

## Assignment 4

Date	05-11-2022
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Maximum Marks	2 Marks

### Assignment Question:

Write code and connections in wokwi for ultrasonic sensor.

Whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events.

### Coding :

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

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

```
#define ECHO_GPIO 12
```

```
#define TRIGGER_GPIO 13
```

```
#define MAX_DISTANCE_CM 100 // Maximum of 5 meters
```

```
#include "Ultrasonic.h"
```

```
Ultrasonic ultrasonic(13, 12);
```

```
int distance;
```

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

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

```
#define ORG "n6k0uf" //IBM ORGANITION ID
```

```
#define DEVICE_TYPE "ESP32_Controller" //Device type mentioned in ibm watson IOT
```

```
Platform #define DEVICE_ID "ESP32" //Device ID mentioned in ibm watson IOT Platform
```

```
#define TOKEN "?NOpMyslFB6D8@p7pX" //Token
```

```
String data3;
```

```
float h, t;
```

```
//----- 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/command/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
```

```
void setup()// configureing the ESP32
{
  Serial.begin(115200);
  delay(10);
  Serial.println();
  wificonnect();
  mqttconnect();
}
```

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

  distance = ultrasonic.read(CM);
  if (distance < 100) {
    Serial.print("Distance in CM: ");
    Serial.println(distance);
    PublishData(distance);
    delay(1000);
    if (!client.loop()) {
      mqttconnect();
    }
  }

  delay(1000);
}
```

```

}

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

void PublishData(float temp) {
  mqttconnect();//function call for connecting to ibm
  /*
    creating the String in in form JSon to update the data to ibm cloud
  */
  String payload = "{\"Alert Distance\":\"";
  payload += temp;
  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 == "lighton")
    {
        Serial.println(data3);
    }
}

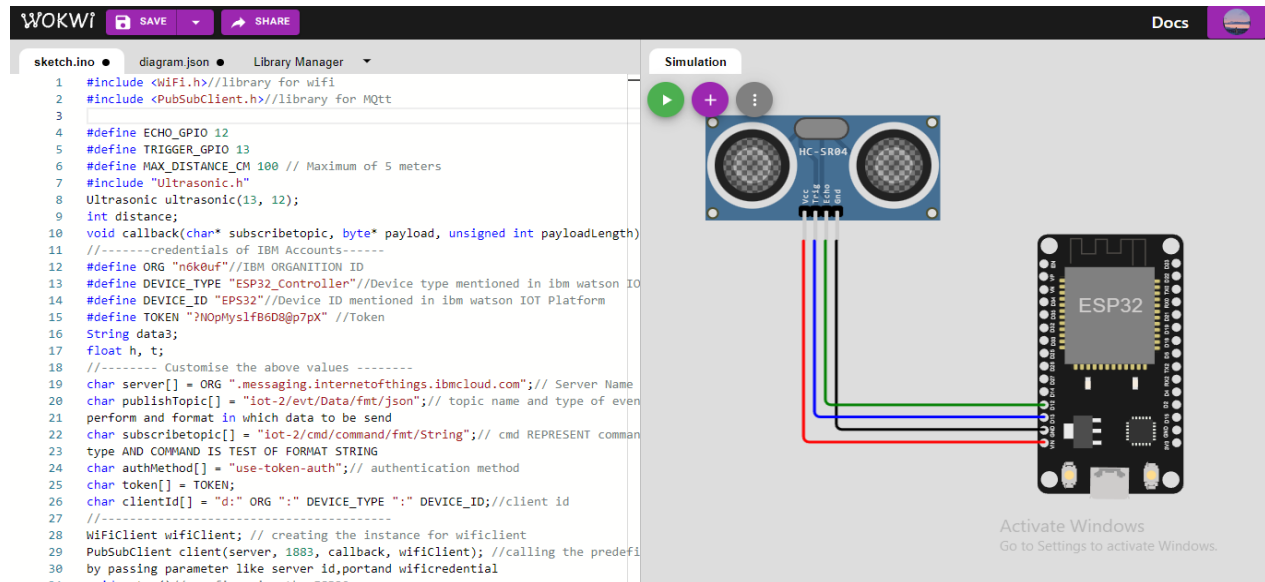
```

```

else
{
    Serial.println(data3);
}
data3 = "";
}

```

## OUTPUT :



Activate Windows  
Go to Settings to activate Windows.

Event	Value	Format	Last Received
Data	{"Alert Distance":98}	json	a few seconds ago
Data	{"Alert Distance":98}	json	a few seconds ago
Data	{"Alert Distance":98}	json	a few seconds ago
Data	{"Alert Distance":98}	json	a few seconds ago
Data	{"Alert Distance":98}	json	a few seconds ago

When the distance is more than 100cm the alert is not sent to the IBM cloud

