# ASSIGNMENT 4

| Assignment Date | 03 November 2022 |
|---|---|
| Student Name | ASWIIN T |
| Student Roll number | 737819ECR016 |
| Maximum Marks | 2 Marks |

## Ultrasonic sensor simulation in Wokwi

**Question :**

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

**Code:**

```
#include<WiFi.h>
#include
<PubSubClient.h>
voidcallback(char*subscribetopic,byte*payload,unsignedint payloadLength);
//-------credentials of IBM Accounts------
#define ORG "kotoq5"//IBM ORGANITIONID
#defineDEVICE_TYPE"ESP32"//DevicetypementionedinibmwatsonIOTPlatform #defineDEVICE_ID
"12345"//DeviceIDmentionedinibmwatsonIOTPlatform
#defineTOKEN"12345678"//Token String
data3;
```

```
charserver[]=ORG".messaging.internetofthings.ibmcloud.com"; char publishTopic[] =
"iot-2/evt/Data/fmt/json";
charsubscribetopic[]="iot-2/cmd/test/fmt/String"; char authMethod[]
="use-token-auth";
```

```cpp
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
WiFiClient  wifiClient;
PubSubClientclient(server,1883,callback,wifiClient); const int trigPin =5;
constintechoPin=18; #define
SOUND_SPEED
0.034 longduration; 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);
```

```cpp
PublishData(distance); delay(1000);
if (!client.loop())
{ mqttconnect();
}
}
delay(1000);
}
void PublishData(float dist)
{ mqttconnect();
Stringpayload=
"{\"Distance\":";payload+= dist;
payload+=",\"ALERT!!\":""\"Distancelessthan100cms\""; 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("Reconnectingclientto ");
Serial.println(server);
while (!!!client.connect(clientId, authMethod, token)){
Serial.print(".")
; delay(500);
}
```

```cpp
  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("IPaddress:
"); 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="";
}
```

**Diagram.json:**

```
{
  "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:GND.1", "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:**
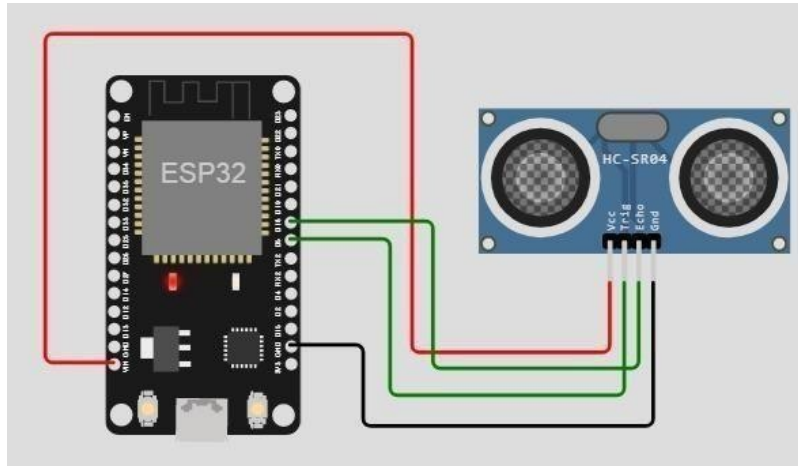


**Output:**
Wokwi output:

```
Connecting to ....
WiFi connected
IP address:
10.10.0.2
Reconnecting client to ytluse.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

Distance (cm): 399.92
Distance (cm): 399.96
Distance (cm): 399.94
Distance (cm): 399.98
Distance (cm): 399.94
Distance (cm): 399.92
Distance (cm): 399.94
```

**IBM cloud output:**