

### Assignment -4

Assignment Date	10 November 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.

[Device Information](#)    [Recent Events](#)    [State](#)    [Logs](#)

its listed show the five 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

#### Output:

##### PROGRAM:

```
#include <WiFi.h> #include <PubSubClient.h> void callback(char*
subscribetopic, byte* payload, unsigned int payloadLength); #define
ORG "6t0grq"
#define DEVICE_TYPE "arduino"
#define DEVICE_ID "12345"
#define TOKEN "12345678"
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, unsignedint
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="";
}
```