

Assignment -4

Assignment Date	21 OCTOBER 2022
Student Name	SENTHAMIZARASU M
Student Roll Number	513419106703
Maximum 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.

Solution

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "jum04x"
#define DEVICE_TYPE "ESP-32"
#define DEVICE_ID "2001"
#define TOKEN "X@XK8Yd)zn)Fg6(H4j"
#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=2;
const int echopin=4;
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="";
}
}

```

Service Details - IBM Cloud x IBM Watson IoT Platform x sketchino - Wokwi Arduino and x Code - senthamizarasu2020@gmail.com x +

← → ↻ jum04x.internetofthings.ibmcloud.com/dashboard/devices/browse

Gmail YouTube Maps

IBM Watson IoT Platform 513419106703@smartinternz.com ID: jum04x

Browse Action Device Types Interfaces Add Device +

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location	Added By
2001	Connected	ESP-32	Device	Nov 8, 2022 7:08 PM		513419106703@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
Data	{"Normal Distance":44.97}	json	a few seconds ago
Data	{"Normal Distance":44.97}	json	a few seconds ago
Data	{"Normal Distance":44.97}	json	a few seconds ago
Data	{"Normal Distance":44.98}	json	a few seconds ago
Data	{"Normal Distance":44.97}	json	a few seconds ago

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0 Simulations running

26°C Mostly cloudy 19:33 08-11-2022

Service Details - IBM Cloud

IBM Watson IoT Platform

W sketch.ino - Wokwi Arduino and

Code - senthamizarasu2020@gr

wokwi.com/projects/347767824890987091

Gmail YouTube Maps

WOKWI

SAVE

SHARE

sketch.ino

Docs

SIGN IN

sketch.ino

diagram.json

libraries.txt

Library Manager

```
//  
78 // Serial.println(client.subscribe(topic));  
79 Serial.println("IBM subscribe to cmd OK");  
80 } else {  
81   Serial.println("subscribe to cmd FAILED");  
82 }  
83 void publishData()  
84 {  
85   digitalWrite(trigpin,LOW);  
86   digitalWrite(trigpin,HIGH);  
87   delayMicroseconds(10);  
88   digitalWrite(trigpin,LOW);  
89   duration=pulseIn(echopin,HIGH);  
90   dist=duration*speed/2;  
91   if(dist<100){  
92     String payload = "{\"Normal Distance\":";  
93     payload += dist;  
94     payload += "}";  
95  
96     Serial.print("\n");  
97     Serial.print("Sending payload: ");  
98     Serial.println(payload);  
99     if (client.publish(publishTopic, (char*) payload.c_str())) {  
100       Serial.println("Publish OK");  
101     }  
102   }  
103  
104   if(dist>101 && dist<111){  
105     String payload = "{\"Alert distance\":";  
106     payload += dist;  
107     payload += "}";  
108  
109     Serial.print("\n");  
110     Serial.print("Sending payload: ");  
111     Serial.println(payload);  
112     if(client.publish(publishTopic, (char*) payload.c_str())) {
```

Simulation

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100%

Publish OK

Sending payload: {"Normal Distance":44.95}

Publish OK

Sending payload: {"Normal Distance":44.97}

Publish OK

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