

ASSIGNMENT -4

Assignment Date	26 October 2022
Team ID	PNT2022TMID17187
Project Name	Project - IoT based safety gadget for Child Safety Monitoring and Notification
Team Leader	BHARANI
Team Members	AJITH V ARULSELVAN A BHARATH M

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.

CODE:

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

WiFiClient wifiClient;
#define ORG "fvdupc"

#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-tokenauth";
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;

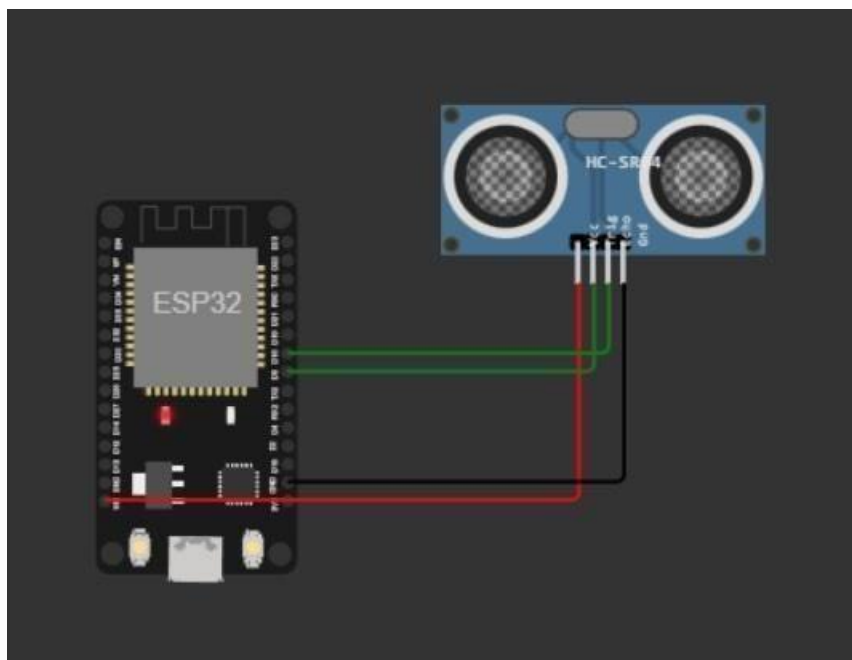
```

```

if(dist<100){ dist=100-dist;
  icon="fatrash";
}else{ dist=0;
  icon="fa-trasho";
}
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/346590330080985684>

OUTPUT:

The WOKWI interface displays a sketch for an ESP32 module. The sketch includes the following code:

```
1 #include <wifi.h>
2 #include <PubSubClient.h>
3 #include <ArduinoJson.h>
4
5 WiFiClient wificlient;
6
7 #define ORG "fvdupc"
8 #define DEVICE_TYPE "abcd"
9 #define DEVICE_ID "rasp"
10 #define TOKEN "12345678"
11 #define speed 0.034
12
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 {
```

The simulation shows an ESP32 module connected to an HC-SR04 ultrasonic sensor. The console output indicates the device is subscribed to the command topic and has successfully published a payload:

```
subscribe to cmd OK

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

The IBM Watson IoT Platform interface displays a device simulation for a device named "abcd_1". The device is connected and has a status of "Connected". The device type is "abcd" and the class ID is "Device". The date added is "Oct 26, 2022 7:33 PM".

The "Recent Events" tab shows a live stream of data from the device. The events are listed in a table:

Event	Value	Format	Last Received
event_1	{"alertdistance":86}	json	a few seconds ago
event_1	{"alertdistance":57}	json	a few seconds ago
event_1	{"alertdistance":27}	json	a few seconds ago
event_1	{"alertdistance":26}	json	a few seconds ago
event_1	{"alertdistance":48}	json	a few seconds ago

The interface also shows a "Simulation running" status at the bottom.