air-quality-dashboard

Air quality monitoring dashboard for term project of Web Application Programming lecture.

We use FreeWeatherAPI for getting the weather and air quality data

webpage

https://minchocoin.github.io/air-quality-dashboard/

source tree

```
   air-quality-dashboard
├─ LICENSE
├─ README.md
├─ about.html : html file for about menu
├─ country.html : html file for City menu
├─ css
│  └─ style.css : css file
├─ csv.html : html file for CSV menu
├─ index.html : html file for Home menu
├─ js
│  ├─ app.js : js file for index.html
│  ├─ app_country.js : js file for country.html
│  ├─ app_csv.js : js file for csv.html
│  └─ key.js.example
├─ markdownimage
├─ presentation.pdf
├─ presentation.pptx
├─ report.pdf
├─ sample3dayforecast(paris).csv : sample csv file that will be downloaded when
the download button is clicked
└─ samplecsv.csv : sample csv file that will be uploaded in CSV menu
```
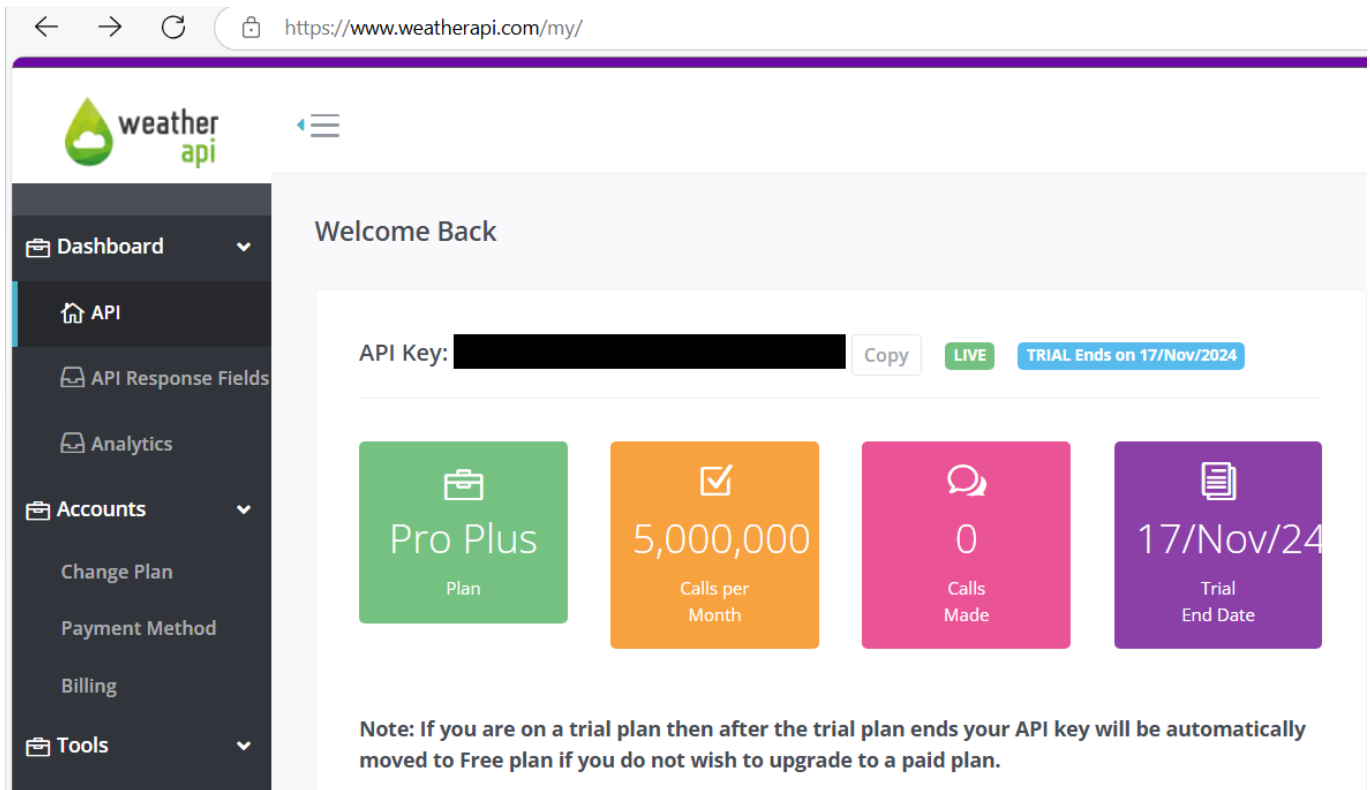
©generated by Project Tree Generator

How to run?

download this code

```
git clone https://github.com/minchoCoin/air-quality-dashboard.git
```

generate API key

you can generate api key on https://www.weatherapi.com/. after sign up and login, you can check the your api key on weatherapi mypage.

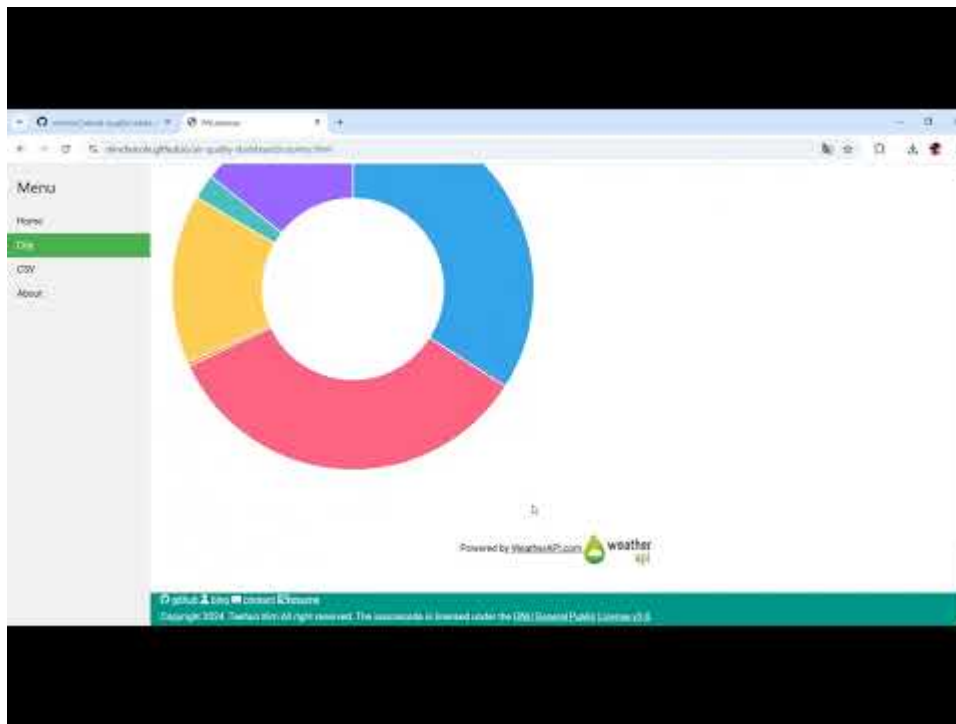## generate key.js in js folder.

generate key.js in js folder. the content of the key.js is:

```
const config = {
    apikey: 'enter your api key'
}
```
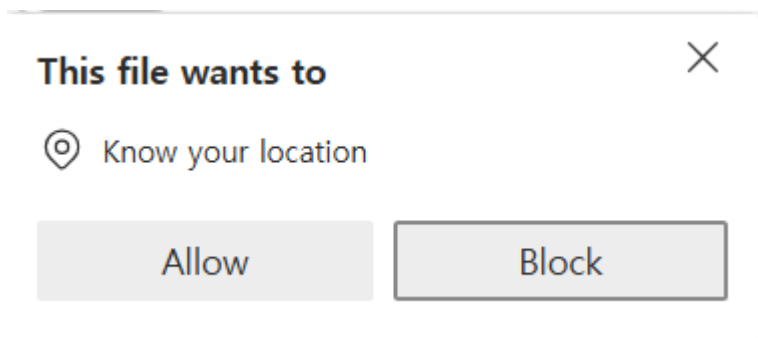
double click index.html and check air quality

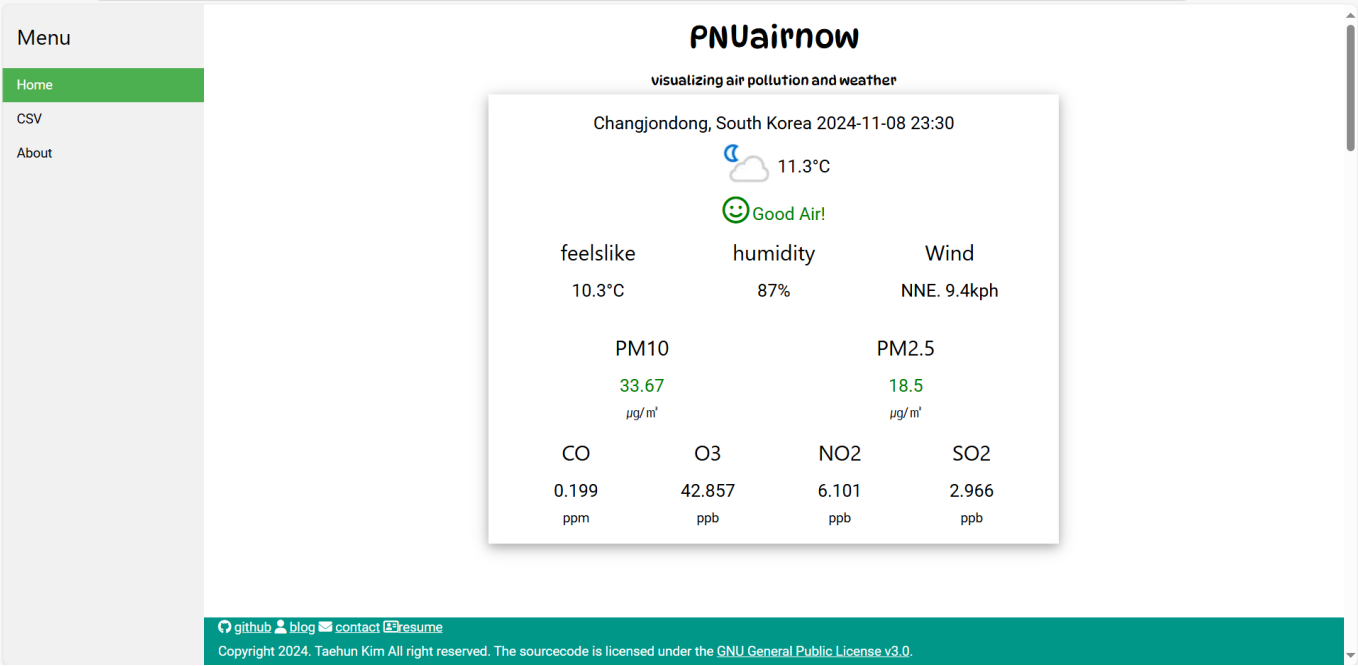double click index.html and check air quality.

demo video

features

real-time air quality monitoring

If you click on index.html, your browser will ask if you allow it to access your location. if you clicked 'Allow', you can view real-time air quality data like this:
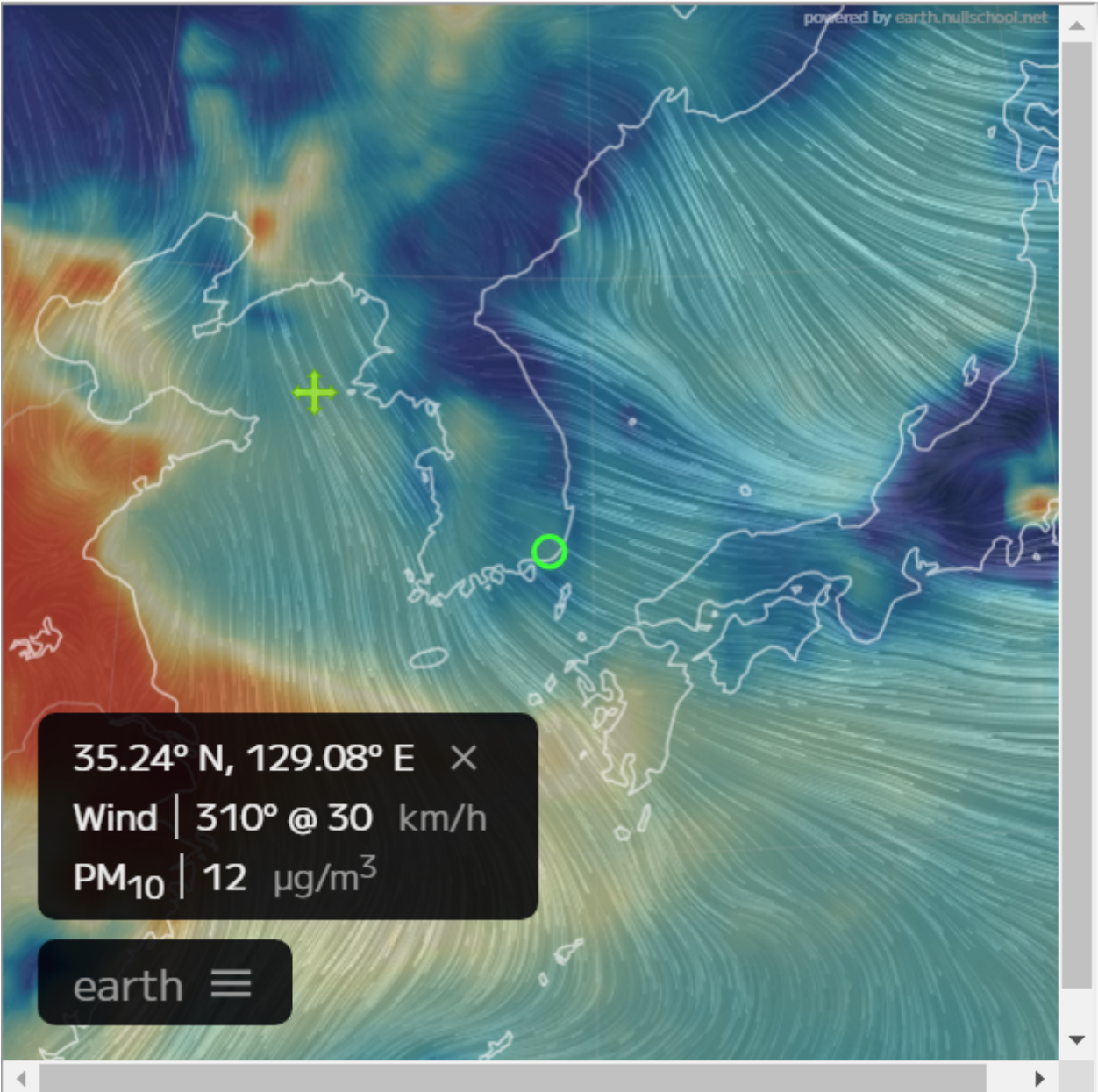
PNUairnow
visualizing air pollution and weather

Changjondong, South Korea 2024-11-08 23:30

11.3°C

😊 Good Air!

feelslike	humidity	Wind
10.3°C	87%	NNE. 9.4kph

PM10	PM2.5
33.67	18.5
µg/m³	µg/m³

CO	O3	NO2	SO2
0.199	42.857	6.101	2.966
ppm	ppb	ppb	ppb

github 👤 blog ✉ contact resume

you can check information

1. your location(city, country)
2. last-updated time
3. weather image
4. temperature
5. current total air quality level(good, moderate, unhealthy, dangerous)
6. feelslike temperature
7. humidity
8. wind(direction and speed)
9. various air quality data
    - pm10(µg/m^3)
    - pm2.5(µg/m^3)
    - CO(ppm)
    - O3(ppb)
    - NO2(ppb)
    - SO2(ppb)

air quality map

you can check the air quality map(blue regions have better air quality(pm10))

(powered by earth nullschool)

current total air quality level

current total air quality level is one of good(green), moderate(orange), unhealthy(red), and dangerous(purple). this level come from gb_defra_index: good air for 1-3 gb_defra_index, moderate air for 4-6 and bad for 7-9, very bad for 10.

text color of pm10 and pm2.5

https://www.airgwangsan.kr/page/?site=airmap&mn=854

text color of pm10 and pm2.5 represent the level of the fine dust level.

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

the text color of 'good' is blue, 'moderate' is green, 'bad' is orange, 'very bad' is red.

PM10

5.23

µg/ m³

PM2.5

5.34

µg/ m³

PM10

30.23

µg/ m³

PM2.5

30.34

µg/ m³

PM10

90.23

µg/ m³

PM2.5

90.34

µg/ m³

PM10

152.23

µg/ m³

PM2.5

101.34

µg/ m³

download 3 day forecast data csv file

if you click 'download' button, you can download the weather information from today to 3days later forecast by hour

PNUairnow

visualizing air pollution and weather

download 3 day forecast data `download`

최근 다운로드 기록 ⊗

📊 Ulsan.csv
5.0KB • 완료

The weather information contains time, city, country, temperature(celsius), humidity, wind_kph, wind_dir, pressure_mb, feelslike temperature, and uv

time	city	country	temp_c	humidity	condition	wind_kph	wind_dir	pressure_r	feelslike_c	uv
2024-12-06 0:00	Ulsan	South Korea	3.3	71	Clear	9	WSW	1016	0.8	0
2024-12-06 1:00	Ulsan	South Korea	3.3	71	Clear	9.4	WSW	1016	0.8	0
2024-12-06 2:00	Ulsan	South Korea	3.4	73	Clear	10.1	WSW	1016	0.7	0
2024-12-06 3:00	Ulsan	South Korea	3.1	75	Clear	7.9	W	1017	0.9	0
2024-12-06 4:00	Ulsan	South Korea	3	77	Cloudy	7.9	W	1017	0.8	0
2024-12-06 5:00	Ulsan	South Korea	3.2	76	Partly Clou	7.9	W	1017	1.1	0
2024-12-06 6:00	Ulsan	South Korea	2.8	78	Clear	8.3	WNW	1018	0.5	0
2024-12-06 7:00	Ulsan	South Korea	2.5	79	Clear	7.6	W	1018	0.3	0
2024-12-06 8:00	Ulsan	South Korea	2.8	77	Sunny	6.8	WSW	1019	0.9	0
2024-12-06 9:00	Ulsan	South Korea	4.3	68	Sunny	6.5	W	1019	2.8	0.5
2024-12-06 10:00	Ulsan	South Korea	5.6	59	Sunny	7.9	W	1020	3.8	1.1
2024-12-06 11:00	Ulsan	South Korea	6.6	55	Sunny	8.3	WSW	1019	4.9	1.8
2024-12-06 12:00	Ulsan	South Korea	7.3	51	Cloudy	11.9	W	1019	5.1	2.1
2024-12-06 13:00	Ulsan	South Korea	7.6	50	Cloudy	15.5	W	1019	4.9	2.1
2024-12-06 14:00	Ulsan	South Korea	7.5	50	Partly Clou	19.1	WNW	1018	4.3	1.6
2024-12-06 15:00	Ulsan	South Korea	7	51	Partly Clou	19.1	WNW	1019	3.7	0.9
2024-12-06 16:00	Ulsan	South Korea	6.4	51	Sunny	17.3	WNW	1019	3.1	0.4
2024-12-06 17:00	Ulsan	South Korea	4.9	54	Sunny	15.1	WNW	1020	1.6	0
2024-12-06 18:00	Ulsan	South Korea	4	55	Clear	14	WNW	1021	0.6	0
2024-12-06 19:00	Ulsan	South Korea	5.1	48	Clear	13.3	WNW	1020	0	0

```
time,city,country,temp_c,humidity,condition,wind_kph,wind_dir,pressure_mb,feelslike_c,uv
2024-12-10 00:00,Paris,France,5.5,80,Patchy rain nearby,16.6,NE,1025,2.1,0
2024-12-10 01:00,Paris,France,5.5,76,Patchy rain nearby,16.9,NE,1025,2.1,0
2024-12-10 02:00,Paris,France,5.4,75,Patchy rain nearby,17.3,NE,1025,1.9,0
2024-12-10 03:00,Paris,France,5.3,76,Overcast ,16.9,NE,1025,1.8,0
2024-12-10 04:00,Paris,France,5.2,79,Patchy rain nearby,16.2,NE,1025,1.8,0
2024-12-10 05:00,Paris,France,5.3,81,Overcast,15.5,NE,1025,1.9,0
...
```
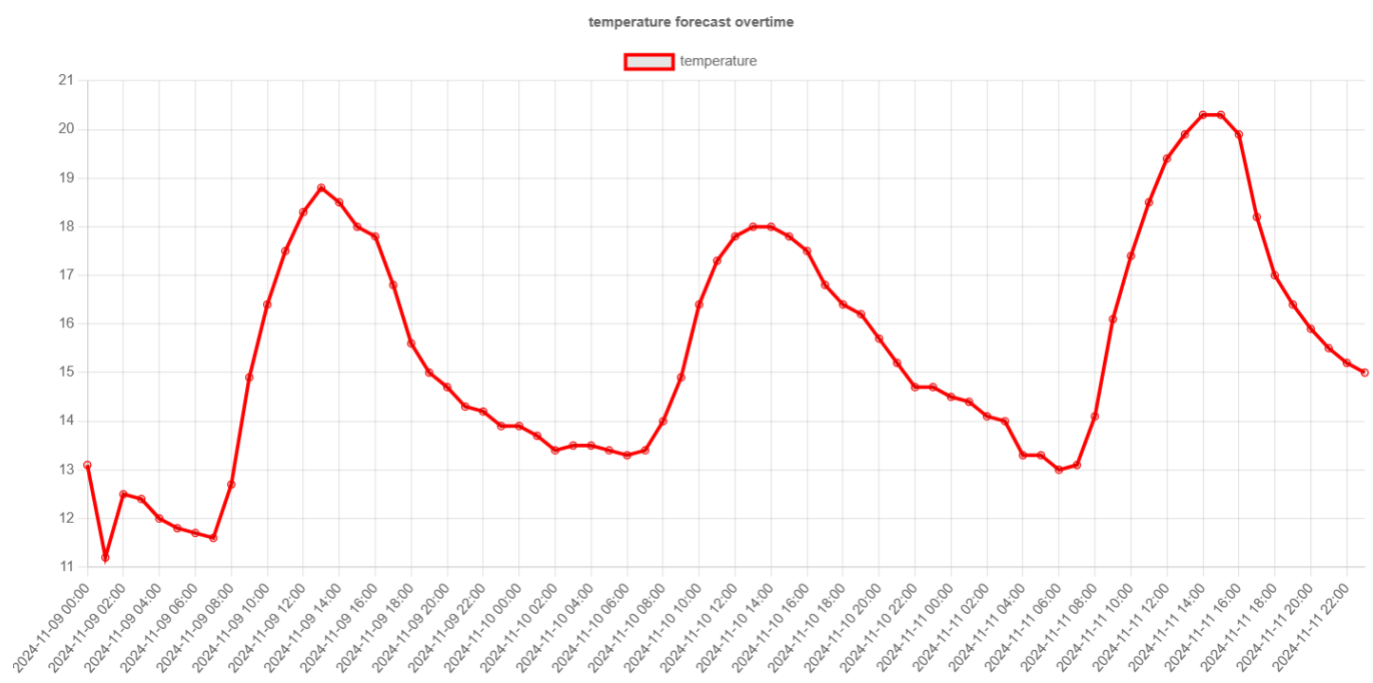
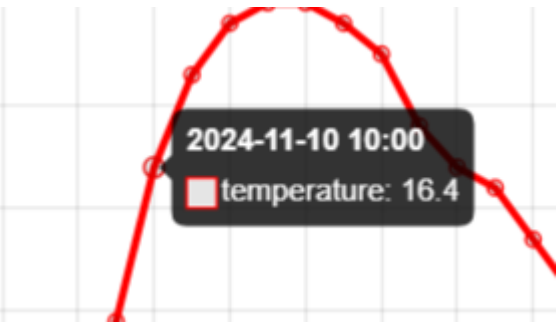(note: air quality forecast data is not available for free API user)

chart

temperature chart

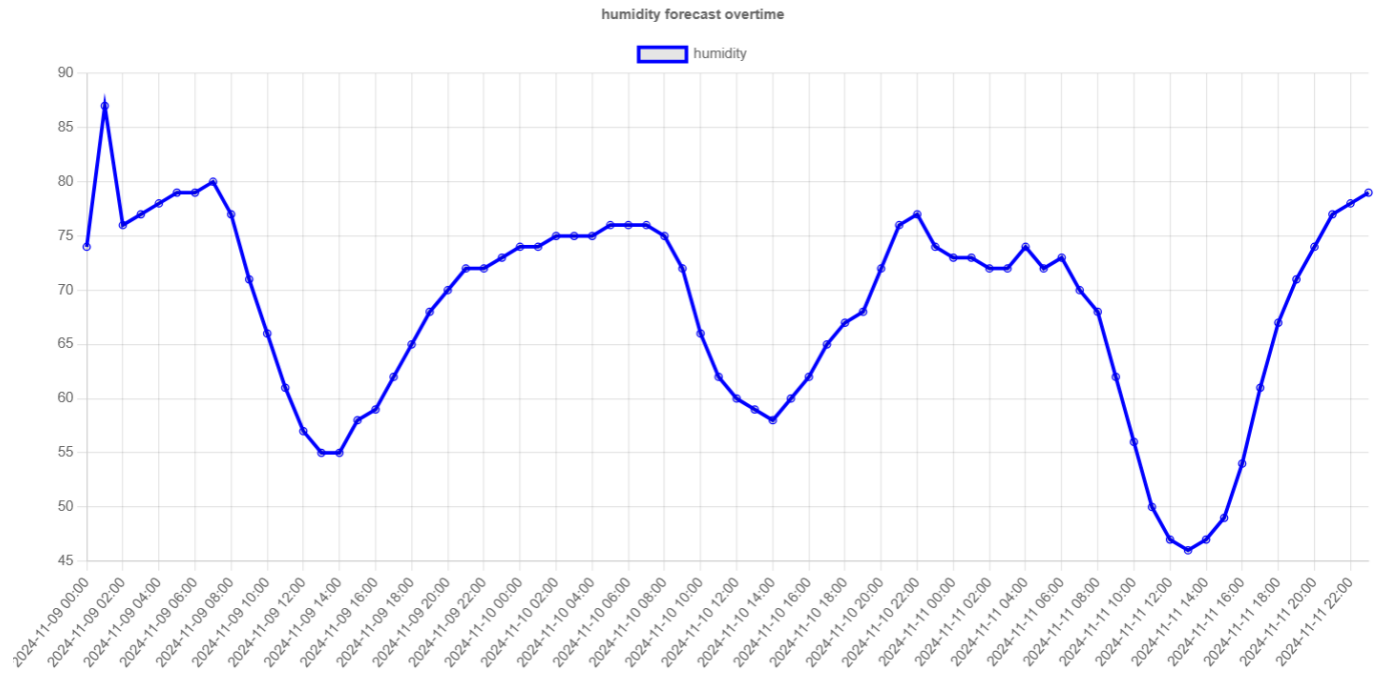you can check temperature change from today to 3 days later forecast by the hour.

you can check values of the chart.
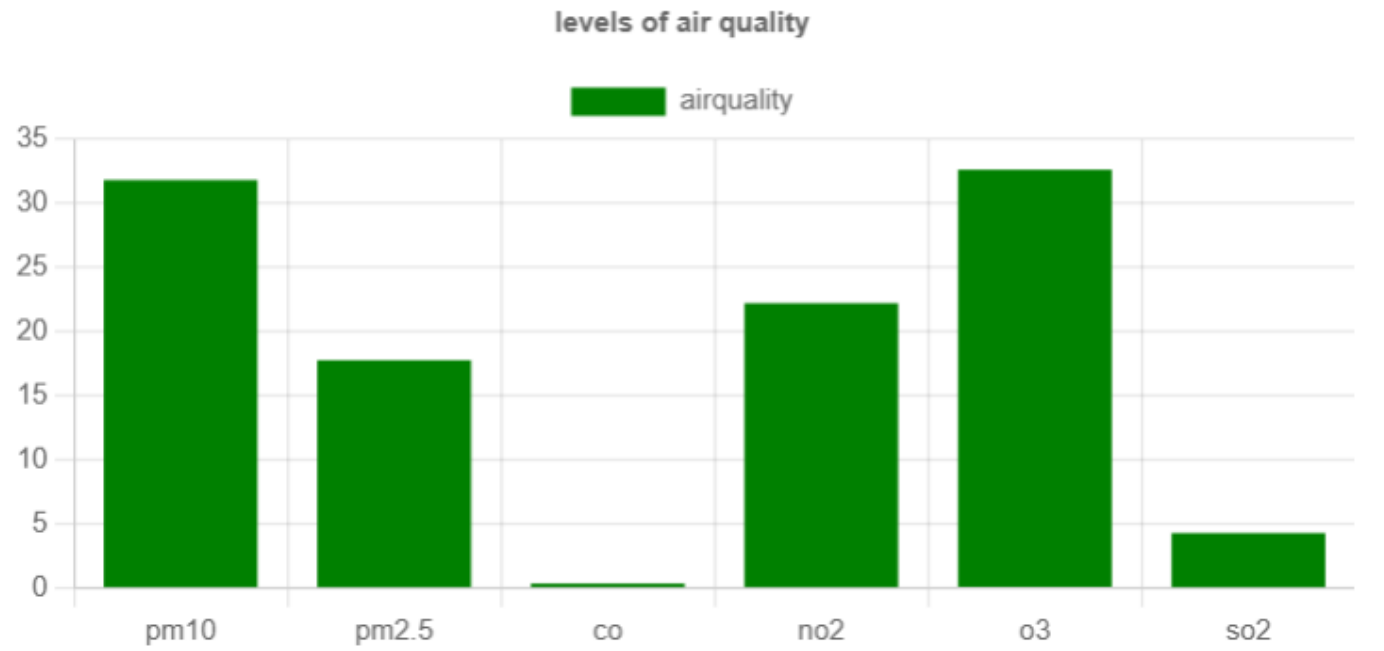

humidity chart

you can check humidity change from today to 3 days later forecast by the hour.
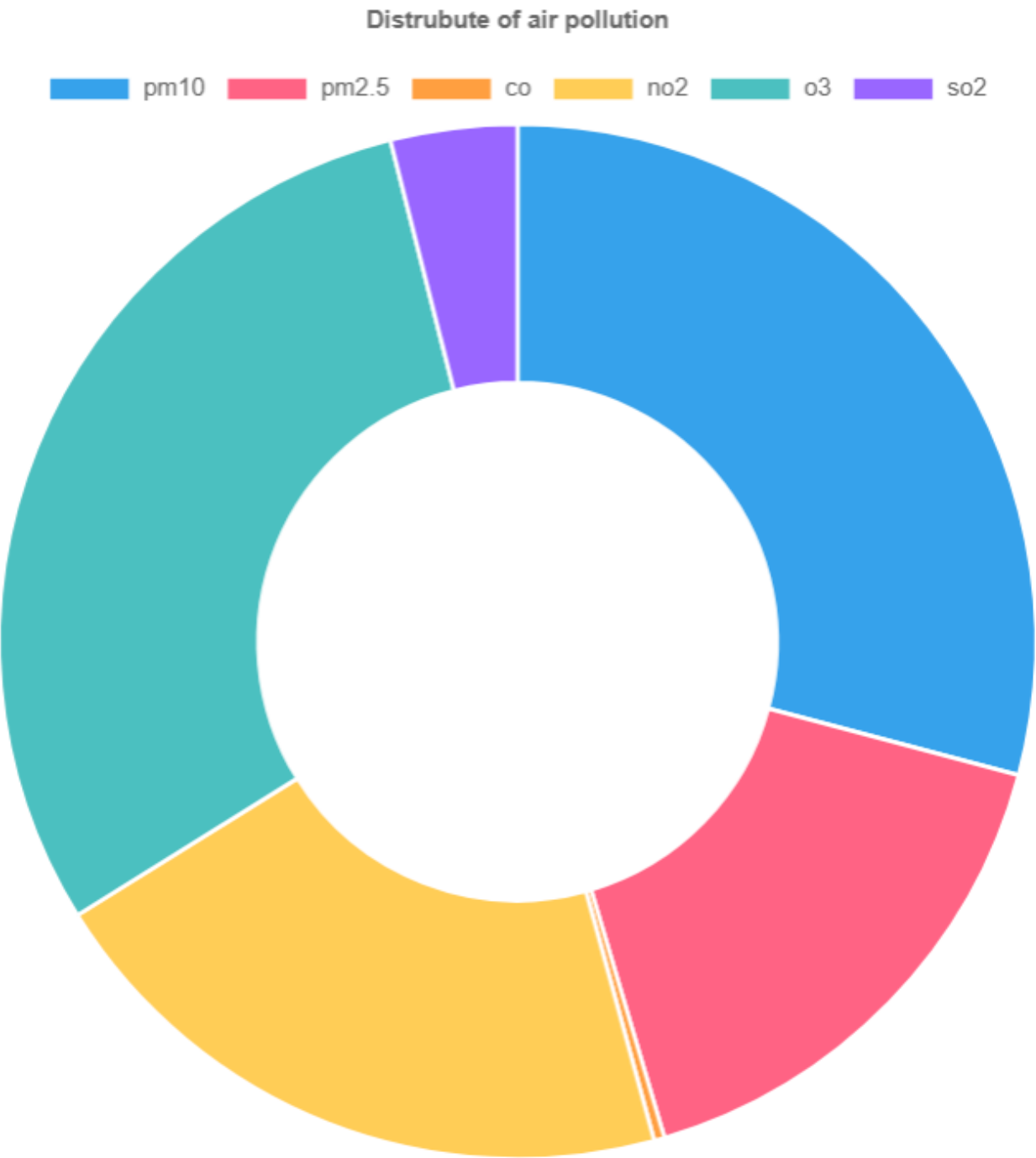

you can check values of the chart.

air pollutions bar chart

you can check the levels of PM10, PM2.5, CO, NO2, SO2 and O3. the color of the bar chart is the color of total air quality level.

air pollutions doughnut chart

you can check the distribution of PM10, PM2.5, CO, NO2, SO2 and O3.

Distrubute of air pollution

CSV

if you clicked 'CSV' on the menu bar, the page is shown like this:

you can upload CSV file, and the page parsing the csv and shows the weather and air quality. parsing library is papaparse.

csv file format is:

```
time,cityname,country,current,temperature,humidity,feelslike,wind_dir,wind_kph,pm1
0,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,,,,,,,,,,,
...
```

time, temperature, humidity columns is required for all rows. cityname and country columns is required for first row. feelslike,wind_dir, wind_kph, pm10, pm2_5, co2, Nox, NH3, SO2, VOC, gb_defra_index is required for rows that the content of 'current' column is 'O'

Other features is same as 'real-time air quality monitor' page except air pollutions are PM10, PM2.5, CO2, NOx, NH3, SO2, VOC.

Weather by city

you can search weather information of various cities.

1. type the city in the textbox
2. click the submit button
3. the page is refreshed and the information will be shown.

about

you can check the information of air pollutions.

success

1. get realtime weather and air quality data using API.
2. draw charts
3. show airquality map
4. download the weather forecast csv file.

fail

1. making mobile version website
2. update the charts after the city is changed(in the City menu)

css bootstrap

- w3 css
- font awesome 6.6.0

js library

- jquery 3.7.1
- chart.js 4.4.1
- papaparse 5.4.1

fonts

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

references

- WeatherAPI docs
- css tutorial
- w3 css docs
- font awesome docs
- jQuery API docs
- Chart.js docs
- papaparse docs
- three.js examples