

# ASSIGNMENT 4

## Ultrasonic sensor simulation in Wokwi

|                 |  |
|-----------------|--|
| TEAM ID         | PN T2 0 2 2 TMI D2 50 4 1                            |
| PROJECT NAME    | Personal Assistance for Seniors Who Are Self-Reliant |
| REGISTER NUMBER | 2 10 51910 60 7 4                                    |

### Question- 1:

Write a code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "Alert" to IBM cloud and display in the device recent events.

#### Code

```
#include <WiFi.h> #include
<PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
//-----credentials of IBM Accounts-----
#define ORG "kotoq5"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "12 34 5"//Device ID mentioned in ibm watson IOT
Platform
#define TOKEN "12 34 567 8" //Token
String data3;
char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; char
publishTopic[] = "iot-2 /evt/Data/fmt/json";
char subscribetopic[] = "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("A LERT!!");
    delay(1000);PublishData(distance);
    delay(1000);
    if (!client.loop())
    { mqttconnect();
    }
}
delay(1000);
}
void PublishData(float dist)
{ mqttconnect();
String payload = "{\"Distance\":"; payload
+= dist;
payload += "\",\"A LERT!!\":\"\"Distance less than 100 cms\""; 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="";
}

```

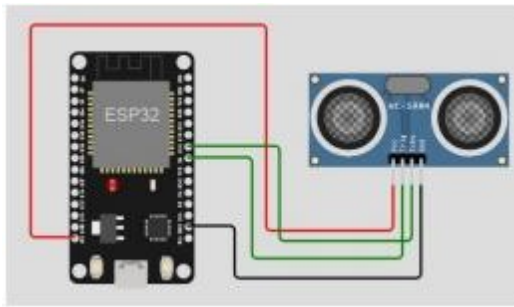
**Diagramjson:**

```

{
"version": 1,
"author": "sweetysharon",
"editor": "wokwi", "parts": [
{ "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -4.67, "left": -114.67, "attrs": {} },
{ "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": 15.96, "left": 89.17, "attrs": {} }
],
"connections": [
[ "esp:TX0", "$serialMonitor:RX", "", [] ],
[ "esp:RX0", "$serialMonitor:TX", "", [] ], [
"esp:VIN",
"ultrasonic1:VCC", "red",
[ "h-37.16", "v-178.79", "h200", "v173.33", "h100.67" ]
],
[ "esp:GND1", "ultrasonic1:GND", "black", [ "h39.87", "v44.04", "h170" ] ],
[ "esp:D5", "ultrasonic1:TRIG", "green", [ "h54.54", "v85.07", "h130.67" ] ],
[ "esp:D18", "ultrasonic1:ECHO", "green", [ "h77.87", "v80.01", "h110" ] ]
]
}

```

## Circuit Diagram



## Output:

Wokwi output:

```
Connecting to .....  
WiFi connected  
IP address:  
192.168.0.2  
Reconnecting client to yti/vm-messaging.internetofthings.dlcloud.com  
Set-2/cmd/test/fat/String:  
subscribe to cmd OK  
  
Distance (cm): 399.93  
Distance (cm): 399.96  
Distance (cm): 399.94  
Distance (cm): 399.98  
Distance (cm): 399.94  
Distance (cm): 399.93  
Distance (cm): 399.94
```