

ASSIGNMENT-4

Assignment Date	29 October 2022
Student Name	ASHWIN S
Student Roll Number	711619104005
Maximum Marks	2 Marks

QUESTION:

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.

SOLUTION:

PROGRAM:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "jl5hf2"
#define DEVICE_TYPE "ASHWIN"
#define DEVICE_ID "ASH"
#define TOKEN "12345678"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/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 = "{\"Normal Distance\":\"";
payload += dist;
payload += "\"}";

Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish OK");
}

}

if(dist>101 && dist<111){
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);
}else {
Serial.println("Publish FAILED");
}

}

}

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="";
}

```

SIMULATION SCREENSHOTS:

WOKWI

SAVE

SHARE

Docs

sketch.ino

diagram.json

libraries.txt

Library Manager

Simulation

00:27.250 100%

Editing Ultrasonic Distance Sensor

Distance: 5cm

Publish OK

Sending payload: {"Normal Distance":4.98}

Publish OK

Sending payload: {"Normal Distance":4.98}

Publish OK

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wifiClient;
4 String data;
5 #define ORG "j15hf2"
6 #define DEVICE_TYPE "ASHWIN"
7 #define DEVICE_ID "ASH"
8 #define TOKEN "12345678"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/Data/fmt/json";
13 char topic[] = "iot-2/cmd/home/fmt/String";
14 char authMethod[] = "use-token-auth";
15 char token[] = TOKEN;
16 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
17 PubSubClient client(server, 1883, wifiClient);
18 void publishData();
19
20
21 const int trigpin=5;
22 const int echopin=18;
23 String command;
24 String data="";
25
26 long duration;
27 float dist;
28
29
30
31 void setup()
32 {
33   Serial.begin(115200);
34   pinMode(led, OUTPUT);
35   pinMode(trigpin, OUTPUT);
36   pinMode(echopin, INPUT);
37   wifiConnect();
38   mqttConnect();

```

IBM Watson IoT Platform

711619104005@smartinternz.com ID: j15hf2

Browse

Action

Device Types

Interfaces

Q

Add Device +

<input type="checkbox"/>	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
>	1234	Disconnected	abcd	Device	28 Oct 2022 10:07 PM	
▼	ASH	Connected	ASHWIN	Device	29 Oct 2022 11:04 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
Data	{"Normal Distance":61.95}	json	a few seconds ago
Data	{"Normal Distance":61.97} {"Normal Distance":61.95}	json	a few seconds ago
Data	{"Normal Distance":61.97}	json	a few seconds ago
Data	{"Normal Distance":61.97}	json	a few seconds ago

1 Simulation running

IBM Watson IoT Platform

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ID: j15hf2

Browse

Action

Device Types

Interfaces

Add Device +

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
Data	{"Normal Distance":4.98}	json	a few seconds ago
Data	{"Normal Distance":4.98}	json	a few seconds ago
Data	{"Normal Distance":4.98}	json	a few seconds ago
Data	{"Normal Distance":4.98}	json	a few seconds ago
Data	{"Normal Distance":4.98}	json	a few seconds ago

>

☐

abcd

Disconnected

1234

Device

11 Oct 2022 6:12 PM

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1 Simulation running

WOKWI LINK:

<https://wokwi.com/projects/346874832176022099>