

#### Assignment -4

Assignment Date	25 October 2022
Student Name	Akshayakumar R
Student Roll Number	731719106001
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 "cwc5b7"
#define DEVICE_TYPE "ak"

#define DEVICE_ID "7868827081"
#define TOKEN "731719106001"
#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");
    }

}

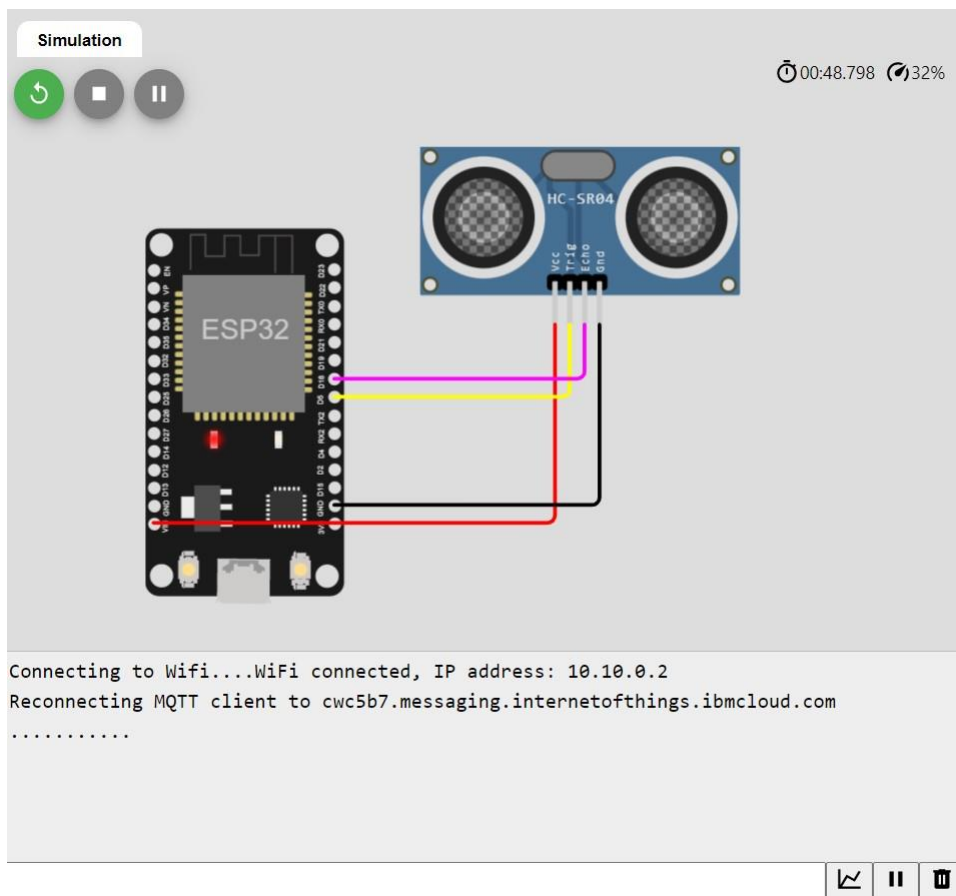
    if(dist>100){
        String payload = "{\\"Distance\\":";
payload += dist;    payload += "}";

        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:

```



Output:

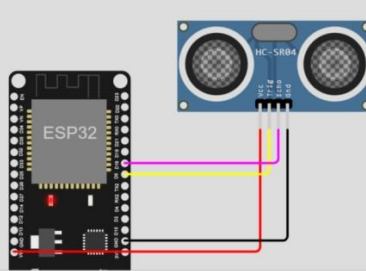
WOKWI

esp32-dht22.ino

```
1 #include <wifi.h>
2 #include <PubSubClient.h>
3 WiFiClient wifiClient;
4 String data3;
5 #define ORG "cwc5b7"
6 #define DEVICE_TYPE "ak"
7 #define DEVICE_ID "7868827081"
8 #define TOKEN "731719106001"
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;
28
29
30
31 void setup()
32 {
33   Serial.begin(115200);
34   pinMode(led, OUTPUT);
35   pinMode(trigpin, OUTPUT);
36 }
```

Simulation

00:20.599 48%



Connecting to Wifi...WiFi connected, IP address: 10.10.0.2  
Reconnecting MQTT client to cwc5b7.messaging.internetofthings.ibmcloud.com  
....

Type here to search

Rain 155 AM 11/11/2022

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 a top navigation bar with tabs: 'Browse', 'Action', 'Device Types', and 'Interfaces'. Below this, a text block explains that the table shows a summary of all devices and can be filtered, organized, and searched. A search bar labeled 'Search by Device ID' is present. The main table lists devices with columns: Device ID, Status, Device Type, Class ID, Date Added, and Descriptive Location. One device is listed with ID '12345', status 'Connected', and type 'NodeMCU'. Below the table, a section titled 'Recent Events' shows a live stream of data. It includes a table with columns: Event, Value, Format, and Last Received. The events are all 'Data' type with a value of '["Alert distance":93.96]' in 'json' format, received 'a few seconds ago'. At the bottom, a footer indicates 'Items per page 100' and '1-1 of 1 item'.

Browse Action Device Types Interfaces

This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

Search by Device ID

<input type="checkbox"/>	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
<input checked="" type="checkbox"/>	12345	Connected	NodeMCU	Device	Oct 17, 2022 2:36 PM	

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
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

Items per page 100 | 1-1 of 1 item

Link: <https://wokwi.com/projects/348024258930147922>