

## ASSIGNMENT 4

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DATE	25-10-2022
TEAM ID	PNT2022TMID22325
PROJECT NAME	Signs with Smart Connectivity for Better Road Safety

**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**

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "c0mbt9"
#define DEVICE_TYPE "Node"
#define DEVICE_ID "1234"
#define TOKEN "987654321"
#define speed 0.034 #define
led 14

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-
2/evt/shanmugam_assignment4/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);
```

```
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 = "{\"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("Publish OK");
    }
}

if(dist>100){
    String payload = "{\"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");
    }else {
        Serial.println("Publish FAILED");
    }
}
}

```

}

## OUTPUT:

i) When distance greater than 100 cm

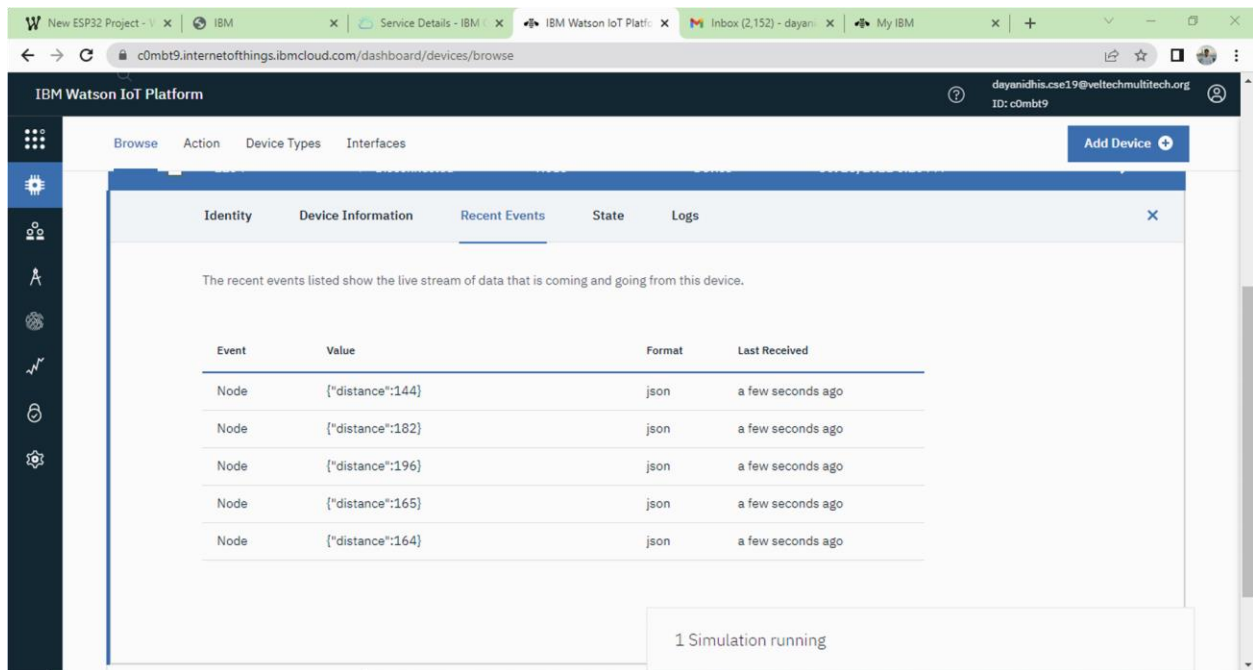
The screenshot displays the Wokwi online IDE interface. On the left, the 'sketch.ino' file is open, showing the following code:

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wificlient;
4 String data3;
5 #define ORG "x0fxss"
6 #define DEVICE_TYPE "Node"
7 #define DEVICE_ID "1234"
8 #define TOKEN "987654321"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/shanmugam_assignment4/fmt/json";
13 char topic[] = "iot-2/cmd/home/fmt/String";
14 char authMethod[] = "use-token-auth";
15 char token[] = TOKEN;
16 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
17 PubSubClient client(server, 1883, wificlient);
18
19
20
21 const int trigpin=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);
```

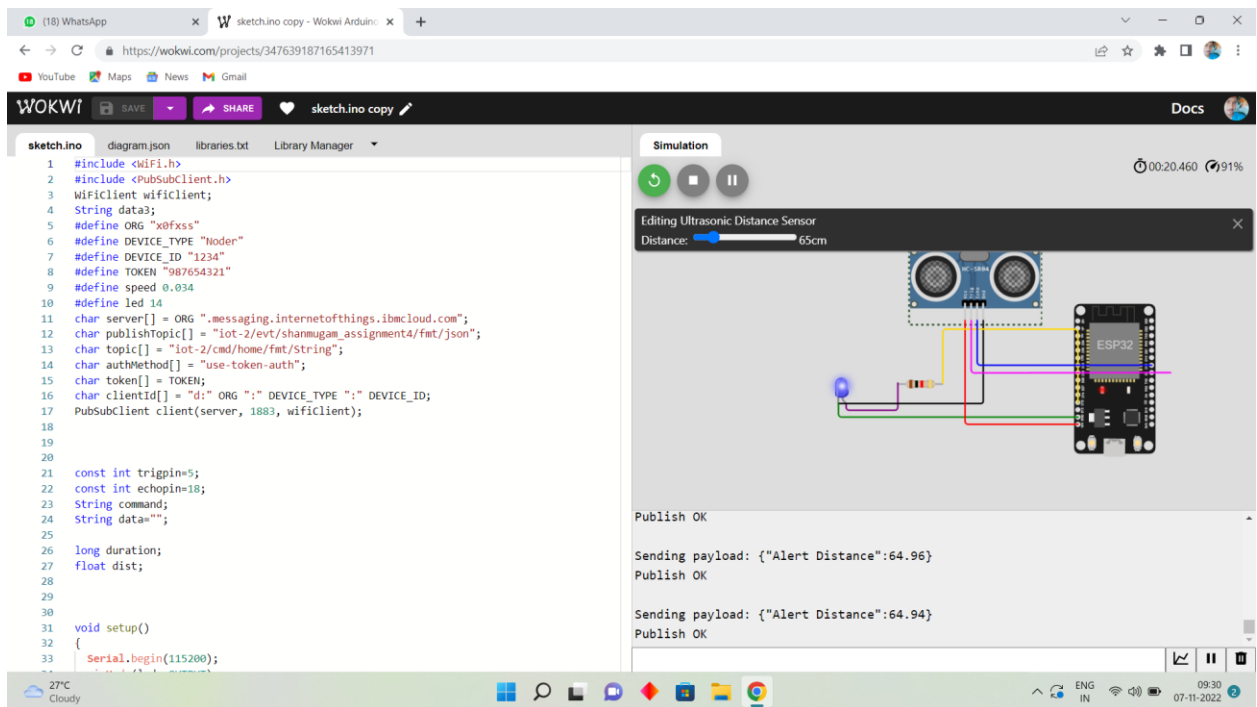
On the right, the 'Simulation' window shows a visual representation of the ESP32 microcontroller and an ultrasonic sensor module connected by wires. Below the simulation, the serial output is visible, showing the following messages:

```
Publish OK
Sending payload: {"Distance":399.96}
Publish OK
Sending payload: {"Distance":399.96}
Publish OK
```

The bottom status bar of the IDE indicates a temperature of 27°C, a cloudy weather condition, and the system time as 09:30 on 07-11-2022.



ii)When distance less than 100



W New ESP32 Project - x IBM Service Details - IBM x IBM Watson IoT Platf: x Inbox (2,152) - dayani x My IBM x

c0mbt9.internetofthings.ibmcloud.com/dashboard/devices/browse

IBM Watson IoT Platform

dayanidhis.cse19@veltechmultitech.org ID: c0mbt9

Browse Action Device Types Interfaces Add Device

Event	Value	Format	Last Received
Node	{"distance":8}	json	a few seconds ago
Node	{"distance":88}	json	a few seconds ago
Node	{"distance":5}	json	a few seconds ago
Node	{"distance":9}	json	a few seconds ago
Node	{"distance":11}	json	a few seconds ago

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1 Simulation running

**WOKWI LINK –**

<https://wokwi.com/projects/347639187165413971>