

Assignment -4

Assignment Date	01 November 2022
Student Name	NAVEEN KUMAR S
Student Roll Number	953619106049
Maximum Marks	2 Marks

Question-1:

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events. Upload document with wokwi share link and images of IBM cloud.

Solution:

```
#include <WiFi.h>

#include <PubSubClient.h>

WiFiClient wifiClient;

String data3;

#define ORG "ors2mf"

#define DEVICE_TYPE "DESKTOP-Q2MHRQ6"

#define DEVICE_ID "naveen-device"

#define TOKEN "@hNPg*g@tNske9NSYa"

#define speed 0.034

#define led 14

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[] = "iot-2/evt/Naveen/fmt/json";

char topic[] = "iot-2/cmd/led/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 {

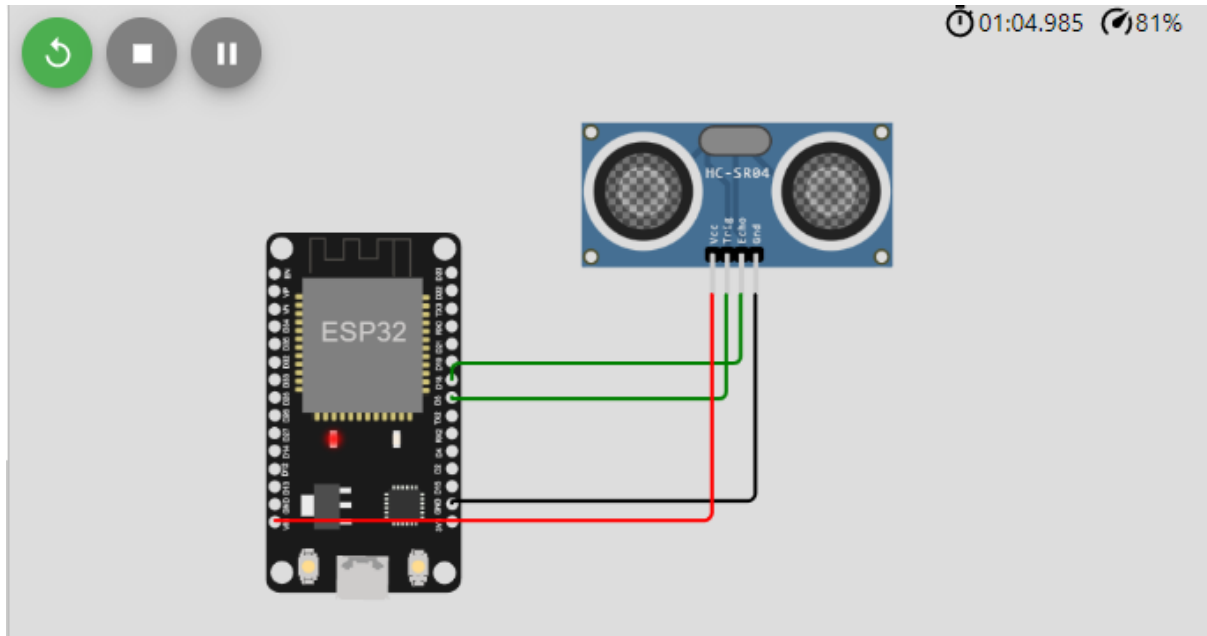
Serial.println("Publish FAILED");

}

}

}
```

Output:



Connecting to Wifi.WiFi connected, IP address: 10.10.0.2

Reconnecting MQTT client to tf8b7z.messaging.internetofthings.ibmcloud.com

IBM subscribe to cmd OK

Sending payload: {"Distance":399.92}

Publish OK

Sending payload: {"Distance":399.92}

Publish OK

Sending payload: {"Distance":399.92}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.92}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.92}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.92}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.94}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.94}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

IBM Output:

The screenshot displays the Watson IoT Platform interface. At the top, the header shows 'Watson IoT Platform' and a user profile with email '953619106049@nitrrpm.ac.in' and ID 'ors2mf'. Below the header, a navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. A blue button labeled 'Add Device' is on the right. The main content area shows a device named 'naveen-device' with status 'Disconnected' and ID 'DESKTOP-Q2MHRQ6'. The 'Recent Events' tab is selected, showing a table of events. The table has columns: Event, Value, Format, and Last Received. The events listed are:

Event	Value	Format	Last Received
Naveen	{"Distance":399.96}	json	a few seconds ago
Naveen	{"Distance":399.94}	json	a few seconds ago
Naveen	{"Distance":399.96}	json	a few seconds ago
Naveen	{"Distance":399.96}	json	2 minutes ago
Naveen	{"Distance":399.96}	json	2 minutes ago

Wokwi Link:

<https://wokwi.com/projects/347134616744755794>