Team ID: PNT2022TMID11019:

```
#include
<time.h>
            #include <WiFi.h>
            #include <PubSubClient.h>


            #define ORG "wt19pm"
            #define DEVICE_TYPE "NodeMCU"
            #define DEVICE_ID "12345"
            #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);


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


            String flame_status = "";
            String Gas_status = "";
            String exhaust_fan_status = "";
            String sprinkler_status = "";




            void setup() {
              Serial.begin(99900);
               wifiConnect();
               mqttConnect();
            }
```

```
void loop() {

  srand(time(0));

    //initial variables and random generated data

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

    //set a flame status

    switch (flame) {
    case 0:
        flame_status = "No Fire";
        break;
    case 1:
        flame_status = "Fire is Detected";
        break;
    }

    //send the sprinkler status

    if(flame==1){
        sprinkler_status = "Working";
    }
    else{
        sprinkler_status = "Not Working";

    }

    //toggle the fan according to gas reading

    if(gas > 100){
```

```
        Gas_status = "Gas Leakage is Detected";
        exhaust_fan_status = "Working";


    }
    else{
        Gas_status = "No Gas Leakage is Detected";
        exhaust_fan_status = "Not Working";
    }


    //json format for IBM Watson


    String payload = "{";
    payload+="\"gas\":";
    payload+=gas;
    payload+=",";
    payload+="\"temperature\":";
    payload+=(int)temperature;
    payload+=",";
    payload+="\"flame\":";
    payload+=flamereading;
    payload+=",";
    payload+="\"fire_status\":\""+flame_status+"\",";
    payload+="\"sprinkler_status\":\""+sprinkler_status+"\",";
    payload+="\"Gas_status\":\""+Gas_status+"\",";
    payload+="\"exhaust_fan_status\":\""+exhaust_fan_status+"\"}";

    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();
  }
}
```