

Assignment - 4

Assignment Date	21 October 2022
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Maximum Mark	

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.

Solution:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "1wiom1"
#define DEVICE_TYPE "Sandhiya_P"
#define DEVICE_ID "13022002"
#define TOKEN "9994588925"
#define speed 0.034
#define led 14
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=12;  
const int echopin=14;  
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 = "{\"Normal 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>101 && dist<111){
    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("Warning crosses 110cm -- it automatically of the loop");
        digitalWrite(led,HIGH);
    }else {
        Serial.println("Publish FAILED");
    }
}

}

}

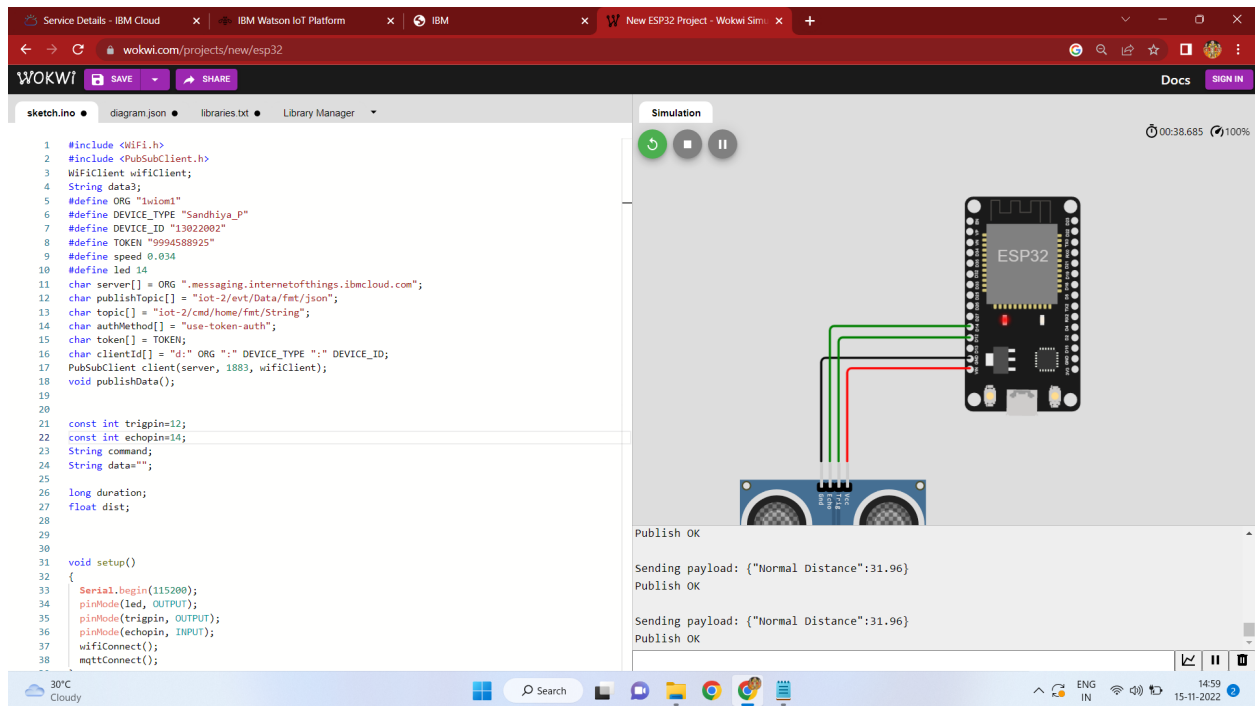
void callback(char* subscribeTopic, byte* payload, unsigned int payloadLength){
    Serial.print("callback invoked for topic:");
    Serial.println(subscribeTopic);
    for(int i=0; i<payloadLength; i++){
        dist += (char)payload[i];
    }
    Serial.println("data:" + data3);
}

```

```

if(data3=="lighton"){
  Serial.println(data3);
  digitalWrite(led,HIGH);
}
data3="";
}

```



Service Details - IBM Cloud

IBM Watson IoT Platform

IBM

New ESP32 Project - Wokwi Sim

1wio1.internetofthings.ibmcloud.com/dashboard/devices/browse

IBM Watson IoT Platform

maiermyno02@gmail.com

IoT Toolkit

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	Added By	Device Class	Firmware Version	Hardware Version
13022002	Connected	Sandhuja_P	Device	15 Nov 2022 14:46		maiermyno02@gmail.com			

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
Data	[{"Normal Distance":98.94}]	json	a few seconds ago
Data	[{"Normal Distance":98.94}]	json	a few seconds ago
Data	[{"Normal Distance":98.94}]	json	a few seconds ago
Data	[{"Normal Distance":98.94}]	json	a few seconds ago
Data	[{"Normal Distance":98.94}]	json	a few seconds ago

Items per page 50

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0 Simulations running

30°C Cloudy

Search

ENG IN

15:03

15-11-2022