Team ID	PNT2022TMID29501
Project Name	Project – Industry Specific Intelligent Fire Management system

CONFIGURING ESP32 USING WOKWI PROJECTS

PROGRAM:

```cpp
#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 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.
  */
}  void
loop() {

  TempAndHumidity  data = dhtSensor.getTempAndHumidity();
```

```cpp
    //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!!";
  }

  //Obivously 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
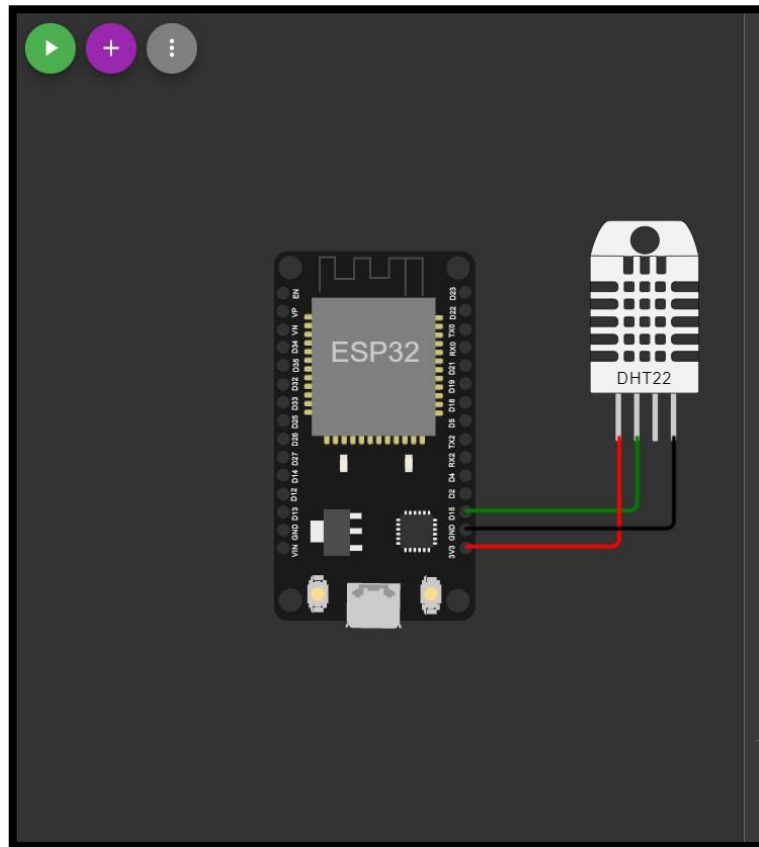
OUTPUT:

```
"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/34845600743371630
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