

Assignment -4

Assignment Date	30 oct2022
Student Name	Yogesh Balaji G
Student Roll Number	2127190701131
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 "0hyrvn"
#define DEVICE_TYPE "dev"
#define DEVICE_ID "811"
#define TOKEN "?P1Z2jV4J*V3YnA)Px"
#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/348102819261186643"](https://wokwi.com/projects/348102819261186643)

Output:

Service Details - IBM Cloud
IBM Watson IoT Platform
(33) WhatsApp
sketch.ino - Wokwi Arduino and
IBM Cloud

https://wokwi.com/projects/348102819261186643

Classroom
Sri Venkateswara C...
task view shortcut ...
1377x | Download t...
Dashboard | Hacker...
flags
Acer
Naruto Shippuuden...
The Joy of Computi...
Agoda
SRI VENKATESWAR...
Other favorites

WOKWI
SAVE
SHARE
sketch.ino
Docs

sketch.ino
diagram.json
libraries.txt
Library Manager

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 #include <ArduinoJson.h>
4 WiFiClient wificlient;
5 #define ORG "ohyrvrm"
6 #define DEVICE_TYPE "dev"
7 #define DEVICE_ID "811"
8 #define TOKEN "?P1Z2jV4J*V3YnA)Px"
9 #define speed 0.034
10 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
11 char publishTopic[] = "iot-2/evt/abcd_1/fmt/json";
12 char topic[] = "iot-2/cmd/home/fmt/String";
13 char authMethod[] = "use-token-auth";
14 char token[] = TOKEN;
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
00:15.776 100%

```

o", "FillPercent":0}
Publish OK

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

```

12-27 12-11-2022

Service Details - IBM Cloud
IBM Watson IoT Platform
(33) WhatsApp
sketch.ino - Wokwi Arduino and
IBM Cloud

https://ohyrvrm.internetofthings.ibmcloud.com/dashboard/devices/browse

Classroom
Sri Venkateswara C...
task view shortcut ...
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flags
Acer
Naruto Shippuuden...
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Agoda
SRI VENKATESWAR...
Other favorites

IBM Watson IoT Platform
2019ec0610@svce.ac.in
ID: Ohyrvrm

Browse
Action
Device Types
Interfaces
Add Device

Search by Device ID
Device Simulator

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
811	Connected	dev	Device	Nov 12, 2022 12:13 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","Longi...	json	a few seconds ago
abcd_1	{"Name":"point2","Latitude":"14.167589","Longi...	json	a few seconds ago
abcd_1	{"Name":"point2","Latitude":"14.167589","Longi...	json	a few seconds ago
abcd_1	{"Name":"point2","Latitude":"14.167589","Longi...	json	a few seconds ago
abcd_1	{"Name":"point2","Latitude":"14.167589","Longi...	json	a few seconds ago

1 Simulation running

12-29 12-11-2022

Service Details - IBM Cloud

IBM Watson IoT Platform

(33) WhatsApp

W sketch.ino - Wokwi Arduino and

IBM Cloud

+

https://0hyrvm.internetofthings.ibmcloud.com/dashboard/devices/browse

ClassroomSri Venkateswara C...task view shortcut ...1377x | Download t...Dashboard | Hacker...flagsAcerNaruto Shippuuden...The Joy of Computi...AgodaSRI VENKATESWAR...Other favorites

IBM Watson IoT Platform

2019ec0610@svce.ac.inID: 0hyrvm

Browse

Action

Device Types

Interfaces

Q

Search by Device ID

Device ID

Status

811

Connect

Identity

Device Information

The recent events listed show the live

Event	Value
abcd_1	{"Name": "point2"
abcd_1	{"Name": "point2"
abcd_1	{"Name": "point2"
abcd_1	{"Name": "point2"
abcd_1	{"Name": "point2"

Event Payload

Event Nameabcd_1

Time ReceivedNov 12, 2022 12:28 PM

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

Device Simulator

Descriptive Location

1 Simulation running

Add Device

ENG

IN

12:29

12-11-2022