

#### Assignment -4

Assignment Date	25 October 2022
Student Name	Prasad R
Student Roll Number	731719106011
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:

```

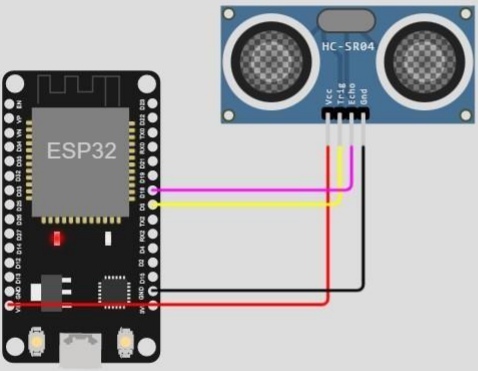
Simulation

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

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Output:

WOKWI

esp32-dht22.ino

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wifiClient;
4 String data;
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

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

Type here to search

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ENG IN 11/11/2022

Output: (IBM Cloud)

The screenshot displays the IBM Cloud IoT Dashboard interface. On the left is a dark sidebar with navigation icons. The main content area has a top navigation bar with tabs: 'Browse' (selected), 'Action', 'Device Types', and 'Interfaces'. Below the tabs, a text block states: '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.' Below this is a search bar labeled 'Search by Device ID'. The main table lists devices with columns: Device ID, Status, Device Type, Class ID, Date Added, and Descriptive Location. One device is listed: ID 12345, Status 'Connected', Device Type 'NodeMCU', Class ID 'Device', and Date Added 'Oct 17, 2022 2:36 PM'. Below the table, there are tabs for 'Identity', 'Device Information', 'Recent Events' (selected), 'State', and 'Logs'. A text block explains: 'The recent events listed show the live stream of data that is coming and going from this device.' Below this is a table of recent events with columns: Event, Value, Format, and Last Received. Five events are listed, all with the value '{"Alert distance":93.96}' and format 'json'. At the bottom, it says 'Items per page 100 | 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/348021145944982098>