

CODE

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Team ID	PNT2022TMID24952
Project Name	Industry-specific intelligent fire management system

The image displays two screenshots of the Wokwi IoT simulator interface, showing the code and simulation results for an ESP32-based fire management system.

Top Screenshot: The code in the left pane defines a subscription to an IoT topic and sets up a Wi-Fi client. The simulation window on the right shows the ESP32 board connected to a breadboard with a thermistor and a red LED. The status bar indicates "WIFI CONNECTED" and "IP address: 10.10.0.2".

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 #define temp_pin 15
4 void callback(char* topic, byte* payload, unsigned int payloadLength);
5 #define ORG "ugapx5"
6 #define DEVICE_TYPE "raspberrypi"
7 #define DEVICE_ID "12345"
8 #define TOKEN "12345678"
9 String data;
10
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/Data/fmt/json";
13 char subscribeTopic[] = "iot-2/cmd/test/fmt/String";
14 char authMethod[] = "use-token-auth";
15 char token[] = TOKEN;
16 char clientId[] = "d:" + ORG + ":" + DEVICE_TYPE + ":" + DEVICE_ID;
17
18 WiFiClient wifiClient;
19 PubSubClient client(server, 1883, callback, wifiClient);
20
21
22
23
24 // should match the Beta Coefficient of the thermistor
25
26 void setup() {
27   Serial.begin(9600);
28   analogReadResolution(10);
29   pinMode(32, INPUT);
30   pinMode(14, OUTPUT);

```

Bottom Screenshot: The code in the left pane shows the main loop logic for reading the thermistor, publishing data, and controlling the LED. The simulation window on the right shows the ESP32 board with the same breadboard setup. The status bar indicates "subscribe to cmd ok" and "Temperature: 23.99 °C".

```

32 wificonnect();
33 mqttconnect();
34
35 }
36 void loop() {
37   const float BETA = 3950; // should match the Beta Coefficient of the thermistor
38   int analogValue = analogRead(A4);
39   float temp = 1 / (log(1 / (1023. / analogValue - 1)) / BETA + 1.0 / 298.15) - 273.15;
40   //float temp = 1 / (log(1 / (1023. / analogValue - 1)) / BETA + 1.0 / 298.15) - 273.15;
41   Serial.print("Temperature: ");
42   Serial.print(temp);
43   Serial.println(" °C");
44   if(temp > 35){
45     PublishData2(temp);
46     digitalWrite(14, HIGH);
47   }else{
48     digitalWrite(14, LOW);
49     PublishData1(temp);
50   }
51   delay(1000);
52   if(!client.loop()){
53     mqttconnect();
54   }
55
56   //delay(2000);
57
58 void PublishData1(float tem){
59   mqttconnect();
60   String payload = "{\"temp\": ";
61   payload += tem;

```

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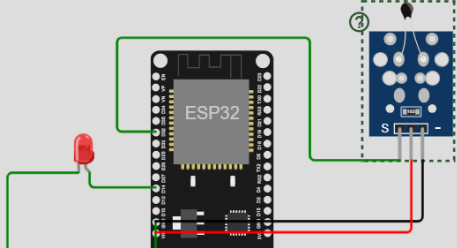
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```

62 payload+=" ";
63
64 Serial.print("Sending payload:");
65 Serial.println(payload);
66
67 if(client.publish(publishTopic,(char*)payload.c_str())){
68   Serial.println("publish ok");
69 } else{
70   Serial.println("publish failed");
71 }
72
73 void PublishData2(float tem){
74   mqttconnect();
75   String payload= "{\"ALERT\": ";
76   payload += tem;
77   payload += " }";
78
79   Serial.print("Sending payload:");
80   Serial.println(payload);
81
82   if(client.publish(publishTopic,(char*)payload.c_str())){
83     Serial.println("publish ok");
84   } else{
85     Serial.println("publish failed");
86   }
87 }
88 void mqttconnect(){
89   if(!client.connected()){
90     Serial.print("Reconnecting to");
91     Serial.println(server);

```

Simulation



Temperature: 23.99 °C
 Sending payload:{"temp":23.99}
 publish ok
 Temperature: 23.99 °C
 Sending payload:{"temp":23.99}
 publish ok
 Temperature: 23.99 °C

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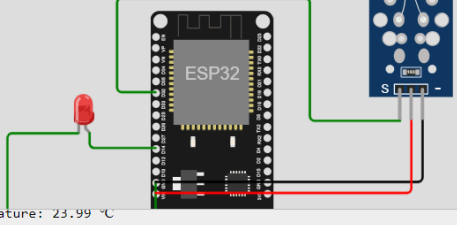
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```

92 while(!client.connect(clientID, authMethod, token)){
93   Serial.print(".");
94   delay(500);
95 }
96 initManagedDevice();
97 Serial.println();
98 }
99
100
101 void wificonnect(){
102   Serial.println();
103   Serial.print("Connecting to");
104
105   WiFi.begin("Wokwi-GUEST","",6);
106   while(WiFi.status()!=WL_CONNECTED){
107     delay(500);
108     Serial.print(".");
109   }
110   Serial.println("");
111   Serial.println("WIFI CONNECTED");
112   Serial.println("IP address:");
113   Serial.println(WiFi.localIP());
114 }
115
116 void initManagedDevice(){
117   if(client.subscribe(subscribeTopic)){
118     Serial.println((subscribeTopic));
119     Serial.println("subscribe to cmd ok");
120   }else{
121     Serial.println("subscribe to cmd failed");
122   }

```

Simulation



Temperature: 23.99 °C
 Sending payload:{"temp":23.99}
 publish ok
 Temperature: 23.99 °C
 Sending payload:{"temp":23.99}
 publish ok
 Temperature: 23.99 °C

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