

SPRINT-3

| | |
|---------|------------------------------------------------------|
| PROJECT | INDUSTRY-SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM |
| TEAM ID | PNT2022TMID15035 |

PYTHON CODE:

```
#include <time.h>
#include <WiFi.h>
#include <PubSubClient.h>

#define ORG "ksgtfi"
#define DEVICE_TYPE "123"
#define DEVICE_ID "123_1"
#define TOKEN "12345678"

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/data/fmt/json";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;

WiFiClient wifiClient;
PubSubClient client(server, 1883, wifiClient);

float temperature = 0;
int gas = 0;
int flame = 0;

String flame_status = "";
String Gas_status = "";
String exhaust_fan_status = "";
String sprinkler_status = "";

void setup() {
    Serial.begin(99900);
    wifiConnect();
    mqttConnect();
}

void loop() {

    srand(time(0));
```

```

//initial variables and random generated data

temperature = random(-20,125);
gas = random(0,1000);
int flamereading = random(200,1024);
flame = map(flamereading,200,1024,0,2);

//set a flame status

switch (flame) {
case 0:
    flame_status = "No Fire";
    break;
case 1:
    flame_status = "Fire is Detected";
    break;
}

//send the sprinkler status

if(flame==1){
    sprinkler_status = "Working";
}
else{
    sprinkler_status = "Not Working";
}

//toggle the fan according to gas reading

if(gas > 100){
    Gas_status = "Gas Leakage is Detected";
    exhaust_fan_status = "Working";
}
else{
    Gas_status = "No Gas Leakage is Detected";
    exhaust_fan_status = "Not Working";
}

//json format for IBM Watson

String payload = "{";
payload+="\"gas\":";
payload+=gas;
payload+=",";
payload+="\"temperature\":";
payload+=(int)temperature;

```

```

payload+=",";
payload+="\"flame\":";
payload+=flamereading;
payload+=",";
payload+="\"fire_status\":"+"\""+flame_status+"\"",";
payload+="\"sprinkler_status\":"+"\""+sprinkler_status+"\"",";
payload+="\"Gas_status\":"+"\""+Gas_status+"\"",";
payload+="\"exhaust_fan_status\":"+"\""+exhaust_fan_status+"\""}";

if(client.publish(publishTopic, (char*) payload.c_str()))
{
    Serial.println("Publish OK");
}
else{
    Serial.println("Publish failed");
}
delay(1000);

if (!client.loop())
{
    mqttConnect();
}
}

void wifiConnect()
{
    Serial.print("Connecting to ");
    Serial.print("Wifi");
    WiFi.begin("Wokwi-GUEST", "", 6);
    while (WiFi.status() != WL_CONNECTED)
    {
        delay(500);
        Serial.print(".");
    }
    Serial.print("WiFi connected, IP address: ");
    Serial.println(WiFi.localIP());
}

void mqttConnect()
{
    if (!client.connected())
    {
        Serial.print("Reconnecting MQTT client to ");
        Serial.println(server);
        while (!client.connect(clientId, authMethod, token))

```

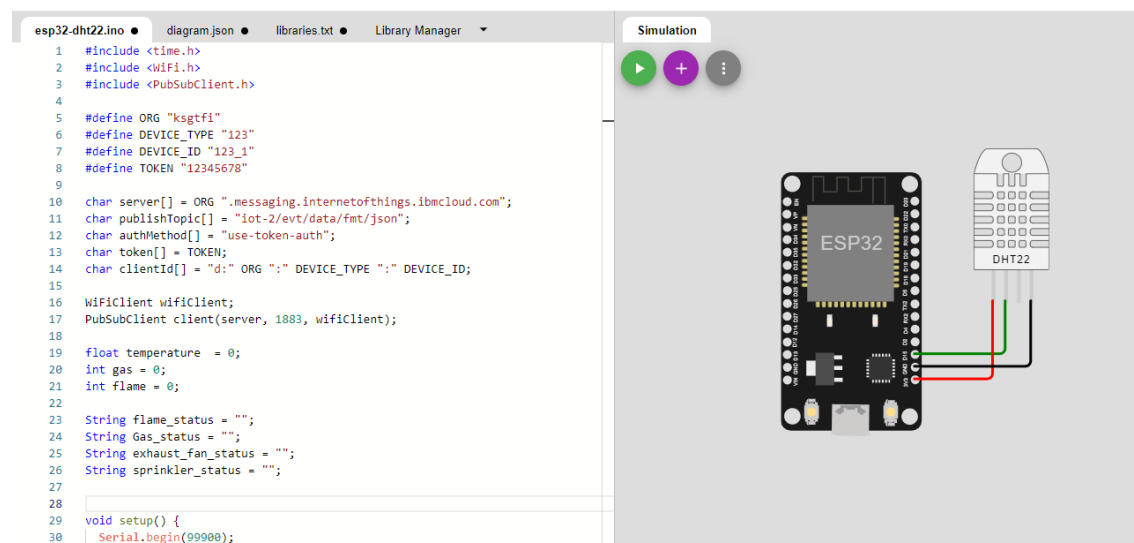
```

    {
        Serial.print(".");
        delay(500);
    }

    Serial.println();
}
}

```

WOKWI CONNECTION:



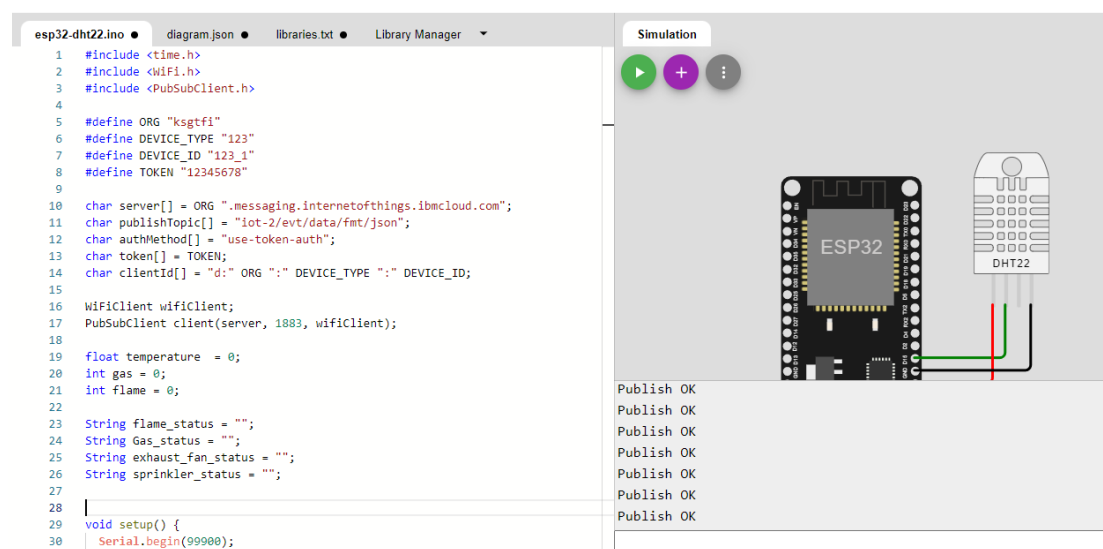
The screenshot shows the Wokwi IDE interface. On the left, the code for `esp32-dht22.ino` is displayed. The code includes necessary libraries, defines constants for the I2C address and token, and sets up a WiFi client and a PubSubClient. The `setup` function initializes the serial port at 99900 baud. On the right, the simulation window shows an ESP32 microcontroller board connected to a DHT22 digital temperature and humidity sensor via I2C pins (SCL and SDA).

```

1  #include <time.h>
2  #include <WiFi.h>
3  #include <PubSubClient.h>
4
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6  #define DEVICE_TYPE "123"
7  #define DEVICE_ID "123_1"
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11 char publishTopic[] = "iot-2/evt/data/fmt/json";
12 char authMethod[] = "use-token-auth";
13 char token[] = TOKEN;
14 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
15
16 WiFiClient wifiClient;
17 PubSubClient client(server, 1883, wifiClient);
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19 float temperature = 0;
20 int gas = 0;
21 int flame = 0;
22
23 String flame_status = "";
24 String Gas_status = "";
25 String exhaust_fan_status = "";
26 String sprinkler_status = "";
27
28
29 void setup() {
30     Serial.begin(99900);

```

WOKWI OUTPUT:



This screenshot shows the same Wokwi IDE interface as the previous one, but the simulation output window on the right now displays a series of "Publish OK" messages, indicating that the device successfully published data to the MQTT broker. The code and simulation setup remain identical to the previous image.

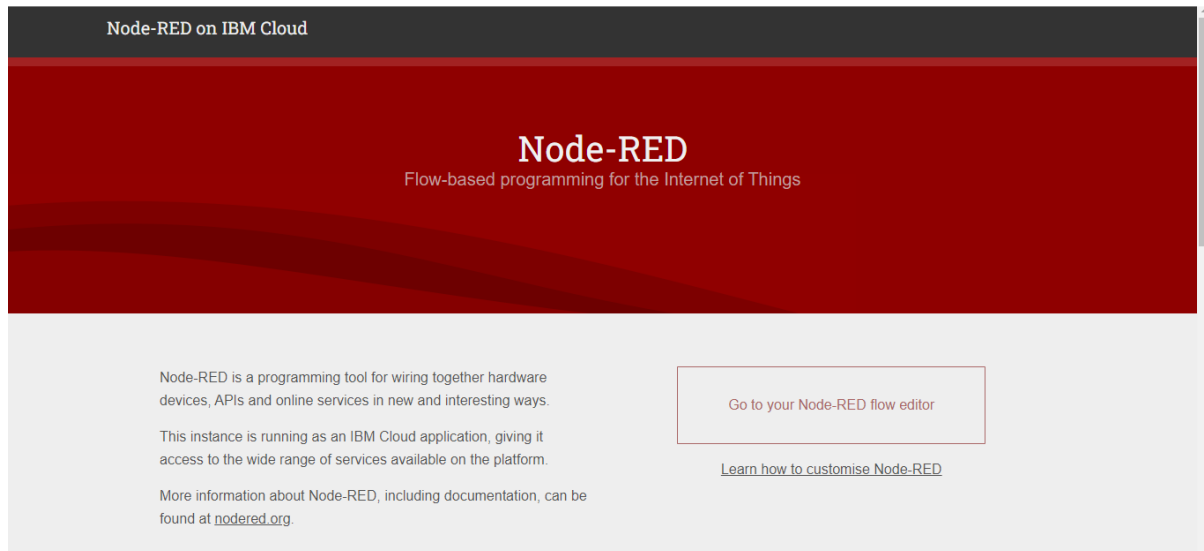
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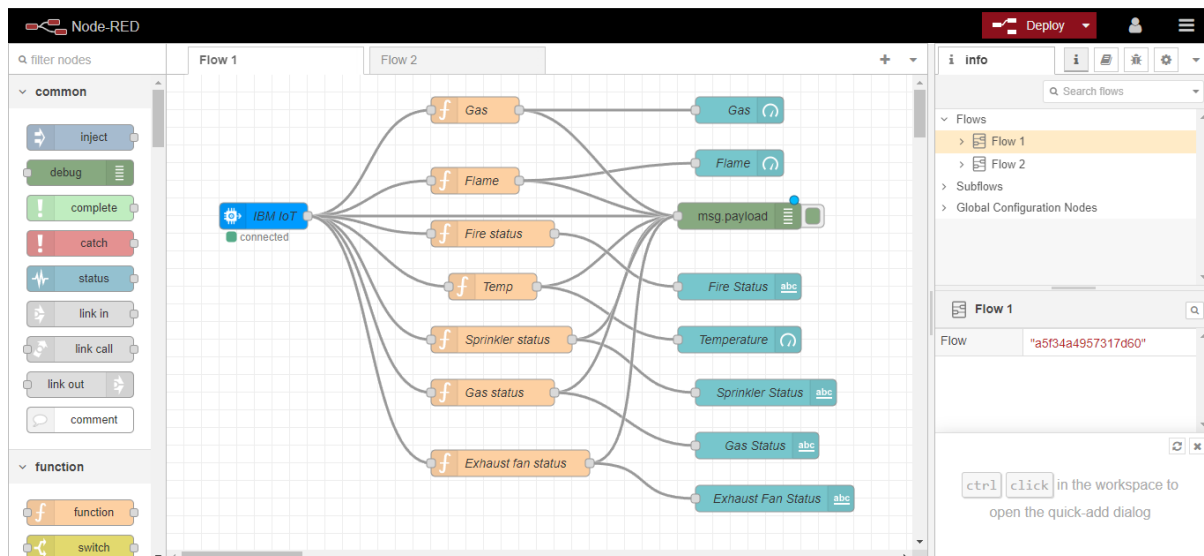
```

Publish OK
Publish OK
Publish OK
Publish OK
Publish OK
Publish OK
Publish OK

NODE-RED :



NODE-RED CONNECTION:



OUTPUT:

