

WOKWI SIMULATION OUTPUT

DATE	19 NOVEMBER 2022
TEAM ID	PNT2022TMID28844
PROJECT TITLE	INDUSTRY-SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM

Source Code :

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQTT
#include "DHT.h"// Library for dht11
#define DHTPIN 15 // what pin we're connected to
#define DHTTYPE DHT22 // define type of sensor DHT 11
#define LED 2
#define BUZZER 4
#define EXFAN1 13
#define EXFAN2 14
#define SPRKLR 12

#include <Wire.h>
#include <LiquidCrystal_I2C.h>

LiquidCrystal_I2C LCD = LiquidCrystal_I2C(0x27, 20, 4);

DHT dht (DHTPIN, DHTTYPE);// creating the instance by passing pin
and type of dht connected

void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);

//-----credentials of IBM Accounts-----

#define ORG "0bm892"//IBM ORGANIZATION ID
#define DEVICE_TYPE "ESP32_Controller"//Device type mentioned in ibm
watson IOT Platform
#define DEVICE_ID "Sensor"//Device ID mentioned in ibm watson IOT
Platform
#define TOKEN "1234567890" //Token
String data3;
float h, t, s, f, fan1=0, fan2=0, spr=0;
```

```

//----- Customise the above values -----
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";//
Server Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and
type of event perform and format in which data to be send
char subscribetopic[] = "iot-2/cmd/command/fmt/String";//
cmd REPRESENT command type AND COMMAND IS TEST OF FORMAT STRING
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id

//-----
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient); //calling
the predefined client id by passing parameter like server id,portand
wificredential

void setup()// configuring the ESP32
{
    Serial.begin(115200);
    dht.begin();
    pinMode(LED,OUTPUT);
    pinMode(BUZZER,OUTPUT);
    pinMode(EXFAN1,OUTPUT);
    pinMode(EXFAN2,OUTPUT);
    digitalWrite(LED,LOW);
    digitalWrite(BUZZER,LOW);
    digitalWrite(EXFAN1,LOW);
    digitalWrite(EXFAN2,LOW);
    pinMode(SPRKLR,OUTPUT);
    digitalWrite(SPRKLR,LOW);
    delay(10);
    Serial.println();
    wificonnect();
    mqttconnect();
    LCD.init();
    LCD.backlight();
    LCD.setCursor(0, 0);
    LCD.print("Connecting to ");
    LCD.setCursor(0, 1);
    LCD.print("WiFi ");
    delay(1000);
    LCD.clear();
}

void loop()// Recursive Function
{

```

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LCD.setCursor(0,2);
LCD.print("Smoke: ");
LCD.setCursor(0, 0);
LCD.print("Temp: ");
LCD.setCursor(14, 0);
LCD.print("C");
LCD.setCursor(0, 1);
LCD.print("Humid: ");
LCD.setCursor(14, 1);
LCD.print("%");
h = dht.readHumidity();
t = dht.readTemperature();
s = random(0,900);
f = random(0,255);
if (s>400)
{
  Serial.print("Smoke: ");
  Serial.println("Detected");
  digitalWrite(BUZZER,HIGH);
  LCD.setCursor(7, 2);
  LCD.print("YES");
  LCD.setCursor(0, 3);
  LCD.print("WARNING!FIREACCIDENT");
  digitalWrite(EXFAN1,HIGH);
  digitalWrite(EXFAN2,HIGH);
  fan1=1;
  fan2=1;
}

else{
  Serial.print("Smoke: ");
  Serial.println("Not Detected");
  digitalWrite(BUZZER,LOW);
  LCD.setCursor(7, 2);
  LCD.print(" NO");
  LCD.setCursor(0, 3);
  LCD.print(" ");
  digitalWrite(EXFAN1,LOW);
  digitalWrite(EXFAN2,LOW);
  fan1=0;
  fan2=0;
}

if(f>80)
{
  Serial.print("Flame: ");
  Serial.println("Detected");
  spr=1;
}

```

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        digitalWrite(SPRKLR,HIGH);
    }

else
{
    Serial.print("Flame: ");
    Serial.println("nOT Detected");
    spr=0;
    digitalWrite(SPRKLR,LOW);
}
Serial.print("Temp:");
Serial.println(t);
LCD.setCursor(7, 0);
LCD.print(t);
Serial.print("Humid:");
Serial.println(h);
LCD.setCursor(7, 1);
LCD.print(h);

PublishData(t, h, s,fan1,fan2,spr);
delay(1000);
if (!client.loop()) {
    mqttconnect();
}
}

/*.....retrieving to
Cloud.....*/

void PublishData(float temp, float humid, float smoke,float
fan1,float fan2,float spr) {
    mqttconnect();//function call for connecting to ibm
    /*
        creating the String in in form JSon to update the data to ibm
cloud
    */
    String payload = "{\"temp\":";
    payload += temp;
    payload += "," " \"Humid\":";
    payload += humid;
    payload += "," " \"Smoke\":";
    payload += smoke;
    payload += "," " \"F1STATUS\":";
    payload += fan1;
    payload += "," " \"F2STATUS\":";
    payload += fan2;

```

```

    payload += "," " \"SPRKLR\":";
    payload += spr;
    payload += "}";

    Serial.print("Sending payload: ");
    Serial.println(payload);

    if (client.publish(publishTopic, (char*) payload.c_str())) {
        Serial.println("Publish ok");// if it sucessfully upload data on
the cloud then it will print publish ok in Serial monitor or else it
will print publish failed
    } else {
        Serial.println("Publish failed");
    }
}

void mqttconnect() {
    if (!client.connected()) {
        Serial.print("Reconnecting client to ");
        Serial.println(server);
        while (!!!client.connect(clientId, authMethod, token)) {
            Serial.print(".");
            delay(500);
        }

        initManagedDevice();
        Serial.println();
    }
}

void wificonnect() //function defination for wificonnect
{
    Serial.println();
    Serial.print("Connecting to ");

    WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to
establish the connection
    while (WiFi.status() != WL_CONNECTED) {
        delay(500);
        Serial.print(".");
    }
    Serial.println("");
    Serial.println("WiFi connected");
    LCD.setCursor(0, 0);
    LCD.print("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++) {
        //Serial.print((char)payload[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="";
}

```

OUTPUT :

WOKWI SAVE SHARE Docs

esp Simulation 00:28.459 44%

Humid:49.50
Sending payload: {"temp":-3.00,"Humid":49.50,"Smoke":428.00,"F1STATUS":1.00,"F2STATUS":1.00,"SPRKLR":1.00}
Publish ok
Smoke: Detected
Flame: Detected
Temp:-3.00
Humid:49.50

WOKWI SAVE SHARE Docs

esp Simulation 00:58.890 58%

Temp: -3.00 C
Humid: 49.50 %
Smoke: YES
WARNING!FIREACCIDENT

Humid:49.50
Sending payload: {"temp":-3.00,"Humid":49.50,"Smoke":428.00,"F1STATUS":1.00,"F2STATUS":1.00,"SPRKLR":1.00}
Publish ok
Smoke: Detected
Flame: Detected
Temp:-3.00
Humid:49.50

