

**ASSIGNMENT 4
WOKWI PROGRAM**

Assignment Date	27 OCT 2022
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PROGRAM

Smart Waste Management System for Metropolitan Cities

ASSIGNMENT 4:

Write code and connections in wokwi for ultrasonic sensors. Whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events. Uplode document with wokwi share link and images of ibm cloud.

CODE:

```
#include <WiFi.h>

#include <PubSubClient.h>

WiFiClient wifiClient;

String data3;

#define ORG "ztcz45"

#define DEVICE_TYPE "naveen"

#define DEVICE_ID "naveen123"

#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);
```

```
    ...
```

```
[10:32 pm, 23/10/2022] Gogul B.E CSE: }
```

```
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 automaticaly 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="";

}

```

out put:

The screenshot displays two side-by-side windows. The left window is the Wokwi IoT simulator, showing a code editor with an Arduino sketch and a virtual breadboard with an ESP32, an ultrasonic sensor, and an LED. The right window is the IBM Watson IoT Platform interface, showing the 'Recent Events' tab for a device named 'naveen123'. The events table shows a series of distance readings in JSON format.

Wokwi IoT Platform Code:

```

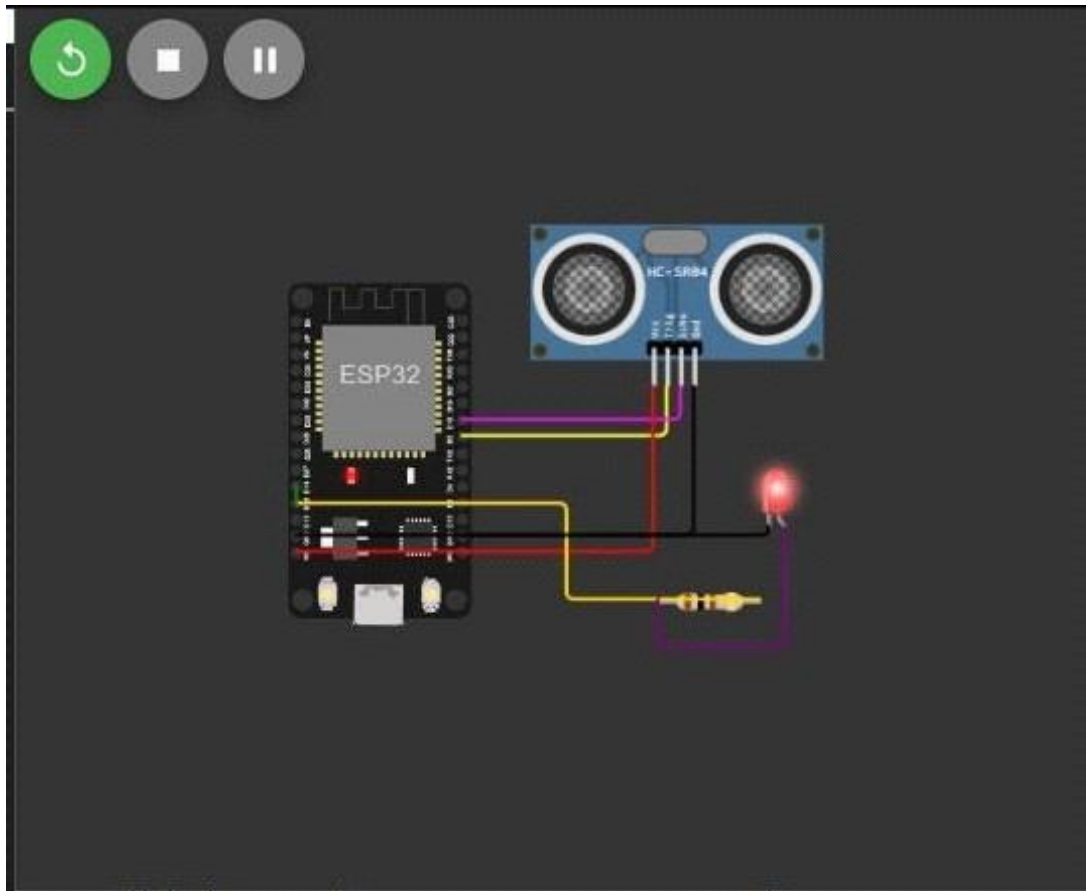
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wifiClient;
4 String data;
5 #define ONG "100cm"
6 #define DEVICE_TYPE "naveen"
7 #define DEVICE_ID "naveen123"
8 #define TOKEN "22856789"
9 #define SPEED 0.014
10 #define led 14
11 char server[] = "mqtt.messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/Data/rm/json";
13 char topic[] = "iot-2/cmd/homeTest/string";
14 char authMethod[] = "use-token-auth";
15 char token[] = TOKEN;
16 char clientId[] = "id-ONG-";
17 PubSubClient client(server, 1883, wifiClient);
18 void publishData();
19
20
21 const int triggerPin=5;
22 const int echopin=18;
23 String Command;
24 String data="";
25
26 long duration;
27 float dist;
28
29
30
31 void setup()
32 {
33   Serial.begin(115200);
34   pinMode(led, OUTPUT);
35   pinMode(triggerPin, OUTPUT);
36   pinMode(echopin, INPUT);
37   wifiConnect();
38   mqttConnect();
39
40 }
41
42 void loop() {
43   bool isNearby = dist < 100;
44   digitalWrite(led, isNearby);

```

IBM Watson IoT Platform Recent Events:

Event	Value	Format	Last threshold
Data	{"Alert distance":110.94}	json	a few second
Data	{"Alert distance":110.96}	json	a few second
Data	{"Alert distance":110.98}	json	a few second
Data	{"Alert distance":110.98}	json	a few second
Data	{"Alert distance":110.98}	json	a few second

1. When distance under 100 cm it wil show normal distance.



Publish OK

Sending payload:{"Normal Distance":89.95}

Publish OK

Sending payload: {'Normal Distance':89.95}

Publish OK

Sending payload:{"Normal Distance":89.95}

Publish OK

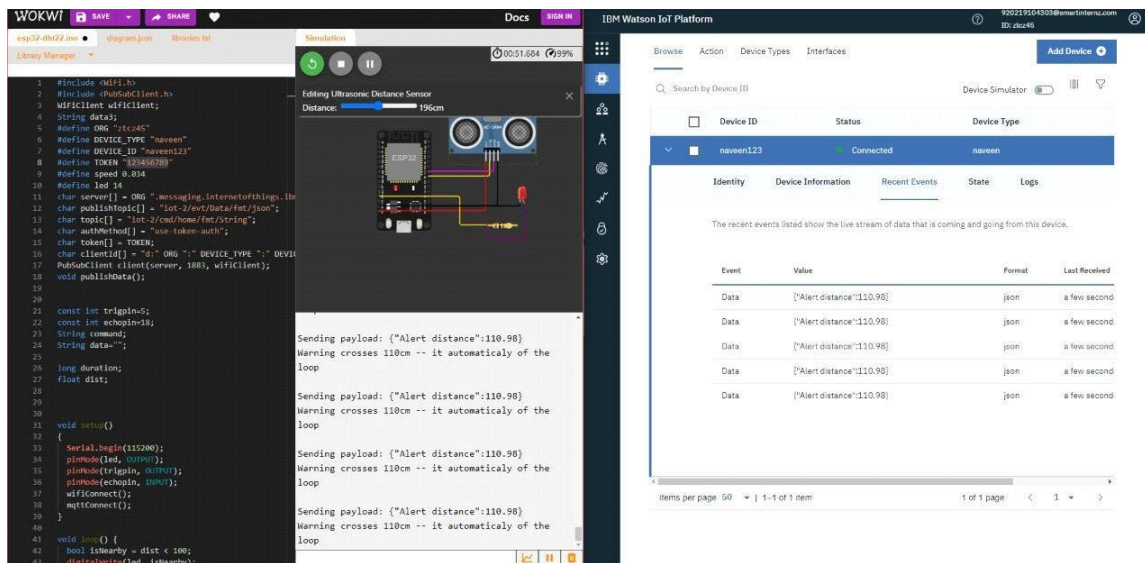
Sending payload: {'Normal Distance':89.95}

Publish OK

Sending payload:{"Normal Distance":89.95}

Publish OK

2. When distance cross 100 cm it wil show ALERT warning message distance



The screenshot displays two side-by-side windows. The left window is the Wokwi IDE, showing a C++ sketch for an ESP32 connected to an Ultrasonic Distance Sensor. The code includes headers for PubSubClient and WiFi, defines device ID 'naveen123' and token 'ztcz45', and sets up a loop that sends distance data to a topic 'data' every 100ms. A comment indicates that when the distance crosses 110cm, it will automatically trigger an alert. The right window is the IBM Watson IoT Platform interface, showing the device 'naveen123' in a 'Connected' state. The 'Recent Events' tab is selected, displaying a table of events where the 'Value' is consistently '["Alert distance":110.98]'.

Event	Value	Format	Last Received
Data	["Alert distance":110.98]	json	a few second
Data	["Alert distance":110.98]	json	a few second
Data	["Alert distance":110.98]	json	a few second
Data	["Alert distance":110.98]	json	a few second
Data	["Alert distance":110.98]	json	a few second

3. When it cross above 110 cm it today move to iff state once it reduce to 110 it on again

Connection information:

Basic connetction information about this device.

Organization ID : ztcz45

Device Type : naveen

Device ID : naveen123

Authentication Method : use-token-auth

Authentication Token : 123456789

▼

■

naveen123

Connected

naveen

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	{"Normal Distance":89.95}	json	a few second:
Data	{"Normal Distance":89.95}	json	a few second:
Data	{"Normal Distance":89.95}	json	a few second:
Data	{"Normal Distance":89.95}	json	a few second:
Data	{"Normal Distance":89.95}	json	a few second: