

Assignment -4

Assignment Date	10 Oct 2022
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Student Roll Number	212019104028
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

Program:

```
#include <WiFi.h>
#include <PubSubClient.h>
#include <ArduinoJson.h>

WiFiClient wifiClient;

#define ORG "kr9fjo"
#define DEVICE_TYPE "TestDeviceType"
#define DEVICE_ID "12345"
#define TOKEN "VJsSC148dk1dCN3UqS"
#define speed 0.034

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/abcd_1/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="";
String lat="14.167589";
String lon="80.248510";
String name="point2";
String icon="";

long duration;
int dist;

void setup()
```

```

{
    Serial.begin(115200);
    pinMode(trigpin, OUTPUT);
    pinMode(echopin, INPUT);
    wifiConnect();
    mqttConnect();
}

void loop() {

    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(1000);
        }
        initManagedDevice();
        Serial.println();
    }
}

void initManagedDevice() {
    if (client.subscribe(topic)) {
        Serial.println(client.subscribe(topic));
        Serial.println("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){
    dist=100-dist;
    icon="fa-trash";
}else{
    dist=0;
    icon="fa-trash-o";
}
DynamicJsonDocument doc(1024);
String payload;
doc["Name"]=name;
doc["Latitude"]=lat;
doc["Longitude"]=lon;
doc["Icon"]=icon;
doc["FillPercent"]=dist;
serializeJson(doc, payload);
delay(3000);
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:

WOKWI

SAVE

SHARE

Docs

SIGN UP

sketch.ino

diagram.json

libraries.txt

Library Manager

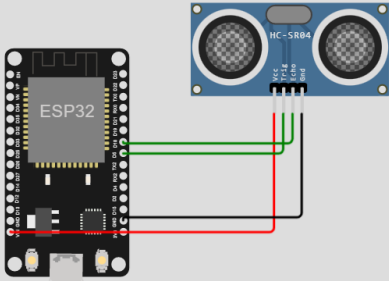
```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 #include <ArduinoJson.h>
4
5 WiFiClient wificlient;
6
7 #define ORG "kr9fjo"
8 #define DEVICE_TYPE "TestDeviceType"
9 #define DEVICE_ID "12345"
10 #define TOKEN "Vj5SC148dK1dCN3Uq5"
11 #define speed 0.034
12
13 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
14 char publishTopic[] = "iot-2/evt/abcd_1/fmt/json";
15 char topic[] = "iot-2/cmd/home/fmt/String";
16 char authMethod[] = "use-token-auth";
17 char token[] = TOKEN;
18 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
19 PubSubClient client(server, 1883, wificlient);
20 void publishData();
21
22 const int trigpin=5;
23 const int echopin=18;
24 String command;
25 String data="";
26 String lat="14.167589";
27 String lon="80.248510";
28 String name="point2";
29 String icon="";
30
31 long duration;
32 int dist;
33
34 void setup()
35 {
36   Serial.begin(115200);
37   pinMode(trigpin, OUTPUT);
```

Simulation

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Activate Windows
Go to Settings to activate Windows.

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⚙️

Browse

Action

Device Types

Interfaces

Add Device

🔍 Search by Device ID

Device Simulator

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location	Added By
12345	Disconnected	RasberryPi	Device	Oct 31, 2022 3:19 PM		venkateshbg01@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
Distance	{"distance":-74}	json	a few seconds ago
Distance	{"distance":-89}	json	a few seconds ago
Distance	{"distance":-12}	json	a few seconds ago
Distance	{"distance":-52}	json	a few seconds ago
Distance	{"distance":-45}	json	a few seconds ago

1 Simulation running

Activate Windows
Go to Settings to activate Windows.