SPRINT-1

Team ID	PNT2022TMID50107
Project Name	Industry-specific intelligent fire management system

CONFIGURING ESP32 USING WOKWI PROJECTS:

Program:-

```
esp32-dht22.ino ●    diagram.json    libraries.txt    Library Manager    ▼
1    #include "DHTesp.h"
2    #include <cstdlib>
3    #include <time.h>
4
5    const int DHT_PIN = 15;
6
7    bool is_exhaust_fan_on = false;
8    bool is_sprinkler_on = false;
9
10   float temperature  = 0;
11
12   int gas_ppm = 0;
13   int flame = 0;
14   int flow = 0;
15
16   String flame_status = "";
17   String accident_status = "";
18   String sprinkler_status = "";
19
20   DHTesp dhtSensor;
21
22
23   void setup() {
24     Serial.begin(99900);
25
26     /**** sensor pin setups ****/
```

```
esp32-dht22.ino ●    diagram.json    libraries.txt    Library Manager    ▼
25
26     /**** sensor pin setups ****/
27     dhtSensor.setup(DHT_PIN, DHTesp::DHT22);
28     //if real gas sensor is used make sure the senor is heated up for acurate readings
29     /*
30       - Here random values for readings and stdout were used to show the
31         working  of the devices as physical or simulated devices are not
32         available.
33     */
34   }
35
36   void loop() {
37
38     TempAndHumidity  data = dhtSensor.getTempAndHumidity();
39
40     //setting a random seed
41     srand(time(0));
42
43     //initial variable activities like declaring , assigning
44     temperature  = data.temperature;
45     gas_ppm = rand()%1000;
46     int flamereading = rand()%1024;
47     flame = map(flamereading,0,1024,0,1024);
48     int flamerange = map(flamereading,0,1024,0,3);
49     int flow = ((rand()%100)>50?1:0);
50
```

```
51    //set a flame status based on how close it is.....
52    switch (flamerange) {
53    case 2:    // A fire closer than 1.5 feet away.
54      flame_status = "Close Fire";
55      break;
56    case 1:    // A fire between 1-3 feet away.
57      flame_status = "Distant Fire";
58      break;
59    case 0:    // No fire detected.
60      flame_status = "No Fire";
61      break;
62    }
63
64    //toggle the fan according to gas in ppm in the room
65    if(gas_ppm > 100){
66      is_exhaust_fan_on = true;
67    }
68    else{
69      is_exhaust_fan_on = false;
70    }
71
72    //find the accident status 'cause fake alert may be caused by some mischief activities
73    if(temperature < 40 && flamerange ==2){
74      accident_status = "need auditing";
75      is_sprinkler_on = false;
```

```
75      is_sprinkler_on = false;
76    }
77    else if(temperature < 40 && flamerange ==0){
78      accident_status = "not found";
79      is_sprinkler_on = false;
80    }
81    else if(temperature > 50 && flamerange == 1){
82      is_sprinkler_on = true;
83      accident_status = "moderate";
84    }
85    else if(temperature > 55 && flamerange == 2){
86      is_sprinkler_on = true;
87      accident_status = "severe";
88    }else{
89      is_sprinkler_on = false;
90      accident_status = "none";
91    }
92
93
94    //send the sprinkler status
95    if(is_sprinkler_on){
96      if(flow){
97        sprinkler_status = "working";
98      }
99      else{
100       sprinkler status = "not working";
```

```
100       sprinkler_status = "not working";
101     }
102   }
103   else if(is_sprinkler_on == false){
104     sprinkler_status = "it should not!";
105   }
106   else{
107     sprinkler_status = "Error!!";
108   }
109
110   //Obivously the output.It is like json format 'cause it will help us for future sprints
111   String out = "{\n\t\"senor_values\":{";
112   out+="\n\t\t\"gas_ppm\":"+String(gas_ppm)+",";
113   out+="\n\t\t\"temperature\":"+String(temperature,2)+",";
114   out+="\n\t\t\"flame\":"+String(flame)+",";
115   out+="\n\t\t\"flow\":"+String(flow)+",\n\t}";
116   out+="\n\t\"output\":{";
117   out+="\n\t\t\"is_exhaust_fan_on\":"+String((is_exhaust_fan_on)?"true":"false")+",";
118   out+="\n\t\t\"is_sprinkler_on\":"+String((is_sprinkler_on)?"true":"false")+",";
119   out+="\n\t}";
120   out+="\n\t\"messages\":{";
121   out+="\n\t\t\"fire_status\":"+flame_status+",";
122   out+="\n\t\t\"flow_status\":"+sprinkler_status+",";
123   out+="\n\t\t\"accident_status\":"+accident_status+",";
124   out+="\n\t}";
125   out+="\n}";
```

```
112    out+="\n\t\t\"gas_ppm\":"+String(gas_ppm)+",";
113    out+="\n\t\t\"temperature\":"+String(temperature,2)+",";
114    out+="\n\t\t\"flame\":"+String(flame)+",";
115    out+="\n\t\t\"flow\":"+String(flow)+",\n\t}";
116    out+="\n\t\"output\":{";
117    out+="\n\t\t\"is_exhaust_fan_on\":"+String((is_exhaust_fan_on)?"true":"false")+",";
118    out+="\n\t\t\"is_sprinkler_on\":"+String((is_sprinkler_on)?"true":"false")+",";
119    out+="\n\t}";
120    out+="\n\t\"messages\":{";
121    out+="\n\t\t\"fire_status\":"+flame_status+",";
122    out+="\n\t\t\"flow_status\":"+sprinkler_status+",";
123    out+="\n\t\t\"accident_status\":"+accident_status+",";
124    out+="\n\t}";
125    out+="\n}";
126    Serial.println(out);
127
128    delay(2000);
129  }
130
```

```json
1   {
2     "version": 1,
3     "author": "Uri Shaked",
4     "editor": "wokwi",
5     "parts": [
6       { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": 0, "left": 0, "attrs": {} },
7       { "type": "wokwi-dht22", "id": "dht1", "top": -15.53, "left": 145.5, "attrs": {} }
8     ],
9     "connections": [
10      [ "esp:TX0", "$serialMonitor:RX", "", [] ],
11      [ "esp:RX0", "$serialMonitor:TX", "", [] ],
12      [ "dht1:SDA", "esp:D15", "green", [ "v0" ] ],
13      [ "dht1:VCC", "esp:3V3", "red", [ "v0" ] ],
14      [ "dht1:GND", "esp:GND.1", "black", [ "v0" ] ]
15    ]
16  }
```

```
1   # Wokwi Library List
2   # See https://docs.wokwi.com/guides/libraries
3
4   DHT sensor library for ESPx
```

OUTPUT:

```
{
        "senor_values":{
                "gas_ppm":0,
                "temperature":24.00,
                "flame":45,
                "flow":0,
        }
        "output":{
                "is_exhaust_fan_on":false,
                "is_sprinkler_on":false,
        }
        "messages":{
                "fire_status":No Fire,
                "flow_status":it should not!,
                "accident_status":not found,
        }
}
```

SIMULATION: