

SPRINT-1

Team ID	PNT2022TMID38457
Project Name	Project – Industry Specific Intelligent Fire Management system

CONFIGURING ESP32 USING WOKWI PROJECTS

PROGRAM:

```
#include "DHTesp.h"
#include <cstdlib>
#include <time.h>
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 sensor is heated up for accurate
  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.
  */
} 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 = "not 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
= "none";
    }

    //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 = "it should not!";
        }    else{            sprinkler_status
= "Error!!";
    }

    //Obviously the output.It is like json format 'cause it will help us for
    future sprints
    String out = "{\n\t\"senor_values\":{";
    out+="\n\t\t\"gas_ppm\": "+String(gas_ppm)+", ";
    out+="\n\t\t\"temperature\": "+String(temperature,2)+", ";
    out+="\n\t\t\"flame\": "+String(flame)+", ";
    out+="\n\t\t\"flow\": "+String(flow)+",\n\t}";    out+="\n\t\"output\":{";

    out+="\n\t\t\"is_exhaust_fan_on\": "+String((is_exhaust_fan_on)?"true":"false
    ")+" , ";

    out+="\n\t\t\"is_sprinkler_on\": "+String((is_sprinkler_on)?"true":"false")+
    ", ";
    out+="\n\t}";
    out+="\n\t\"messages\":{";
    out+="\n\t\t\"fire_status\": "+flame_status+", ";
    out+="\n\t\t\"flow_status\": "+sprinkler_status+", ";
    out+="\n\t\t\"accident_status\": "+accident_status+", ";
    out+="\n\t}";    out+="\n}";
    Serial.println(out);

    delay(2000);
}

```

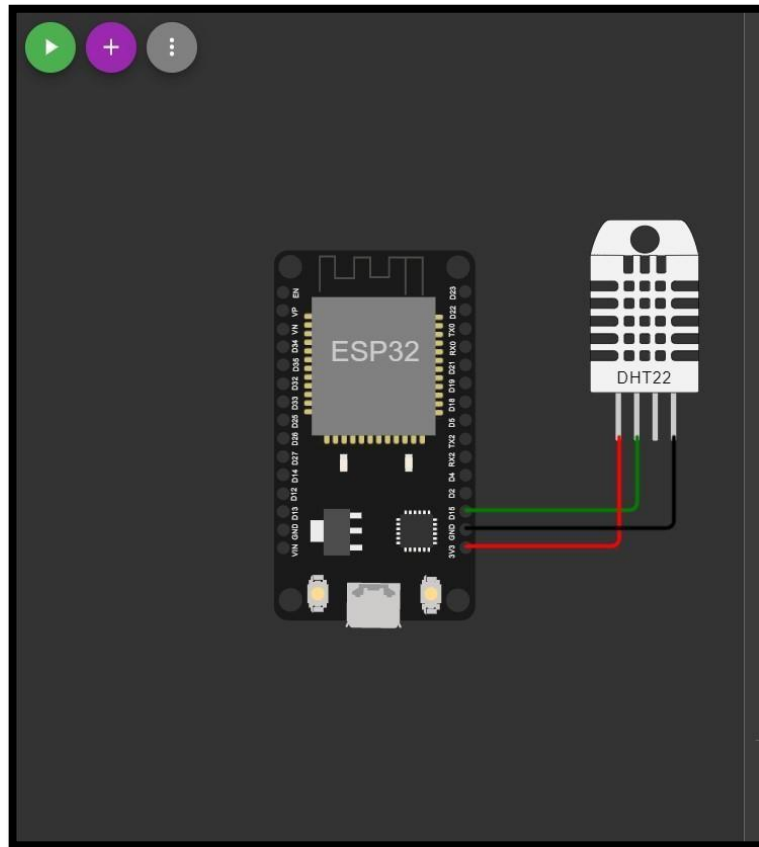
DIAGRAM.JSON

```
sketch.ino  diagram.json  libraries.txt  Library Manager  ▼
1  {
2    "version": 1,
3    "author": "PNT2022TMID34516",
4    "editor": "wokwi",
5    "parts": [
6      { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -16.32, "left": -0.82, "attrs": {} },
7      {
8        "type": "wokwi-dht22",
9        "id": "dht1",
10       "top": -30.22,
11       "left": 165.89,
12       "attrs": { "temperature": "59.3" }
13     }
14   ],
15   "connections": [
16     [ "esp:TX0", "$serialMonitor:RX", "", [ ] ],
17     [ "esp:RX0", "$serialMonitor:TX", "", [ ] ],
18     [ "dht1:SDA", "esp:D15", "green", [ "v0" ] ],
19     [ "dht1:VCC", "esp:3V3", "red", [ "v0" ] ],
20     [ "dht1:GND", "esp:GND.1", "black", [ "v0" ] ]
21   ]
22 }
```

LIBRARIES

```
sketch.ino  diagram.json  libraries.txt  Library Manager  ▼
1  # Wokwi Library List
2  # See https://docs.wokwi.com/guides/libraries
3
4  DHT sensor library for ESPx
5  ArduinoJson
```

CIRCUIT



OUTPUT:

```
"output":{
  "is_exhaust_fan_on":false,
  "is_sprinkler_on":true,
}
"messages":{
  "fire_status":Close Fire,
  "flow_status":not working,
  "accident_status":severe,
}

"senor_values":{
  "gas_ppm":226,
  "temperature":59.30,
  "flame":317,
  "flow":0,
}
```

WOKWI LINK

<https://wokwi.com/projects/34863063505462946>

0