

ASSIGNMENT-4

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Question:

write code and connection in wokwi for ultrasonic sensor. whenever distance is less 100cms send alert to ibm cloud and display in device recent events.

solution:

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

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

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

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

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

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

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

```
#define TOKEN "89101112" //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];
    }
    // Serial.println("data: "+ data3);
    // if(data3=="Near")
    // {
    // Serial.println(data3);
    // digitalWrite(LED,HIGH);
    // }
    // else
    // {
    // Serial.println(data3);
    // digitalWrite(LED,LOW);
    // } data3="";
}

```

reference:<https://wokwi.com/projects/348038577746084435>

WOKWI

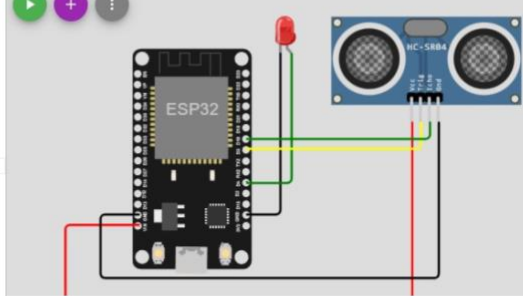
main.ino

```

132 Serial.println(subscribetopic);
133 Serial.println("subscribe to cmd OK");
134 } else {
135   Serial.println("subscribe to cmd FAILED");
136 }
137 }
138
139 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
140 {
141
142   Serial.print("callback invoked for topic: ");
143   Serial.println(subscribetopic);
144   for (int i = 0; i < payloadLength; i++) {
145     //Serial.print((char)payload[i]);
146     data3 += (char)payload[i];
147   }
148   // Serial.println("data: "+ data3);
149   // if(data3=="Near")
150   // {
151   //   Serial.println(data3);
152   //   digitalWrite(LED,HIGH);
153   // }
154   // }
155   // else
156   // {
157   //   Serial.println(data3);
158   //   digitalWrite(LED,LOW);
159   // }
160   // }
161 }

```

Simulation



Connecting to ..
WiFi connected
IP address:
10.10.0.2
Reconnecting client to qguokr.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String

esp32-arduino.in....html

qguokr.internetofthings.ibmcloud.com/dashboard/devices/browse

IBM Watson IoT Platform

210219106039@smartinternz.com
ID: qguokr

Browse Action Device Types Interfaces

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":403.45,"object":"No"}	json	a few seconds ago
Data	{"distance":403.49,"object":"No"}	json	a few seconds ago
Data	{"distance":403.45,"object":"No"}	json	a few seconds ago
Data	{"distance":403.51,"object":"No"}	json	a few seconds ago
Data	{"distance":403.49,"object":"No"}	json	a few seconds ago

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