Sprint-3

Team ID	PNT2022TMID52559
Project Name	INDUSTRY-SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM

CODE:

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
#include "DHT.h"// Library for dht11
#include <cstdlib>
#include <time.h>
#define DHTPIN 15     // what pin we're connected to
#define DHTTYPE DHT22   // define type of sensor DHT 11


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

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

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

#define ORG "3e40vw"
#define DEVICE_TYPE "sample-device"
#define DEVICE_ID "8007"
#define TOKEN "987654321"

String data3 = "";
String accidentstatus ="";
String sprinkstatus = "";
float temp =0;
bool isfanon = false;
bool issprinkon = false;
int gas = 0;
int flame = 0;
int flow = 0;


char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/data/fmt/json";
char subscribetopic[] = "iot-2/cmd/command/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_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()// configureing the ESP32
{
  Serial.begin(115200);
  dht.begin();
  //if real gas sensor is used make sure the senor is heated up for acurate readings
```

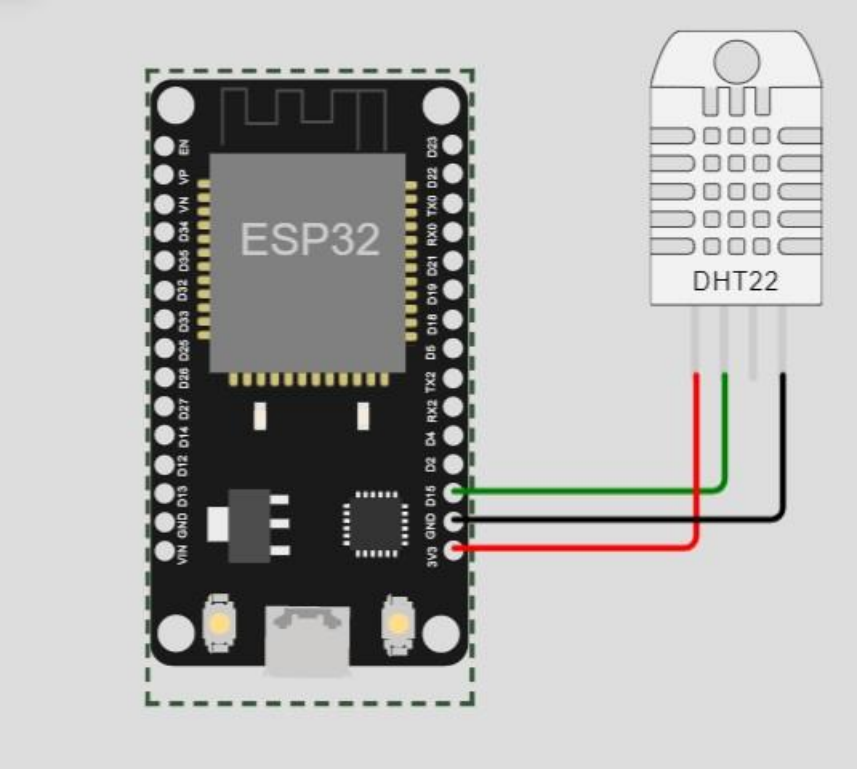
```
 /*
   - Here random values for readings and stdout were used to show the
     working  of the devices as physical or simulated devices are not
     available.
 */


 delay(10);
 Serial.println();
 wificonnect();
 mqttconnect();
}

void loop()// Recursive Function
{


 temp = dht.readTemperature();
 //setting a random seed
 srand(time(0));

 //initial variable activities like declaring , assigning
 gas = rand()%400;
 int flamereading = rand()%1024;
 flame = map(flamereading,0,1024,0,1024);
 int flow = ((rand()%100)>50?1:0);



 //find the accident status 'cause fake alert may be caused by some mischief activities
 if(temp < 45 ){
   if(flame > 650){
     accidentstatus = "Need Auditing";
     isfanon = true;
     issprinkon = false;
   }
   else if(flame <= 10){
     accidentstatus = "nothing happened";
     isfanon = false;
     issprinkon = false;
   }

 }else if(temp >= 45 && temp <= 55 ){
   if(flame <=650 && flame >100  ){
     issprinkon = true;
     accidentstatus = "moderate";
     if(gas > 150){
       isfanon = true;
     }
     else{
       isfanon = false;
     }
   }
   else if(flame <= 100 && flame > 10){
     issprinkon = true;
     isfanon = false;
     accidentstatus = "moderate";
```

```
 }

  }else if(temp > 55){
    if(flame > 650){
      gas = 500 + rand()%500;
      accidentstatus = "severe";
      issprinkon = true;
      isfanon = true;
    }
    else if(flame < 650 && flame > 400 ){
      gas = 300 + rand()%500;
      accidentstatus = "severe";
      issprinkon = true;
      isfanon = true;
    }
  }
  else {
    accidentstatus = "Need Auditing";
    isfanon = false;
    issprinkon = false;
  }


  if(issprinkon){
    if(flow){
      sprinkstatus = "working";
    }
    else{
      sprinkstatus = "not working";
    }
  }
  else if(!issprinkon){
    sprinkstatus = "ready";
  }
  else {
    sprinkstatus = "something's wrong";
  }


  PublishData(temp,gas,flame,flow,isfanon,issprinkon);
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
}



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

void PublishData(float temp, int gas ,int flame ,int flow,bool isfanon,bool issprinkon) {
  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 += "," "\"gas\":";
  payload += gas;
```

```
  payload += "," "\"flame\":";



  payload += flame;
  payload += "," "\"flow\":";
  payload += ((flow)?"true":"false");
  payload += "," "\"isfanon\":";
  payload += ((isfanon)?"true":"false");
  payload += "," "\"issprinkon\":";
  payload += ((issprinkon)?"true":"false");
  payload += "," "\"accidentstatus\":";
  payload += "\""+accidentstatus+"\"";
  payload += "," "\"sprinkstatus\":";
  payload += "\""+sprinkstatus+"\"";
  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");
  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=="foo")
  {
Serial.println(data3);

  }
  else
  {
Serial.println(data3);

  }
data3="";
}
```

CIRCUIT:


ESP32
DHT22
EN
VP
VN
D34
D35
D32
D33
D25
D26
D27
D14
D12
D13
GND
VIN
D23
D22
TX0
RX0
D21
D19
D18
D5
TX2
RX2
D4
D2
D15
GND
3V3

```
Connecting to ..
WiFi connected
IP address:
10.10.0.2
Reconnecting client to
3e40vw.messaging.internetofthings.ibmcloud.comfvs923.messaging.internetofthings.ibmcloud.
com
iot-2/cmd/command/fmt/String
subscribe to cmd OK

Sending payload:
{"temp":24.00,"gas":218,"flame":369,"flow":true,"isfanon":false,"issprinkon":false,"accid
entstatus":"","sprinkstatus":"ready"}
Publish ok
Sending payload:
{"temp":24.00,"gas":103,"flame":531,"flow":false,"isfanon":false,"issprinkon":false,"acci
dentstatus":"","sprinkstatus":"ready"}
Publish ok
```

WOKWI LINK:

https://wokwi.com/projects/34829520685813000