

Assignment -4

Assignment Date	25 October 2022
Student Name	Mr. A JOYSON VASHIIKARAN
Student Roll Number	95071914042

Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cm send “alert” to ibm cloud and display in device recent events.

Code :

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "hycgw4"
#define DEVICE_TYPE "Distance"
#define DEVICE_ID "Ultrasonic"
#define TOKEN "WD6Mb(-d2F+X0xWqnB"
#define speed 0.034 #define led 14 char server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char publishTopic[] = "iot-
2/evt/event2/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,LO
W);
digitalWrite(trigpin,HIG
H);
delayMicroseconds(10);
digitalWrite(trigpin,LO
W);
duration=pulseIn(echopi
n,HIGH);
dist=duration*speed/2;
if(dist<100){
    String payload = "{\"Alert!! 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 += "}";

```

```

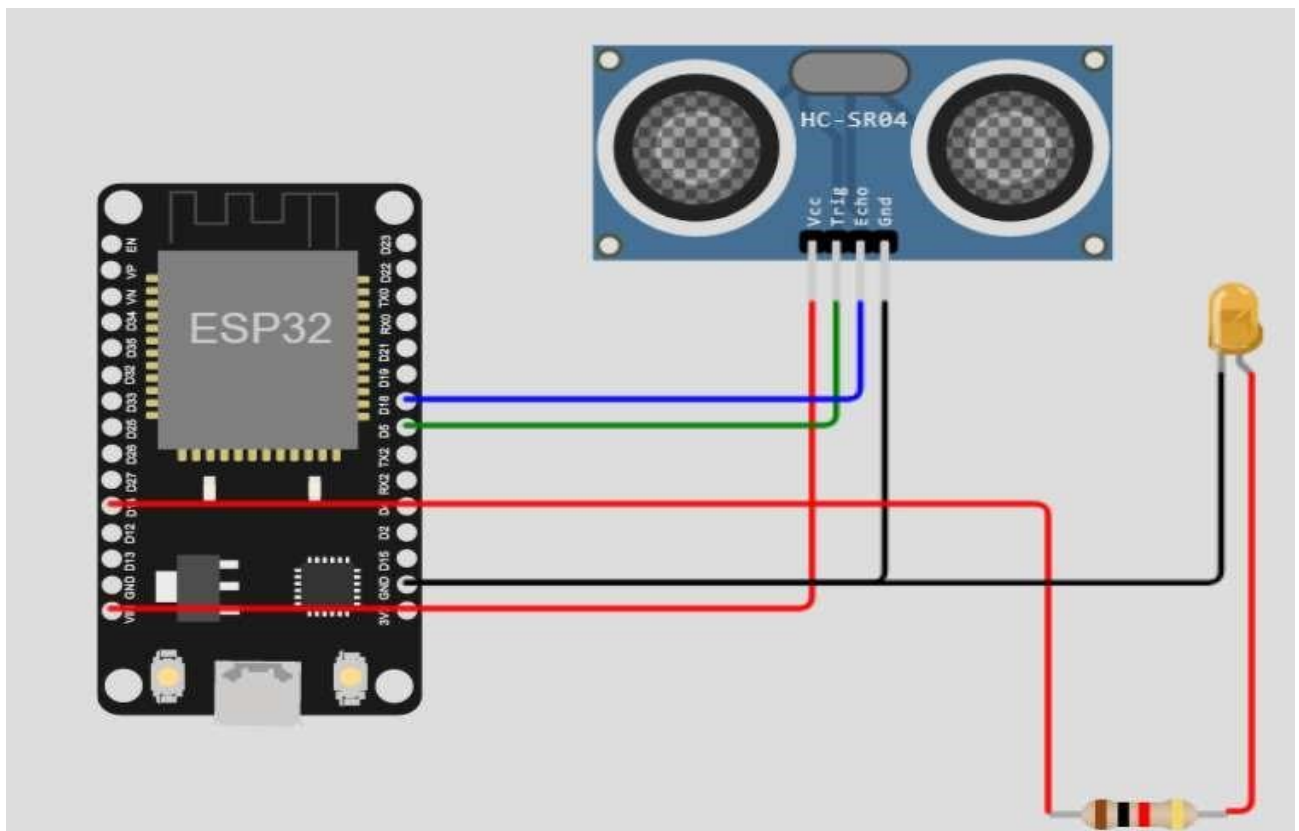
Serial.print("\n");
Serial.print("Sending payload: "); Serial.println(payload);
if(client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish OK");
}else {
    Serial.println("Publish FAILED");
}

}

}

```

Connections:



WOKWI AND IBM CLOUD CONNECTED:

IBM Watson IoT Platform

hariprasad.cse19@veltechmultitech.org
ID: hycgw4

Browse Action Device Types Interfaces

Add Device

Browse Devices

All Devices Diagnose

This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

Search by Device ID

Device Simulator

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
12	Disconnected	abcd	Device	Oct 12, 2022 6:39 PM	
Ultrasonic	Connected	Distance	Device	Oct 25, 2022 7:04 PM	

Items per page 50 of 2 items

1 of 1 page

1 Simulation running

OUTPUT:

1. Distance = 95 cm Status
= Alert Message

WOKWI

SAVE SHARE

Docs

sketch.ino diagram.json libraries.txt Library Manager

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wifiClient;
4 String data3;
5 #define ORG "hycgw4"
6 #define DEVICE_TYPE "Distance"
7 #define DEVICE_ID "Ultrasonic"
8 #define TOKEN "wD6Mb(-d2F+X0x4qN8"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/event2/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);

```

Simulation

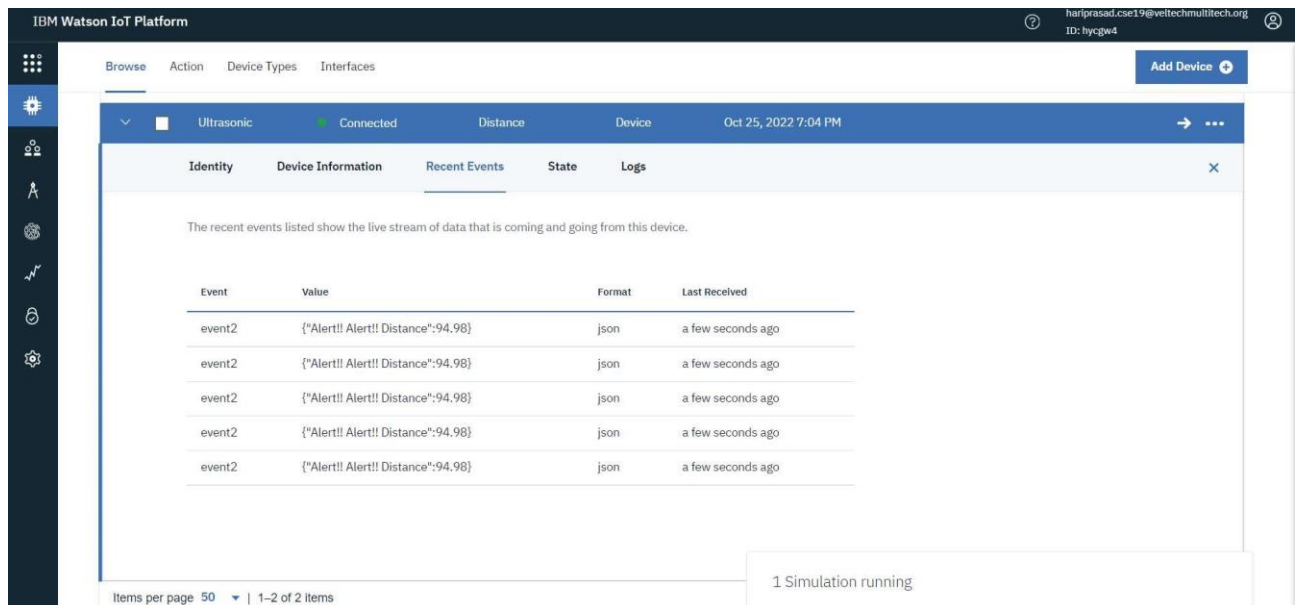
00:25.433 99%

Editing Ultrasonic Distance Sensor

Distance: 95cm

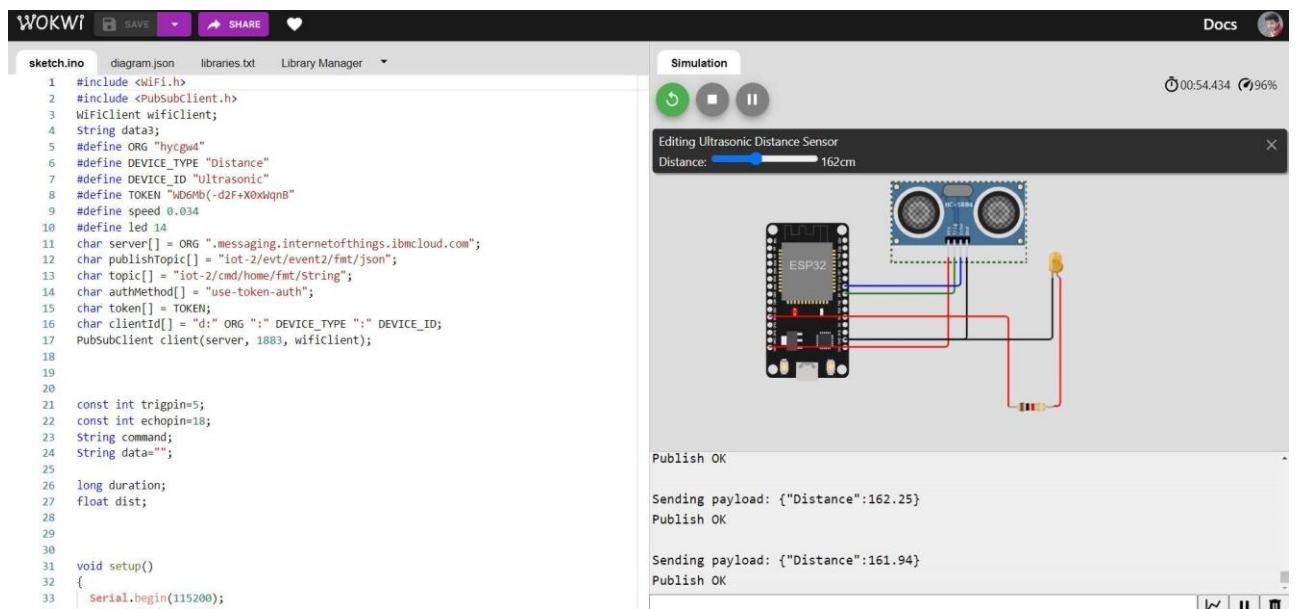
Connecting to Wifi.....Wifi connected, IP address: 10.10.0.2
Reconnecting MQTT client to hycgw4.messaging.internetofthings.ibmcloud.com
IBM subscribe to cmd OK

Sending payload: {"Alert!! Alert!! Distance":95.03}
Publish OK



Wokwi data publishing to ibm cloud

- Distance = 162 cm
Status = Normal



IBM Watson IoT Platform

hariprasad.cse19@vettechnilitech.org
ID: hycgw4

Browse Action Device Types Interfaces

Add Device

▼ Ultrasonic Connected Distance Device Oct 25, 2022 7:04 PM

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
event2	{"Distance":161.94}	json	a few seconds ago
event2	{"Distance":161.94}	json	a few seconds ago
event2	{"Distance":161.94}	json	a few seconds ago
event2	{"Distance":161.94}	json	a few seconds ago
event2	{"Distance":161.94}	json	a few seconds ago

Items per page 50 | 1-2 of 2 items

1 Simulation running

3. Distance = 27 cm Status
= Alert Message

WOKWI

SAVE SHARE

Docs

sketch.ino diagram.json libraries.txt Library Manager

```

1 #include <WiFi.h>
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3 WiFiClient wifiClient;
4 String data3;
5 #define ORG "hycgw4"
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10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
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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);
34   // Serial.begin(115200);
  
```

Simulation

01:03.901 99%

Editing Ultrasonic Distance Sensor

Distance: 27cm

Publish OK

Sending payload: {"Alert!! Alert!! Distance":26.98}

Publish OK

Sending payload: {"Alert!! Alert!! Distance":26.98}

Publish OK

IBM Watson IoT Platform

hari@prasad.cse19@veltechmultitech.org
ID: hycgm4

hamburger menu

Browse

Action

Device Types

Interfaces

Add Device

Ultrasonic

Connected

Distance

Device

Oct 25, 2022 7:04 PM

More

Identity

Device Information

Recent Events

State

Logs

Close

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
event2	{"Alert!! Alert!! Distance":26.98}	json	a few seconds ago
event2	{"Alert!! Alert!! Distance":26.98}	json	a few seconds ago
event2	{"Alert!! Alert!! Distance":26.98}	json	a few seconds ago
event2	{"Alert!! Alert!! Distance":26.98}	json	a few seconds ago
event2	{"Alert!! Alert!! Distance":26.98}	json	a few seconds ago

1 Simulation running

Items per page 50

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Reference link = <https://wokwi.com/projects/346498745135792724>