

IBM assignment-4

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```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic,byte* payload, unsigned int payloadLength);
#define ORG "fdd82r"
#define DEVICE_TYPE "Pi"
#define DEVICE_ID "123"
#define TOKEN "12345678"
String data3;

char server[]= ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[]="iot-2/evt/distance/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 2
#define TRIG_PIN 4
#define led 5

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="";
}

```

WOKWI project link

<https://wokwi.com/projects/346327942785139284>

Alert Case:

WOKWI interface showing the Alert Case simulation. The sketch code is as follows:

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 void callback(char* topic, byte* payload, unsigned int payloadLength);
4 #define ORG "fdd82r"
5 #define DEVICE_TYPE "Pi"
6 #define DEVICE_ID "123"
7 #define TOKEN "12345678"
8 String data3;
9
10 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
11 char publishTopic[] = "iot-2/evt/distance/fmt/json";
12 char subscribeTopic[] = "iot-2/cmd/test/fmt/string";
13 char authMethod[] = "use-token-auth";
14 char token[] = TOKEN;
15 char clientId[] = "d:" + ORG + ":" + DEVICE_TYPE + ":" + DEVICE_ID;
16
17 WiFiClient wifiClient;
18 PubSubClient client(server, 1883, callback, wifiClient);
19
20 #define ECHO_PIN 2
21 #define TRIG_PIN 4
22 #define led 5
23
24 void setup() {
25   // put your setup code here, to run once:
26   Serial.begin(115200);
27   pinMode(led, OUTPUT);
28   pinMode(TRIG_PIN, OUTPUT);
29   pinMode(ECHO_PIN, INPUT);
30   wifiConnect();
31   mqttConnect();
32 }

```

The simulation output shows the following sequence of events:

- publish ok
- Measured distance: 161.00
- Sending payload:{"distance":161.00}
- publish ok
- Measured distance: 23.00
- Sending payload:{"ALERT":23.00}
- publish ok

Normal Case:

WOKWI interface showing the Normal Case simulation. The sketch code is as follows:

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 void callback(char* topic, byte* payload, unsigned int payloadLength);
4 #define ORG "fdd82r"
5 #define DEVICE_TYPE "Pi"
6 #define DEVICE_ID "123"
7 #define TOKEN "12345678"
8 String data3;
9
10 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
11 char publishTopic[] = "iot-2/evt/distance/fmt/json";
12 char subscribeTopic[] = "iot-2/cmd/test/fmt/string";
13 char authMethod[] = "use-token-auth";
14 char token[] = TOKEN;
15 char clientId[] = "d:" + ORG + ":" + DEVICE_TYPE + ":" + DEVICE_ID;
16
17 WiFiClient wifiClient;
18 PubSubClient client(server, 1883, callback, wifiClient);
19
20 #define ECHO_PIN 2
21 #define TRIG_PIN 4
22 #define led 5
23
24 void setup() {
25   // put your setup code here, to run once:
26   Serial.begin(115200);
27   pinMode(led, OUTPUT);
28   pinMode(TRIG_PIN, OUTPUT);
29   pinMode(ECHO_PIN, INPUT);
30   wifiConnect();
31   mqttConnect();
32 }

```

The simulation output shows the following sequence of events:

- Measured distance: 171.00
- Sending payload:{"distance":171.00}
- publish ok
- Measured distance: 155.00
- Sending payload:{"distance":155.00}
- publish ok

Cloud storage:

IBM Watson IoT Platform

2019504513@smartinternoz.com

ID: fdd827

Browse

Action

Device Types

Interfaces

Add Device

Identity

Device Information

Recent Events

State

Logs

×

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
distance	{"ALERT":-95}	json	a few seconds ago
distance	{"ALERT":-14}	json	a few seconds ago
distance	{"distance":193}	json	a few seconds ago
distance	{"ALERT":-79}	json	a few seconds ago
distance	{"distance":186}	json	a few seconds ago

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