#### Assignment -4

Assignment Date	30 October 2022
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Maximum Marks	2 Marks

#### **Ouestion:**

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>
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 "12345"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "12345678" //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)</pre>
Serial.println("ALERT!!");
delay(1000);
```

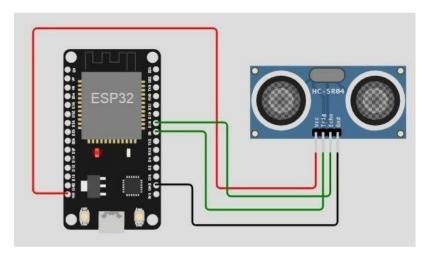
```
PublishData(distance)
; delay(1000);
if (!client.loop()) {
mqttconnect();
delay(1000);
void PublishData(float dist) {
mqttconnect();
String payload = "{\"Distance\":";
payload += dist;
payload += ",\"ALERT!!\":""\"Distance less than 100cms\"";
payload += "}";
Serial.print("Sending payload: ");
Serial.println(payload);
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++) {</pre>
```

```
//Serial.print((char)payload[i])
; data3 += (char)pavload[i];
Serial.println("data: "+ data3);
data3="";
Diagram ison:
  "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): 399.92
Distance (cm): 399.92
Distance (cm): 399.92
```

### IBM cloud output:

