

## Assignment - 4

Team ID	PNT2022TMID01720
Register Number	Smart Waste Management System For Metropolitan Cities
Maximum Marks	2 Marks

### ASSIGNMENT TOPIC:

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.

Upload document with wokwi share link and images of ibm cloud.

### CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
#define ORG "dluuhi"
#define DEVICE_TYPE "Assignment_4"
#define DEVICE_ID "23323850"
#define TOKEN "12345678"
#define speed 0.034

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=2;
const int echopin=15;
String command;
String data="";
long duration;
float dist;

void setup()
{
  Serial.begin(115200);
  pinMode(trigpin, OUTPUT);
```

```

pinMode(echopin, INPUT);
wifiConnect();
mqttConnect();
}
void loop() {
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("subscribe to cmd OK");
    }
    else {
        Serial.println("subscribe to cmd FAILED"); }
}
void publishData()
{
    digitalWrite(trigpin, LOW);
    digitalWrite(trigpin, HIGH);
    delayMicroseconds(10);
}

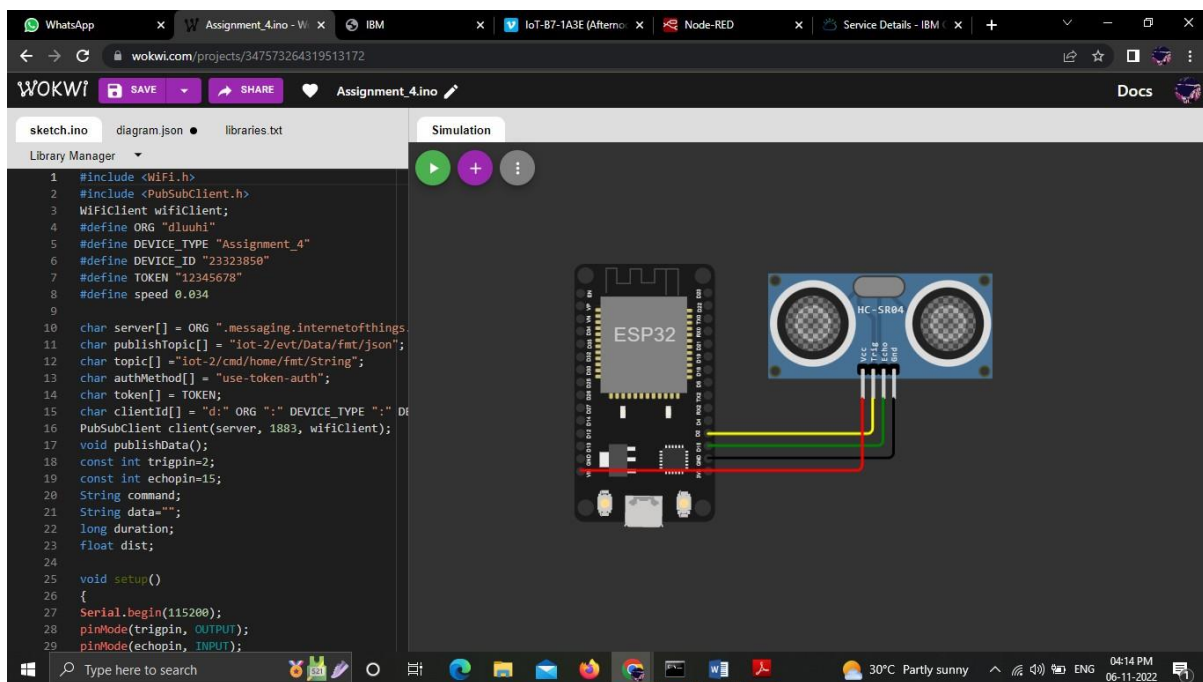
```

```

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");
    } else {
        Serial.println("Publish FAILED");
    }
}
}
}

```

## CONNECTIONS:



## OUTPUT:

The image displays two screenshots of the Wokwi IoT simulator interface, showing the execution of an Arduino sketch on an ESP32 microcontroller connected to an HC-SR04 ultrasonic distance sensor.

**Top Screenshot:**

- Sketch Code:**

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wificlient;
4 #define ORG "dluuhi"
5 #define DEVICE_TYPE "Assignment_4"
6 #define DEVICE_ID "23323850"
7 #define TOKEN "12345678"
8 #define speed 0.034
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10 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
11 char publishTopic[] = "iot-2/evt/Data/fmt/json";
12 char topic[] = "iot-2/cmd/home/fmt/String";
13 char authMethod[] = "use-token-auth";
14 char token[] = TOKEN;
15 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
16 PubSubClient client(server, 1883, wificlient);
17 void publishData();
18 const int trigpin=2;
19 const int echopin=15;
20 String command;
21 String data="";
22 long duration;
23 float dist;
24
25 void setup()
26 {
27   Serial.begin(115200);
28   pinMode(trigpin, OUTPUT);
29   pinMode(echopin, INPUT);
30   wifiConnect();
31 }
```
- Simulation Log:**
  - Connecting to Wifi..Wifi connected, IP address: 10.10.0.2
  - Reconnecting MQTT client to dluuhi.messaging.internetofthings.ibmcloud.com
  - subscribe to cmd OK
  - Sending payload: {"Alert distance":67.95}
  - Publish OK

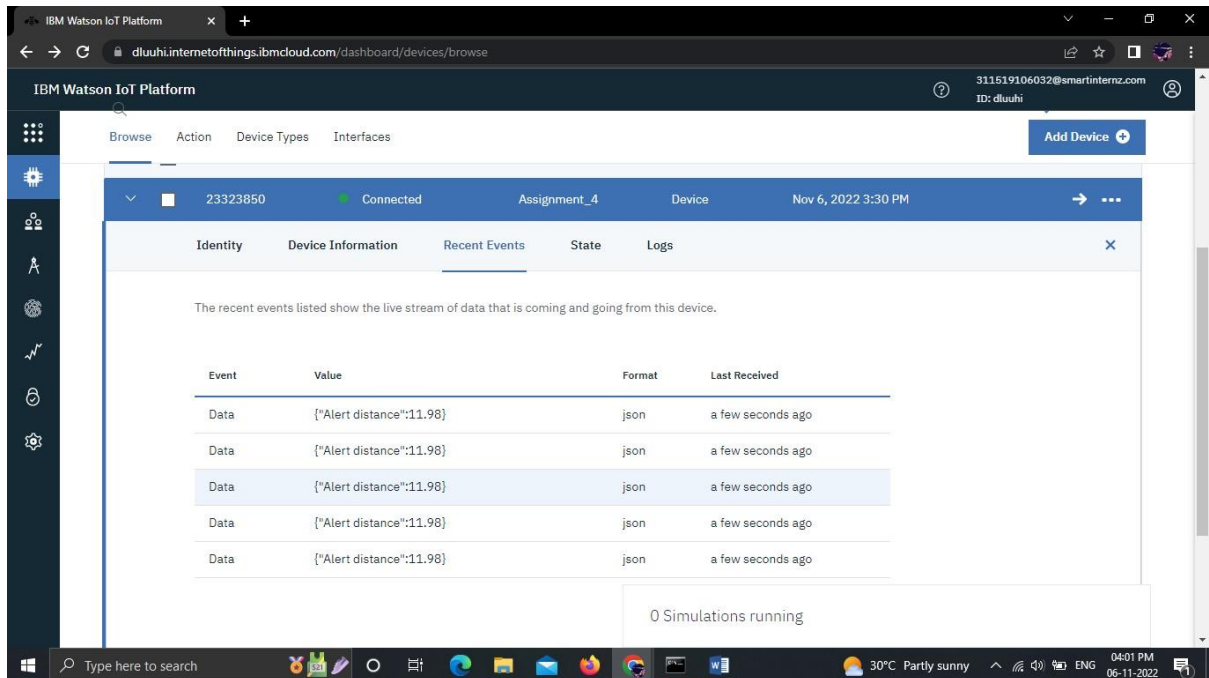
**Bottom Screenshot:**

- Sketch Code:**

```
1 #include <WiFi.h>
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3 WiFiClient wificlient;
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24
25 void setup()
26 {
27   Serial.begin(115200);
28   pinMode(trigpin, OUTPUT);
29   pinMode(echopin, INPUT);
30   wifiConnect();
31 }
```
- Simulation Log:**
  - Publish OK
  - Sending payload: {"Alert distance":11.97}
  - Publish OK
  - Sending payload: {"Alert distance":11.98}
  - Publish OK

The interface also shows a visual representation of the ESP32 board and the HC-SR04 sensor connected via jumper wires. A control panel for the sensor is visible, showing a distance of 12cm.

## OUTPUT IN IOT CLOUD PLATFORM:



The screenshot displays the IBM Watson IoT Platform interface. The top navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. A sidebar on the left contains various icons for navigation. The main content area shows a device with ID '23323850' in a 'Connected' state, assigned to 'Assignment\_4'. Below this, a 'Recent Events' tab is selected, showing a table of events. The table has columns for 'Event', 'Value', 'Format', and 'Last Received'. The events listed are all 'Data' events with the value '{"Alert distance":11.98}' in 'json' format, received 'a few seconds ago'. A status bar at the bottom indicates '0 Simulations running'.

Event	Value	Format	Last Received
Data	{"Alert distance":11.98}	json	a few seconds ago
Data	{"Alert distance":11.98}	json	a few seconds ago
Data	{"Alert distance":11.98}	json	a few seconds ago
Data	{"Alert distance":11.98}	json	a few seconds ago
Data	{"Alert distance":11.98}	json	a few seconds ago

## WOKWI LINK:

<https://wokwi.com/projects/34757326431951317>