

ASSIGNMENT-4

Assignment Date	27 october 2022
Student Name	K.BRINDHA DEVI
Student Roll Number	711619106701
Maximum Marks	2 Marks

QUESTION:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cms send "alert" to ibm cloud and display in 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 DEVICE_TYPE "ABCD"
#define DEVICE_ID "DCBA"
#define TOKEN "987654321"
#define speed 0.034
#define led 14
#define ORG "kvnnui"
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/status/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:

The screenshot displays the IBM Watson IoT Platform interface. The main content area is titled 'Browse Devices' and includes a table of devices. The table has columns for Device ID, Status, Device Type, Class ID, Date Added, Descriptive Location, and Added By. A single device, 'DCBA', is listed with a 'Connected' status and a device type of 'ABCD'. The interface also features a search bar, a 'Device Simulator' toggle, and a bottom status bar showing '0 Simulations running'.

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location	Added By
DCBA	Connected	ABCD	Device	Oct 27, 2022 7:08 AM		711619106701@smartinternz.com

0 Simulations running

W sketch.ino - Wokwi Arduino and x IBM Watson IoT Platform x Node-RED x +

wokwi.com/projects/346573737482519122

WOKWI SAVE SHARE

Docs

sketch.ino diagram.json libraries.txt Library Manager

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21
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24 String command;
25 String data="";
26
27 long duration;
28 float dist;
29
30
31

```

Simulation

00:32.225 62%

kvnnui.messaging.internetofthings.ibmcloud.com
IBM subscribe to cmd OK

Reconnecting MQTT client to
kvnnui.messaging.internetofthings.ibmcloud.com
IBM subscribe to cmd OK

Satisfactory air ENG 07:09

W sketch.ino - Wokwi Arduino and x +

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31

```

Simulation

01:37.927 85%

Sending payload: {"Alert distance":107.97}
Warning crosses 110cm -- it automatically of the loop

26°C Haze ENG 07:39

Wokwi - Wokwi Arduino and IBM Watson IoT Platform Node-RED

wokwi.com/projects/346573737482519122

WOKWI SAVE SHARE

Docs

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```

Simulation

00:42.918 79%

Editing Ultrasonic Distance Sensor

Distance: 97cm

Publish OK

Sending payload: {"Normal Distance":96.93}

Publish OK

Sending payload: {"Normal Distance":96.93}

Publish OK

AQI 84 ENG 07:10

Wokwi - Wokwi Arduino and IBM Watson IoT Platform

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WOKWI SAVE SHARE

Docs

sketch.ino diagram.json libraries.txt Library Manager

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31

```

Simulation

01:12.022 68%

Editing Ultrasonic Distance Sensor

Distance: 108cm

Warning crosses 110cm -- it automatically of the loop

Sending payload: {"Alert distance":107.97}

Warning crosses 110cm -- it automatically of the loop

Sending payload: {"Alert distance":107.95}

Warning crosses 110cm -- it automatically of the loop

28°C Partly clo... ENG 07:27

sketch.ino - Wokwi Arduino and x IBM Watson IoT Platform x +

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

IBM Watson IoT Platform

711619106701@smartinternz.com
ID: kvnnui

Browse Action Device Types Interfaces

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
DCBA	Connected	ABCD	Device	Oct 27, 2022 7:08 AM		711619106701@smartinternz.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
status	{"Alert distance":107.97}	json	a few seconds ago
status	{"Alert distance":107.97}	json	a few seconds ago
status	{"Alert distance":107.97}	json	a few seconds ago
status	{"Alert distance":107.97}	json	a few seconds ago
status	{"Alert distance":107.97}	json	a few seconds ago

0 Simulations running

WOKWI LINK:

<https://wokwi.com/projects/346573737482519122>