

Assignment Date	27 OCT 2022
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Team id	PNT2022TMID46747
Project Title	Smart solution for railways
Maximum Marks	2 marks

ASSIGNMENT 4

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cm s 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.

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "g736vj"
#define DEVICE_TYPE "sathana"
#define DEVICE_ID "sathu123"
#define TOKEN "12345678"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/sathana/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="";

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("Warning crosses 110cm -- it automatically of
the loop");
            digitalWrite(led,HIGH);
        }
    }
    if(dist>101 && dist<111){
        String payload = "{\"Normal Distance\":\"";
        payload += dist;
        payload += "}";

        Serial.print("\n");
        Serial.print("Sending payload: ");
        Serial.println(payload);

    }
}

```

```

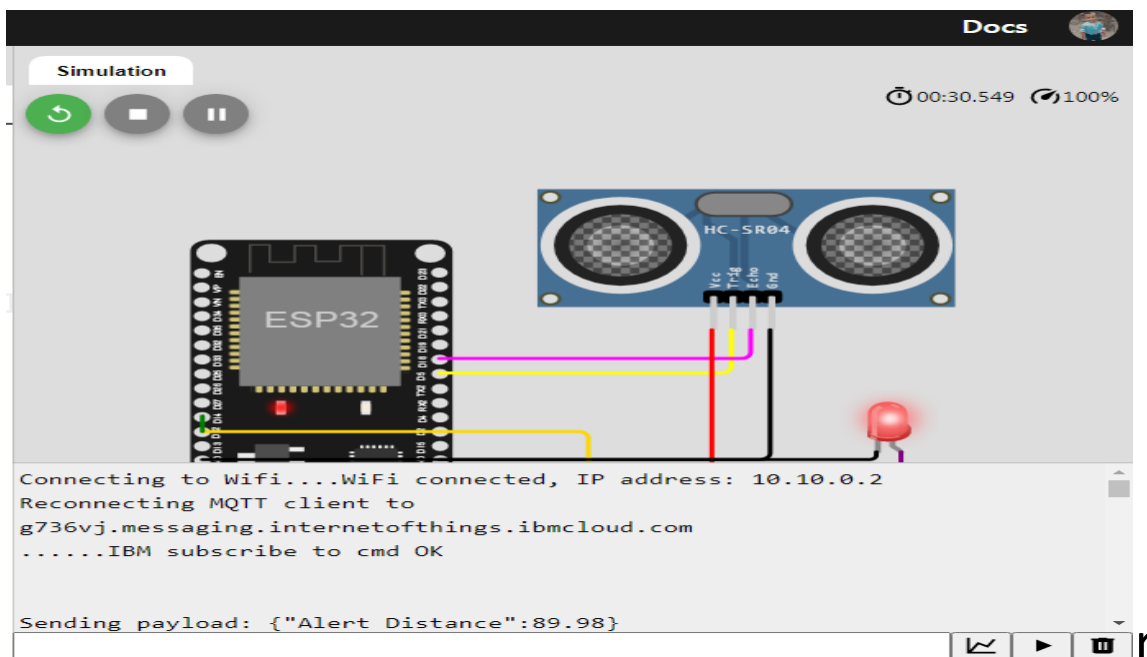
void callback(char* subscribeTopic, byte* payload, unsigned int
payloadLength){

```

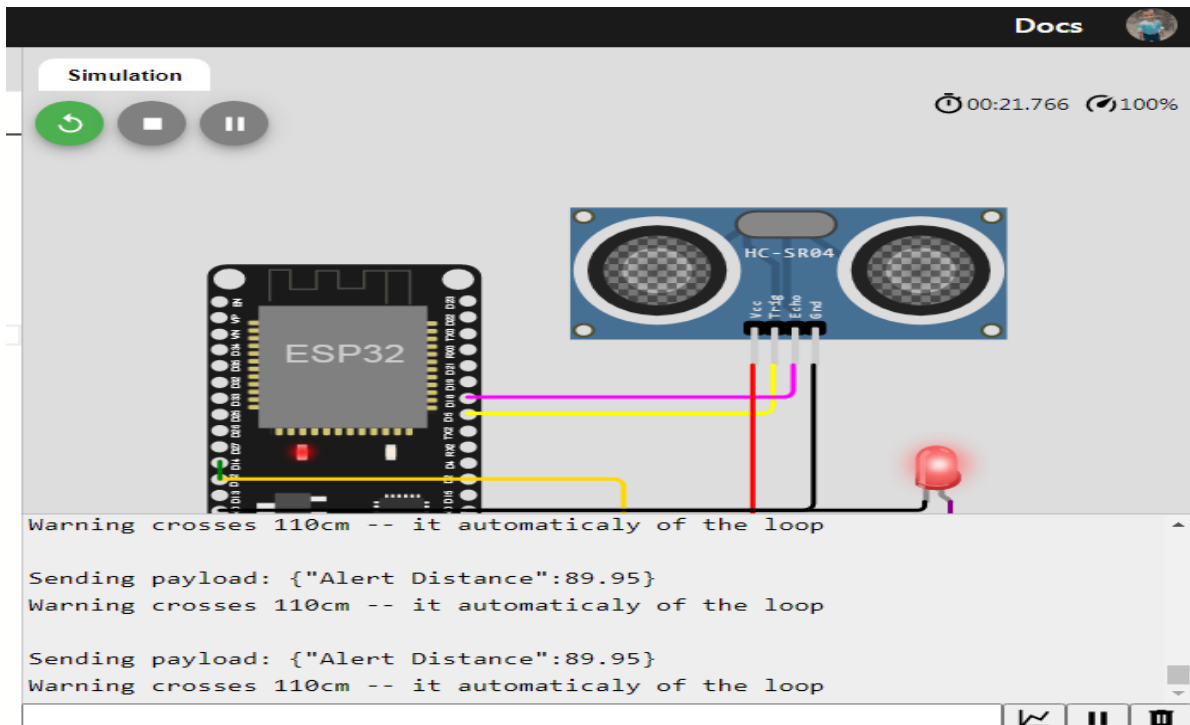
```

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="";
}

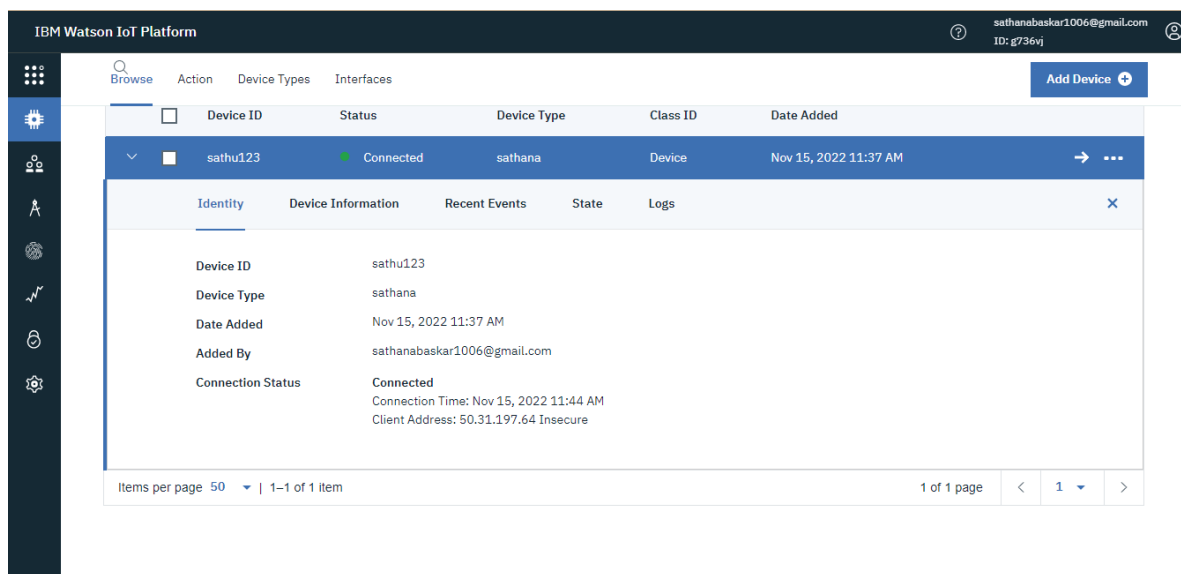
```



While Distance is greater than 100cm there is no alert message in the IBM cloud.



When the distance is less than 100cm alert message will appear in the IBM cloud.



IBM Watson IoT Platform

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Device Drilldown - sathu123

Recent Events

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

Event	Value	Format	Last Received
sathana	{"Alert Distance":89.95}	json	a few seconds ago
sathana	{"Alert Distance":89.95}	json	a few seconds ago
sathana	{"Alert Distance":89.95}	json	a few seconds ago
sathana	{"Alert Distance":89.96}	json	a few seconds ago
sathana	{"Alert Distance":89.95}	json	a few seconds ago

Connection Information

Recent Events

State

Device Information

Metadata

Diagnostics

Connection Logs

Device Actions

<https://wokwi.com/projects/348372548239491666>