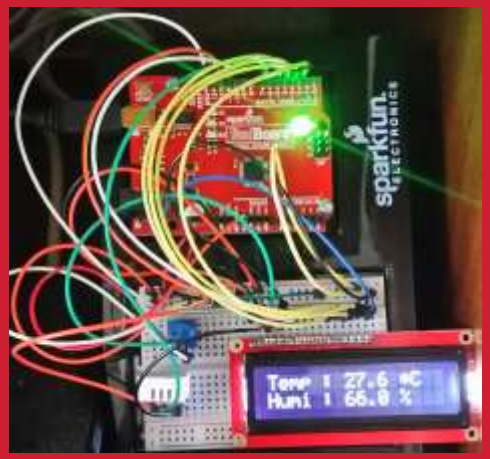
Arduino-IOT

[wk15]



nano33 BLE sensor Final Project

Visualization of Signals using Arduino, Node.js & storing signals in MongoDB & mining iot data using Python

Drone-IoT-Comsi, INJE University

2nd semester, 2023

Email : chaos21c@gmail.com

My ID

ID를 확인하고 github에 repo 만들기

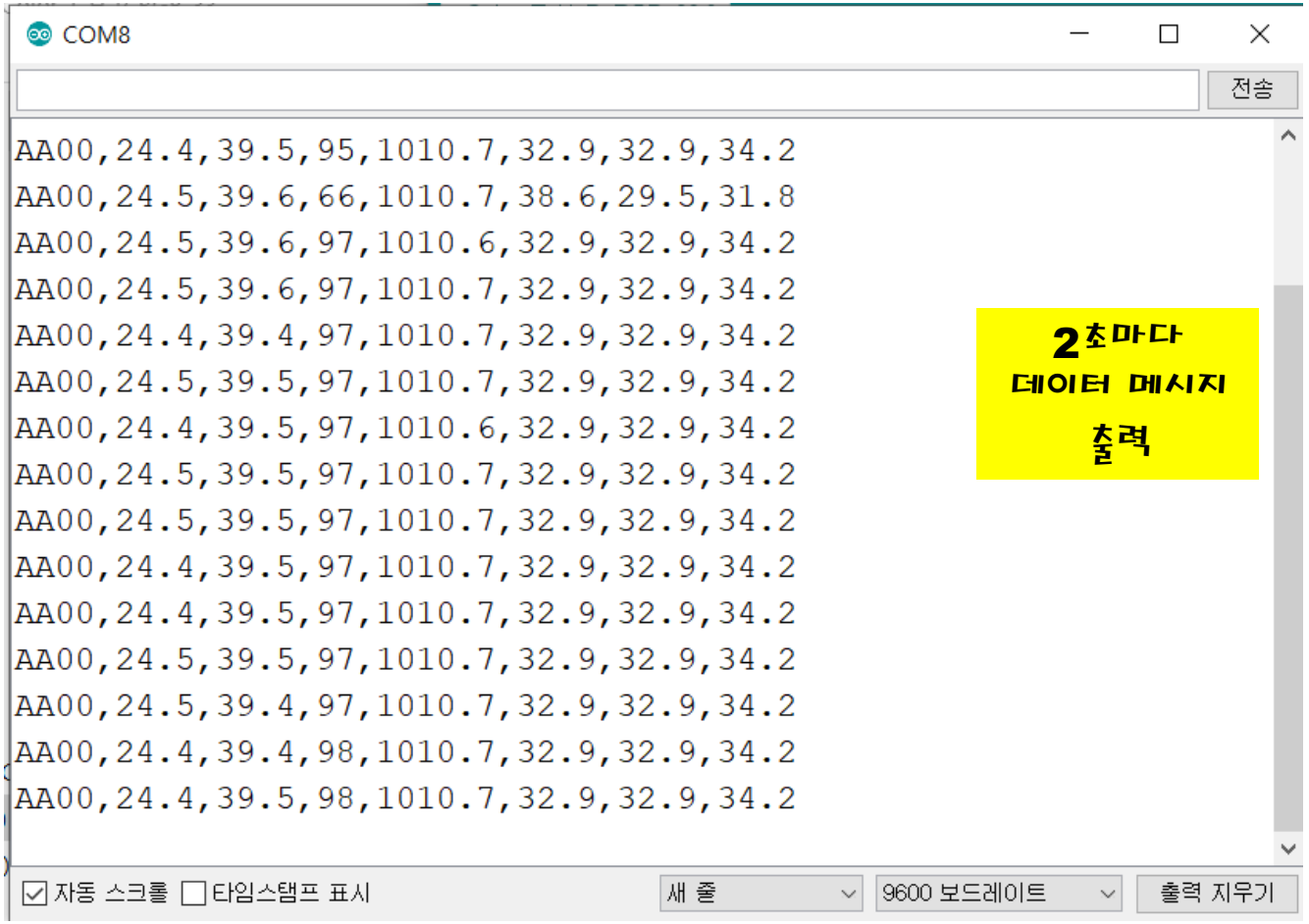
ID	성명
AA01	강동하
AA02	고서진
AA03	김민재
AA04	김예원
AA05	김주호
AA06	김창욱
AA07	김현서
AA08	박종혁
AA09	서명진
AA10	유동기
AA11	
AA12	이근보
AA13	정호기

위의 id를 이용해서 github에 repo를 만드시오.

Option: 아두이노응용 실습 과제 – AAnn

Public, README.md check

Arduino: serial monitor



npm install

```
D:\aann\aann-rpt12\nano33>npm install
npm WARN deprecated debug@4.1.1: Debug versions >=3.2.0 <3.2.7 || >=4 <4.3.1 have a low-severity ReDos regression w
hen used in a Node.js environment. It is recommended you upgrade to 3.2.7 or 4.3.1. (https://github.com/visionmedia
/debug/issues/797)
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/debug/issues/797)

added 255 packages, and audited 256 packages in 14s

29 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities

D:\aann\aann-rpt12\nano33>
```

Project: nano33BLE sensor

db33rgb.js

```
24  // Schema
25  var iotSchema = new Schema({
26      date : String,
27      temperature : String,
28      humidity : String,
29      luminosity : String,
30      pressure : String,
31      r_ratio : String,
32      g_ratio : String,
33      b_ratio : String
34  });
```

Project: nano33BLE sensor

db33rgb.js

```
86  // process data using parser
87  parser.on('data', (data) => { // call back when data is received
88      readData = data.toString(); // append data to buffer
89      firstcommaidx = readData.indexOf(',');
90      secondcommaidx = readData.indexOf(',',firstcommaidx+1);
91      thirdcommaidx = readData.indexOf(',',secondcommaidx+1);
92      fourthcommaidx = readData.indexOf(',',thirdcommaidx+1);
93      fifthcommaidx = readData.indexOf(',',fourthcommaidx+1);
94      sixthcommaidx = readData.indexOf(',',fifthcommaidx+1);
95
96      // parsing data into signals
97      if (readData.lastIndexOf(',') > firstcommaidx && firstcommaidx > 0) {
98          temp = readData.substring(firstcommaidx + 1, secondcommaidx);
99          humi = readData.substring(secondcommaidx + 1, thirdcommaidx);
100         lux = readData.substring(thirdcommaidx + 1, fourthcommaidx);
101         pres = readData.substring(fourthcommaidx + 1, fifthcommaidx);
102         rr = readData.substring(fifthcommaidx + 1, sixthcommaidx);
103         gg = readData.substring(sixthcommaidx + 1, readData.indexOf(',',sixthcommaidx+1));
104         bb = readData.substring(readData.lastIndexOf(',')+1);
```

Project: nano33BE sensor

db33rgb.js

```
108  dStr = getDateString();
109  mdata[0]=dStr;     // Date
110  mdata[1]=temp;     // temperature data
111  mdata[2]=humi;     // humidity data
112  mdata[3]=lux;      //  luminosity data
113  mdata[4]=pres;     // pressure data
114  mdata[5]=rr;        // r_ratio
115  mdata[6]=gg;        // g_ratio
116  mdata[7]=bb;        // b_ratio
117  //console.log(mdata);
118  var iotData = new Sensor({date:dStr, temperature:temp, humidity:humi, luminosity:lux, pressure:pres,
119      r_ratio:rr, g_ratio:gg, b_ratio:bb});
120  // save iot data to MongoDB
121  iotData.save(function(err,data) {
122      if(err) return handleEvent(err);
123      data.info();  // Display the information of iot data  on console.
124  })
```

Layout [H S C]

```
D:\aann\aann-rpt12\nano33>node -v
v16.17.0

D:\aann\aann-rpt12\nano33>node db33rgb
mongo db connection OK.
iotInfo: Current date: 2022-11-14 20:18:48.836, Temp: 25.1, Humi: 55.9, Lux: 112, Pres: 1007.6, R: 27.7, G: 46.1, B: 26.2
iotInfo: Current date: 2022-11-14 20:18:53.882, Temp: 25.2, Humi: 55.9, Lux: 113, Pres: 1007.6, R: 27.5, G: 45.8, B: 26.8
iotInfo: Current date: 2022-11-14 20:18:58.926, Temp: 25.2, Humi: 56.0, Lux: 115, Pres: 1007.6, R: 27.6, G: 45.5, B: 26.9
iotInfo: Current date: 2022-11-14 20:19:03.969, Temp: 25.2, Humi: 56.0, Lux: 114, Pres: 1007.6, R: 27.3, G: 46.2, B: 26.6
iotInfo: Current date: 2022-11-14 20:19:09.013, Temp: 25.2, Humi: 56.0, Lux: 113, Pres: 1007.6, R: 27.5, G: 45.8, B: 26.8
iotInfo: Current date: 2022-11-14 20:19:14.059, Temp: 25.1, Humi: 56.0, Lux: 114, Pres: 1007.6, R: 27.3, G: 46.2, B: 26.6
iotInfo: Current date: 2022-11-14 20:19:19.103, Temp: 25.2, Humi: 56.1, Lux: 113, Pres: 1007.6, R: 27.5, G: 45.8, B: 26.8
iotInfo: Current date: 2022-11-14 20:19:24.145, Temp: 25.3, Humi: 56.4, Lux: 113, Pres: 1007.6, R: 27.5, G: 45.8, B: 26.8
iotInfo: Current date: 2022-11-14 20:19:29.192, Temp: 25.3, Humi: 56.4, Lux: 115, Pres: 1007.6, R: 27.8, G: 45.1, B: 27.1
iotInfo: Current date: 2022-11-14 20:19:34.238, Temp: 25.3, Humi: 56.3, Lux: 11, Pres: 1007.6, R: 36.4, G: 36.4, B: 27.3
iotInfo: Current date: 2022-11-14 20:19:39.281, Temp: 25.3, Humi: 56.2, Lux: 112, Pres: 1007.5, R: 27.3, G: 46.0, B: 26.6
iotInfo: Current date: 2022-11-14 20:19:44.326, Temp: 25.3, Humi: 56.1, Lux: 111, Pres: 1007.6, R: 27.3, G: 46.0, B: 26.6
iotInfo: Current date: 2022-11-14 20:19:49.370, Temp: 25.3, Humi: 56.4, Lux: 113, Pres: 1007.6, R: 27.5, G: 45.8, B: 26.8
iotInfo: Current date: 2022-11-14 20:19:54.413, Temp: 25.3, Humi: 56.2, Lux: 93, Pres: 1007.5, R: 27.1, G: 46.6, B: 26.3
iotInfo: Current date: 2022-11-14 20:19:59.459, Temp: 25.5, Humi: 59.6, Lux: 110, Pres: 1007.6, R: 27.5, G: 45.7, B: 26.8
iotInfo: Current date: 2022-11-14 20:20:04.506, Temp: 25.3, Humi: 60.6, Lux: 96, Pres: 1007.5, R: 27.3, G: 46.3, B: 26.4
iotInfo: Current date: 2022-11-14 20:20:09.548, Temp: 25.5, Humi: 63.0, Lux: 110, Pres: 1007.6, R: 27.0, G: 46.0, B: 27.0
iotInfo: Current date: 2022-11-14 20:20:14.593, Temp: 25.4, Humi: 63.1, Lux: 113, Pres: 1007.5, R: 27.0, G: 46.1, B: 27.0
iotInfo: Current date: 2022-11-14 20:20:19.638, Temp: 25.4, Humi: 62.1, Lux: 113, Pres: 1007.5, R: 27.1, G: 45.7, B: 27.1
iotInfo: Current date: 2022-11-14 20:20:24.683, Temp: 25.4, Humi: 61.5, Lux: 111, Pres: 1007.6, R: 27.3, G: 46.0, B: 26.6
```

Project: nano33BLE sensor

express33rgb.js

```
23  // Schema
24  var iotSchema = new Schema({
25      date : String,
26      temperature : String,
27      humidity : String,
28      luminosity : String,
29      pressure : String,
30      r_ratio : String,
31      g_ratio : String,
32      b_ratio : String
33  });
34  var Sensor = mongoose.model("Sensor", iotSchema);  // sensor data model
35
```

Network socket/DB server : port=3000

Express server : port=3030

node db33rgb

node express33rgb

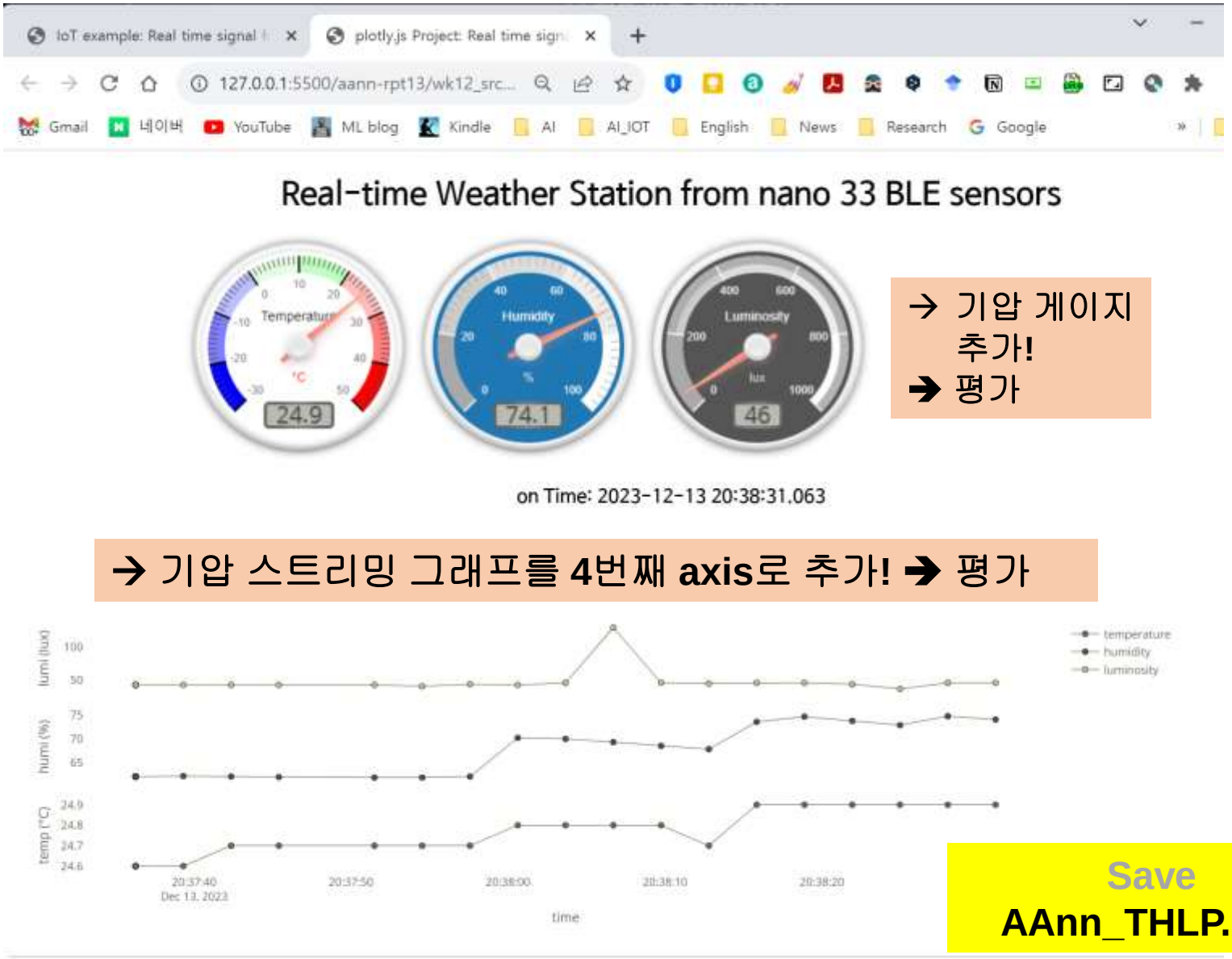
```
D:\aann\aann-rpt12\nano33>node db33rgb
mongo db connection OK.
iotInfo: Current date: 2022-11-14 20:52:35.126, Temp: 25.9, Humi: 54.5, Lux: 109, Pres: 1007.6,
 R: 27.2, G: 46.3, B: 26.5
iotInfo: Current date: 2022-11-14 20:52:40.170, Temp: 26.0, Humi: 54.5, Lux: 111, Pres: 1007.6,
 R: 27.3, G: 46.0, B: 26.6
iotInfo: Current date: 2022-11-14 20:52:45.214, Temp: 26.0, Humi: 54.5, Lux: 109, Pres: 1007.6,
 R: 27.2, G: 46.3, B: 26.5
iotInfo: Current date: 2022-11-14 20:52:50.259, Temp: 26.0, Humi: 54.5, Lux: 109, Pres: 1007.5,
 R: 27.0, G: 46.0, B: 27.0
iotInfo: Current date: 2022-11-14 20:52:55.302, Temp: 26.0, Humi: 54.6, Lux: 110, Pres: 1007.6,
 R: 27.2, G: 46.3, B: 26.5
iotInfo: Current date: 2022-11-14 20:53:00.349, Temp: 26.0, Humi: 54.6, Lux: 108, Pres: 1007.6,
 R: 27.4, G: 45.9, B: 26.7
iotInfo: Current date: 2022-11-14 20:53:05.390, Temp: 26.0, Humi: 54.5, Lux: 111, Pres: 1007.6,
 R: 27.3, G: 46.0, B: 26.6
iotInfo: Current date: 2022-11-14 20:53:10.434, Temp: 26.0, Humi: 54.5, Lux: 110, Pres: 1007.6,
 R: 27.0, G: 46.0, B: 27.0
iotInfo: Current date: 2022-11-14 20:53:15.479, Temp: 26.0, Humi: 54.5, Lux: 108, Pres: 1007.5,
 R: 27.2, G: 46.3, B: 26.5
```

```
D:\aann\aann-rpt12\nano33>node express33rgb
Express_IOT is running at port:3030, CORS power
ed!
mongo db connection OK.
```

node

node

http://127.0.0.1:3030/client_33.html



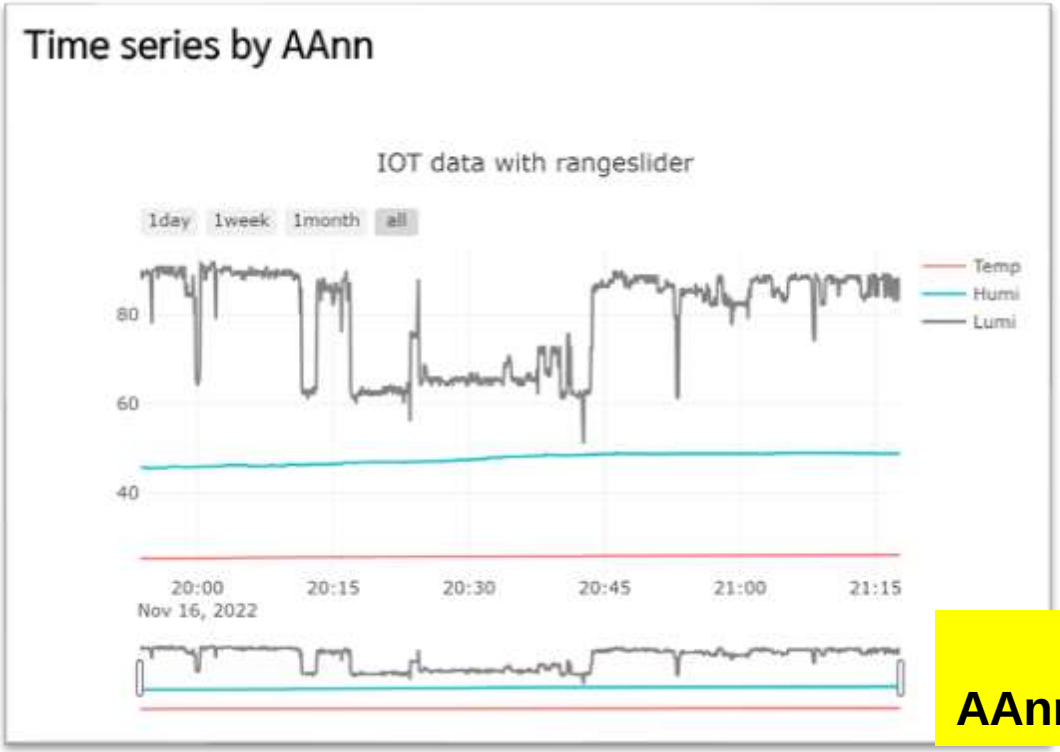
A5.9.8 MongoDB management

[DIY]

1. iot33 db의 최근 데이터 1500개를 csv 파일 (aann_iot33_800.csv)로 저장하시오.
2. 저장된 aann_iot33_800.csv 파일을 public/data 폴더에 복사.
3. csv 파일을 이용하는 Rangeslider가 포함된 웹 클라이언트 client_33csv.html 파일을 완성하시오.
4. localhost:3030/client_33csv.html 로 실행하고 확인.

[hint] iot33 db의 최근 데이터 500개를 csv 파일 (iot_500.csv)로 저장할 때,

- mongoexport /db:iot33 /collection:sensors /sort:"{_id: -1}" /limit:500 /fields:date,temperature,humidity,luminosity /type:csv /out:iot_500.csv



client_33csv.html

코드를 완성하시오.

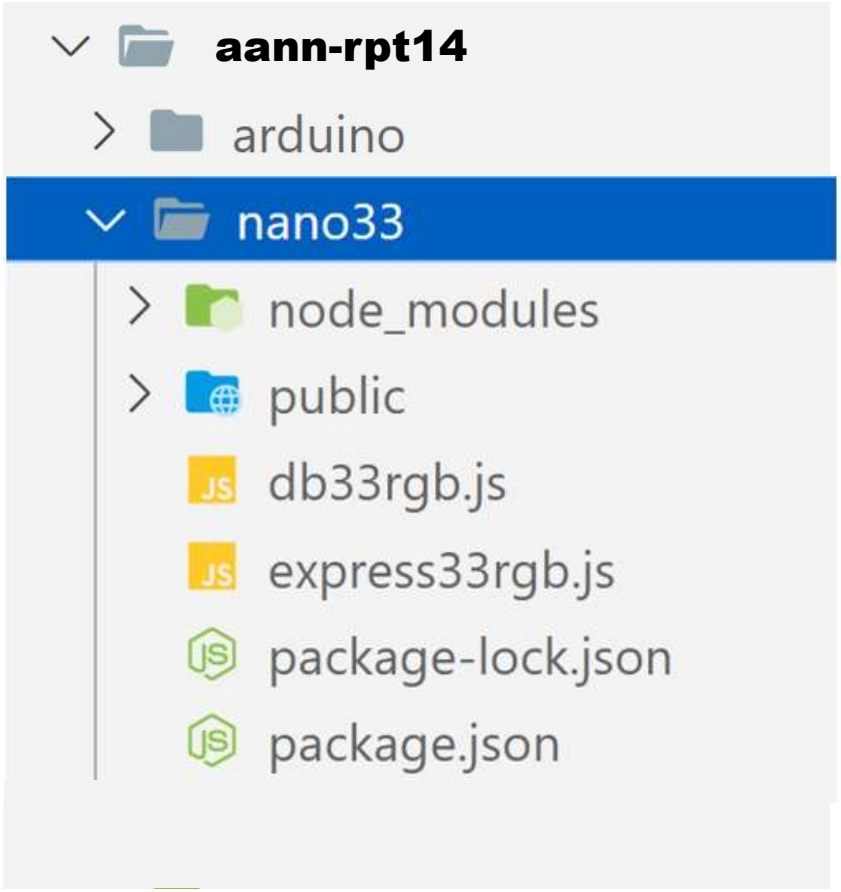
public 폴더에 저장

Save

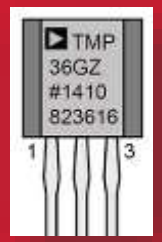
AAnn_THLP_db.png

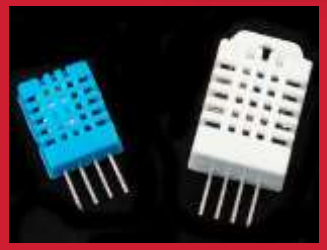
Project: nano33BLE sensor

작업 폴더 구조 [2023-nano33-project]



[Practice]





- [wk15]
  - IoT Project: nano33ble
  - Multi-sensor circuits : T,H,L,P
  - Complete your project
  - Upload folder: aann-rpt14
  - Use repo “aann” in github

wk15 : Final Project : aann-rpt14

[Target of this week]

- Complete your works
- Save your outcomes and upload outputs in github

제출폴더명 : **aann-rpt14**

- 제출할 파일들

① **Arduino code**

② **nano33 folder**

③ aann_THLP.png

④ aann_THLP_iot.png

⑤ nano33/public/ *.html

⑥ nano33/public/data/aann_iot33_800.csv

⑦ node_modules 폴더는 삭제