

**Assignment -4 Data**  
Publish to IOT Device

Assignment Date	27 October 2022
Student Name	G.Jefrin
Student Roll Number	960519106305
Maximum Marks	2 Marks

**Question-1:**

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less 100 cms send "alert" to ibm cloud and display in device recent events.

**Solution:**

```
#include <WiFi.h>//library for wifi
```

```
#include <PubSubClient.h>//library for MQTT
```

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

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

```
#define ORG "rdegk"//IBM ORGANITION ID
```

```
#define DEVICE_TYPE "weather1"//Device type mentioned in ibm watson IOT Platform
```

```
#define DEVICE_ID "weather1"//Device ID mentioned in ibm watson IOT Platform
```

```
#define TOKEN "_oa-3bajxqvCrO(6kW " //Token
```

```
String data3; float dist;
```

```
//----- Customise the above values -----char server[] = ORG
```

```
".messaging.internetofthings.ibmcloud.com";// Server Name
```

```
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform and format  
in which data to be send
```

```
char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd REPRESENT command type AND  
COMMAND IS TEST OF FORMAT STRING char authMethod[] = "use-token-auth";//  
authentication method
```

```
char token[] = TOKEN; char clientId[] = "d:" ORG ":" DEVICE_TYPE  
":" DEVICE_ID;//client id
```

```
//-----
```

```
WiFiClient wifiClient; // creating the instance for wificlient
```

```
PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefined client id by passing  
parameter like server id,portand wificredential
```

```
int LED = 4;
```

```
int trig = 5;
```

```
int echo = 18;
```

```
void setup()
```

```
{
```

```
Serial.begin(115200);
```

```
pinMode(trig,OUTPUT);
```

```
pinMode(echo,INPUT);
```

```
pinMode(LED, OUTPUT);
```

```
delay(10); wificonnect();
```

```
mqttconnect();
```

```
}
```

```
void loop()// Recursive Function
```

```
{
```

```
digitalWrite(trig,LOW);
```

```
digitalWrite(trig,HIGH);
```

```
delayMicroseconds(10);
```

```
digitalWrite(trig,LOW); float
```

```
dur = pulseIn(echo,HIGH); float
```

```
dist = (dur * 0.0343)/2;
```

```
Serial.print ("Distancein cm");
```

```
Serial.println(dist);
```

```

    PublishData(dist);
    delay(1000); if
    (!client.loop()) {
    mqttconnect();
    }
}

/* .....retrieving to Cloud..... */

```

```

void PublishData(float dist) {
    mqttconnect();//function call for connecting to ibm
    /*   creating the String in in form JSon to update the data to ibm
    cloud
    */ String
    object; if
    (dist <100)
    {
        digitalWrite(LED,HIGH);
        Serial.println("object is near");
        object = "Near";
    }
    else
    {
        digitalWrite(LED,LOW);
        Serial.println("no object found");
        object = "No";
    }

    String payload = "{\"distance\":";
    payload += dist;  payload += ","
    "\"object\":"; payload +=
    object;  payload += "\"}";

```

```

    Serial.print("Sending payload: ");
    Serial.println(payload); if (client.publish(publishTopic,
(char*) payload.c_str())) {
    Serial.println("Publish ok");// if it sucessfully upload data on the cloud then it will print publish ok
in Serial monitor or else it will print publish failed
    } 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() //function defination for wificonnect
{
    Serial.println();
    Serial.print("Connecting to ");
    WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish the connection
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++) {
//Serial.print((char)payload[i]);    data3 +=
(char)payload[i];
    }
    data3="";
}

```

Reference:

<https://wokwi.com/projects/347311168141918803>

WOKWI

SAVE

SHARE

sketch.ino

Docs

sketch.ino

diagram.json

libraries.txt

Library Manager

```
64  /*
65  */ creating the String in in form JSON to update the data to ibm cloud
66
67  String object;
68  if (dist <100)
69  {
70      digitalWrite(LED,HIGH);
71      Serial.println("object is near");
72      object = "Near";
73  }
74  else
75  {
76      digitalWrite(LED,LOW);
77      Serial.println("no object found");
78      object = "No";
79  }
80
81  String payload = "{\"distance\":";
82  payload += dist;
83  payload += "," " \"object\":\":";
84  payload += object;
85  payload += "\":";
86
87
88  Serial.print("Sending payload: ");
89  Serial.println(payload);
90
91
92  */
```

Simulation

00:59.614 98%

object is near  
Sending payload: {"distance":59.51,"object":"Near"}  
Publish ok  
Distancein cm59.51  
object is near  
Sending payload: {"distance":59.51,"object":"Near"}  
Publish ok

IBM Watson IoT Platform

110119104034@aaimtec.ac.in  
ID: rdegylk

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Device Drilldown - weather1

Connection Information

Recent Events

State

Device Information

Metadata

Diagnostics

Connection Logs

Device Actions

Recent Events

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"distance":59.51,"object":"Near"}	json	a few seconds ago
Data	{"distance":59.51,"object":"Near"}	json	a few seconds ago
Data	{"distance":2.01,"object":"Near"}	json	a few seconds ago
Data	{"distance":347.01,"object":"No"}	json	a few seconds ago
Data	{"distance":403.49,"object":"No"}	json	a few seconds ago

0 Simulations running