:24

Recent Events:

Event	Value	Format	Last Received
event_1	{"Alert distance":99.96}	json	a few seconds ago
event_1	{"Alert distance":99.98}	json	a few seconds ago
event_1	{"Alert distance":99.98}	json	a few seconds ago
event_1	{"Alert distance":99.98}	json	a few seconds ago
event_1	{"Alert distance":99.99}	json	a few seconds ago

0 Simulations running