

## Assignment - 4

### Wowki & IBM Cloud

<b>Assignment Date</b>	27 October 2022
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<b>Maximum Marks</b>	2 Marks

Question-1:

Write code and connections in wowki for the ultrasonic sensor. Whenever the distance is less than 100cms sent "alert" to IBM cloud and display in device recent events.

Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
#include <ArduinoJson.h>

WiFiClient wifiClient;

#define ORG "kr9fjo"
#define DEVICE_TYPE "TestDeviceType"
#define DEVICE_ID "12345"
#define TOKEN "VJsSC148dk1dCN3UqS"
#define speed 0.034

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/abcd_1/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="";
String lat="14.167589";
String lon="80.248510";
String name="point2";
String icon="";

long duration;
int 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(1000);
        }
        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){
        dist=100-dist;
        icon="fa-trash";
    }else{
        dist=0;
        icon="fa-trash-o";
    }
    DynamicJsonDocument doc(1024);
    String payload;
    doc["Name"]=name;
    doc["Latitude"]=lat;

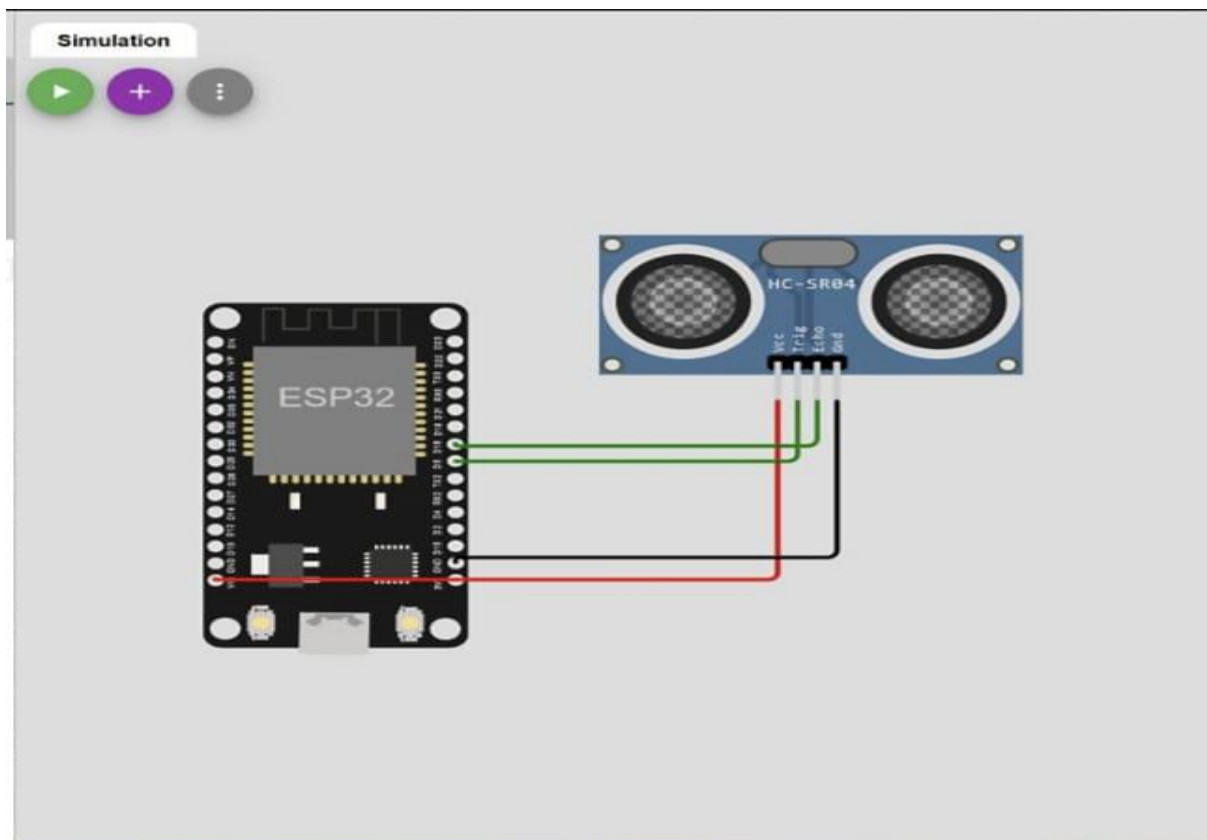
```

```

doc["Longitude"]=lon;
doc["Icon"]=icon;
doc["FillPercent"]=dist;
serializeJson(doc, payload);
delay(3000);
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 screenshot shows the Wokwi web interface for an ESP32 simulation. The left pane displays the sketch code, which includes headers for WiFi, PubSubClient, and ArduinoJson, and defines device-specific constants like ORG, DEVICE\_TYPE, DEVICE\_ID, and TOKEN. The main logic involves connecting to an IBM Cloud IoT endpoint, publishing data, and sending a payload. The right pane shows a virtual circuit diagram with an ESP32 module connected to an HC-SR04 ultrasonic sensor. The simulation status bar at the top right indicates a runtime of 00:33.768 and 100% completion. The bottom status bar shows system information like temperature (29°C) and date (29-10-2022).

```
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2 #include <PubSubClient.h>
3 #include <ArduinoJson.h>
4
5 WiFiClient wifiClient;
6
7 #define ORG "kr9fjo"
8 #define DEVICE_TYPE "TestDeviceType"
9 #define DEVICE_ID "12345"
10 #define TOKEN "Vjs5C148dk1dCN3Uq5"
11 #define speed 0.034
12
13 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
14 char publishTopic[] = "iot-2/evt/abcd_1/fmt/json";
15 char topic[] = "iot-2/cmd/home/fmt/String";
16 char authMethod[] = "use-token-auth";
17 char token[] = TOKEN;
18 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
19 PubSubClient client(server, 1883, wifiClient);
20 void publishData();
21
22 const int trigPin=5;
23 const int echopin=18;
24 String command;
25 String data="";
26 String lat="14.167589";
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```

## Output:(IBM Cloud)

The screenshot displays the IBM Watson IoT Platform dashboard. The top navigation bar includes tabs for Browse, Action, Device Types, and Interfaces. The main content area shows the 'Recent Events' tab for a specific device. A table lists the recent events, including the event name, value, format, and last received time. The table shows five events, all with the value '{"Alert distance":51}' and format 'json'. The bottom status bar indicates '1 Simulation running'.

Event	Value	Format	Last Received
event_1	{"Alert distance":51}	json	a few seconds ago
event_1	{"Alert distance":23}	json	a few seconds ago
event_1	{"Alert distance":73}	json	a few seconds ago
event_1	{"Alert distance":66}	json	a few seconds ago
event_1	{"Alert distance":51}	json	a few seconds ago

Link: <https://wokwi.com/projects/346858285644644946>

**Link :**<https://wokwi.com/projects/346857404558738004>