

Assignment -4

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|-------------------------|--------------|
| Assignment Date | 10 Oct 2022 |
| Student Name | Dhinesh P |
| Student Register Number | 422719106002 |
| 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:

IBM | Assignments | IBM-Project-25759-16 | Service Details - IBM C | IBM Watson IoT Platform | (6) WhatsApp | Ultra sonic sensor copy

← → ↻ | wokwi.com/projects/346858285644644946 | Docs | SIGN UP

WOKWI | SAVE | SHARE | ❤️

sketch.ino | diagram.json | libraries.txt | Library Manager

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

WiFiClient wificlient;

#define ORG "kr9fjo"
#define DEVICE_TYPE "TestDeviceType"
#define DEVICE_ID "12345"
#define TOKEN "V35SC148dk1dCH3uqS"
#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);
```

Simulation

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Activate Windows
Go to Settings to activate Windows.

Windows Taskbar

15:28 31-10-2022

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← → ↻ | ci5v5e.internetofthings.ibmcloud.com/dashboard/devices/browse | venkateshb01@gmail.com ID: ci5v5e

IBM Watson IoT Platform | 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 | | venkateshb01@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.

Windows Taskbar

15:29 31-10-2022