SPRINT-1

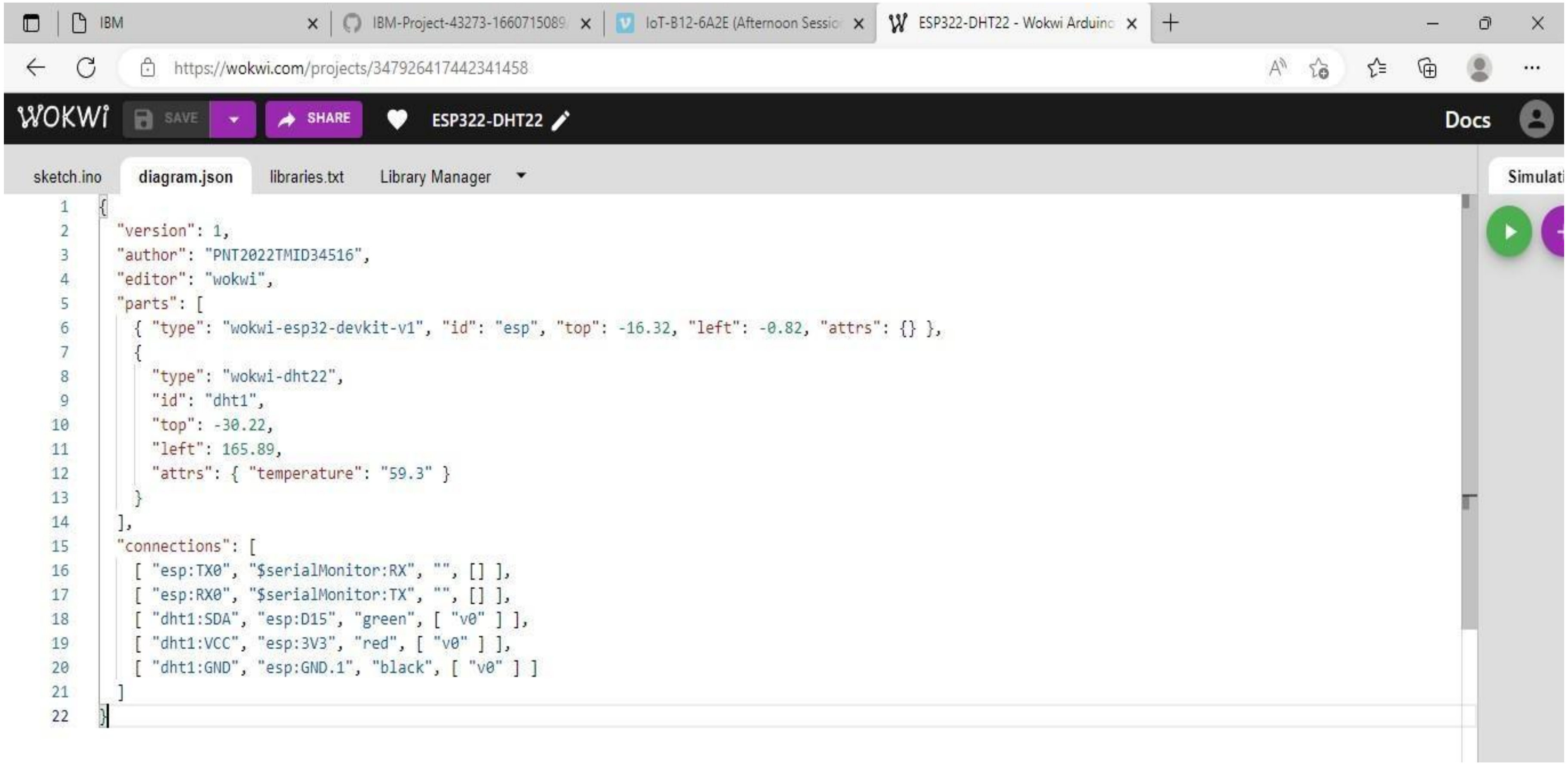
PROJECT	**INDUSTRY-SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM**
TEAM ID	**PNT2022TMID49436**

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);
```

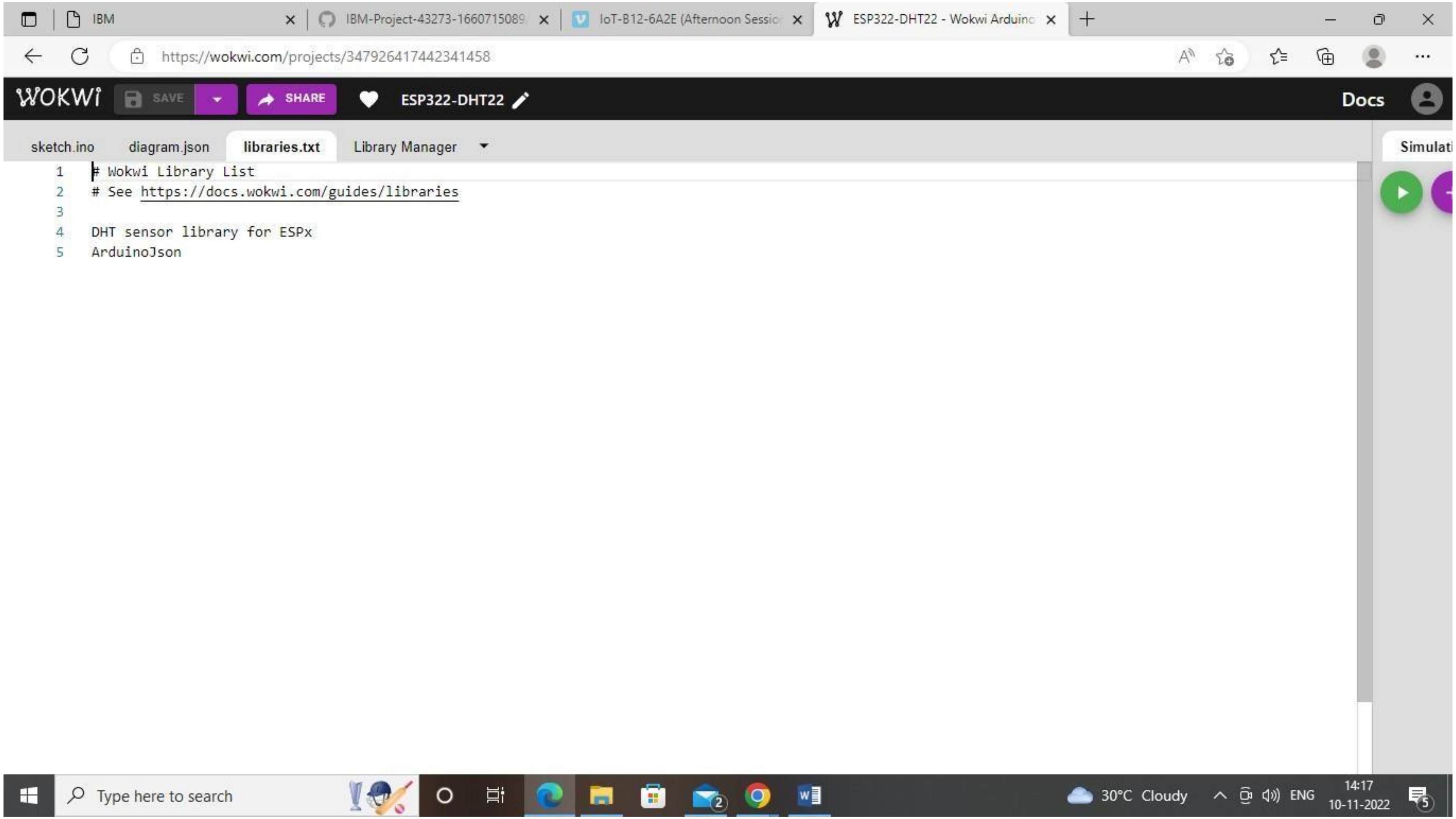
```
  //if real gas sensor is used make sure the senor is heated up for acurate readings
/*
    - Here random values for readings and stdout were used to show the
working  of the devices as physical or simulated devices are not
available.
  */
}  void loop()
{

  TempAndHumidity  data = dhtSensor.getTempAndHumidity();

  //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 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(1000);
}
```

DIAGRAM.JSON:


IBM
IBM-Project-43273-166071508
IoT-B12-6A2E (Afternoon Sessio
ESP322-DHT22 - Wokwi Arduino
https://wokwi.com/projects/347926417442341458
WOKWi
SAVE
SHARE
ESP322-DHT22
Docs
sketch.ino
diagram.json
libraries.txt
Library Manager
Simulati

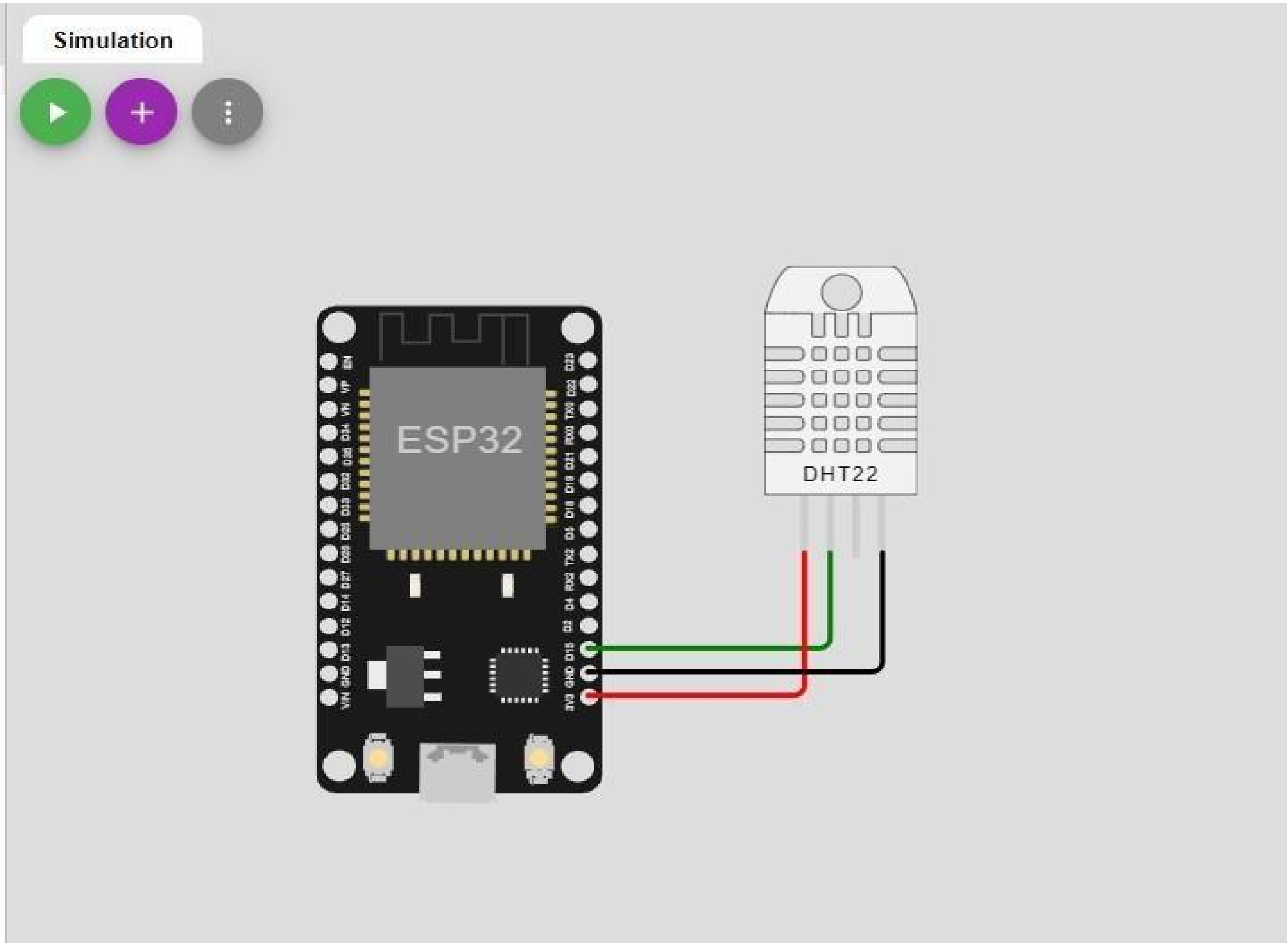
```
{
  "version": 1,
  "author": "PNT2022TMID34516",
  "editor": "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -16.32, "left": -0.82, "attrs": {} },
    {
      "type": "wokwi-dht22",
      "id": "dht1",
      "top": -30.22,
      "left": 165.89,
      "attrs": { "temperature": "59.3" }
    }
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0", "$serialMonitor:TX", "", [] ],
    [ "dht1:SDA", "esp:D15", "green", [ "v0" ] ],
    [ "dht1:VCC", "esp:3V3", "red", [ "v0" ] ],
    [ "dht1:GND", "esp:GND.1", "black", [ "v0" ] ]
  ]
}
```

LIBRARIES TEXT:

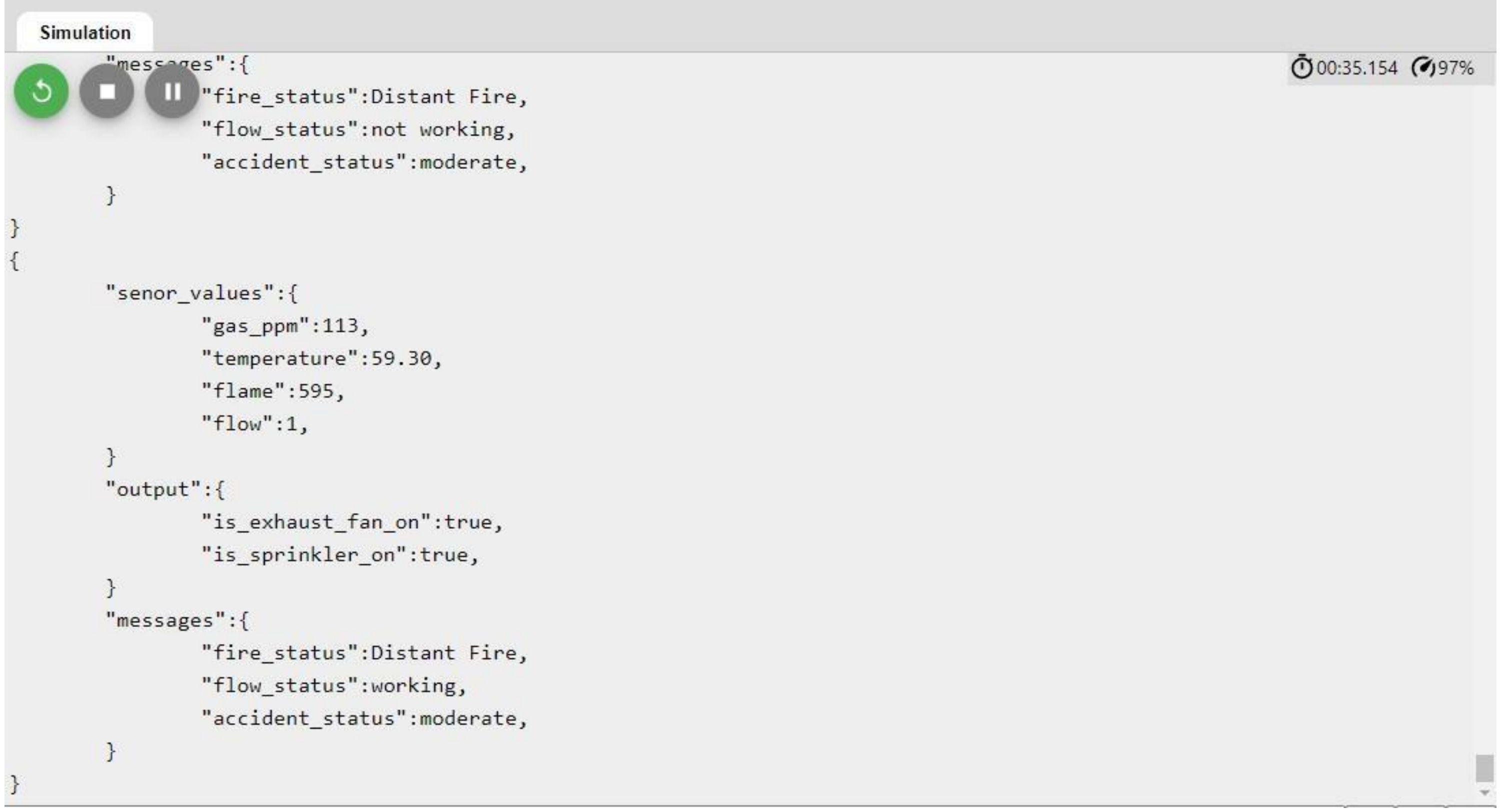


```
# Wokwi Library List
# See https://docs.wokwi.com/guides/libraries

DHT sensor library for ESPx
ArduinoJson
```

CIRCUIT:



OUTPUT:



```
        "messages":{
                "fire_status":Distant Fire,
                "flow_status":not working,
                "accident_status":moderate,
        }
}
{
        "senor_values":{
                "gas_ppm":113,
                "temperature":59.30,
                "flame":595,
                "flow":1,
        }
        "output":{
                "is_exhaust_fan_on":true,
                "is_sprinkler_on":true,
        }
        "messages":{
                "fire_status":Distant Fire,
                "flow_status":working,
                "accident_status":moderate,
        }
}
```

WOKWI LINK:

https://wokwi.com/projects/348654406394184276