

#### Assignment -4

Assignment Date	19 September 2022
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#### QUESTION:

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

#### Output:

Device Information	Recent Events	State	Logs
nts listed show the live stream of data that is coming and going from this device.			
Value	Format	Last Received	
{"distance":152}	json	a few seconds ago	
{"ALERT":91}	json	a few seconds ago	
{"ALERT":42}	json	a few seconds ago	
{"distance":186}	json	a few seconds ago	
{"distance":190}	json	a few seconds ago	

#### PROGRAM:

```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic,byte* payload, unsigned int payloadLength);
#define ORG "sw0rr5"
#define DEVICE_TYPE "abcd"
#define DEVICE_ID "1234567"
#define TOKEN "02aug01@"
String data3;

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[]="iot-2/evt/AKSHAYKP/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);

#define ECHO_PIN 12
```

```

#define TRIG_PIN 13
#define led 14

void setup() {
    // put your setup code here, to run once:
    Serial.begin(115200);
    pinMode(led, OUTPUT);
    pinMode(TRIG_PIN, OUTPUT);
    pinMode(ECHO_PIN, INPUT);
    wificonnect();
    mqttconnect();
}

float readDistanceCM() {
    digitalWrite(TRIG_PIN, LOW);
    delayMicroseconds(2);
    digitalWrite(TRIG_PIN, HIGH);
    delayMicroseconds(10);
    digitalWrite(TRIG_PIN, LOW);
    int duration=random(1,200);
    //Serial.println(duration);
    //duration = pulseIn(ECHO_PIN, HIGH);
    return duration ;
    //Serial.println(duration);
}

void loop() {
    float distance = readDistanceCM();
    //Serial.println(distance);

    bool isNearby = distance < 100;
    digitalWrite(led, isNearby);

    Serial.print("Measured distance: ");
    Serial.println(distance);
    if(distance<100){
        PublishData2(distance);

    }else{
        PublishData1(distance);
    }
    //PublishData(distance);
    delay(1000);
    if(!client.loop()){
        mqttconnect();
    }
}

```

```

    //delay(2000);
}
void PublishData1(float dist){
    mqttconnect();
    String payload= "{\"distance\":\"";
    payload += dist;
    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 PublishData2(float dist){
    mqttconnect();
    String payload= "{\"ALERT\":\"";
    payload += dist;
    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 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++){
        data3 += (char)payload[i];
    }
    Serial.println("data:"+ data3);
    if(data3=="lighton"){
        Serial.println(data3);
        digitalWrite(led,HIGH);
    }else{
        Serial.println(data3);
        digitalWrite(led,LOW);
    }
    data3="";
}

```