

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

Assignment Date	28 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 "m1r2sh"//IBM ORGANITION ID
```

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

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

```
#define TOKEN "-EtNxjJmbkBC5x_7)k" //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 successfully 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 definition 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");
}
}

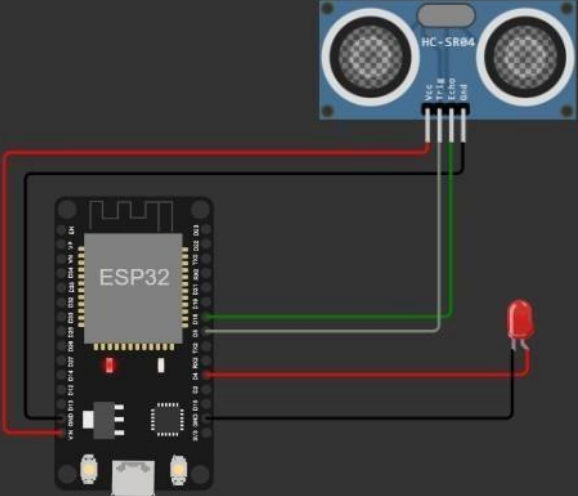
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{
    Serial.print("callback invoked for topic: ");
    Serial.println(subscribetopic);
    for (int i = 0; i < payloadLength; i++) {
        //Serial.print((char)payload[i]);    data3 +=
        (char)payload[i];
    }
    data3="";
}

```

Reference: <https://wokwi.com/projects/346754066125161044>

00:44.356 99%

art 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	