

Assignment -4

Assignment Date	25 October 2022
Student Name	Janarthanan S
Student Roll Number	731719106007
Maximum Marks	2 Marks

Question-4:

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

PROGRAM

```
#include <WiFi.h>

#include <PubSubClient.h>

WiFiClient wifiClient;

String data3;

#define ORG "3yngbh"

#define DEVICE_TYPE "Assignment"

#define DEVICE_ID "1234"

#define TOKEN "234567890"

#define speed 0.034 #define

led 14

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[] = "iot-2/evt/shreedharen/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");
        }

    }

}

Connection:

```

Simulation

02:51.147 104%

ESP32

HC-SR04

VCC Trig Echo Gnd

Connecting to Wifi...WiFi connected, IP address: 10.10.0.2
Reconnecting MQTT client to 3yngbh.messaging.internetofthings.ibmcloud.com
.....

Output:

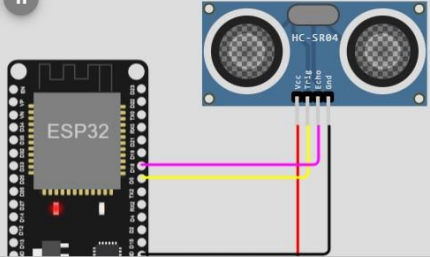
WOKWI SAVE SHARE esp32-dht22.ino by urish Docs

esp32-dht22.ino • diagram.json • libraries.txt • Library Manager

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wifiClient;
4 String data3;
5 #define ORG "3ynghb"
6 #define DEVICE_TYPE "Assignment"
7 #define DEVICE_ID "1234"
8 #define TOKEN "234567890"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/shreedharen/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

02:03.938 99%

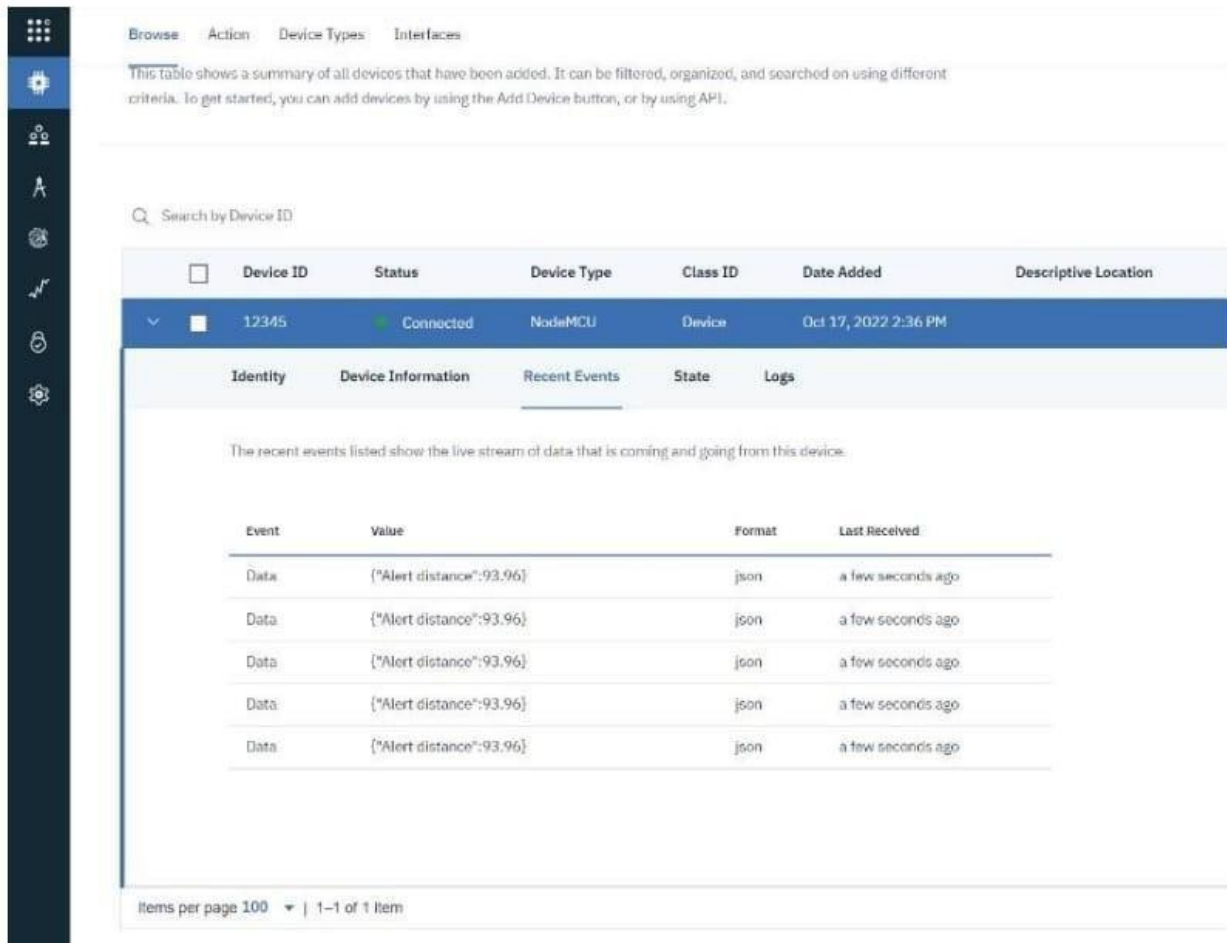


Connecting to Wifi...WiFi connected, IP address: 10.10.0.2
Reconnecting MQTT client to 3ynghb.messaging.internetofthings.ibmcloud.com
.....

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Type here to search 22°C Mostly clear 21:19 09-11-2022

Output: (IBM Cloud)



The screenshot displays the IBM Cloud IoT Platform console. On the left is a dark sidebar with navigation icons. The main content area has tabs for 'Browse', 'Action', 'Device Types', and 'Interfaces'. Below these is a descriptive paragraph about the device table. A search bar labeled 'Search by Device ID' is present. A table lists devices, with one device '12345' highlighted in blue, showing a status of 'Connected' and a 'NodeMCU' type. Below the table, the 'Recent Events' tab is active, showing a live stream of data events. Each event is a JSON object containing an 'Alert distance' of 93.96. The events are listed in a table with columns for Event, Value, Format, and Last Received. At the bottom, it indicates 'Items per page 100' and '1-1 of 1 item'.

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
12345	Connected	NodeMCU	Device	Oct 17, 2022 2:36 PM	

Event	Value	Format	Last Received
Data	{"Alert distance":93.96}	json	a few seconds ago
Data	{"Alert distance":93.96}	json	a few seconds ago
Data	{"Alert distance":93.96}	json	a few seconds ago
Data	{"Alert distance":93.96}	json	a few seconds ago
Data	{"Alert distance":93.96}	json	a few seconds ago

Link: <https://wokwi.com/projects/347926322766414419>