

# IBM Assignment - 4

## 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.

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## CODE:

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

```

WiFiClient wifiClient;

#define ORG "1bk1kq"
#define DEVICE_TYPE "abcd"
#define DEVICE_ID "rasp"
#define TOKEN "12345678"
#define speed 0.034

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/abcd_1/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="";
String lat="14.167589";
String lon="80.248510";
String name="point2";
String icon="";

long duration; int
dist;
void setup()
{
    Serial.begin(115200);
    pinMode(trigpin, OUTPUT);
    pinMode(echopin, INPUT);
    wifiConnect();
    mqttConnect();
}
void loop() {

    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() {

```

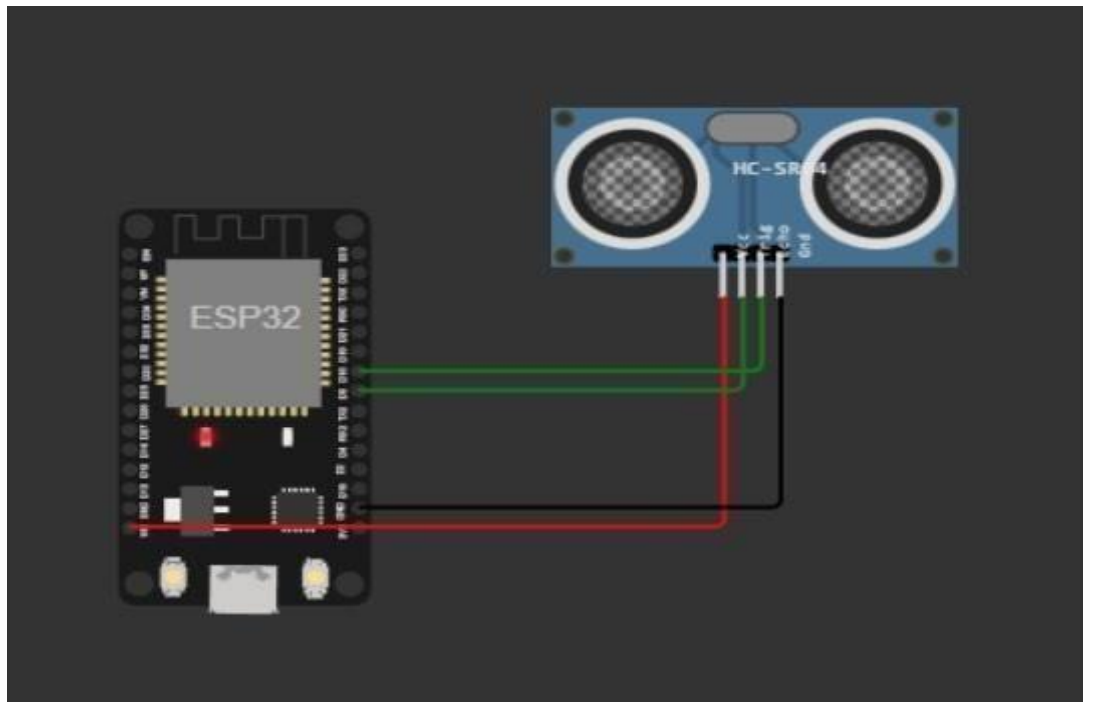
```

if (!client.connected()) {
    Serial.print("Reconnecting MQTT client to "); Serial.println(server);
    while (!client.connect(clientId, authMethod, token)) {
        Serial.print("."); delay(1000);
    }
    initManagedDevice();
    Serial.println();
}
}

void initManagedDevice() {
    if (client.subscribe(topic)) {
        Serial.println(client.subscribe(topic));
        Serial.println("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){
    dist=100-dist; icon="fa-
    trash";
}else{ dist=0;
    icon="fa-trash-
    o";
}
DynamicJsonDocument doc(1024);
String payload;
doc["Name"]=name;
doc["Latitude"]=lat;
doc["Longitude"]=lon;
doc["Icon"]=icon;
doc["FillPercent"]=dist;
serializeJson(doc, payload);
delay(3000);
Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish OK");
} else {
    Serial.println("Publish FAILED");
}
}
}

```

## Connections:



## WOKWI LINK:

<https://wokwi.com/projects/346587874175484499>

## OUTPUT:

WOKWI

SAVE

SHARE

Docs

sketch.ino

diagram.json

libraries.txt

Library Manager

```

1 #include <PubSubClient.h>
2 #include <ArduinoJson.h>
3
4 WiFiClient wifiClient;
5
6 #define ORG "1bk1kq"
7 #define DEVICE_TYPE "abcd"
8 #define DEVICE_ID "rasp"
9 #define TOKEN "12345678"
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13 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
14 char publishTopic[] = "iot-2/evt/abcd_1/fmt/json";
15 char topic[] = "iot-2/cmd/home/fmt/String";
16 char authMethod[] = "use-token-auth";
17 char token[] = TOKEN;
18 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
19 PubSubClient client(server, 1883, wifiClient);
20 void publishData();
21
22 const int trigpin=5;
23 const int echopin=18;
24 String command;
25 String data="";
26 String lat="14.167589";
27 String lon="80.248510";
28 String name="point2";
29 String icon="";
30
31 long duration;
32 int dist;
33
34 void setup()
35 {
36   Serial.begin(115200);

```

Simulation

00:40.678

```

o","FillPercent":0}
Publish OK

Sending payload:
{"Name":"point2","Latitude":"14.167589","Longitude":"80.248510","Icon":"fa-trash-o","FillPercent":0}
Publish OK

```

26 October

IBM

Service Details - IBM Cloud

IBM Watson IoT Platform

Ultra sonic sensor copy - Wokwi

1bk1kq.internetofthings.ibmcloud.com/dashboard/devices/browse

IBM Watson IoT Platform

412719104016@...

ID: 1bk1kq

Browse

Action

Device Types

Interfaces

Device ID

Status

Device Type

Class ID

Date Added

Descriptive Location

abcd\_1

Connected

abcd

Device

Oct 26, 2022 6:53 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
event_1	{"Alert Distance":83}	json	a few seconds ago
event_1	{"Alert Distance":59}	json	a few seconds ago
event_1	{"Alert Distance":7}	json	a few seconds ago
event_1	{"Alert Distance":30}	json	a few seconds ago
event_1	{"Alert Distance":51}	json	a few seconds ago