

Assignment -4
Data Pulish to IOT Device

Assignment Date	27 October 2022
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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 "17rb95"//IBM ORGANITION ID
```

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

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

```
#define TOKEN "?4l@aqlzKhwuD(C6Om" //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/346597491075973714>

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Start the simulation

```

no object found
Sending payload: {"distance":335.90,"object":"No"}
Publish ok
Distancein cm335.90
no object found
Sending payload: {"distance":335.90,"object":"No"}
Publish ok
  
```

weather_today

Connected

weather_device

Device

Oct 8, 2022 4:58 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	{"distance":262.22,"object":"No"}	json	a few seconds ago
Data	{"distance":262.22,"object":"No"}	json	a few seconds ago
Data	{"distance":262.26,"object":"No"}	json	a few seconds ago
Data	{"distance":53.42,"object":"Near"}	json	a few seconds ago
Data	{"distance":53.42,"object":"Near"}	json	a few seconds ago