# Sprint-2

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

**CODE:**

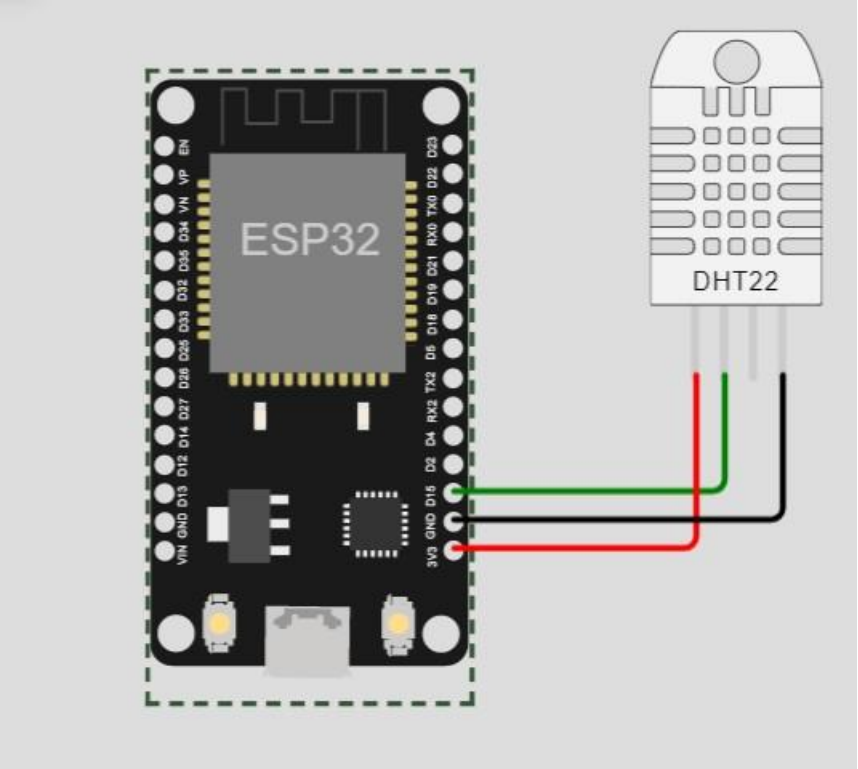
```
#include "DHTesp.h"
#include <cstdlib>
#include <time.h>
#include <WiFi.h>
#include <PubSubClient.h>

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

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);

const int DHT_PIN = 15;

bool is_exhaust_fan_on = false;
bool is_sprinkler_on = false;

float temperature  = 0;

int gas_ppm = 0;
int flame = 0;
int flow = 0;

String flame_status = "";
String accident_status = "";
String sprinkler_status = "";

DHTesp dhtSensor;


void setup() {
  Serial.begin(99900);

  /**** sensor pin setups ****/
  dhtSensor.setup(DHT_PIN, DHTesp::DHT22);
  //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.
  */
```

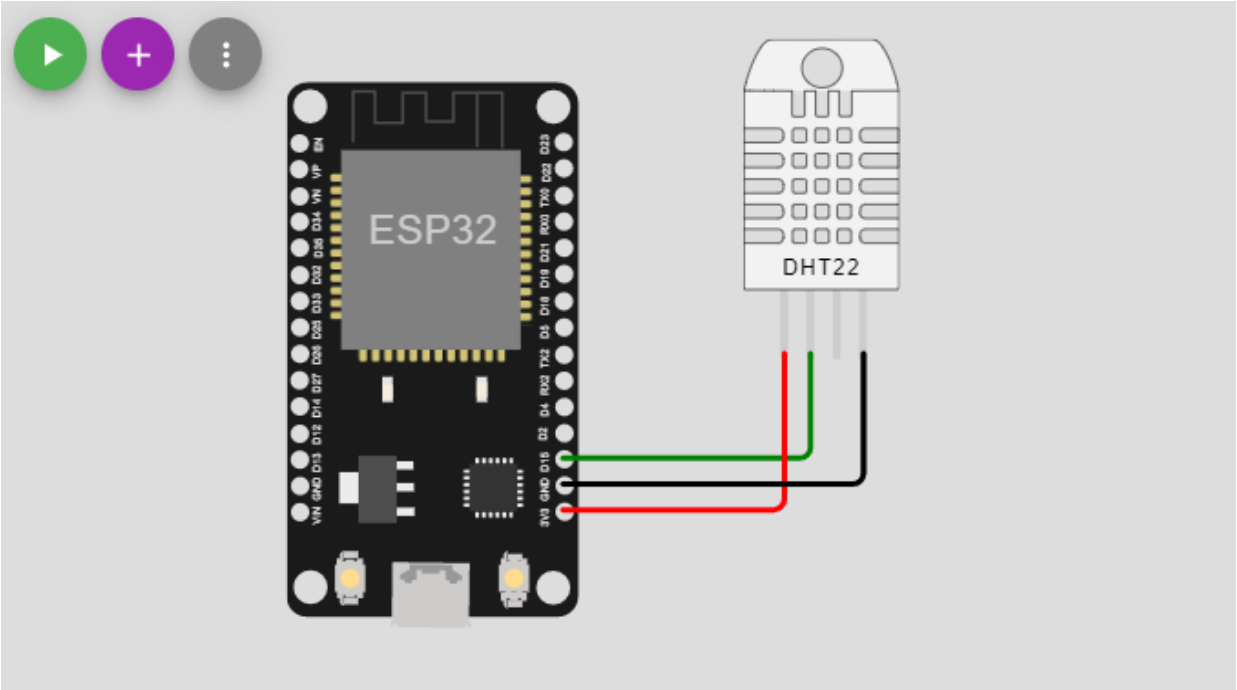
```
  wifiConnect();
  mqttConnect();
}

void loop() {

  TempAndHumidity  data = dhtSensor.getTempAndHumidity();

  //setting a random seed
  srand(time(0));

  //initial variable activities like declaring , assigning
  temperature  = data.temperature;
  gas_ppm = rand()%1000;
  int flamereading = rand()%1024;
  flame = map(flamereading,0,1024,0,1024);
  int flamerange = map(flamereading,0,1024,0,3);
  int flow = ((rand()%100)>50?1:0);

  //set a flame status based on how close it is.....
  switch (flamerange) {
  case 2:    // A fire closer than 1.5 feet away.
    flame_status = "Close Fire";
    break;
  case 1:    // A fire between 1-3 feet away.
    flame_status = "Distant Fire";
    break;
  case 0:    // No fire detected.
    flame_status = "No Fire";
    break;
  }

  //toggle the fan according to gas in ppm in the room
  if(gas_ppm > 100){
    is_exhaust_fan_on = true;
  }
  else{
    is_exhaust_fan_on = false;
  }

  //find the accident status 'cause fake alert may be caused by some mischief activities
  if(temperature < 40 && flamerange ==2){
    accident_status = "need auditing";
    is_sprinkler_on = false;
  }
  else if(temperature < 40 && flamerange ==0){
    accident_status = "nothing found";
    is_sprinkler_on = false;
  }
  else if(temperature > 50 && flamerange == 1){
    is_sprinkler_on = true;
    accident_status = "moderate";
  }
  else if(temperature > 55 && flamerange == 2){
    is_sprinkler_on = true;
    accident_status = "severe";
  }else{
    is_sprinkler_on = false;
```

```
  accident_status = "nil";
}


//send the sprinkler status
if(is_sprinkler_on){
  if(flow){
    sprinkler_status = "working";
  }
  else{
    sprinkler_status = "not working";
  }
}
else if(is_sprinkler_on == false){
  sprinkler_status = "now it shouldn't";
}
else{
  sprinkler_status = "something's wrong";
}

//Obivously the output.It is like json format 'cause it will help us for future sprints
String payload = "{\"senor_values\":{";
payload+="\"gas_ppm\":";
payload+=gas_ppm;
payload+=",";
payload+="\"temperature\":";
payload+=(int)temperature;
payload+=",";
payload+="\"flame\":";
payload+=flame;
payload+=",";
payload+="\"flow\":";
payload+=flow;
payload+="},";
payload+="\"output\":{";
payload+="\"is_exhaust_fan_on\":"+String((is_exhaust_fan_on)?"true":"false")+",";
payload+="\"is_sprinkler_on\":"+String((is_sprinkler_on)?"true":"false")+"";
payload+="},";
payload+="\"messages\":{";
payload+="\"fire_status\":\""+flame_status+"\",";
payload+="\"flow_status\":\""+sprinkler_status+"\",";
payload+="\"accident_status\":\""+accident_status+"\"";
payload+="}";
payload+="}";
//Serial.println(payload);


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();
  }
}
```

**CIRCUIT:**




```
Connecting to Wifi..WiFi connected, IP address: 10.10.0.2
Reconnecting MQTT client to 3e40vw.messaging.internetofthings.ibmcloud.com
Publish OK
```

**WOKWI LINK:**

https://wokwi.com/projects/348293883716698708