

PNUAIRNOW:

AIR QUALITY DASHBOARD

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About the project...

- Using HTML, CSS and JS
- Create a responsive web application to monitor and display real-time air quality data
- Including temperature, feelslike temperature, humidity, wind
- PM2.5, PM10, CO, O3, NO2, SO2
- Visualize trends for temperature and humidity over time
- Represent the distribution of various pollutants using Bar charts and Doughnut chart
- Implement color coding to indicate air quality levels

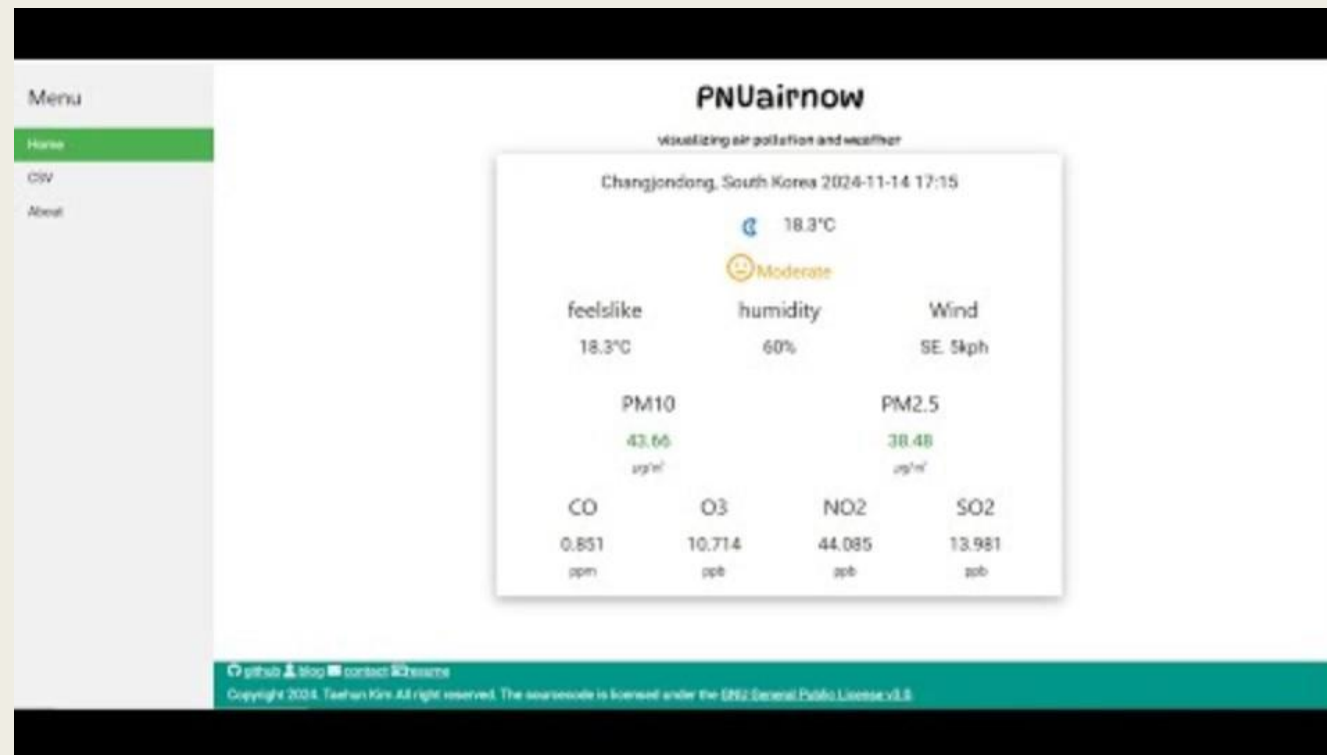
Air quality web page link

- <https://staging.d3ksq6ksws80c.amplifyapp.com/>
- You can download source code on
- <https://github.com/minchoCoin/air-quality-dashboard2>



Demo video

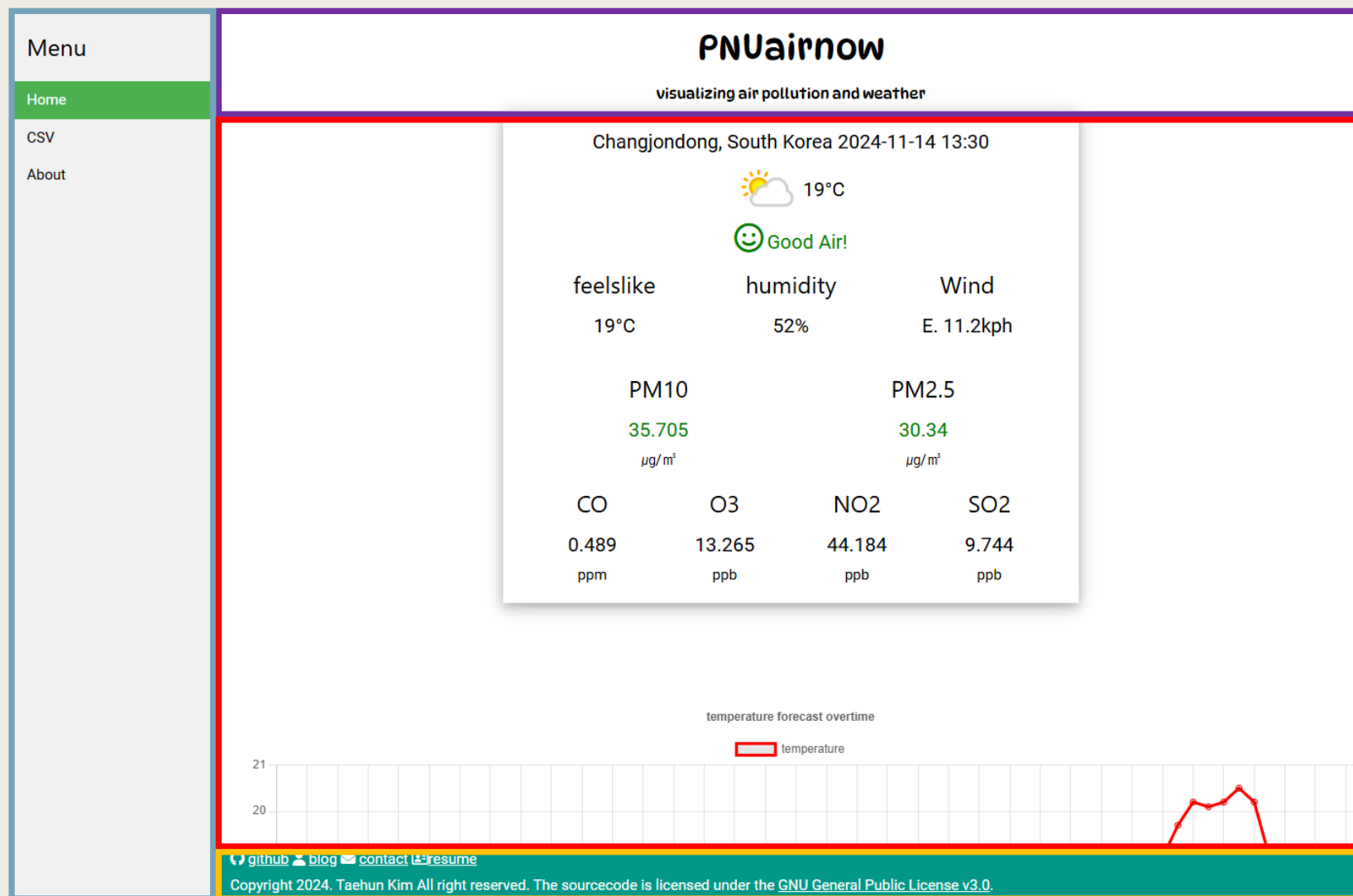
<https://youtu.be/VFPmD9clYjk>



layout

Header

Navigation Bar



Main Dashboard

Footer

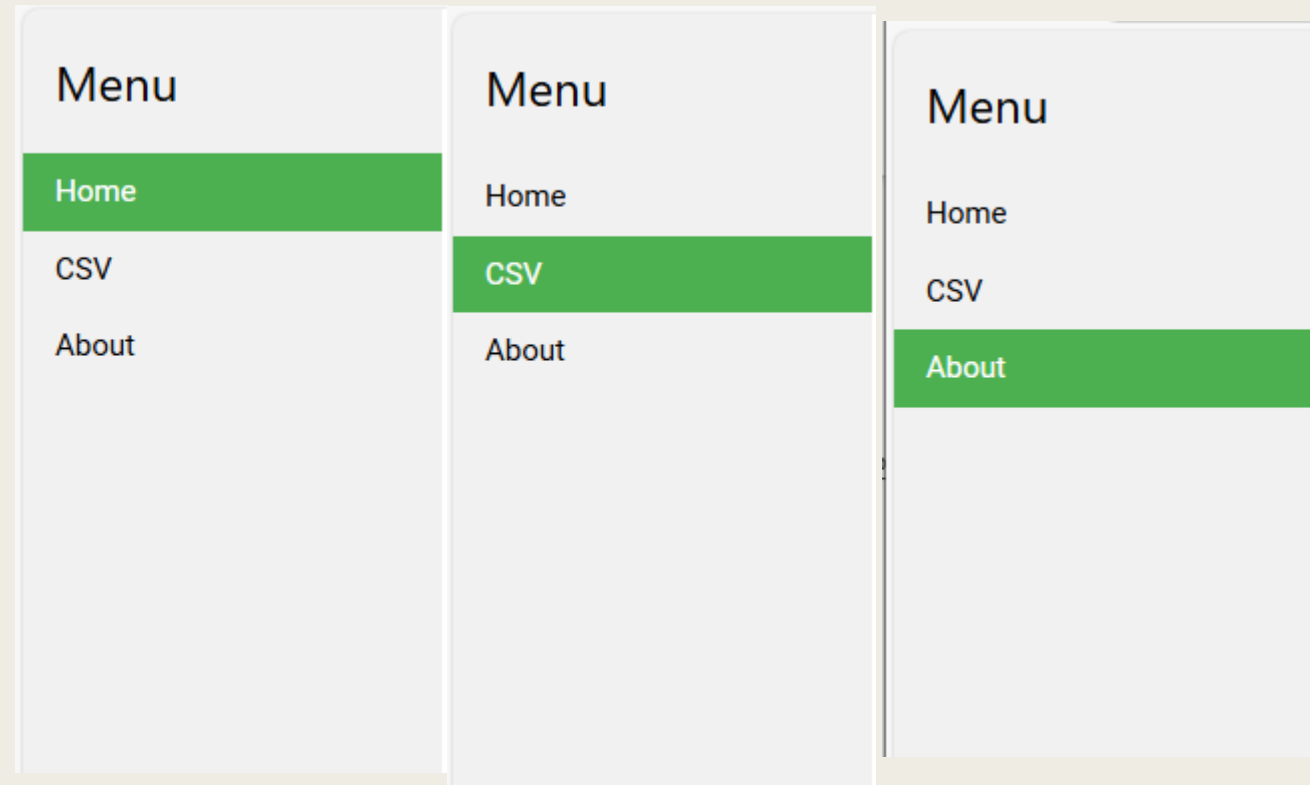
layout-header



- Title of the application and a brief description.

Layout-navigation bar

- You can switch the page
- through this navigation bar.



Layout- footer

 [github](#)  [blog](#)  [contact](#)  [resume](#)

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- You can view my github, blog, contact, resume link
- License link(GNU General Public License v3.0)

Feature1. real-time dashboard

This file wants to

📍 Know your location

Allow

Block

Changjondong, South Korea 2024-11-14 14:00



19.3°C



Good Air!

feelslike

19.3°C

humidity

52%

Wind

E. 9.4kph

PM10

34.595

μg/m³

PM2.5

29.045

μg/m³

CO

0.508

ppm

O3

12.755

ppb

NO2

43.396

ppb

SO2

9.532

ppb

Using Free Weather API, jquery and AJAX

Get real-time data

- City
- Country
- Last updated
- Weather image
- Air quality
- Temperature
- Feelslike temperature
- Humidity
- Wind
- Pm10
- Pm2.5
- CO
- O3
- NO2
- SO2

Featur1-1. color of PM10 and PM2.5

- PM10 and PM2.5
 - Good: blue
 - Moderate: green
 - Bad: orange
 - Very bad: red

	good	moderate	bad	very bad
pm10	0-30	31-80	81-150	151-
pm2.5	0-15	16-50	51-100	101-

PM10

5.23

$\mu\text{g}/\text{m}^3$

PM2.5

5.34

$\mu\text{g}/\text{m}^3$

PM10

30.23

$\mu\text{g}/\text{m}^3$

PM2.5

30.34

$\mu\text{g}/\text{m}^3$

PM10

90.23

$\mu\text{g}/\text{m}^3$

PM2.5

90.34

$\mu\text{g}/\text{m}^3$

PM10

152.23

$\mu\text{g}/\text{m}^3$

PM2.5

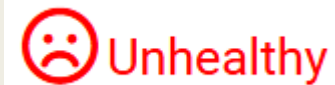
101.34

$\mu\text{g}/\text{m}^3$

Feature 1-2. color of air quality

■ UK DEFRA INDEX

- *Good: blue*
- *Moderate: green*
- *Bad: orange*
- *Very bad: red*



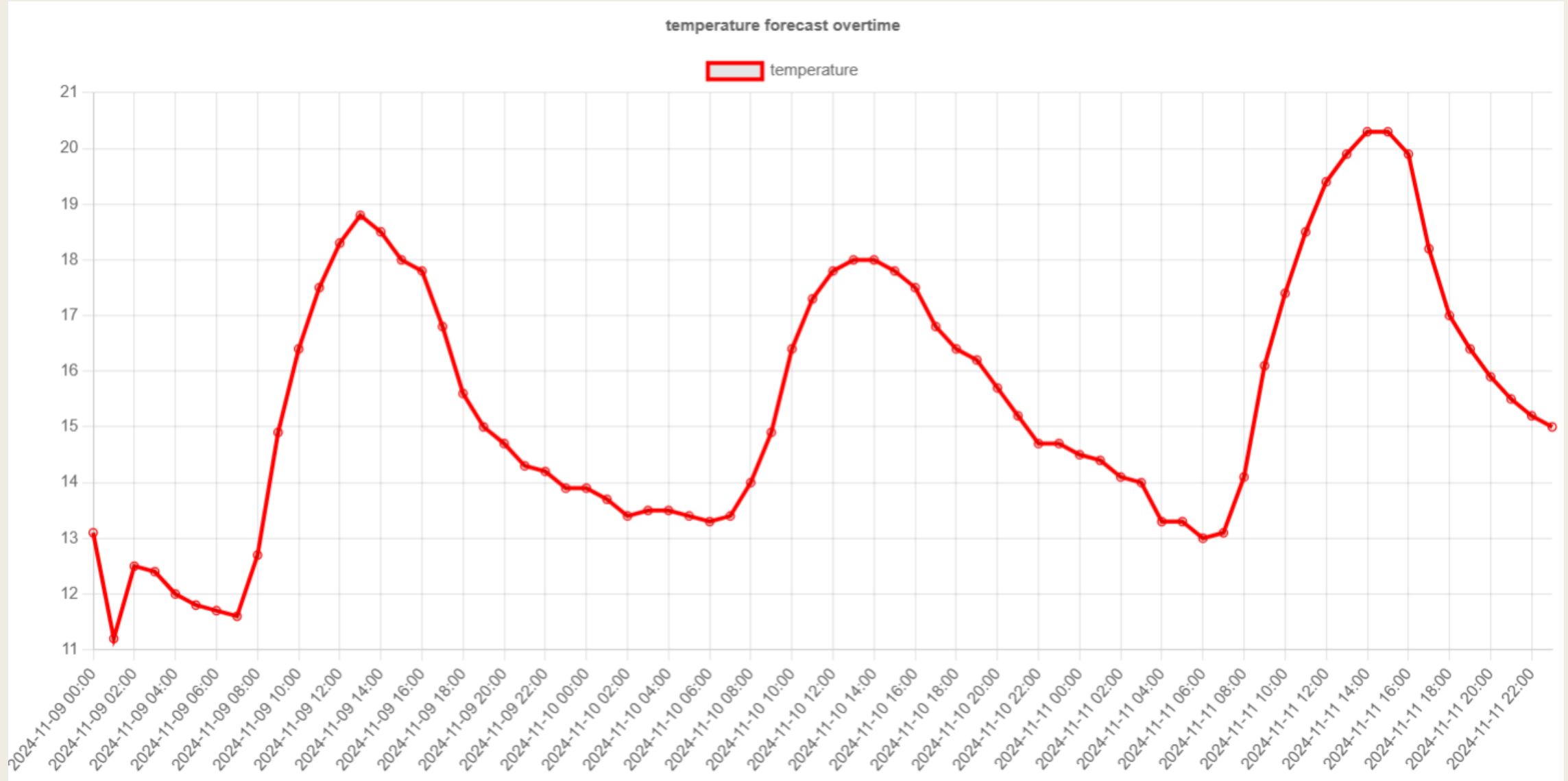
UK DEFRA INDEX Table

Index	1	2	3	4	5	6	7	8	9	10
Band	Low	Low	Low	Moderate	Moderate	Moderate	High	High	High	Very High
μgm^{-3}	0-11	12-23	24-35	36-41	42-47	48-53	54-58	59-64	65-70	71 or more

* UK DEFRA INDEX tells you about levels of air pollution and provides recommended actions and health advice.

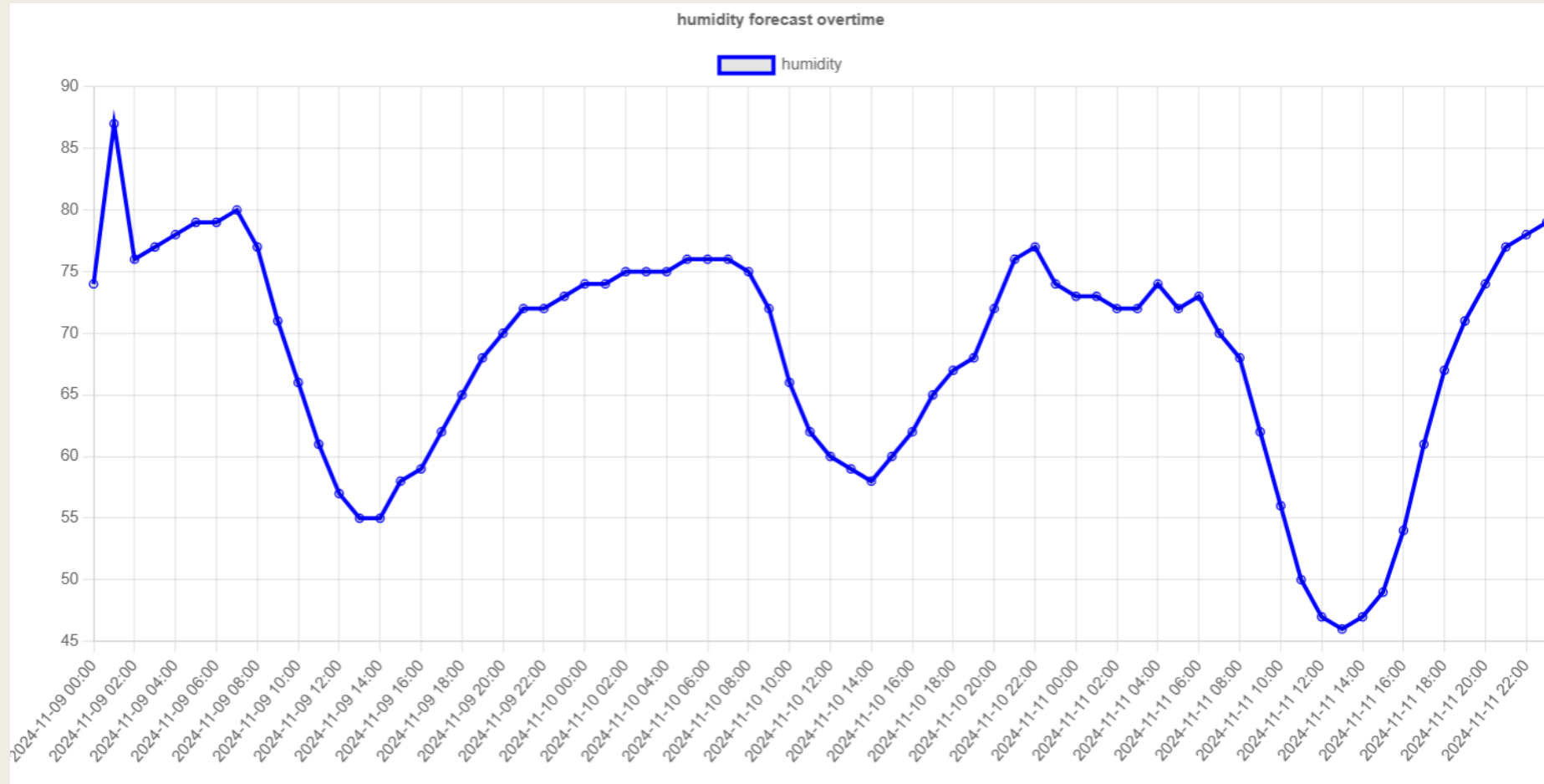
Feature2. temperature & humidity chart

Temperature 3day forecast chart by hour

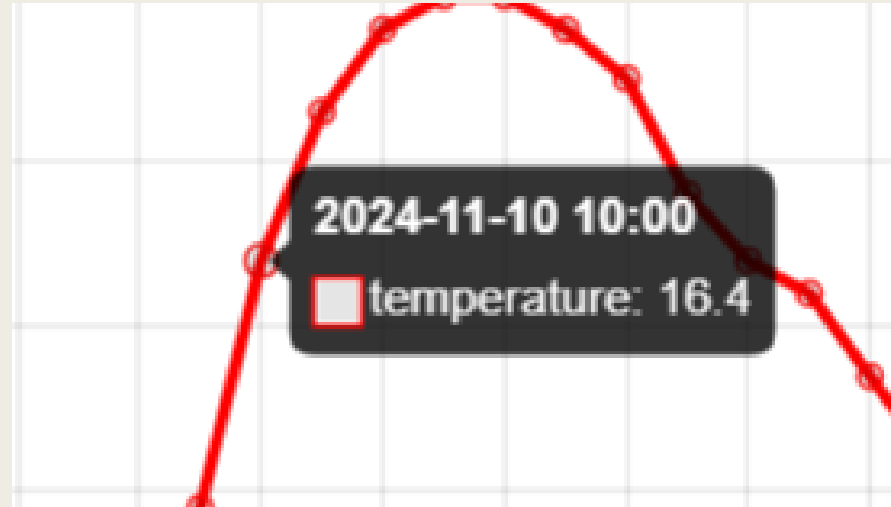


Feature2. temperature & humidity chart

humidity 3day forecast chart by hour

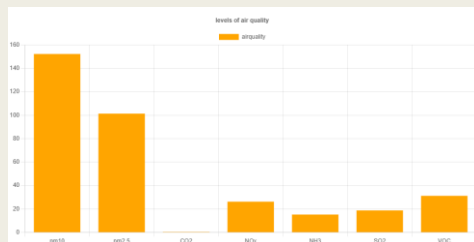
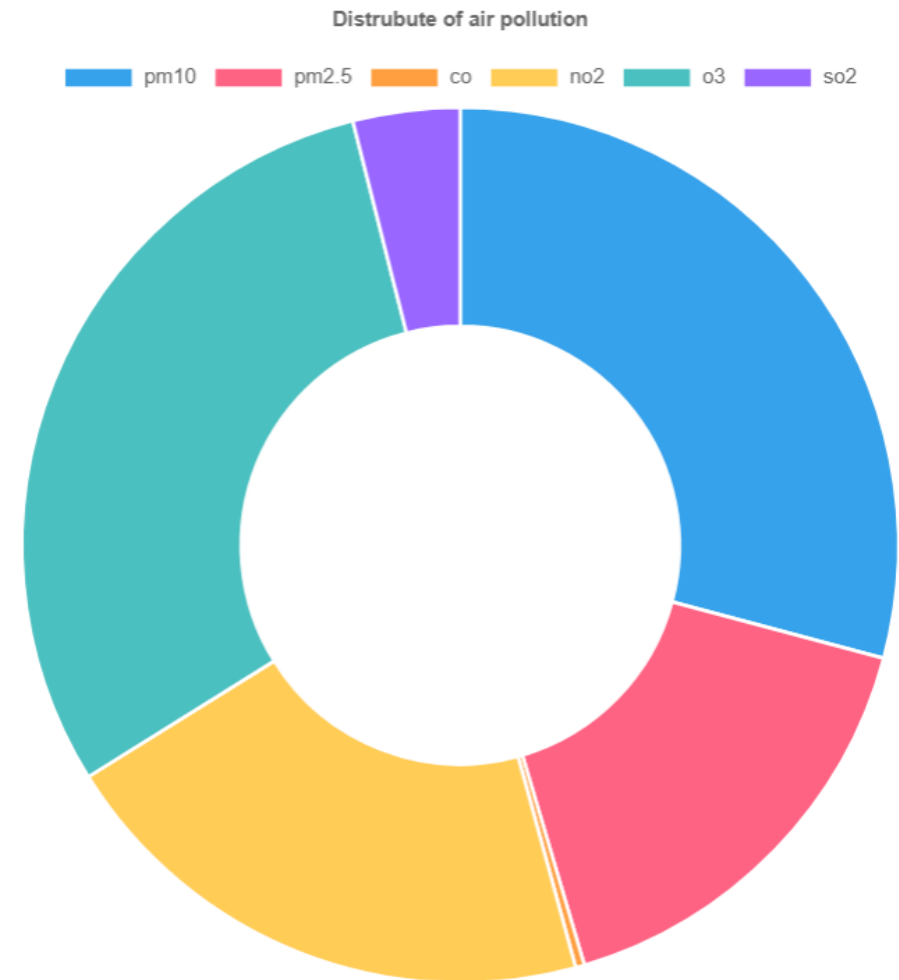
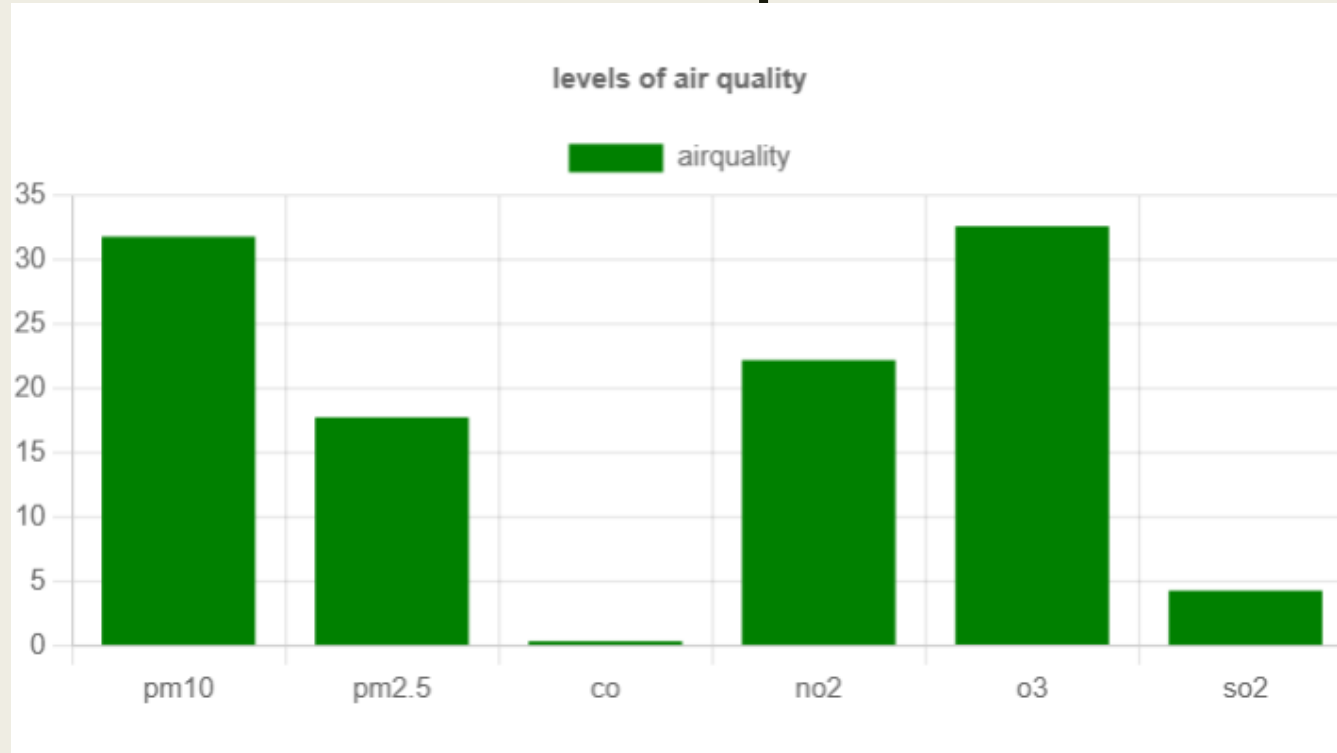


Feature2. temperature & humidity chart



You can check the value of the chart by hover the chart

Feature3. Air pollutants chart



The color of air quality bar chart is the color of air quality

Feature4. CSV file dashboard

```
time,cityname,country,current,temperature,humidity,feelslike,wind_dir,wind_kph,pm10,pm2_5,co2,Nox,NH3,SO2,VOC,gb_defra_index
2024-11-06 0:00,Pusan, South Korea,,9.8,62,,,,,,
2024-11-06 1:00,,,9.2,62,,,,,,
2024-11-06 2:00,,,8.7,55,,,,,,
2024-11-06 3:00,,,8,48,,,,,,
2024-11-06 4:00,,,7.7,46,,,,,,
2024-11-06 5:00,,,7.4,48,,,,,,
2024-11-06 6:00,,,7.4,50,,,,,,
2024-11-06 7:00,,,7,52,,,,,,
2024-11-06 8:00,,,8.3,34,,,,,,
2024-11-06 9:00,,,10.1,47,,,,,,
2024-11-06 10:00,,,0,11.5,43,8.3,W,2.3,152.23,101.34,0.458,26.231,15.241,18.756,31.215,5
2024-11-06 11:00,,,12.5,40,,,,,,
2024-11-06 12:00,,,13.1,37,,,,,,
2024-11-06 13:00,,,13.5,37,,,,,,
2024-11-06 14:00,,,13.7,37,,,,,,
2024-11-06 15:00,,,13.5,37,,,,,,
2024-11-06 16:00,,,12.9,39,,,,,,
2024-11-06 17:00,,,11.8,42,,,,,,
2024-11-06 18:00,,,10.6,45,,,,,,
2024-11-06 19:00,,,9.9,48,,,,,,
2024-11-06 20:00,,,9.3,52,,,,,,
2024-11-06 21:00,,,8.8,55,,,,,,
2024-11-06 22:00,,,8.4,58,,,,,,
2024-11-06 23:00,,,8.1,61,,,,,,
```

Read csv file and visualize

Time, cityname, country, temperature, humidity ,feelslike,
wind, pm10,pm2.5, co2, Nox, NH3, SO2,VOC,defra_index

Pusan, South Korea 2024-11-06 10:00



☹ Moderate

feelslike

8.3°C

humidity

43%

Wind

W. 2.3kph

PM10

152.23

μg/ m³

PM2.5

101.34

μg/ m³

CO2

0.458

ppm

NH3

15.241

ppb

NOx

26.231

ppb

SO2

18.756

ppb

VOC

31.215

ppb

Sample of csv file

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
time	cityname	country	current	temperatu	humidity	feelslike	wind_dir	wind_kph	pm10	pm2_5	co2	Nox	NH3	SO2	VOC	gb_defra_index	
2024-11-06 0:00	Pusan	South Korea		9.8	62												
2024-11-06 1:00				9.2	62												
2024-11-06 2:00				8.7	55												
2024-11-06 3:00				8	48												
2024-11-06 4:00				7.7	46												
2024-11-06 5:00				7.4	48												
2024-11-06 6:00				7.4	50												
2024-11-06 7:00				7	52												
2024-11-06 8:00				8.3	34												
2024-11-06 9:00				10.1	47												
2024-11-06 10:00			O	11.5	43	8.3 W		2.3	152.23	101.34	0.458	26.231	15.241	18.756	31.215	5	
2024-11-06 11:00				12.5	40												
2024-11-06 12:00				13.1	37												
2024-11-06 13:00				13.5	37												
2024-11-06 14:00				13.7	37												
2024-11-06 15:00				13.5	37												
2024-11-06 16:00				12.9	39												
2024-11-06 17:00				11.8	42												

Index: time

Columns: cityname, country, current, temperature, humidity, feelslike, wind_dir, wind_kph, pm10, pm2.5, co2, Nox, NH3, SO2, VOC, gb_defra_index


- City name and country are needed only for the first row.
- From "feelslike" to "gb_defra_index" columns, data is needed only for rows where "current" equals "O".

Feature5. about

- Video about air pollutions
- Information of air pollutions

PNUairnow

visualizing air pollution and weather



you can download source code of this webpage on this [link](#)
Real time weather and air pollution data is received from [Free Weather API](#)

Air Quality

Particulate Matter(PM₁₀,PM_{2.5})

Particulate Matter is classified into PM10 and PM2.5 depending on their diameters, PM10 is a dust less than 10/1000mm and PM2.5 is a dust less than 2.5/1000mm which are smaller than 1/20~1/30 of the hair diameter(about 60μm). Particulate Matter is a mixture of airborne solid particles and liquid droplets. These particles take various shapes and sizes as they are emitted not only from natural sources, but also from various fixed or mobile sources. PM2.5 is either directly emitted from such sources or indirectly generated from gases such as SOx and NOx. They aggravate respiratory diseases like asthma and weaken the functions of the lungs. Furthermore, they reduce visibility, disturb the metabolism of plants after remaining on the leaf, and particularly cause the corrosion of historic relics or statues.

	good	moderate	bad	very bad
pm10	0-30	31-80	81-150	151-
pm2.5	0-15	16-50	51-100	101-

O₃

Ozone(O₃) is a photochemical oxidant such as PANs, aldehyde, and acrolein which are formed during the photochemical reaction of NOx and VOCs in the presence of sunlight, and is classified as a secondary pollutant. VOCs, a precursor, are emitted from various sources such as motor vehicles and industrial facilities including chemical plants and refineries. They are

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Used Bootstrap & library

- w3 css
- font awesome 6.6.0
- jquery 3.7.1
- chart.js 4.4.1
- papaparse 5.4.1

Fonts

- Dynapuff: title and logo
- Roboto: other contents except title

What will I do

- Add air quality data(like what is the UK DEFRA INDEX) more in about.html
- Add recommend action and health advices in index.html and csv.html
- Change UI more user-friendly
- Add error handling(API key expired, csv syntax error, etc)
- And so on...

Thank you