

SPRINT 2

Link :

<https://wokwi.com/projects/348775277739901522>

```
#include "DHTesp.h"
#include <cstdlib>
#include <time.h>
#include <WiFi.h>
#include <PubSubClient.h>

#define ORG "fvs923"
#define DEVICE_TYPE "zenabc"
#define DEVICE_ID "221"
#define TOKEN "12345678"

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-
2/evt/data/fmt/json";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;

WiFiClient wifiClient;
PubSubClient client(server, 1883, wifiClient);

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);
```

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/**** sensor pin setups ****/
dhtSensor.setup(DHT_PIN, DHTesp::DHT22);
//if real gas sensor is used make sure the sensor is heated up for accurate
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.
*/

  wifiConnect();
  mqttConnect();
}

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;
  }
}

```

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}

//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";
}

//Obviously the output.It is like json format 'cause it will help us for
future sprints
String payload = "{\"senor_values\":{\"";
payload+="\"gas_ppm\":";
payload+=gas_ppm;
payload+=",";
payload+="\"temperature\":";
payload+=(int)temperature;

```

```

payload+=",";
payload+="\"flame\":\"";
payload+=flame;
payload+=",";
payload+="\"flow\":\"";
payload+=flow;
payload+="},";
payload+="\"output\":{\"";
payload+="\"is_exhaust_fan_on\":\""+String((is_exhaust_fan_on)?"true":"false")
+",";
payload+="\"is_sprinkler_on\":\""+String((is_sprinkler_on)?"true":"false")+"";
payload+="},";
payload+="\"messages\":{\"";
payload+="\"fire_status\":"\""+flame_status+"\"";
payload+="\"flow_status\":"\""+sprinkler_status+"\"";
payload+="\"accident_status\":"\""+accident_status+"\"";
payload+="}";
payload+="}";
//Serial.println(payload);

```

```

if(client.publish(publishTopic, (char*) payload.c_str()))
{
    Serial.println("Publish OK");
}
else{
    Serial.println("Publish failed");
}
delay(1000);

```

```

if (!client.loop())
{
    mqttConnect();
}

```

```

}

```

```

void wifiConnect()
{
    Serial.print("Connecting to ");
    Serial.print("Wifi");
    WiFi.begin("Wokwi-GUEST", "", 6);
    while (WiFi.status() != WL_CONNECTED)
    {
        delay(500);
    }
}

```

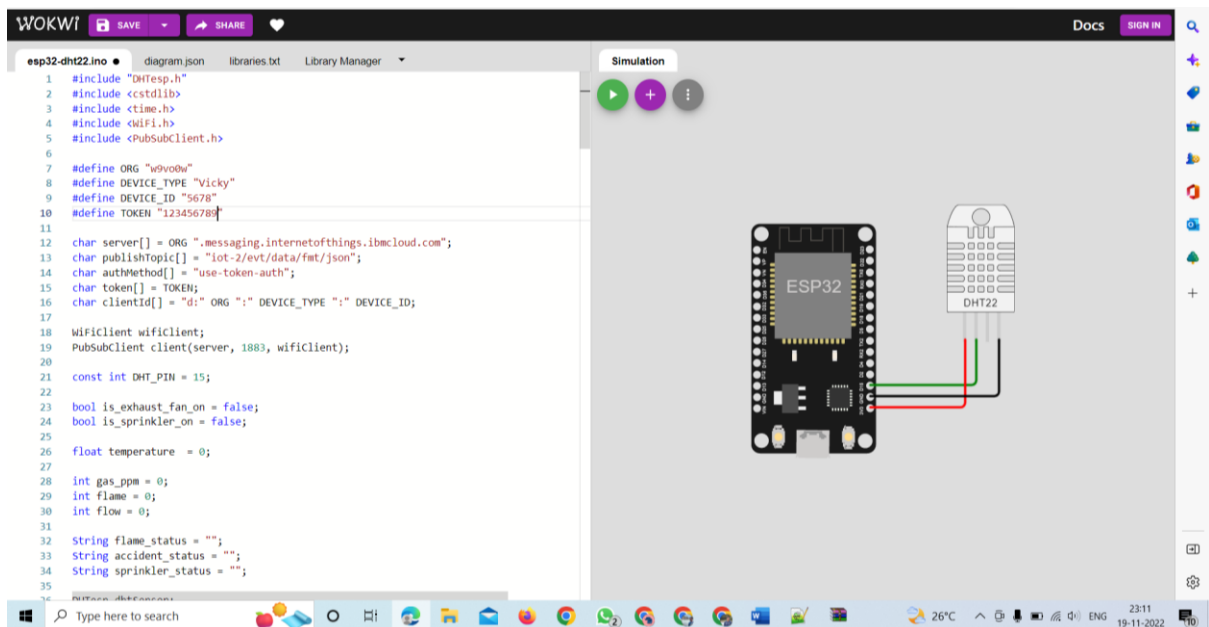
```

        Serial.print(".");
    }
    Serial.print("WiFi connected, IP address: ");
    Serial.println(WiFi.localIP());
}

void mqttConnect()
{
    if (!client.connected())
    {
        Serial.print("Reconnecting MQTT client to ");
        Serial.println(server);
        while (!client.connect(clientId, authMethod, token))
        {
            Serial.print(".");
            delay(500);
        }

        Serial.println();
    }
}

```



WOKWI

esp32-dht22.ino

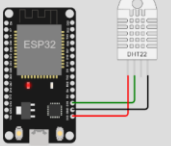
```

185 }
186 Serial.print("WiFi connected, IP address: ");
187 Serial.println(WiFi.localIP());
188 }
189 }
190
191 void mqttConnect()
192 {
193   if (!client.connected())
194   {
195     Serial.print("Reconnecting MQTT client to ");
196     Serial.println(server);
197     while (!client.connect(clientId, authMethod, token))
198     {
199       Serial.print(".");
200       delay(500);
201     }
202     Serial.println();
203   }
204 }
205
206 }
207
208

```

Simulation

00:07.854 85%



Publish OK
 Publish OK
 Publish failed
 Publish OK
 Publish OK
 Publish OK
 Publish OK

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IBM Watson IoT Platform

3070

Identity Device Information Recent Events State Logs

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

Event	Value	Format	Last Received
event_1	{"temperature":97,"Gas":100,"Flame":95,"random..."}	json	a few seconds ago
event_1	{"temperature":96,"Gas":64,"Flame":95,"random..."}	json	a minute ago
event_1	{"temperature":98,"Gas":84,"Flame":85,"random..."}	json	2 minutes ago
event_1	{"temperature":98,"Gas":63,"Flame":91,"random..."}	json	3 minutes ago
event_1	{"temperature":98,"Gas":62,"Flame":93,"random..."}	json	4 minutes ago

1 Simulation running

Software.docx Software.pdf

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