

Assignment -4

Assignment Date	20 OCTOBER 2022
Student Name	MELIKIS SAM S
Student Roll Number	722819106052
Maximum Marks	2 Marks

Question-1:

Write code and connections in wowki for ultrasonic sensor.

Whenever distance is less than 100 cms send “alert” to IBM cloud and display in device recent events.

Solution:

WOWKI LINK: <https://wokwi.com/projects/346235465961046612>

```
#include <WiFi.h>
#include <PubSubClient.h>
#define TRIGGER 2
#define ECHO 15
#define sound_speed 0.034
int distance;

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

//-----credentials of IBM Accounts-----

#define ORG "wp72r7"
#define DEVICE_TYPE "iot-device-1"
#define DEVICE_ID "123456789"
#define TOKEN "987654321"
String data3;
```

```
//----- Customise the above values -----  
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";  
char publishTopic[] = "iot-2/evt/Data/fmt/json"; char  
subscribetopic[] = "iot-2/cmd/test/fmt/String"; char  
authMethod[] = "use-token-auth"; char token[] = TOKEN; char  
clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
```

```
//----- WiFiClient wifiClient;  
PubSubClient client(server, 1883, callback ,wifiClient); void  
setup()  
{  
  Serial.begin(115200);  pinMode(TRIGGER,  
OUTPUT);  
  pinMode(ECHO, INPUT);  
  delay(10); Serial.println();  
  wificonnect();  
  mqttconnect();  
}  
  
void loop()  
{  
  
  digitalWrite(TRIGGER, HIGH);  
  delayMicroseconds(10); digitalWrite(TRIGGER,  
LOW);  
  
  int duration=pulseIn(ECHO,HIGH);  
  distance=(duration*sound_speed)/2;  
  Serial.print("Distance:");  
  Serial.print(distance);  
  Serial.println("cms"); if(distance<100){  PublishData(distance);  
  }  
  delay(1000); if (!client.loop())  
  {
```

```
mqttconnect();
}
}
```

/.....retrieving to Cloud...../

```
void PublishData(int d) {
mqttconnect();
```

```
String payload = "{\"message\":\"alert\"}";
```

```
Serial.print("Sending payload: ");
Serial.println(payload);
```

```
if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");
} else {
    Serial.println("Publish failed");
}
```

```
}
void mqttconnect() { if (!client.connected())
{
    Serial.print("Reconnecting client to ");
    Serial.println(server);
    while (!client.connect(clientId, authMethod, token)) {
        Serial.print(".");
        delay(500);
    }
    initManagedDevice();
    Serial.println();
}
}
```

```

void wificonnect()
{
    Serial.println();
    Serial.print("Connecting to ");

    WiFi.begin("Wokwi-GUEST", "", 6); while
(WiFi.status() != WL_CONNECTED) {
delay(500);
Serial.print("."); }
    Serial.println("");
    Serial.println("WiFi connected");
    Serial.println("IP address: ");
    Serial.println(WiFi.localIP());
}

void initManagedDevice() {
    if (client.subscribe(subscribetopic)) {
Serial.println((subscribetopic));
        Serial.println("subscribe to cmd OK");
    } else {
        Serial.println("subscribe to cmd 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++) {    data3 +=
(char)payload[i];
    }

    Serial.println("data: "+ data3);

    data3="";
}

```

}

WOKWI

SAVE

SHARE

Docs

sketch.ino

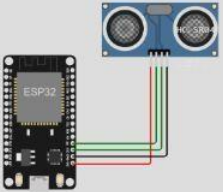
diagram.json

libraries.txt

Library Manager

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 #define TRIGGER 2
4 #define ECHO 15
5 #define sound_speed 0.034
6 int distance;
7
8 void callback(char* subscribetopic, byte* payload, unsigned int payloadlength);
9
10 //-----credentials of IBM Accounts-----
11
12 #define ORG "wp72r7"
13 #define DEVICE_TYPE "iot-device-1"
14 #define DEVICE_ID "123456789"
15 #define TOKEN "987654321"
16 String data3;
17
18
19 //----- Customise the above values -----
20 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
21 char publishTopic[] = "iot-2/evt/Data/fmt/json";
22 char subscribetopic[] = "iot-2/cmd/test/fmt/String";
23 char authMethod[] = "use-token-auth";
24 char token[] = TOKEN;
25 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
26
27
28 //-----
29 WiFiClient wificlient;
30 PubSubClient client(server, 1883, callback ,wificlient);
31 void setup()
32 {
33   Serial.begin(115200);
34   pinMode(TRIGGER, OUTPUT);
35   pinMode(ECHO, INPUT);
36 }
```

Simulation



Connecting to
WiFi connected
IP address:
10.10.0.2
Reconnecting client to wp72r7.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

399 cms.
399 cms.
399 cms.
212 cms.
30 cms.
Sending payload: {"message":"alert"}
Publish ok
30 cms

CIRCUIT DIAGRAM:

The screenshot displays the 'Browse Devices' section of the IBM Watson IoT Platform. At the top, there's a navigation bar with 'Browse', 'Action', 'Device Types', and 'Interfaces'. A sidebar on the left contains icons for various functions. The main heading is 'Browse Devices', followed by two buttons: 'All Devices' and 'Diagnose'. Below this, a paragraph explains that the table shows a summary of all devices added, which can be filtered, organized, and searched. A search bar labeled 'Search by Device ID' is present. On the right, there are controls for 'Device Simulator' and filters. The device list table has columns: Device ID, Status, Device Type, Class ID, Date Added, Descriptive Location, Added By, Device Class, Firmware Version, Hardware Version, Manufacturer, Model, Serial Number, and Description. One device is listed: ID 123456789, status 'Disconnected', type 'iot-device-1', class 'Device', added on Oct 22, 2022 at 9:47 PM, by 'karthikeyan.c@sece.ac.in'. Below the table, tabs for 'Identity', 'Device Information', 'Recent Events', 'State', and 'Logs' are shown. The 'Recent Events' tab is active, displaying a message: 'The recent events listed show the live stream of data that is coming and going from this device.' Below this is a table with columns: Event, Value, Format, and Last Received. It lists five 'Data' events, each with a value of '{"message":"alert"}' in 'json' format, received 'a few seconds ago'. At the bottom, pagination shows 'Items per page 50' and '1 - 1 of 1 item'.

Browse Devices

All Devices Diagnose

This table shows a summary of all devices that have been added. It can be Filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

Search by Device ID

Device Simulator

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location	Added By	Device Class	Firmware Version	Hardware Version	Manufacturer	Model	Serial Number	Description
123456789	Disconnected	iot-device-1	Device	Oct 22, 2022 9:47 PM		karthikeyan.c@sece.ac.in							

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	{"message":"alert"}	json	a few seconds ago
Data	{"message":"alert"}	json	a few seconds ago
Data	{"message":"alert"}	json	a few seconds ago
Data	{"message":"alert"}	json	a few seconds ago
Data	{"message":"alert"}	json	a few seconds ago

Items per page 50 | 1 - 1 of 1 item

IBM CLOUD RECENT EVENTS: