SPRINT-1

PROJECT	**INDUSTRY-SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM**
TEAM ID	**PNT2022TMID45101**

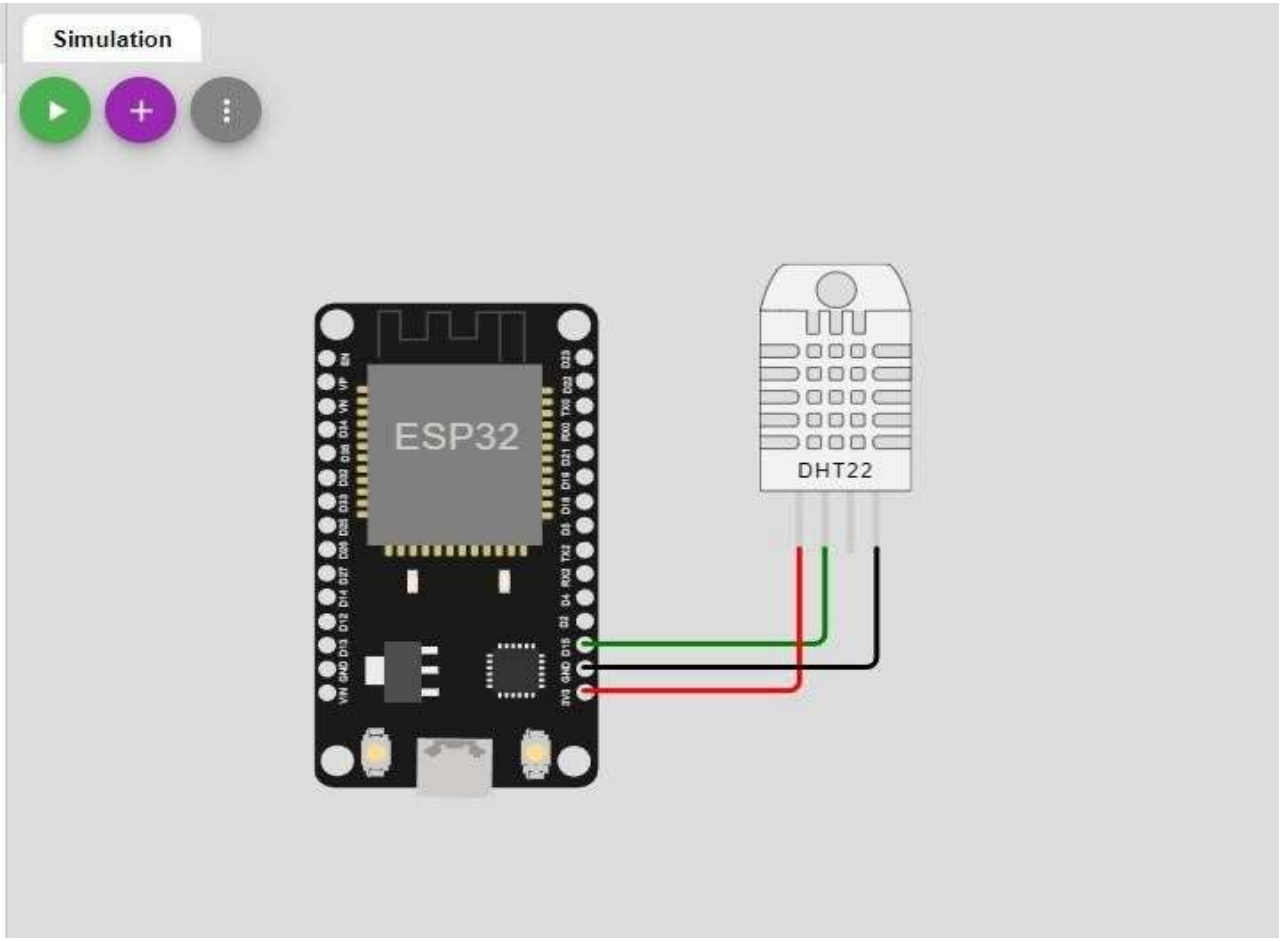
PROGRAM

```
#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);
```

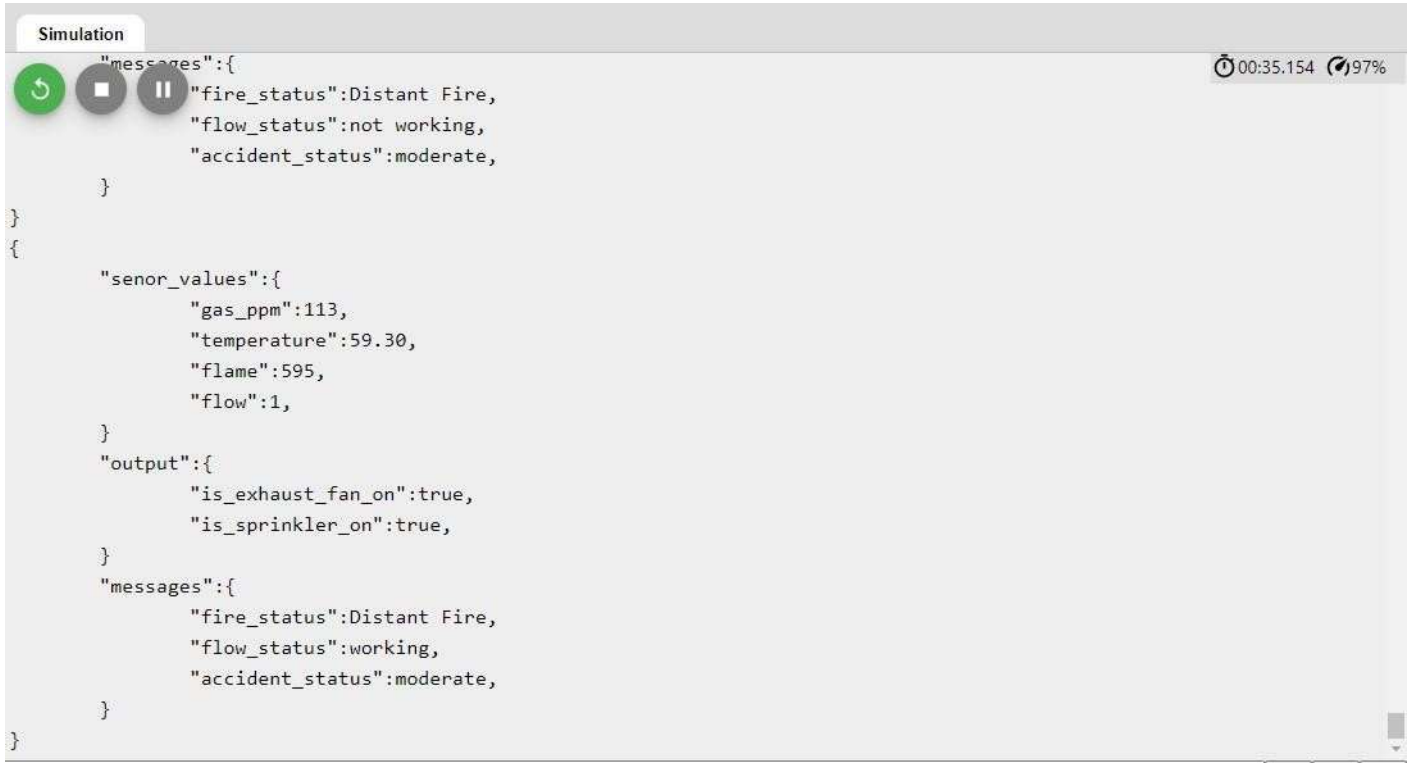
```
  /**** sensor pin setups ****/
dhtSensor.setup(DHT_PIN, DHTesp::DHT22);
  //if real gas sensor is used make sure the senor is heated up for acurate readings
/*
    - Here random values for readings and stdout were used to show the
working  of the devices as physical or simulated devices are not
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);
}
```



OUTPUT:


Simulation
00:35.154
97%
"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,
}
}