

파이썬 웹 크롤링

강사장철원

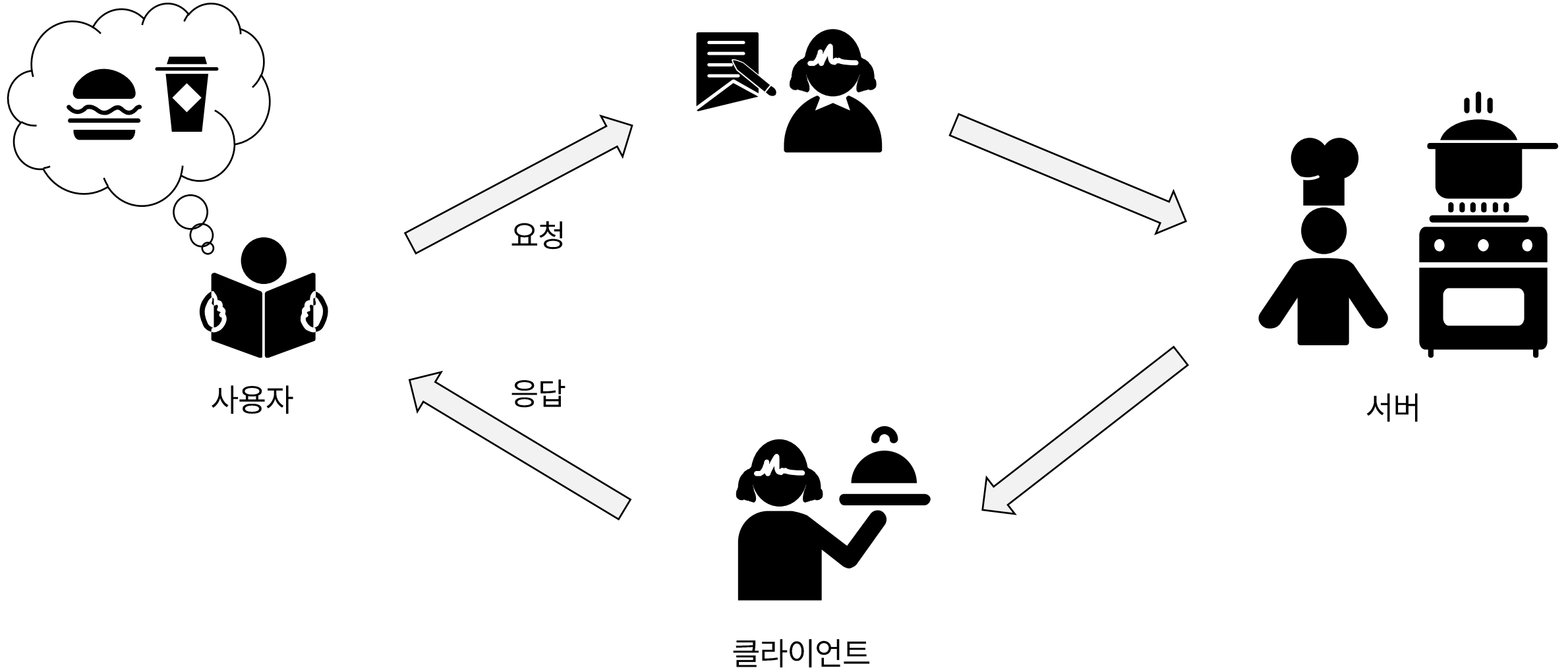
□ API를 활용한 날씨 데이터 크롤링하기

파이썬 웹 크롤링

Section 1. 날씨 데이터 크롤링

Section 1-1. 크롤링 웹 사이트 확인

API(Application Programming Interface)



크롤링 개요

https://openweathermap.org/

OpenWeather

Weather in your city

Guide

API

Dashboard

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Support

OpenWeather

Weather forecasts, nowcasts and history in a fast and elegant way

Search city

Search

Different Weather?

Metric: °C, m/s

Imperial: °F, mph

Nov 8, 07:21am

London, GB

☁ 9°C

Feels like 8°C. Overcast clouds. Light breeze

▼ 2.1m/s ESE

📍 1026hPa

Humidity: 85%

Dew point: 7°C

Visibility: 7.0km

OXFORD

Chelmsford

Southend-on-Sea

LONDON

Leicester

© OpenStreetMap

No precipitation within an hour

now

15min

30min

45min

60min

07:21am

07:36am

07:51am

08:06am

08:21am

0mm/h

seoul

Search

Different Weather?

Metric: °C, m/s

Imperial: °F, mph

Nov 8, 04:35pm

Seoul, KR

● 17°C

Feels like 16°C. Clear sky. Light air

🏠 1.5m/s WNW

📍 1027hPa

Humidity: 36%

UV: 0

Dew point: 2°C

Visibility: 10.0km

HAEJU

Kaesong

Chuncheon

Uijeonabu

GOYANG

SEOUL

INCHEON

SEONGNAM

Ansan-si

SUWON

Wonju

Jecheon-si

© OpenStreetMap

No precipitation

Hourly forecast

4pm

5pm

6pm

7pm

8pm

9pm

10pm

11pm

Nov 09

18°

16°

14°

12°

10°

0%

0%

0%

0%

0%

0%

0%

0%

0%

8-day forecast

Fri, Nov 08

● 17 / 8°C

clear sky

▼

Sat, Nov 09

● 17 / 10°C

clear sky

▼

Sun, Nov 10

☁ 17 / 12°C

overcast clouds

▼

Mon, Nov 11

● 18 / 12°C

clear sky

▼

Tue, Nov 12

● 18 / 12°C

clear sky

▼

Wed, Nov 13

☁ 18 / 12°C

overcast clouds

▼

Thu, Nov 14

● 18 / 12°C

clear sky

▼

크롤링 개요

https://openweathermap.org/

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Sign In To Your Account

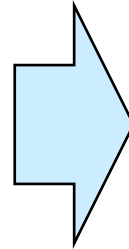


☐ Remember me

Submit

Not registered? [Create an Account.](#)

Lost your password? [Click here to recover.](#)



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Create New Account

We will use information you provided for management and administration purposes, and for keeping you informed by mail, telephone, email and SMS of other products and services from us and our partners. You can proactively manage your preferences or opt-out of communications with us at any time using Privacy Centre. You have the right to access your data held by us or to request your data to be deleted. For full details please see the OpenWeather [Privacy Policy](#).

☐ I am 16 years old and over

☐ I agree with [Privacy Policy](#), [Terms and conditions of sale](#) and [Websites terms and conditions of use](#)

크롤링 개요

https://openweathermap.org/

☆ OpenWeatherMap Account confirmation

^ 보낸사람

OpenWeather Team <robot4@openweathermap.org>

받는사람

Customer

2024년 11월 8일 (금) 오후 4:38

🔄 영어 → 한국어 [번역하기](#)

Dear Customer!

Thank you for choosing [OpenWeatherMap](#)!

Please confirm your email address to help us ensure your account is always protected.

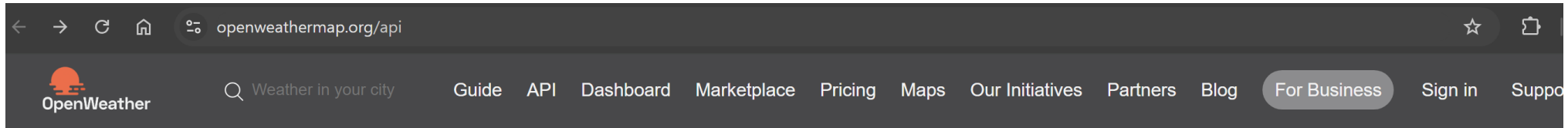
Verify your email

이메일 인증

For further technical questions and support, please contact us at info@openweathermap.org

크롤링 개요

https://openweathermap.org/api



Weather API

[Home](#) / [Weather API](#)

Please, [sign up](#) to use our fast and easy-to-work weather APIs. As a start to use OpenWeather products, we recommend our [One Call API 3.0](#). For more functionality, please consider our products, which are included in [professional collections](#).

One Call API 3.0

[API doc](#)

[Subscribe](#)

Pay as you call

Make an API call to receive access to the various data:

- **Current weather and forecasts:**
 - minute forecast for 1 hour
 - hourly forecast for 48 hours
 - daily forecast for 8 daysand government weather alerts
- **Weather data for any timestamp** for 45+ years historical archive and 4 days ahead forecast
- **Daily aggregation** of weather data for 45+ years archive and 1.5 years ahead forecast
- **Weather overview** with a human-readable weather summary for today and tomorrow's forecast

1,000 API calls per day for free
0.0012 GBP per API call over the daily limit


[Subscribe](#)

This is a separate subscription plan, which includes only One Call API.

Read more about this API and subscription plan in the [FAQ](#).

크롤링 개요

<https://openweathermap.org/>

 OpenWeather

Weather in your city

Guide API Dashboard Marketplace Pricing Maps Our Initiatives Partners Blog For Business

- Included in the Professional and Enterprise subscription plans
- **Monthly subscription.** Please **contact us** to get access.

구독

5 Day / 3 Hour Forecast

API doc

Subscribe

- 5 day forecast for any location on the globe
- 5 day forecast with a 3-hour step
- JSON and XML formats
- Included in both free and paid subscriptions

Road Risk API

Doc

Get a quote

- Specify your route and get weather data and national alerts for the point of destination and along the route
- Current, forecast for 5 days and historical weather data for 1 year for your route
- Weather data are available for any point on the globe
- To receive information on price and get a quote, please **contact us**

Solar Irradiance & Energy Prediction service

크롤링 개요

<https://openweathermap.org/>

Current weather and forecasts collection

Free	Startup	Developer	Professional	Enterprise
	30 GBP/ month	140 GBP/ month	370 GBP/ month	1500 GBP/ month
Get API key	Subscribe	Subscribe	Subscribe	Subscribe
60 calls/minute 1,000,000 calls/month	600 calls/minute 10,000,000 calls/month	3,000 calls/minute 100,000,000 calls/month	30,000 calls/minute 1,000,000,000 calls/month	200,000 calls/minute 5,000,000,000 calls/month
Current Weather 3-hour Forecast 5 days Hourly Forecast 4 days Daily Forecast 16 days Climatic Forecast 30 days Bulk Download	Current Weather 3-hour Forecast 5 days Hourly Forecast 4 days Daily Forecast 16 days Climatic Forecast 30 days Bulk Download	Current Weather 3-hour Forecast 5 days Hourly Forecast 4 days Daily Forecast 16 days Climatic Forecast 30 days Bulk Download	Current Weather 3-hour Forecast 5 days Hourly Forecast 4 days Daily Forecast 16 days Climatic Forecast 30 days Bulk Download (global cities)	Current Weather 3-hour Forecast 5 days Hourly Forecast 4 days Daily Forecast 16 days Climatic Forecast 30 days Bulk Download (global cities + ZIPs of US, EU, UK)

크롤링 개요

<https://openweathermap.org/>



OpenWeather



Weather in your city

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- Included in the Professional and Enterprise subscription plans

- [Monthly subscription](#). Please [contact us](#) to get access.

5 Day / 3 Hour Forecast

API 문서
확인하기

[API doc](#)

[Subscribe](#)

- 5 day forecast for any location on the globe
- 5 day forecast with a 3-hour step
- JSON and XML formats
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Road Risk API

[Doc](#)

[Get a quote](#)

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- Current, forecast for 5 days and historical weather data for 1 year for your route
- Weather data are available for any point on the globe
- To receive information on price and get a quote, please [contact us](#)

Solar Irradiance & Energy Prediction service

크롤링 개요

<https://openweathermap.org/>

답장 전체답장 전달 삭제 스팸차단 안읽음 이동 ▾ 더보기 ▾

받는사람 Customer

2024년 11월 8일 (금) 오후 4:41

🌐 영어 → 한국어 [번역하기](#)

Dear Customer!

Thank you for subscribing to Free [OpenWeatherMap](#)!

API 키 보관 잘하기

API key:

- Within the next couple of hours, your API key  will be activated and ready to use
- You can later create more API keys on your [account page](#)
- Please, always use your API key in each API call

Endpoint:

- Please, use the endpoint api.openweathermap.org for your API calls
- Example of API call:
api.openweathermap.org/data/2.5/weather?q=London,uk&APPID=b100918669f8c8c3a9f3f109eb9ab47a

Useful links:

- API documentation <https://openweathermap.org/api>
- Details of your plan <https://openweathermap.org/price>
- Please, note that [16-days daily forecast](#) and [History API](#) are not available for Free subscribers

크롤링 개요

https://openweathermap.org/

Coordinates by location name

How to make an API call

API call

http://api.openweathermap.org/geo/1.0/direct?q={city name},{state code},{country code}&limit={limit}&appid={API key}

Parameters

q	required	City name, state code (only for the US) and country code divided by comma. Please use ISO 3166 country codes.
appid	required	Your unique API key (you can always find it on your account page under the "API key" tab)
limit	optional	Number of the locations in the API response (up to 5 results can be returned in the API response)

Example of API call

http://api.openweathermap.org/geo/1.0/direct?q=London&limit=5&appid={API key}

Call 5 day / 3 hour forecast data

How to make an API call

You can search weather forecast for 5 days with data every 3 hours by geographic coordinates. All weather data can be obtained in JSON and XML formats.

API call

api.openweathermap.org/data/2.5/forecast?lat={lat}&lon={lon}&appid={API key}

Parameters

lat	required	Latitude. If you need the geocoder to automatic convert city names and zip-codes to geo coordinates and the other way around, please use our Geocoding API
lon	required	Longitude. If you need the geocoder to automatic convert city names and zip-codes to geo coordinates and the other way around, please use our Geocoding API
appid	required	Your unique API key (you can always find it on your account page under the "API key" tab)
units	optional	Units of measurement. <code>standard</code> , <code>metric</code> and <code>imperial</code> units are available. If you do not use the <code>units</code> parameter, <code>standard</code> units will be applied by default. Learn more
mode	optional	Response format. JSON format is used by default. To get data in

날씨 데이터 크롤링 <https://openweathermap.org/>

```
[1]: from bs4 import BeautifulSoup  
from urllib.request import urlopen
```

```
[12]: cityname = "Seoul"  
limit = 3  
apikey = "51b081762640f6b6c12d9f3f289404b47e"
```

```
[3]: url_location = "http://api.openweathermap.org/geo/1.0/direct?q={}&limit={}&appid={}".format(cityname, limit, apikey)
```

```
[4]: print(url_location)
```

```
http://api.openweathermap.org/geo/1.0/direct?q=Seoul&limit=3&appid=51b081762640f6b6c12d9f3f289404b47e
```

날씨 데이터 크롤링 <https://openweathermap.org/>

```
[5]: html = urlopen(url_location)
      bs_obj = BeautifulSoup(html, "html.parser")
      print(bs_obj)
```

```
{["name": "Seoul", "local_names": {"ml": "꺤뉡뉡", "ba": "Ceyл", "an": "Seúl", "mk": "Ceyл", "my": "ဆိုးလ်မြို့", "bs": "Seul", "ky": "Ceyл", "de": "Seoul", "vo": "Söul", "sk": "Soul", "hr": "Seul", "fa": "سئول", "ur": "سؤل", "nl": "Seoel", "kn": "ಸೌಲ್", "az": "Seul", "mr": "सील", "pl": "Seul", "ku": "Sêûl", "th": "โซล", "eo": "Seulo", "eu": "Seu
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a": "Seulum", "cs": "Soul", "am": "ሰል", "sv": "Seoul", "pt": "Seul"}, {"lat": 37.5666791, "lon": 126.9782914, "country": "KR"}]}
```

```
[44]: bs_obj.text
```

```
[44]: '[{"name": "Seoul", "local_names": {"ml": "꺤뉡뉡", "ba": "Ceyл", "an": "Seúl", "mk": "Ceyл", "my": "ဆိုးလ်မြို့", "bs": "Seul", "ky": "Ceyл", "de": "Seoul", "vo": "Söul", "sk": "Soul", "hr": "Seul", "fa": "سئول", "ur": "سؤل", "nl": "Seoel", "kn": "ಸೌಲ್", "az": "Seul", "mr": "सील", "pl": "Seul", "ku": "Sêûl", "th": "โซล", "eo": "Seulo", "eu": "Seu
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a": "Seulum", "cs": "Soul", "am": "ሰል", "sv": "Seoul", "pt": "Seul"}, {"lat": 37.5666791, "lon": 126.9782914, "country": "KR"}]'
```

```
[45]: len(bs_obj.text)
```

```
[45]: 988
```

날씨 데이터 크롤링 <https://openweathermap.org/>

```
[46]: import json
```

```
[52]: loc_list = json.loads(bs_obj.text)
```

```
[53]: print(loc_list)
```

```
[{'name': 'Seoul', 'local_names': {'ml': 'செயல்', 'ba': 'Сейл', 'an': 'Seül', 'mk': 'Сейл', 'my': 'ဆိုးလ်မြို့', 'bs': 'Seul', 'ky': 'Сейл', 'de': 'Seoul', 'vo': 'Söul', 'sk': 'Soul', 'hr': 'Seul', 'fa': 'سئول', 'ur': 'سؤل', 'nl': 'Seoel', 'kn': 'ಸೌಲ್', 'az': 'Seul', 'mr': 'सौल', 'pl': 'Seul', 'ku': 'Sêul', 'th': 'โซล', 'eo': 'Seulo', 'eu': 'Seul', 'cv': 'Сейл', 'uk': 'Сейл', 'qu': 'Siul', 'sr': 'Сейл', 'it': 'Seul', 'ro': 'Seul', 'hy': 'Սեւլ', 'os': 'Сейл', 'el': 'Σεούλ', 'ar': 'سول', 'tg': 'Сейл', 'ta': 'செயல்', 'bg': 'Сейл', 'ko': '서울', 'ka': 'სეულ', 'tk': 'Seul', 'kk': 'Сейл', 'hu': 'Szöul', 'lt': 'Seulas', 'vi': 'Seoul', 'ca': 'Seül', 'be': 'Сейл', 'uz': 'Seul', 'bn': 'সিওল', 'mn': 'Сөүл', 'tr': 'Seul', 'en': 'Seoul', 'oc': 'Seol', 'gl': 'Seúl', 'he': 'סֵאוּל', 'es': 'Seül', 'hi': 'सियोल', 'fi': 'Soul', 'is': 'Seúl', 'lv': 'Seula', 'km': 'សៀល', 'ru': 'Сейл', 'bo': 'ཤེལ་ཁུལ་', 'af': 'Seoeul', 'bh': 'सियोल', 'et': 'Söul', 'sl': 'Seul', 'yi': 'סעול', 'ja': 'ソウル', 'zh': '首尔市 / 首爾', 'fr': 'Séoul', 'la': 'Seulum', 'cs': 'Soul', 'am': 'ሶል', 'sv': 'Seoul', 'pt': 'Seul'}, 'lat': 37.5666791, 'lon': 126.9782914, 'country': 'KR'}]
```

```
[54]: type(loc_list)
```

```
[54]: list
```

```
[55]: len(loc_list)
```

```
[55]: 1
```


Section

크롤링 웹사이트 확인

날씨 데이터 크롤링 <https://openweathermap.org/>

```
[57]: print(loc_list[0])

{'name': 'Seoul', 'local_names': {'ml': 'செயல்', 'ba': 'Сейл', 'an': 'Seúl', 'mk': 'Сейл', 'vo': 'Söul', 'sk': 'Soul', 'hr': 'Seul', 'fa': 'سئول', 'ur': 'سؤل', 'nl': 'Seoel', 'kn': 'ಸಿೞಲ್', 'th': 'โซล', 'eo': 'Seulo', 'eu': 'Seul', 'cv': 'Сейл', 'uk': 'Сейл', 'qu': 'Siul', 's': 'Сейл', 'el': 'Σεούλ', 'ar': 'سول', 'tg': 'Сейл', 'ta': 'செய்ப்பல்', 'bg': 'Сейл', 'ko': '서울', 'lt': 'Seulas', 'vi': 'Seoul', 'ca': 'Seül', 'be': 'Сейл', 'uz': 'Seul', 'bn': 'সিওল', 'l': 'Seúl', 'he': 'ז'רמלן', 'es': 'Seúl', 'hi': 'सियोल', 'fi': 'Soul', 'is': 'Seúl', 'lv': 'Soul', 'bh': 'सियोल', 'et': 'Sõul', 'sl': 'Seul', 'yi': 'זשעל', 'ja': 'ソウル', 'zh': '首尔市', 'sv': 'Seoul', 'pt': 'Seul'}, 'lat': 37.5666791, 'lon': 126.9782914, 'country': 'KR'}
```

```
[58]: print(loc_list[1])

-----
IndexError                                Traceback (most recent call last)
Cell In[58], line 1
----> 1 print(loc_list[1])

IndexError: list index out of range
```

```
[59]: type(loc_list[0])
```

```
[59]: dict
```

```
[60]: loc_list[0]['lat']
```

```
[60]: 37.5666791
```

```
[62]: loc_list[0]['lon']
```

```
[62]: 126.9782914
```

<https://openweathermap.org/>

```
lat = loc_list[0]['lat']
lon = loc_list[0]['lon']
```

```
url_history = "http://api.openweathermap.org/data/2.5/forecast?lat={}&lon={}&appid={}".format(lat, lon, apikey)
```

```
html2 = urlopen(url_history)
bs_obj2 = BeautifulSoup(html2, "html.parser")
print(bs_obj2)
```

[illegible]

날씨 데이터 크롤링 <https://openweathermap.org/>



json 뷰어



전체

이미지

동영상

쇼핑

뉴스

도서

웹

⋮ 더보기

도구



Chrome Web Store

<https://chromewebstore.google.com/detail/json-viewer> ⋮

JSON Viewer - Chrome 웹 스토어

세부정보 · 버전. 0.18.1 · 업데이트됨. 2020년 12월 23일 · 우려사항 신고 · 제공. tulios · 크기. 310KiB

· 언어. English (United States) · 개발자. Tulio Ornelas



Online JSON Viewer

<https://jsonviewer.stack.hu> ⋮

Online JSON Viewer and Formatter

JSON, short for JavaScript Object Notation, is a lightweight computer data interchange format.

JSON is a text-based, human-readable format for representing ...

날씨 데이터 크롤링

https://jsonviewer.stack.hu/

← → ↺ 🏠 🔍 jsonviewer.stack.hu ☆ 📁 | 🎵 🌐 ⋮

ViewerText

message : 0

cnt : 40

list

- 0
 - dt : 1731218400
 - main
 - weather
 - 0
 - id : 801
 - main : "Clouds"
 - description : "few clouds"
 - icon : "02d"
 - clouds
 - all : 24
 - wind
 - speed : 1.75
 - deg : 307
 - gust : 2.18
 - visibility : 10000
 - pop : 0
 - sys
 - dt_txt : "2024-11-10 06:00:00"
 - 1
 - 2
 - 3

Name ▲	Value
city	...
cnt	40
cod	"200"
list	...
message	0

날씨 데이터 크롤링 <https://openweathermap.org/>

```
[66]: weather = json.loads(bs_obj2.text)
```

```
[70]: type(weather)
```

```
[70]: dict
```

```
[73]: weather['list'][0]
```

```
[73]: {'dt': 1731218400,
      'main': {'temp': 292.38,
                'feels_like': 291.66,
                'temp_min': 291.37,
                'temp_max': 292.38,
                'pressure': 1022,
                'sea_level': 1022,
                'grnd_level': 1015,
                'humidity': 50,
                'temp_kf': 1.01},
      'weather': [{'id': 801,
                    'main': 'Clouds',
                    'description': 'few clouds',
                    'icon': '02d'}],
      'clouds': {'all': 24},
      'wind': {'speed': 1.75, 'deg': 307, 'gust': 2.18},
      'visibility': 10000,
      'pop': 0,
      'sys': {'pod': 'd'},
      'dt_txt': '2024-11-10 06:00:00'}
```

```
[74]: weather['list'][0]['main']
```

```
[74]: {'temp': 292.38,
      'feels_like': 291.66,
      'temp_min': 291.37,
      'temp_max': 292.38,
      'pressure': 1022,
      'sea_level': 1022,
      'grnd_level': 1015,
      'humidity': 50,
      'temp_kf': 1.01}
```

```
[75]: weather['list'][0]['main']['temp']
```

```
[75]: 292.38
```

```
[76]: len(weather['list'])
```

```
[76]: 40
```

날씨 데이터 크롤링 <https://openweathermap.org/>

```
[27]: temp_list = []  
      n = len(weather['list'])  
      for i in range(0, n):  
          temp_value = weather['list'][i]['main']['temp']  
          temp_list.append(temp_value)
```

```
[28]: print(temp_list)
```

```
[304.32, 302.38, 299.38, 297.83, 298.13, 301.66, 304.6, 305.19, 303.07, 300.9, 299.79, 298.86, 298.54, 302.09, 306.47, 307.79, 305.98, 302.84, 301.31, 300.18, 299.33, 303.4, 308.48, 310.33, 308.42, 304.83, 303.36, 302.03, 300.87, 304.58, 309.09, 311.14, 307.5, 304.92, 303.35, 302.52, 300.82, 304.31, 309.61, 309.7]
```

날씨 데이터 크롤링 <https://openweathermap.org/>

```
[29]: weather['list'][0]['dt_txt']
```

```
[29]: '2025-07-21 09:00:00'
```

```
[30]: dt_list = []  
      for i in range(0, n):  
          dt_value = weather['list'][i]['dt_txt']  
          dt_list.append(dt_value)
```

```
[31]: print(dt_list)
```

```
['2025-07-21 09:00:00', '2025-07-21 12:00:00', '2025-07-21 15:00:00', '2025-07-21 18:00:00', '2025-07-21 21:00:00', '2025-07-22 00:00:00', '2025-07-22 03:00:00', '2025-07-22 06:00:00', '2025-07-22 09:00:00', '2025-07-22 12:00:00', '2025-07-22 15:00:00', '2025-07-22 18:00:00', '2025-07-22 21:00:00', '2025-07-23 00:00:00', '2025-07-23 03:00:00', '2025-07-23 06:00:00', '2025-07-23 09:00:00', '2025-07-23 12:00:00', '2025-07-23 15:00:00', '2025-07-23 18:00:00', '2025-07-23 21:00:00', '2025-07-24 00:00:00', '2025-07-24 03:00:00', '2025-07-24 06:00:00', '2025-07-24 09:00:00', '2025-07-24 12:00:00', '2025-07-24 15:00:00', '2025-07-24 18:00:00', '2025-07-24 21:00:00', '2025-07-25 00:00:00', '2025-07-25 03:00:00', '2025-07-25 06:00:00', '2025-07-25 09:00:00', '2025-07-25 12:00:00', '2025-07-25 15:00:00', '2025-07-25 18:00:00', '2025-07-25 21:00:00', '2025-07-26 00:00:00']
```

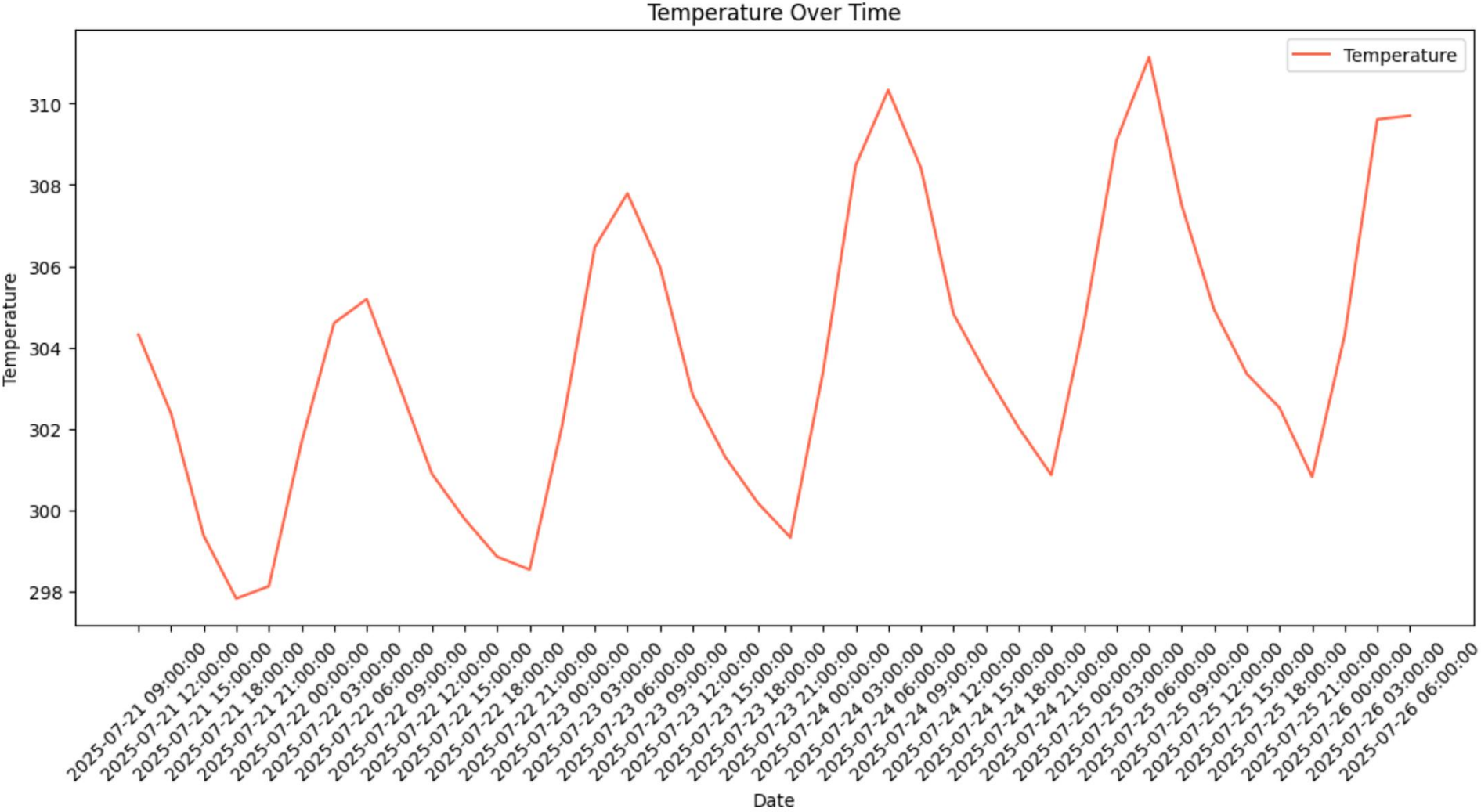
날씨 데이터 크롤링 <https://openweathermap.org/>

```
[83]: import matplotlib.pyplot as plt
```

```
[89]: plt.figure(figsize=(14, 6))
plt.plot(dt_list, temp_list, color='tomato', label='Temperature')
plt.xlabel('Date')
plt.ylabel('Temperature')
plt.title('Temperature Over Time')
plt.xticks(rotation=45)
plt.legend()
plt.show()
```


날씨 데이터 크롤링

<https://openweathermap.org/>



감사합니다.

Q & A