

Assignment - 4

Assignment Date	21 OCTOBER 2022
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Maximum 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.

Solution

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "qlmiip"
#define DEVICE_TYPE "Ramya_H"
#define DEVICE_ID "20062002"
#define TOKEN "6380176790"
#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=32;
const int echopin=33;
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 automaticaly of the loop");
            digitalWrite(led,HIGH);
        }else {
            Serial.println("Publish FAILED");
        }

    }

}

}

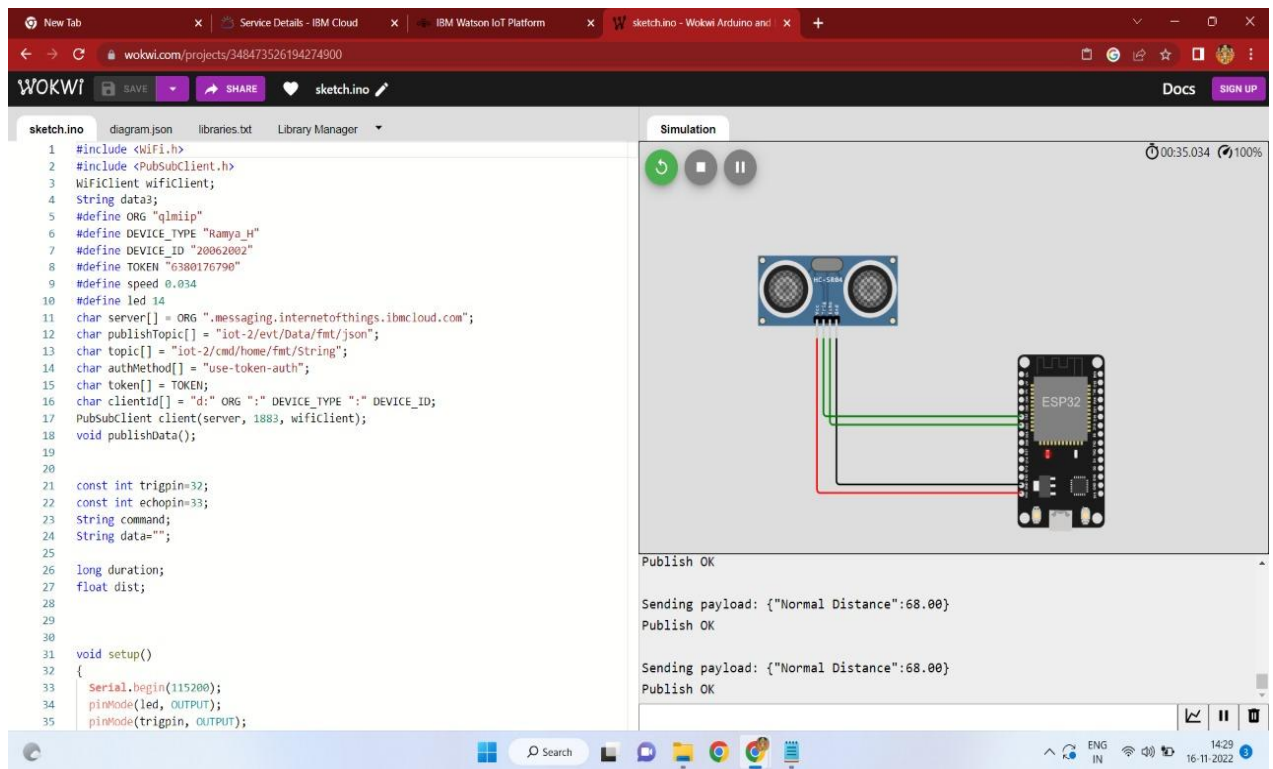
void callback(char* subscribeTopic, byte* payload, unsigned int payloadLength){
    Serial.print("callback invoked for topic:");
    Serial.println(subscribeTopic);

```

```

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="";
}

```



New TabService Details - IBM CloudIBM Watson IoT PlatformSketchino - Wokwi Arduino and

qlmiip.internetofthings.ibmcloud.com/dashboard/devices/browse

IBM Watson IoT Platform513419106028@smartinternz.comID: qlmiip

BrowseActionDevice TypesInterfaces

Add Device

Search by Device IDDevice Simulator

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
20062002	Connected	Ramya_H	Device	16 Nov 2022 12:41	

IdentityDevice InformationRecent EventsStateLogs

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":68}	json	a few seconds ago
Data	{"Normal Distance":68}	json	a few seconds ago
Data	{"Normal Distance":68}	json	a few seconds ago
Data	{"Normal Distance":68}	json	a few seconds ago
Data	{"Normal Distance":68}	json	a few seconds ago

Search

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