

Assignment 4

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Project Name	IoT Based Safety Gadget for Child Safety Monitoring & Notification

1. Write Code and connections in wokwi for ultrasonic sensor. whatever distance is less than 100 cms send "Alert" to ibm cloud and display in device recent events.

```
#include <WiFi.h>
```

```
#include <PubSubClient.h>
```

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

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

```
#define ORG "c4e77h"//IBM ORGANITION ID
```

```
#define DEVICE_TYPE "nodemcu"//Device type mentioned in ibm watson IOT Platform
```

```
#define DEVICE_ID "6553"//Device ID mentioned in ibm watson IOT Platform
```

```
#define TOKEN "S3FUWX1R&OpcJZ-ijf" //Token
```

```
String data3;
```

```
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
```

```
char publishTopic[] = "iot-2/evt/Data/fmt/json";
```

```
char subscribtopic[] = "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);

const int trigPin = 5;

const int echoPin = 18;

#define SOUND_SPEED 0.034

long duration;

float distance;


void setup() {

    Serial.begin(115200);

    pinMode(trigPin, OUTPUT);

    pinMode(echoPin, INPUT);

    wificonnect();

    mqttconnect();

}


void loop()

{

    digitalWrite(trigPin, LOW);

    delayMicroseconds(2);

    digitalWrite(trigPin, HIGH);

    delayMicroseconds(10);

    digitalWrite(trigPin, LOW);

    duration = pulseIn(echoPin, HIGH);

    distance = duration * SOUND_SPEED/2;

    Serial.print("Distance (cm): ");
```

```

Serial.println(distance);
if(distance<100)
{
    Serial.println("ALERT!!");
    delay(1000);

    PublishData(distance);
    delay(1000);
    if (!client.loop()) {
        mqttconnect();
    }
}
delay(1000);
}

void PublishData(float dist) {
    mqttconnect();

    String payload = "{\"Distance\":\"";
    payload += dist;
    payload += "\",\"ALERT!!\":\"\"Distance less than 100cms\"";
    payload += "}";

    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++) {
        //Serial.print((char)payload[i]);
        data3 += (char)payload[i];
    }
    Serial.println("data: "+ data3);
    data3="";
}

```

IBM Watson IoT Platform

Device Drilldown - 6553

← Back

Connection Information

- Recent Events
- State
- Device Information
- Metadata
- Diagnostics
- Connection Logs
- Device Actions

Recent Events

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"Distance":29.97,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":29.97,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":29.97,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":29.97,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":29.97,"ALERT!!":"Distance less than ...	json	a few seconds ago

State

25°C Haze

22:50 07-11-2022

Wokwi link: <https://wokwi.com/projects/new/esp32>

IBM

IBM Cloud Account Creation Pro

Internet of Things Platform - IBM

IBM Watson IoT Platform

Device Management protocol - I

New ESP32 Project - Wokwi

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wokwi.com/projects/new/esp32

WOKWI

SAVE

SHARE

Docs

sketch.ino

diagram.json

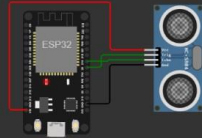
libraries.txt

Library Manager




```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3
4 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
5
6 //-----credentials of IBM Accounts-----
7
8 #define ORG "c4e77h"//IBM ORGANITION ID
9 #define DEVICE_TYPE "nodemcu"//Device type mentioned in ibm watson IOT Platform
10 #define DEVICE_ID "6553"//Device ID mentioned in ibm watson IOT Platform
11 #define TOKEN "53FUX1R&OpJZ-ijf" //Token
12 String data3;
13
14 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
15 char publishTopic[] = "iot-2/evt/Data/fmt/json";
16 char subscribetopic[] = "iot-2/cmd/test/fmt/String";
17 char authMethod[] = "use-token-auth";
18 char token[] = TOKEN;
19 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
20 WiFiClient wifiClient;
21 PubSubClient client(server, 1883, callback ,wifiClient);
22 const int trigPin = 5;
23 const int echoPin = 18;
24 #define SOUND_SPEED 0.034
25 long duration;
26 float distance;
27
28 void setup() {
29   Serial.begin(115200);
30   pinMode(trigPin, OUTPUT);
31   pinMode(echoPin, INPUT);
32   wifiConnect();
33   mqttConnect();
34 }
35
36 void loop()
37 {
38   digitalWrite(trigPin, LOW);
39   delayMicroseconds(2);
```

Simulation


02:51.488 99%



Distance (cm): 29.97
ALERT!!
Sending payload: {"Distance":29.97,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 29.97
ALERT!!
Reconnecting client to c4e77h.messaging.internetofthings.ibmcloud.com

25°C
Haze



ENG
IN

22:57
07-11-2022