GOVERNMENT COLLEGE OF ENGINEERING – SALEM 11

SPRINT-1

NAME: Purnima R G
DEPT: ECE
ROLL NO:2031T304
TEAM ID:PNT2022TMID06832
TOPIC: Industry Specific Intelligent Fire Management Systems

CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
#include <time.h>
#include "DHTesp.h"
#define temp_pin 15
void callback(char* subscribetopic,byte* payload, unsigned int
payloadLength);
#define ORG "jesccj"
#define DEVICE_TYPE "ESP32_Controller"
#define DEVICE_ID "PURNI"
#define TOKEN "*Vzh&EwwgbRpqohJd+"
String data3;
char server[]= ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[]="iot-2/evt/Data/fmt/json";
char subscribeTopic[]="iot-2/cmd/test/fmt/String";
char authMethod[]="use-token-auth";
char token[]=TOKEN;
char clientID[]="d:"ORG":"DEVICE_TYPE":"DEVICE_ID;
WiFiClient wifiClient;
PubSubClient client(server,1883,callback,wifiClient);

const int DHT_PIN = 15;

DHTesp dhtSensor;
```

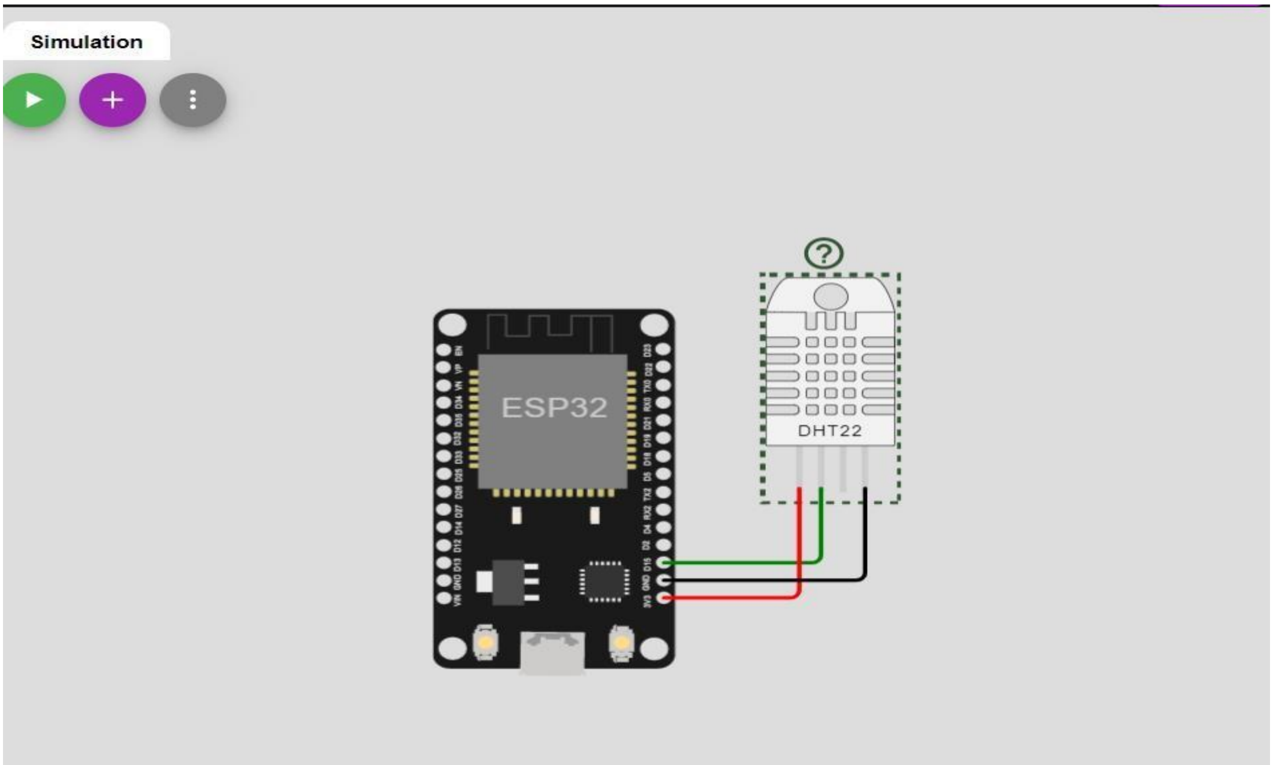
```
bool exhaust_fan_on = false;
bool sprinkler_on = false;

float temperature  = 0;
int gas = 0;
int flame = 0;

String flame_status = "";
String accident_status = "";
String sprinkler_status = "";

void setup() {
    Serial.begin(99900);

wificonnect();
mqttconnect();

  dhtSensor.setup(DHT_PIN, DHTesp::DHT22);
}


void loop() {
  srand(time(0));

    //initial variable

    temperature = random(-20,125);
    gas = random(0,1000);
    int flamereading = random(200,1024);
    flame = map(flamereading,0,1024,0,2);

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

```
Serial.println("Temperature: "+ String(data.temperature, 2) + "°C");
Serial.println("Humidity: " + String(data.humidity, 1) + "%");
  Serial.println("---");
  delay(1000);
if(data.temperature<38){PublishData1(data.temperature);
        flame_status = "No Fire";
        Serial.println("Flame Status : "+flame_status);
    }
    else{ PublishData2(data.temperature);
        flame_status = "Fire is Detected";
        Serial.println("Flame Status : "+flame_status);

    }
    if(data.humidity<30){PublishData3(data.humidity);
        Serial.println("Gas Status : Gas leakage Detected");
    }
    else{PublishData4(data.humidity);
        exhaust_fan_on = false;
        Serial.println("Gas Status : No Gas leakage Detected");
    }

    //send the sprinkler status
    if(data.temperature<38){
        sprinkler_status = " not working";
        Serial.println("Sprinkler Status : "+sprinkler_status);
    }
    else{
        sprinkler_status = " working";
        Serial.println("Sprinkler Status : "+sprinkler_status);
    }

    //toggle the fan according to gas

    if(data.humidity<30){
        exhaust_fan_on = true;
        Serial.println("Exhaust fan Status : Working");
    }
    else{
        exhaust_fan_on = false;
        Serial.println("Exhaust fan Status : Not Working");
    }

    Serial.println("");
    Serial.println("");
    Serial.println(" -------------------------*************---------------------");
    Serial.println("");
    Serial.println("");
delay(1000);
if(!client.loop()){
mqttconnect();
}
}void PublishData1(float temp){
  mqttconnect();
  String payload = "{\"temp\":";
payload += temperature;
payload += ",\"nrml!\":""\"temperature less than 38\"";
payload += "}";
Serial.print("Sending payload: ");
Serial.println(payload);

if(client.publish(publishTopic,(char*)payload.c_str())){
    Serial.println("publish ok");
  } else{
    Serial.println("publish failed");
  }
}
void PublishData2(float temperature){
  mqttconnect();
  String payload = "{\"temp\":";
payload += temperature;
payload += ",\"ALERT!!\":""\"temperature greater than 38\"";
payload += "}";
Serial.print("Sending payload: ");
Serial.println(payload);
  if(client.publish(publishTopic,(char*)payload.c_str())){
    Serial.println("publish ok");
  } else{
    Serial.println("publish failed");
  }
}
void PublishData3(float humidity){
  mqttconnect();
  String payload = "{\"hum\":";
payload += humidity;
payload += ",\"ALERT!!\":""\"humidity less than 30\"";
payload += "}";
Serial.print("Sending payload: ");
Serial.println(payload);
  if(client.publish(publishTopic,(char*)payload.c_str())){
    Serial.println("publish ok");
  } else{
    Serial.println("publish failed");
  }
}
void PublishData4(float humidity){
  mqttconnect();
  String payload = "{\"hum\":";
payload += humidity;
payload += ",\"nrml!!\":""\"humidity greater than 30\"";
payload += "}";
Serial.print("Sending payload: ");
Serial.println(payload);
```

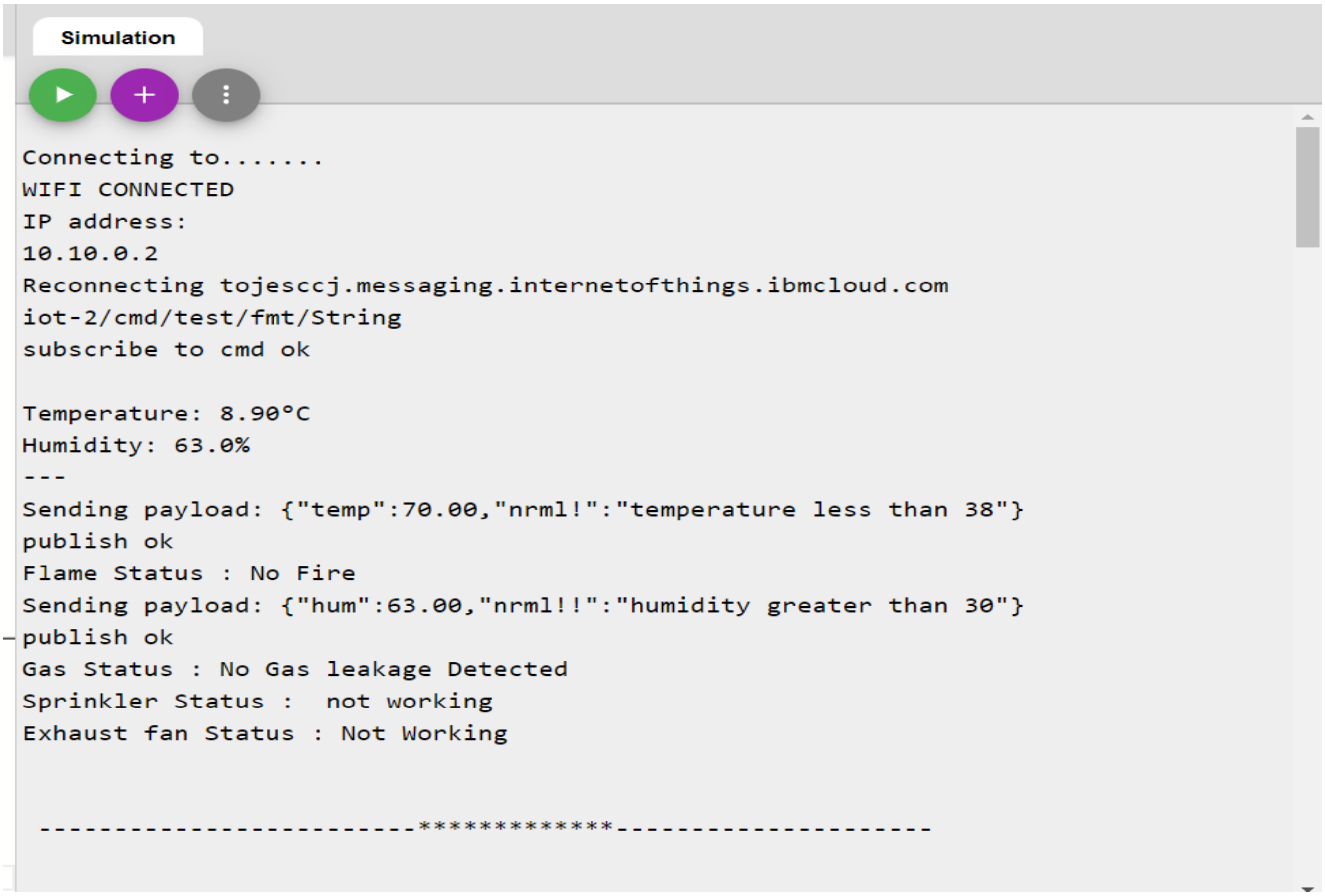
```
  if(client.publish(publishTopic,(char*)payload.c_str())){
    Serial.println("publish ok");
  } else{
    Serial.println("publish failed");
  }
}
void mqttconnect(){
  if(!client.connected()){
    Serial.print("Reconnecting to");
    Serial.println(server);
    while(!!!client.connect(clientID, authMethod, token)){
      Serial.print(".");
      delay(500);
    }
    initManagedDevice();
    Serial.println();
  }
}

void wificonnect(){
  Serial.println();
  Serial.print("Connecting to");

  WiFi.begin("Wokwi-GUEST","",6);
  while(WiFi.status()!=WL_CONNECTED){
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WIFI CONNECTED");
  Serial.println("IP address:");
  Serial.println(WiFi.localIP());
```

```
}

void initManagedDevice(){
  if(client.subscribe(subscribeTopic)){
    Serial.println((subscribeTopic));
    Serial.println("subscribe to cmd ok");
  }else{
    Serial.println("subscribe to cmd failed");
  }
}

void callback(char* subscribeTopic, byte* payload, unsigned int
payloadLength){
  Serial.print("callback invoked for topic:");
  Serial.println(subscribeTopic);
  for(int i=0; i<payloadLength; i++){
    data3 += (char)payload[i];
  }
}//coded by purni
```

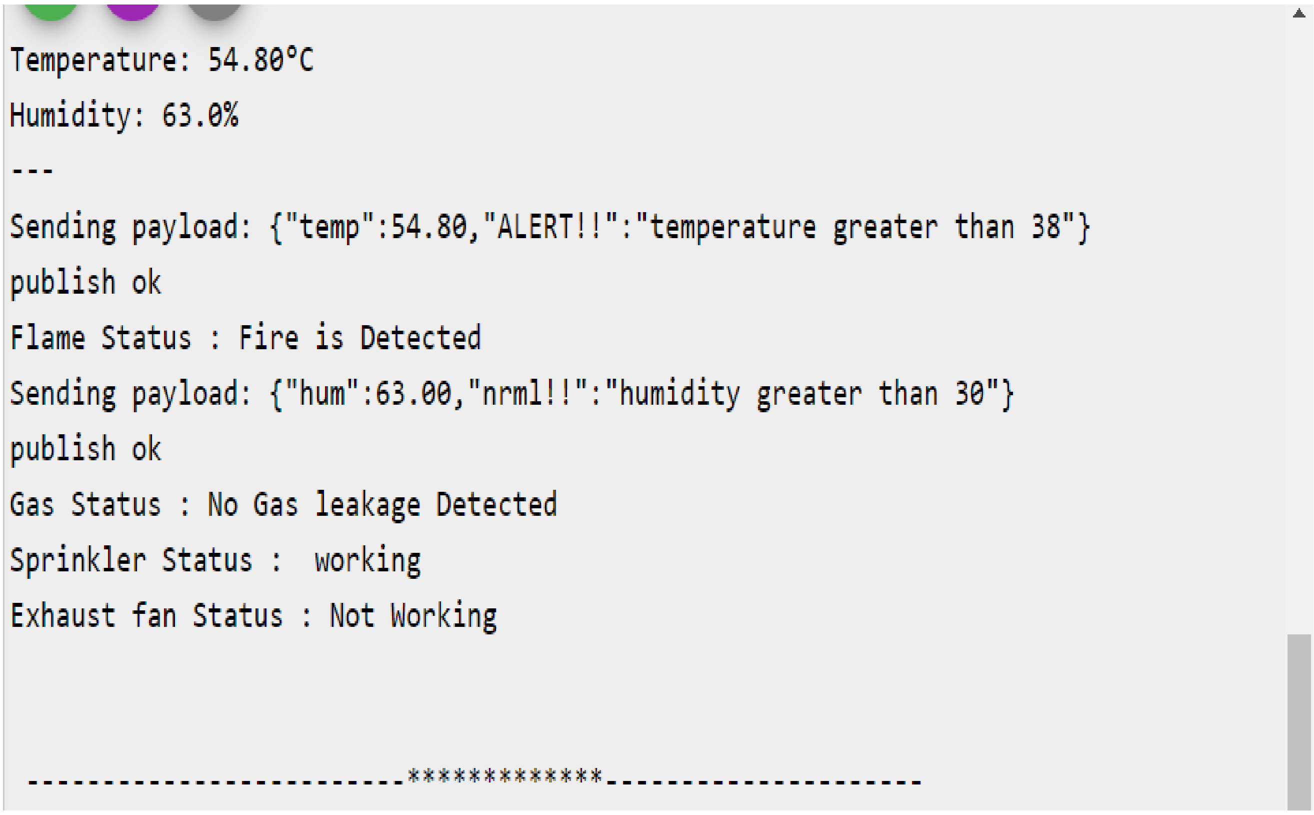
DIAGRAM:



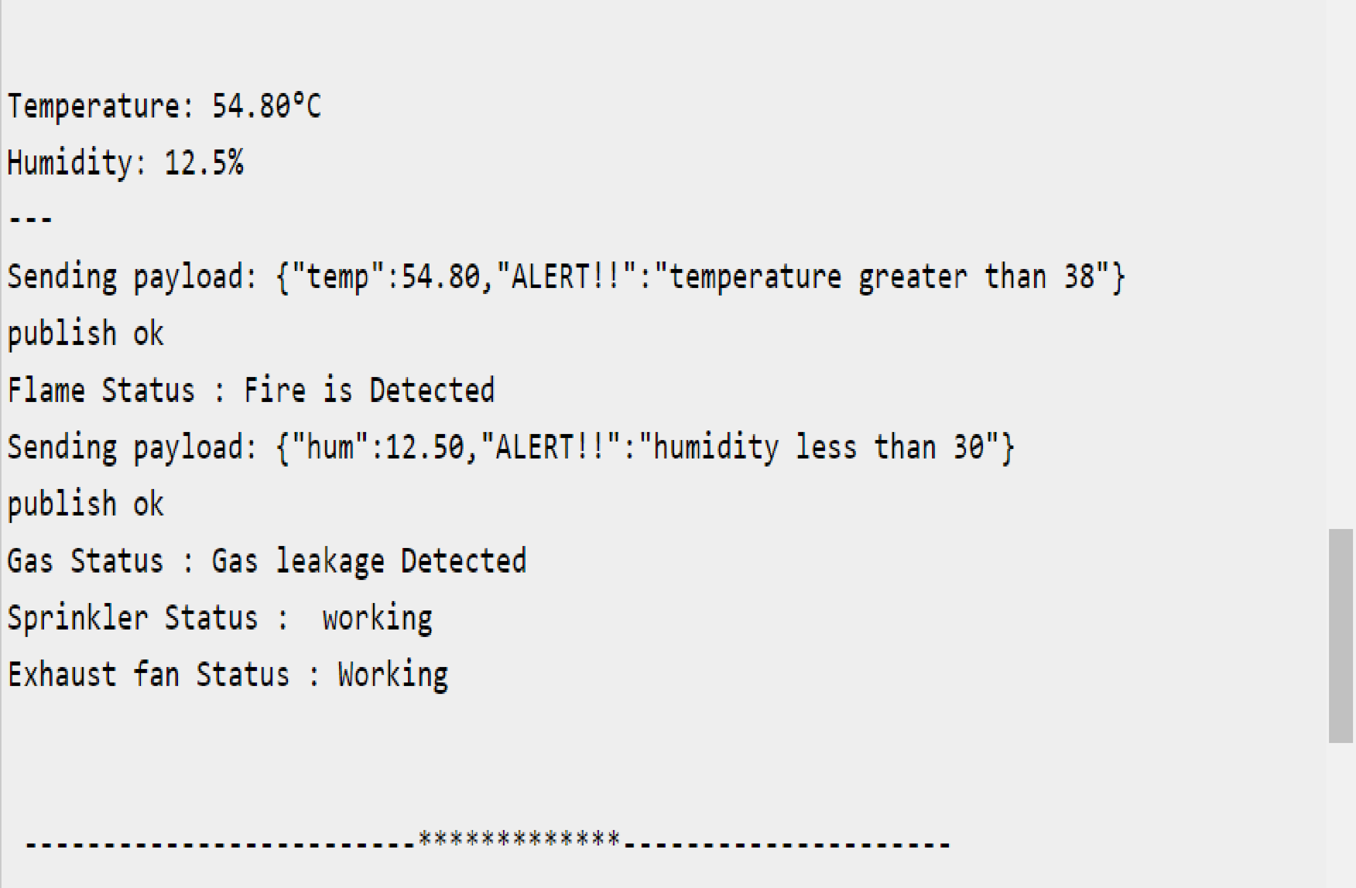
SIMULATED OUTPUT:



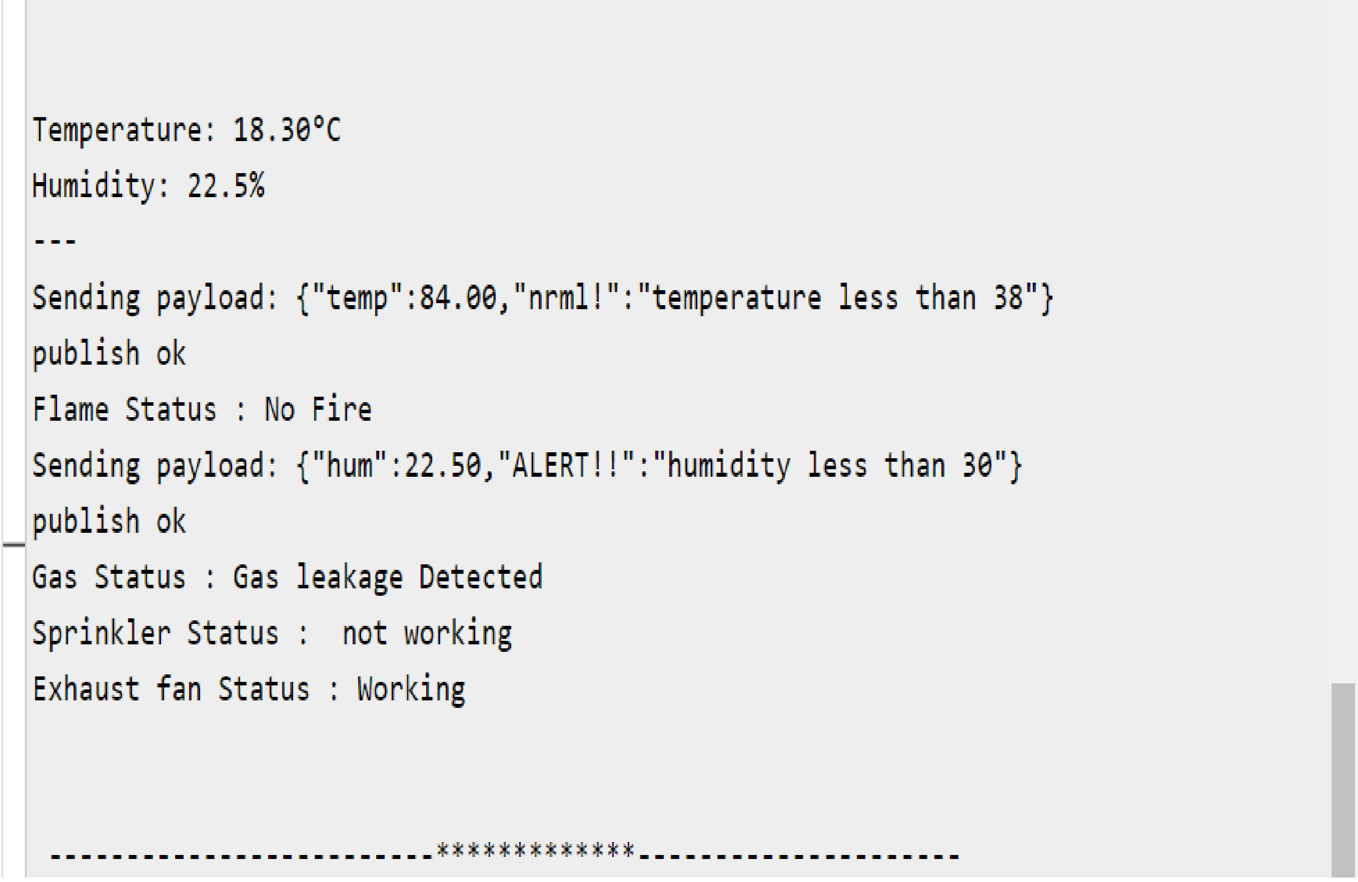
```
Connecting to.......
WIFI CONNECTED
IP address:
10.10.0.2
Reconnecting tojesccj.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd ok

Temperature: 8.90°C
Humidity: 63.0%
---
Sending payload: {"temp":70.00,"nrml!":"temperature less than 38"}
publish ok
Flame Status : No Fire
Sending payload: {"hum":63.00,"nrml!!":"humidity greater than 30"}
publish ok
Gas Status : No Gas leakage Detected
Sprinkler Status :  not working
Exhaust fan Status : Not Working


 -------------------------*************---------------------
```



```
Temperature: 54.80°C
Humidity: 63.0%
---
Sending payload: {"temp":54.80,"ALERT!!":"temperature greater than 38"}
publish ok
Flame Status : Fire is Detected
Sending payload: {"hum":63.00,"nrml!!":"humidity greater than 30"}
publish ok
Gas Status : No Gas leakage Detected
Sprinkler Status :  working
Exhaust fan Status : Not Working


 -------------------------*************---------------------
```

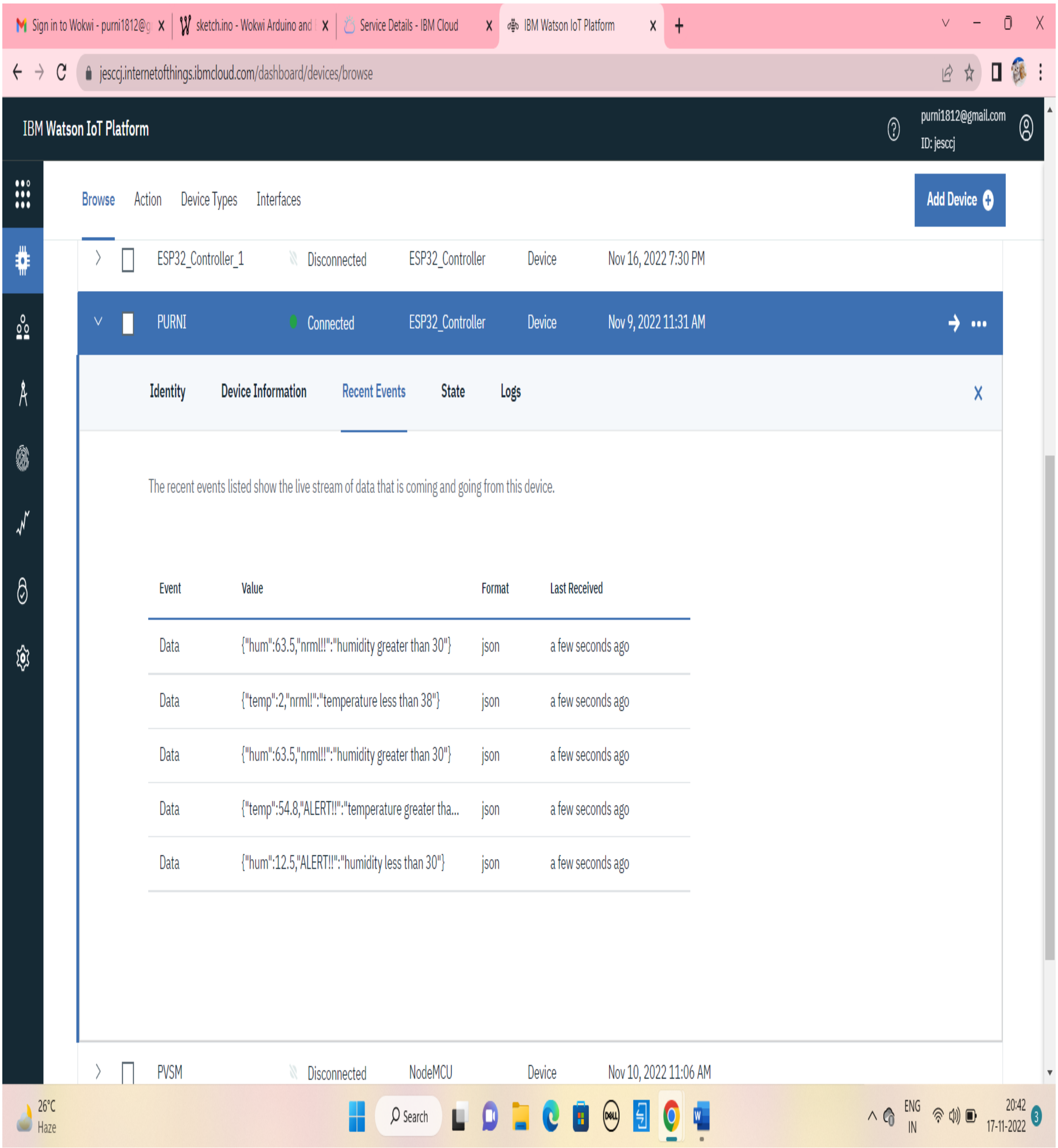


```
Temperature: 54.80°C
Humidity: 12.5%
---
Sending payload: {"temp":54.80,"ALERT!!":"temperature greater than 38"}
publish ok
Flame Status : Fire is Detected
Sending payload: {"hum":12.50,"ALERT!!":"humidity less than 30"}
publish ok
Gas Status : Gas leakage Detected
Sprinkler Status :  working
Exhaust fan Status : Working


 -------------------------*************---------------------
```



```
Temperature: 18.30°C
Humidity: 22.5%
---
Sending payload: {"temp":84.00,"nrml!":"temperature less than 38"}
publish ok
Flame Status : No Fire
Sending payload: {"hum":22.50,"ALERT!!":"humidity less than 30"}
publish ok
Gas Status : Gas leakage Detected
Sprinkler Status :  not working
Exhaust fan Status : Working


 -------------------------*************---------------------
```

CLOUD STIMULATED OUTPUT:



ESP32_Controller_1	Disconnected	ESP32_Controller	Device	Nov 16, 2022 7:30 PM
PURNI	Connected	ESP32_Controller	Device	Nov 9, 2022 11:31 AM
PVSM	Disconnected	NodeMCU	Device	Nov 10, 2022 11:06 AM

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"hum":63.5,"nrml!!":"humidity greater than 30"}	json	a few seconds ago
Data	{"temp":2,"nrml!":"temperature less than 38"}	json	a few seconds ago
Data	{"hum":63.5,"nrml!!":"humidity greater than 30"}	json	a few seconds ago
Data	{"temp":54.8,"ALERT!!":"temperature greater tha...	json	a few seconds ago
Data	{"hum":12.5,"ALERT!!":"humidity less than 30"}	json	a few seconds ago

WOKWI LINK:

https://wokwi.com/projects/348369196688605779