PROJECT DEVELOPMENT PHASE
Delivery Of Sprint-3

Date	12 November 2022
Team ID	PNT2022TMID45922
Project Name	Gas Leakage Monitoring and Alerting Systems

SPRINT 3:

Functional Requirement

Customization of Coding and Code Testing.

User Story

--> As a designer, I Develop a code with related Libraries.
--> As a designer, I can create an overall programming with testing of code.

Procedure

The code is generated and the output of parameters such as temperature,pressure and Gas level is displayed in ibm Watson platform.

Required components :

1.Wokwi Simulator.

2.IBM Watson Platform.

Code:

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
#include <LiquidCrystal.h>
#include <ESP32Servo.h>
#include "DHT.h"// Library for dht11
```

```
#define DHTPIN 15     // what pin we're connected to
#define DHTTYPE DHT22   // define type of sensor DHT 11


LiquidCrystal lcd(2,4,19,21,12,14);
int GreenLED = 18;
int RedLED = 5;
int BUZZER_PIN = 13;
const int servoPin = 22;
String data3;
int g;
Servo door;
int pos;


DHT dht (DHTPIN, DHTTYPE);// creating the instance by passing pin and typr of dht connected

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);


//-------credentials of IBM Accounts------

#define ORG "u9pz01"//IBM ORGANITION ID
#define DEVICE_TYPE "gassense"//Device type mentioned in ibm watson IOT Platform
```

```
#define DEVICE_ID "sensor"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "12345678"      //Token
float h, t;



//-------- Customise the above values --------
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
 char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform and format in which data to be send
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd  REPRESENT command type AND COMMAND IS TEST OF FORMAT STRING
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id



//-------------------------------------
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback, wifiClient); //calling the predefined client id by passing parameter like server id,portand wificredential


void setup() {
Serial.begin(115200);
dht.begin();
```

```
pinMode(GreenLED, OUTPUT);
pinMode(RedLED, OUTPUT);
pinMode(BUZZER_PIN, OUTPUT);
lcd.begin(16,2);
lcd.setCursor(1,0);
lcd.print(("GAS DETECTION"));
door.attach(servoPin, 500, 2400);
 Serial.println();
wificonnect();
mqttconnect();
}
void loop() {
g =random(0,100);
Serial.print("Gas Level in Percentage :");
Serial.println(g);
 h = dht.readHumidity();
 t = dht.readTemperature();
Serial.print("temp:");
Serial.println(t);
 Serial.print("Humid:");
Serial.println(h);
condition(g);
```

```
      PublishData(t, h ,g);
       delay(1000);
       if (!client.loop()) {
     mqttconnect();
   }
  delay(5000);
}

 //               Condition for buzzer
void myTone( int pin)
{
  ledcAttachPin(pin, 0);              // pin, channel
  ledcWriteNote(0, NOTE_F, 4);     // channel, frequency, octave
}

void myNoTone( int pin)
{
  ledcDetachPin(pin);
}

//                  Condition for Gaslevel
void condition(int g)
{
  if(g > 50)
```

```
  {
    myTone(BUZZER_PIN);
    digitalWrite(RedLED, HIGH);
    digitalWrite(GreenLED, LOW);
    delay(500);
    lcd.setCursor(0,1);
    lcd.print("ALERT!!");
    delay(300);
    lcd.setCursor(0,1);
    lcd.print("HAZARDOUS LEVEL!");
  }
  else
  {
    myNoTone(BUZZER_PIN);
     digitalWrite(RedLED, LOW);
     digitalWrite(GreenLED, HIGH);
     delay(500);
     lcd.setCursor(0,1);
     lcd.print("NORMAL GAS LEVEL");

  }
}
```

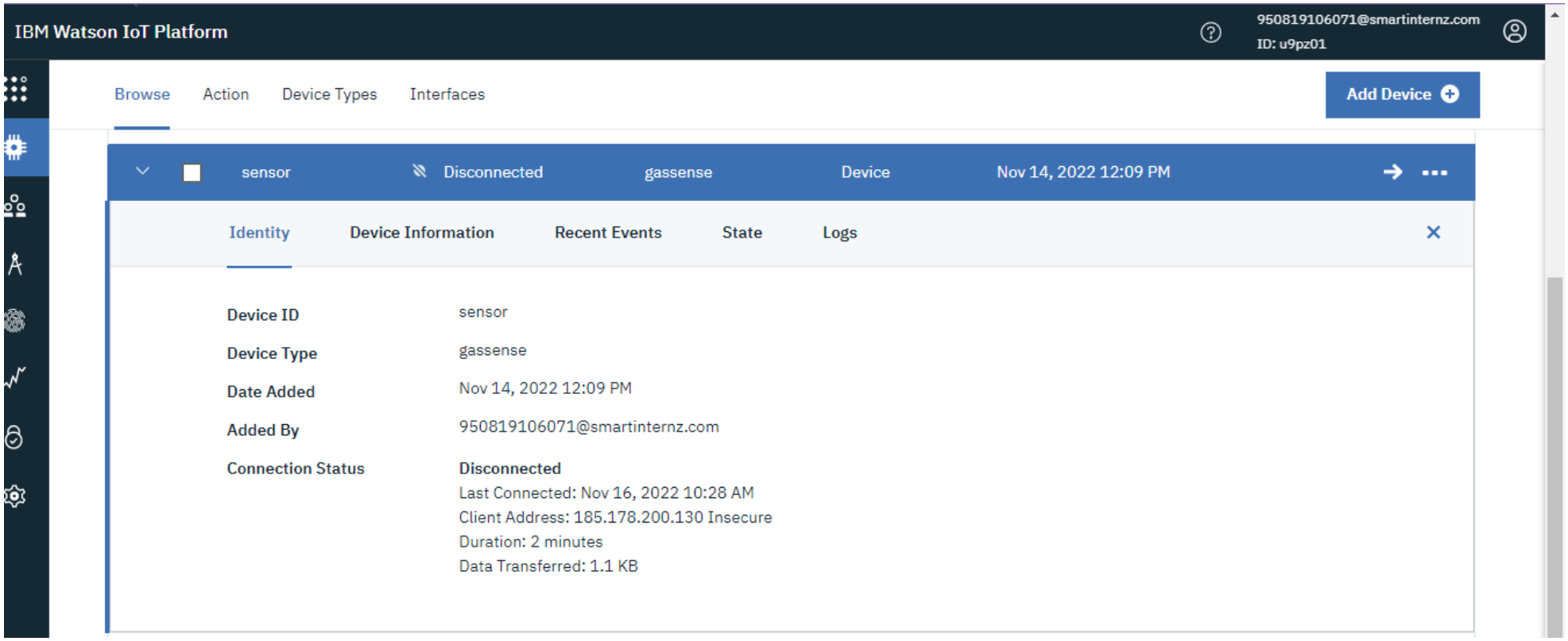
```
/*.....................................retrieving to Cloud. ..........................................*/

void PublishData(float temp, float Humid, int Gas) {
  mqttconnect();//function call for connecting to ibm
  /*
     creating the String in in form JSon to update the data to ibm cloud
  */
  String payload = "{\"temp\":";
  payload += temp;
  payload += "," "\"Humid\":";
  payload += Humid;
  payload += "," "\"Gas\":";
  payload += Gas;
  payload += "}";


  Serial.print("Sending payload: ");
  Serial.println(payload);


  if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");// if it sucessfully upload data on the cloud then it will print publish ok in Serial monitor or else it will print publish failed
  }
```

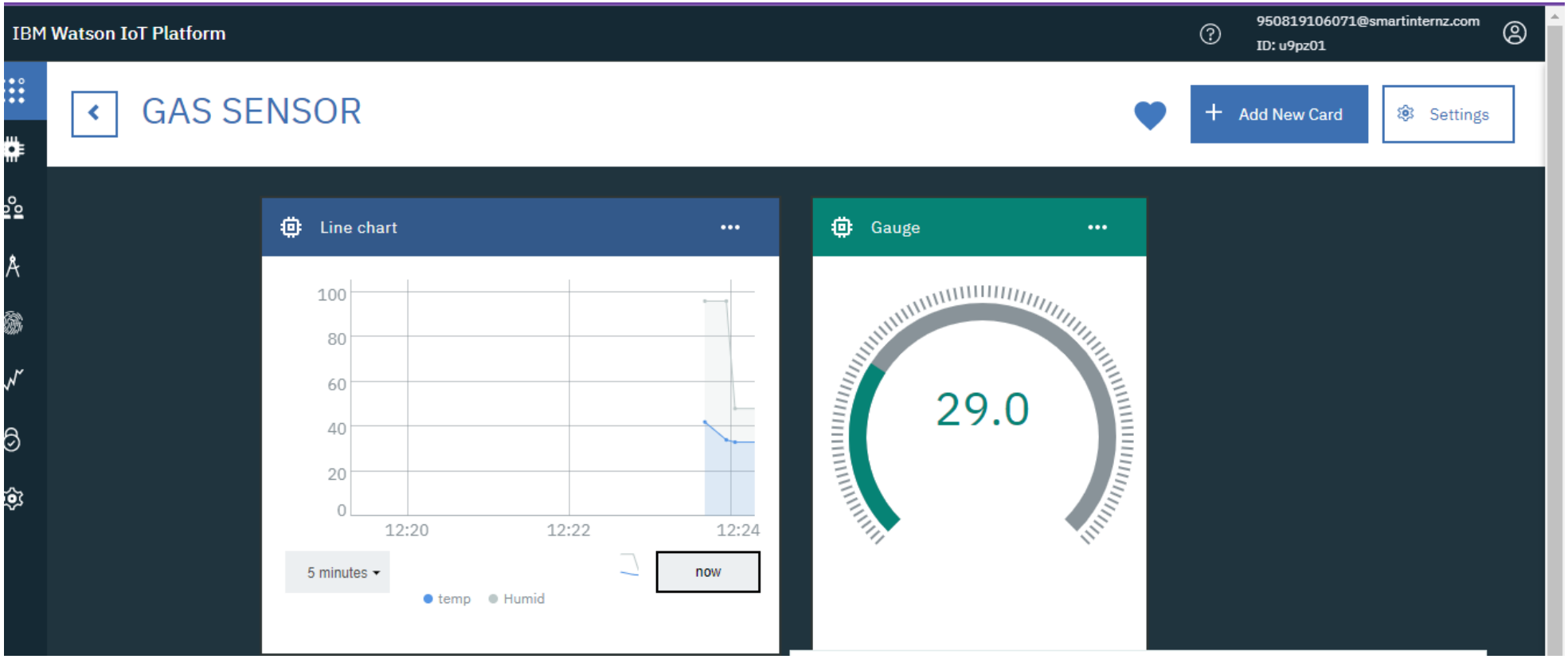
```
  else {
    Serial.println("Publish failed");
  }

}



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

     initManagedDevice();
     Serial.println();
  }
}
void wificonnect() //function defination for wificonnect
{
  Serial.println();
  Serial.print("Connecting to ");
```

```
  WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish the connection
  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++) {
    //Serial.print((char)payload[i]);
    data3 += (char)payload[i];
  }
  Serial.println("data: "+ data3);
  if(data3=="dooropen")
  {
    Serial.println(data3);
    pos = 180; //open the door
    door.write(pos);
  }
  else
  {
   Serial.println(data3);
    pos = 0; // closing the door
    door.write(pos);
  }
data3="";
}
```

IBM Watson Platform:




IBM Watson IoT Platform
950819106071@smartinternz.com
ID: u9pz01
GAS SENSOR
Add New Card
Settings
Line chart
100
80
60
40
20
0
12:20
12:22
12:24
5 minutes
now
temp
Humid
Gauge
29.0