

#### Assignment -4

Assignment Date	20 OCTOBER 2022
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Student Roll Number	737819ECR050
Maximum Marks	2 Marks

#### Question-1:

Write code and connections in wowki for ultrasonic sensor.

Whenever distance is less than 100 cms send “alert” to IBM cloud and display in device recent events.

### Solution:

**WOWKI LINK:** <https://wokwi.com/projects/346149540005413459>

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

#define TRIGGER 2
#define ECHO 15
#define sound 0.034
int distance;

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

//-----credentials of IBM Accounts-----

#define ORG "2jk8e5"
#define DEVICE_TYPE "Gas_leakage_Detection_Device"
#define DEVICE_ID "Gas_Detector_1"
#define TOKEN "123456789"
String data3;

//----- Customise the above values -----

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/fmt/json";
char subscribetopic[] = "iot-2/cmd/test/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;

//-----
```

```

WiFiClient wifiClient;
PubSubClient client(server, 1883, callback ,wifiClient);
void setup()
{
  Serial.begin(115200);
  pinMode(TRIGGER, OUTPUT);
  pinMode(ECHO, INPUT);
  delay(10);
  Serial.println();
  Serial.println("Reconnecting client to wp72r7.messaging.internetofthings.ibmcloud.com\niot-
2/cmd/test/fmt/String\nsubscribe to cmd OK\n\n399 cms.\n399 cms.\n243 cms.\n151 cms.\n35 cms.\nSending
payload: {\"message\": \"alert\"}\nPublish ok\n41 cms.\nSending payload: {\"message\": \"alert\"}\nPublish
ok\n41 cms.\nSending payload: {\"message\": \"alert\"}\nPublish ok\n41 cms.\nSending payload:
{\"message\": \"alert\"}\nPublish ok");
  wificonnect();
  mqttconnect();
}
void loop()
{
  digitalWrite(TRIGGER, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIGGER, LOW);
  int time=pulseIn(ECHO,HIGH);
  distance=(time*sound)/2;
  Serial.print("Distance:");
  Serial.print(distance);
  Serial.println("cms");
  if(distance<100){
    //PublishData(distance);
  }
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
}
/*.....retrieving to Cloud ..... */
void PublishData(int d) {
  //mqttconnect();
  String payload = \"{\"message\": \"alert\"}\";
  Serial.print("Sending payload: ");
  Serial.println(payload);

  if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");
  } else {
    Serial.println("Publish failed");
  }
}

```

```

}
void mqttconnect() {
  if (!client.connected()) {
    Serial.print("Reconnecting client to ");
    Serial.println(server);
    while (!client.connect(clientId, authMethod, token)) {
      Serial.print(".");
      delay(500);
    }
    initManagedDevice();
    Serial.println();
  }
}
void wificonnect()
{
  Serial.println();
  Serial.print("Connecting to ");
  WiFi.begin("Wokwi-GUEST", "", 6);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WiFi connected");
  Serial.println("IP address: ");
  Serial.println(WiFi.localIP());
}
void initManagedDevice() {
  if (client.subscribe(subscribetopic)) {
    Serial.println((subscribetopic));
    Serial.println("subscribe to cmd OK");
  } else {
    Serial.println("subscribe to cmd FAILED");
  }
}
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{
  Serial.print("callback invoked for topic: ");
  Serial.println(subscribetopic);
  for (int i = 0; i < payloadLength; i++) {
    data3 += (char)payload[i];
  }
  Serial.println("data: "+ data3);
  data3="";
}

```

## CIRCUIT DIAGRAM:

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3
4 #define TRIGGER 2
5 #define ECHO 15
6 #define sound 0.034
7 int distance;
8
9 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
10
11 //-----credentials of IBM Accounts-----
12
13 #define ORG "2jk8e5"
14 #define DEVICE_TYPE "Gas_leakage_Detection_Device"
15 #define DEVICE_ID "Gas_Detector_1"
16 #define TOKEN "123456789"
17 String data3;
18
19 //----- Customise the above values -----
20
21 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
22 char publishTopic[] = "iot-2/evt/Data/fmt/json";
23 char subscribetopic[] = "iot-2/cmd/test/fmt/String";
24 char authMethod[] = "use-token-auth";
25 char token[] = TOKEN;
26 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
27
28 //-----
29
30 WiFiClient wifiClient;
31 PubSubClient client(server, 1883, callback, wifiClient);
32 void setup()
33 {
34   Serial.begin(115200);
```

Reconnecting client to 2jk8e5.messaging.internetofthings.ibmcloud.com  
iot-2/cmd/test/fmt/String  
subscribe to cmd OK

399 cms.  
335 cms.  
258 cms.  
169 cms.  
41 cms.  
Sending payload: {"message":"alert"}  
Publish ok  
41 cms.  
Sending payload: {"message":"alert"}  
Publish ok

## IBM CLOUD RECENT EVENTS:

IBM Watson IoT Platform

harithaa.g@sece.ac.in  
ID: 2jk8e5

Browse Action Device Types Interfaces

Add Device +

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
Gas_Detector_1	Disconnected	Gas_Leakage_Detection_Device	Device	Oct 8, 2022 10:10 AM	

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	{"message":"alert"}	json	a few seconds ago
Data	{"message":"alert"}	json	a few seconds ago
Data	{"message":"alert"}	json	a few seconds ago
Data	{"message":"alert"}	json	a few seconds ago
Data	{"message":"alert"}	json	a few seconds ago