

NALAIYA THIRAN

ASSIGNMENT-4

**USER CASE: PERSONAL ASSISTANCE FOR SENIORS WHO ARE SELF RELIANT
BY TEAM MEMBER 4: HARISH KUMAR.A**

Write a code and connection in wokwi for the Ultrasonic sensor. Whenever the distance is less than 100cm send an “Alert” to the IBM cloud and display in the device recent events.

CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "3eqctu"
#define DEVICE_TYPE "ESP32"
#define DEVICE_ID "0000"
#define TOKEN "123456789"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/shreedharen/fmt/json";
char topic[] = "iot-2/cmd/led/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
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("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 = "{\"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("Publish OK");
}
}
if(dist>100){
String payload =
"{\"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");
}else {
Serial.println("Publish FAILED");
}
}}
```

OUTPUT:

LINK: <https://wokwi.com/projects/348038026125902419>

The screenshot shows the Wokwi IDE interface. On the left, the sketch.ino file is open, displaying the following code:

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wificlient;
4 String data3;
5 #define ORG "3eqctu"
6 #define DEVICE_TYPE "ESP32"
7 #define DEVICE_ID "0000"
8 #define TOKEN "123456789"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/shreedharen/fmt/json";
13 char topic[] = "iot-2/cmd/led/fmt/String";
14 char authMethod[] = "use-token-auth";
15 char token[] = TOKEN;
16 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
17 PubSubClient client(server, 1883, wificlient);
18 const int trigpin=5;
19 const int echopin=18;
20 String command;
21 String data="";
22 long duration;
23 float dist;
24 void setup()
25 {
26   Serial.begin(115200);
27   pinMode(led, OUTPUT);
28   pinMode(trigpin,
29   OUTPUT);
30   pinMode(echopin, INPUT);
31   wifiConnect();
32   mqttConnect();
33 }
34 void loop() {
35   bool isNearby = dist < 100;
```

On the right, the simulation window shows a virtual circuit with an ESP32 microcontroller connected to an HC-SR04 ultrasonic sensor. Below the simulation, the console output shows the following messages:

```
Publish OK
Sending payload:{"Distance":399.94}
Publish OK
Sending payload:{"Distance":399.96}
Publish OK
```

The screenshot shows the IBM Watson IoT Platform dashboard. The top navigation bar includes links for Browse, Action, Device Types, and Interfaces. A search bar is present, and a "Device Simulator" toggle is visible. The main content area displays a table of devices, with the selected device (ID: 0000, Status: Connected, Device Type: ESP32) expanded to show its recent events.

| Event | Value | Format | Last Received |
|-------------|---------------------|--------|-------------------|
| shreedharen | {"Distance":399.96} | json | a few seconds ago |
| shreedharen | {"Distance":399.96} | json | a few seconds ago |
| shreedharen | {"Distance":399.94} | json | a few seconds ago |
| shreedharen | {"Distance":399.94} | json | a few seconds ago |
| shreedharen | {"Distance":399.96} | json | a few seconds ago |