

Assignment -4

Assignment Date	30 oct2022
Student Name	Vignesh V M
Student Roll Number	2127190701126
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 "pz9w6r"
#define DEVICE_TYPE "dev_1"
#define DEVICE_ID "001"
#define TOKEN "?qDGHrFbu0v0Mq2CwE"
#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");
}
}

```

Wokwi Share link:- ["https://wokwi.com/projects/348033704820474451"](https://wokwi.com/projects/348033704820474451)

Output:

W sketch.ino - Wokwi Arduino and x Service Details - IBM Cloud x IBM Watson IoT Platform x +

wokwi.com/projects/348033704820474451

YouTube Gmail Maps SRI VENKATESWAR...

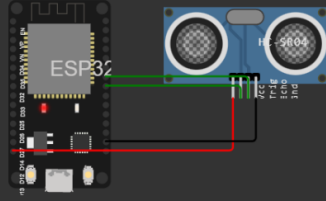
WOKWI SAVE SHARE sketch.ino Docs

sketch.ino diagram.json libraries.txt Library Manager

```
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15 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
16 PubSubClient client(server, 1883, wifiClient);
17 void publishData();
18 const int trigpin=5;
19 const int echopin=18;
20 String command;
21 String data="";
22 String lat="14.167589";
23 String lon="80.248510";
24 String name="point2";
25 String icon="";
26 long duration;
27 int dist;
28 void setup()
29 {
30   Serial.begin(115200);
31   pinMode(trigpin, OUTPUT);
32   pinMode(echopin, INPUT);
33   wifiConnect();
34 }
```

Simulation

00:06.665 99%



Sending payload:
{ "Name": "point2", "Latitude": "14.167589", "Longitude": "80.248510", "Icon": "fa-trash-o", "FillPercent": 0 }
Publish OK

Sending payload:
{ "Name": "point2", "Latitude": "14.167589", "Longitude": "80.248510", "Icon": "fa-trash-o", "FillPercent": 0 }
Publish OK

Sending payload:
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Publish OK

11-11-2022 19:12

New ESP32 Project - Wokwi Sim x sketch.ino - Wokwi Arduino and x Service Details - IBM Cloud x IBM Watson IoT Platform x +

pz9w6r.internetofthings.ibmcloud.com/dashboard/devices/browse

YouTube Gmail Maps SRI VENKATESWAR...

IBM Watson IoT Platform 2019ec0350@svce.ac.in ID: pz9w6r

Browse Action Device Types Interfaces Add Device

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
001	Connected	dev_1	Device	Nov 11, 2022 6:07 PM	

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
abcd_1	{ "Name": "point2", "Latitude": "14.167589", "Longitude": "80.248510", "Icon": "fa-trash-o", "FillPercent": 0 }	json	a few seconds ago
abcd_1	{ "Name": "point2", "Latitude": "14.167589", "Longitude": "80.248510", "Icon": "fa-trash-o", "FillPercent": 0 }	json	a few seconds ago
abcd_1	{ "Name": "point2", "Latitude": "14.167589", "Longitude": "80.248510", "Icon": "fa-trash-o", "FillPercent": 0 }	json	a few seconds ago
event_1	{ "randomNumber": 44 }	json	a few seconds ago
abcd_1	{ "Name": "point2", "Latitude": "14.167589", "Longitude": "80.248510", "Icon": "fa-trash-o", "FillPercent": 0 }	json	a few seconds ago

1 Simulation running

11-11-2022 11:53

The recent events listed show the live

Event	Value
event_1	{"randomNumber": 1}
event_1	{"randomNumber": 2}
abcd_1	{"Name": "point2", "randomNumber": 1}
event_1	{"randomNumber": 3}
abcd_1	{"Name": "point2", "randomNumber": 2}

Event Name	abcd 1
------------	--------

Time Received Nov 11, 2022 7:13 PM

```
1 {
2   "Name": "point2",
3   "Latitude": "14.167589",
4   "Longitude": "80.248510",
5   "Icon": "fa-trash-o",
6   "FillPercent": 0
7 }
```

1 Simulation running