

### Assignment - 4

Assignment Date	17 November 2022
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Maximum Marks	2 Marks

#### Question-1:

Write a code and make a connection in wokwi for ultrasonic sensor. Whenever distance is less than 100 send 'alert' to ibm cloud and display in device recent events.

#### Solution:

##### Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "4yi0vc"
#define DEVICE_TYPE "nodeMcu"
#define DEVICE_ID "Assignment4"
#define TOKEN "123456789"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/fmt/json";
char topic[] = "iot-2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
void publishData();
```

```
const int trigpin=5;
const int echopin=18;
String command;
String data="";
```

```
long duration;
float dist;
```

```
void setup()
```

```

{
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
  wifiConnect();
  mqttConnect();
}

void loop() {
  bool isNearby = dist < 100;
  digitalWrite(led, isNearby);

  publishData();
  delay(500);

  if (!client.loop()) {
    mqttConnect();
  }
}

void wifiConnect() {
  Serial.print("Connecting to "); Serial.print("Wifi");
  WiFi.begin("Wokwi-GUEST", "", 6);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.print("WiFi connected, IP address: "); Serial.println(WiFi.localIP());
}

void mqttConnect() {
  if (!client.connected()) {
    Serial.print("Reconnecting MQTT client to "); Serial.println(server);
    while (!client.connect(clientId, authMethod, token)) {
      Serial.print(".");
      delay(500);
    }
    initManagedDevice();
    Serial.println();
  }
}

void initManagedDevice() {
  if (client.subscribe(topic)) {
    // Serial.println(client.subscribe(topic));
    Serial.println("IBM subscribe to cmd OK");
  } else {
    Serial.println("subscribe to cmd FAILED");
  }
}

void publishData()

```

```

{
  digitalWrite(trigpin,LOW);
  digitalWrite(trigpin,HIGH);
  delayMicroseconds(10);
  digitalWrite(trigpin,LOW);
  duration=pulseIn(echopin,HIGH);
  dist=duration*speed/2;
  if(dist<100){
    String payload = "{\"Normal Distance\".";
    payload += dist;
    payload += "}";

    Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload);
    if (client.publish(publishTopic, (char*) payload.c_str())) {
      Serial.println("Publish OK");
    }

  }
  if(dist>101 && dist<111){
    String payload = "{\"Alert distance\".";
    payload += dist;
    payload += "}";

    Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload);
    if(client.publish(publishTopic, (char*) payload.c_str())) {
      Serial.println("Warning crosses 110cm -- it automatically of the loop");
      digitalWrite(led,HIGH);
    }else {
      Serial.println("Publish 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++){
    dist += (char)payload[i];
  }
  Serial.println("data:"+ data3);
  if(data3=="lighton"){
    Serial.println(data3);
    digitalWrite(led,HIGH);
  }
  data3="";
}

```

**WOKWI CODE:**

# OUTPUT

WOKWT

SAVE

SHARE

♥

sketch.ino

diagram.json

Browser tab

Library Manager

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wificlient;
4 String data;
5 #define DIO "k8Opti"
6 #define DEVICE_TYPE "ESP32"
7 #define DEVICE_ID "a33143"
8 #define TOKEN "323456789"
9 #define speed 0.004
10 #define led 18
11 char server[] = DIO ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/ent/Kannen/fet/json";
13 char topic[] = "iot-2/cmd/home/fet/String";
14 char authMethod[] = "use-token-auth";
15 char token[] = TOKEN;
16 char client[] = "i:" DIO "/" DEVICE_TYPE "/" DEVICE_ID;
17 PubSubClient client(server, speed, wificlient);
18 void publishData();
19
20
21 const int trigPin=5;
22 const int echoPin=18;
23 String command;
24 String data="";
25
26 //void setup() {
27   pinMode(trigPin, OUTPUT);
28   pinMode(echoPin, OUTPUT);
29   Serial.begin(115200);
30   Serial.println("Starting...");
31   pinMode(led, OUTPUT);
32   digitalWrite(led, LOW);
33   delay(1000);
34   digitalWrite(led, HIGH);
35   delay(1000);
36   digitalWrite(led, LOW);
37   delay(1000);
38   digitalWrite(led, HIGH);
39   delay(1000);
40   digitalWrite(led, LOW);
41   delay(1000);
42   digitalWrite(led, HIGH);
43   delay(1000);
44   digitalWrite(led, LOW);
45   delay(1000);
46   digitalWrite(led, HIGH);
47   delay(1000);
48   digitalWrite(led, LOW);
49   delay(1000);
50   digitalWrite(led, HIGH);
51   delay(1000);
52   digitalWrite(led, LOW);
53   delay(1000);
54   digitalWrite(led, HIGH);
55   delay(1000);
56   digitalWrite(led, LOW);
57   delay(1000);
58   digitalWrite(led, HIGH);
59   delay(1000);
60   digitalWrite(led, LOW);
61   delay(1000);
62   digitalWrite(led, HIGH);
63   delay(1000);
64   digitalWrite(led, LOW);
65   delay(1000);
66   digitalWrite(led, HIGH);
67   delay(1000);
68   digitalWrite(led, LOW);
69   delay(1000);
70   digitalWrite(led, HIGH);
71   delay(1000);
72   digitalWrite(led, LOW);
73   delay(1000);
74   digitalWrite(led, HIGH);
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76   digitalWrite(led, LOW);
77   delay(1000);
78   digitalWrite(led, HIGH);
79   delay(1000);
80   digitalWrite(led, LOW);
81   delay(1000);
82   digitalWrite(led, HIGH);
83   delay(1000);
84   digitalWrite(led, LOW);
85   delay(1000);
86   digitalWrite(led, HIGH);
87   delay(1000);
88   digitalWrite(led, LOW);
89   delay(1000);
90   digitalWrite(led, HIGH);
91   delay(1000);
92   digitalWrite(led, LOW);
93   delay(1000);
94   digitalWrite(led, HIGH);
95   delay(1000);
96   digitalWrite(led, LOW);
97   delay(1000);
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118  digitalWrite(led, HIGH);
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204  digitalWrite(led, LOW);
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216  digitalWrite(led, LOW);
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218  digitalWrite(led, HIGH);
219  delay(1000);
220  digitalWrite(led, LOW);
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222  digitalWrite(led, HIGH);
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224  digitalWrite(led, LOW);
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226  digitalWrite(led, HIGH);
227  delay(1000);
228  digitalWrite(led, LOW);
229  delay(1000);
230  digitalWrite(led, HIGH);
231  delay(1000);
232  digitalWrite(led, LOW);
233  delay(1000);
234  digitalWrite(led, HIGH);
235  delay(1000);
236  digitalWrite(led, LOW);
237  delay(1000);
238  digitalWrite(led, HIGH);
239  delay(1000);
240  digitalWrite(led, LOW);
241  delay(1000);
242  digitalWrite(led, HIGH);
243  delay(1000);
244  digitalWrite(led, LOW);
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246  digitalWrite(led, HIGH);
247  delay(1000);
248  digitalWrite(led, LOW);
249  delay(1000);
250  digitalWrite(led, HIGH);
251  delay(1000);
252  digitalWrite(led, LOW);
253  delay(1000);
254  digitalWrite(led, HIGH);
255  delay(1000);
256  digitalWrite(led, LOW);
257  delay(1000);
258  digitalWrite(led, HIGH);
259  delay(1000);
260  digitalWrite(led, LOW);
261  delay(1000);
262  digitalWrite(led, HIGH);
263  delay(1000);
264  digitalWrite(led, LOW);
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266  digitalWrite(led, HIGH);
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297  delay(1000);
298  digitalWrite(led, HIGH);
299  delay(1000);
300  digitalWrite(led, LOW);
301  delay(1000);
302  digitalWrite(led, HIGH);
303  delay(1000);
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306  digitalWrite(led, HIGH);
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310  digitalWrite(led, HIGH);
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314  digitalWrite(led, HIGH);
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316  digitalWrite(led, LOW);
317  delay(1000);
318  digitalWrite(led, HIGH);
319  delay(1000);
320  digitalWrite(led, LOW);
321  delay(1000);
322  digitalWrite(led, HIGH);
323  delay(1000);
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344  digitalWrite(led, LOW);
345  delay(1000);
346  digitalWrite(led, HIGH);
347  delay(1000);
348  digitalWrite(led, LOW);
349  delay(1000);
350  digitalWrite(led, HIGH);
351  delay(1000);
352  digitalWrite(led, LOW);
353  delay(1000);
3
```

## Distance is less than 100

## IBM Cloud foundry connection

The screenshot shows the IBM Watson IoT Platform interface. At the top, there's a header with the platform name and a user profile. Below the header, there's a navigation bar with tabs: 'Browse', 'Action', 'Device Types', and 'Interfaces'. A blue 'Add Device' button is on the right. The main content area displays a table with the following data:

Event	Value	Format	Last Received
Kannan	{"Alert Distance":57.96}	json	a few seconds ago
Kannan	{"Alert Distance":47.96}	json	a few seconds ago
Kannan	{"Alert Distance":57.96}	json	a few seconds ago
Kannan	{"Alert Distance":47.96}	json	a few seconds ago
Kannan	{"Alert Distance":47.96}	json	a few seconds ago

At the bottom of the table, there's a pagination bar showing 'Items per page: 50' and '1-2 of 2 items'. On the right side of the pagination bar, it says '1 of 1 page' with navigation arrows.

Getting alert message from wokwi