

Assignment -4

Data

Publish to IOT Device

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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++) {

```

<https://wokwi.com/projects/34731168141918803>

