PROJECT DEVELOPMENT PHASE
Delivery Of Sprint-3

Date	12 November 2022
Team ID	PNT2022TMID30897
Project Name	Gas Leakage Monitoring and Alerting Systems

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 "w1p5bv"//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));
```

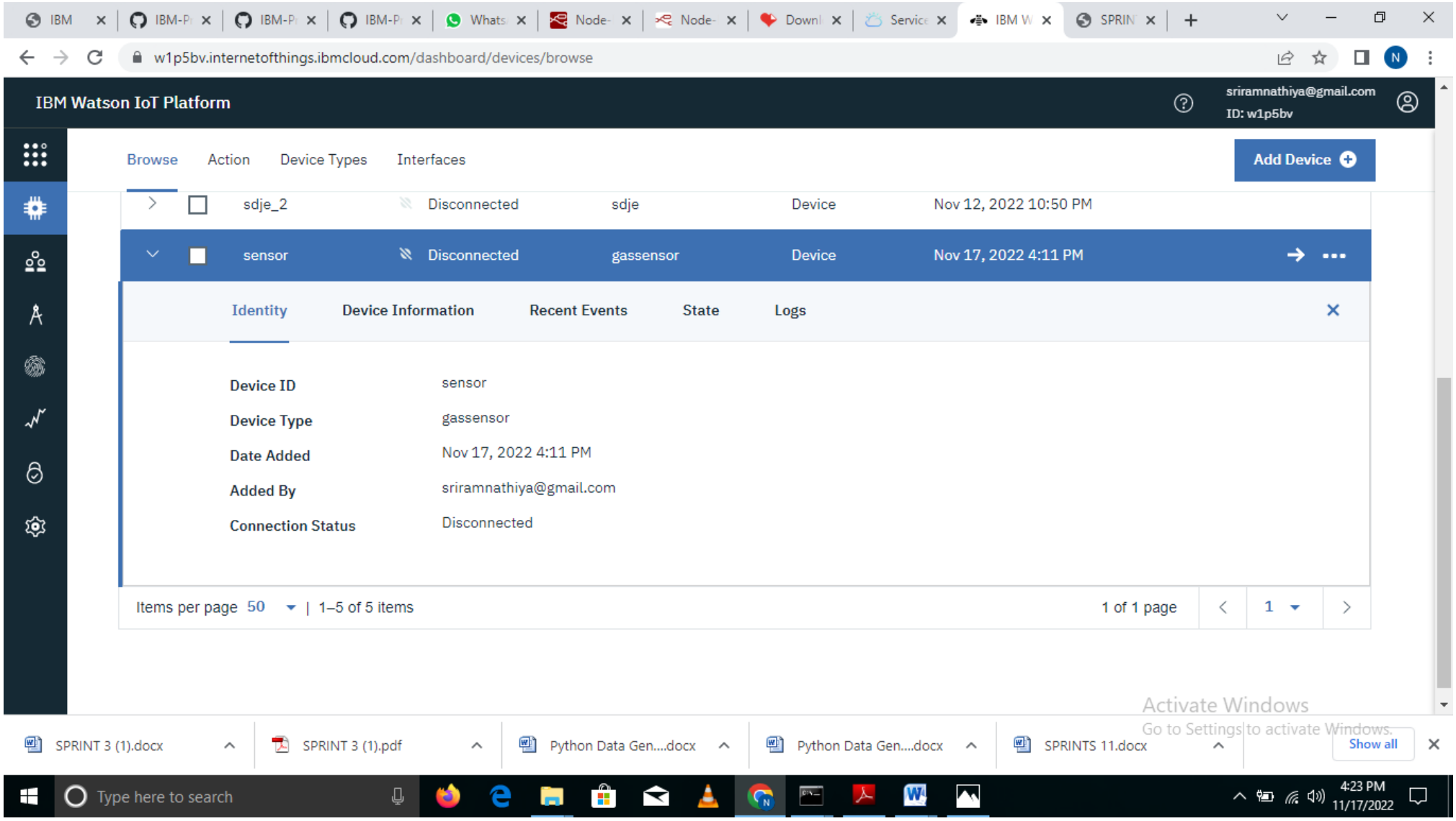
```
    Serial.println("subscribe to cmd OK");
  } else {
    Serial.println("subscribe to cmd FAILED");
  }
}
```

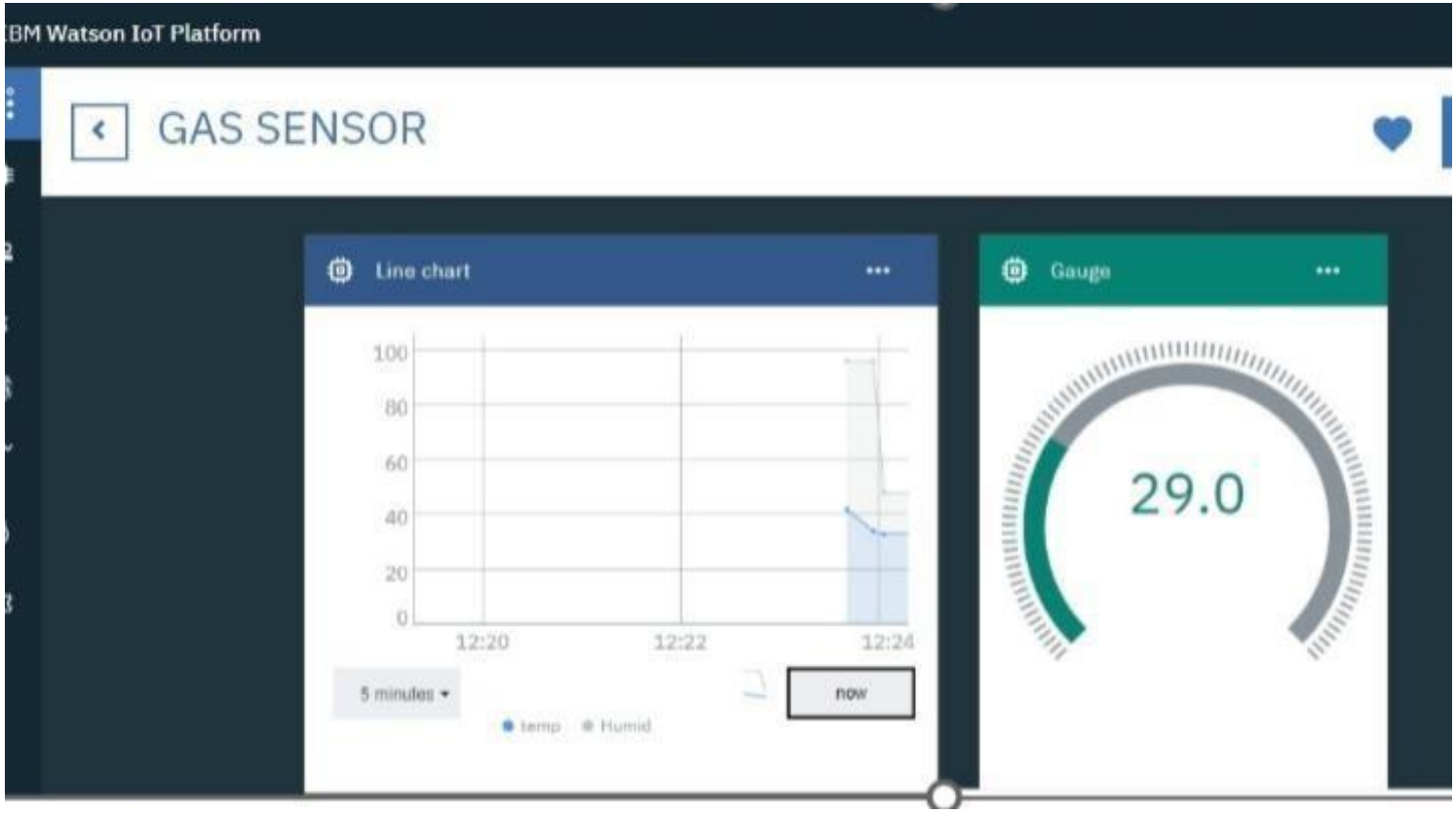
```
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{

  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 Output


IBM Watson IoT Platform
sriramnathiya@gmail.com
ID: w1p5bv
Browse
Action
Device Types
Interfaces
Add Device
sdje_2 Disconnected sdje Device Nov 12, 2022 10:50 PM
sensor Disconnected gassensor Device Nov 17, 2022 4:11 PM
Identity
Device Information
Recent Events
State
Logs
Device ID sensor
Device Type gassensor
Date Added Nov 17, 2022 4:11 PM
Added By sriramnathiya@gmail.com
Connection Status Disconnected
Items per page 50 | 1–5 of 5 items
1 of 1 page
Activate Windows
Go to Settings to activate Windows.
SPRINT 3 (1).docx
SPRINT 3 (1).pdf
Python Data Gen....docx
Python Data Gen....docx
SPRINTS 11.docx
Show all
Type here to search
4:23 PM
11/17/2022


IBM Watson IoT Platform
GAS SENSOR
Line chart
100
80
60
40
20
0
12:20
12:22
12:24
5 minutes
now
temp
Humid
Gauge
29.0