

파이썬활용 데이터 분석과정



Python



강사:
황성민

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1. Python이란?

1. 1989년 귀도 반 로썸(Guido van Rossum)에 의해 개발된 고급 프로그래밍 언어.
2. 비교적 쉽고 간단한 문법으로 배우고 사용하기 쉬운 언어.
3. 머신러닝(Machine Learning), 딥러닝(Deep Learning)등 4차 산업의 핵심적인 기술을 구현하는데 필요한 라이브러리가 많음.

Aug 2021	Aug 2020	Change	Programming Language	Ratings	Change
1	1		 C	12.57%	-4.41%
2	3		 Python	11.86%	+2.17%
3	2		 Java	10.43%	-4.00%
4	4		 C++	7.36%	+0.52%
5	5		 C#	5.14%	+0.46%

세계 프로그래밍 언어 순위

출처:
<https://www.tiobe.com/tiobe-index/>

2. Python 언어의 특징

1. 인터프리티드 언어로 컴파일이 필요 없다.
C 언어처럼 컴파일을 하지 않기 때문에
2. 읽고 쓰기 편하다. (공백 4칸 들여쓰기 = 코드를 적으면서 자동적으로 정리가 됨)

```
def bigger_than_five(x):
    if x > 5: print("X is bigger than five")
    else:
        print("x is 5 or smaller")
```

2. Python 언어의 특징

3. 변수 타입을 자동으로 지정

자바

```
String myName = "Erik";  
int myAge = 37;  
float mySalary = 1250.70;
```

파이썬

```
my_name = "Erik"  
my_age = 37  
my_salary = 1250.70
```

4. Garbage Collection (메모리 관리)을 자동으로 해줌

5. 간결한 코드로 쉽고 빠르게 프로그래밍 가능



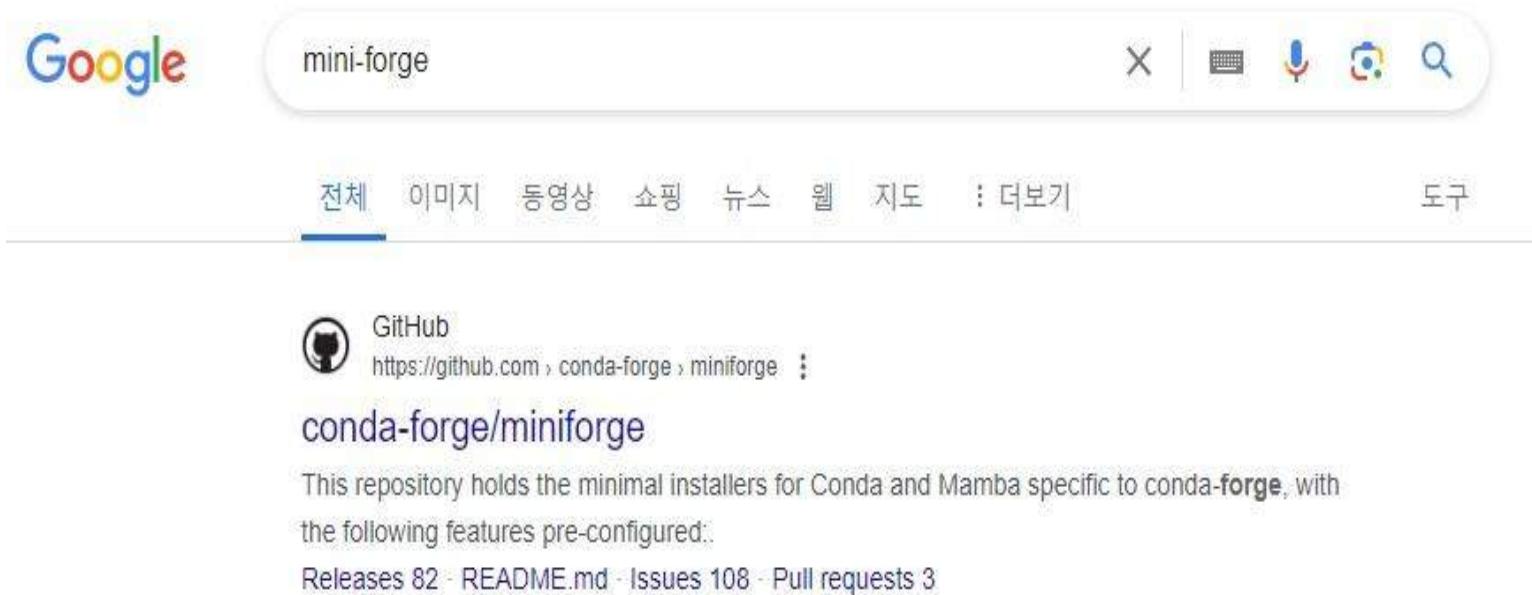
3. Anaconda?

파이썬의 여러 패키지 간 호환성을 관리해 주는
배포판



4. Mini-forge 설치

1. google에서 mini-forge 검색 후 mini-forge github 접속
<https://github.com/conda-forge/miniforge>



A screenshot of a Google search results page. The search bar at the top contains the query "mini-forge". Below the search bar, there are filter options: 전체 (selected), 이미지, 동영상, 쇼핑, 뉴스, 웹, 지도, and : 더보기. To the right of these filters is a "도구" (Tools) button. The main search results area shows a GitHub link for "conda-forge/miniforge". The result card includes the GitHub logo, the repository name "conda-forge/miniforge", a brief description stating "This repository holds the minimal installers for Conda and Mamba specific to conda-forge, with the following features pre-configured.", and metrics: Releases 82, README.md, Issues 108, and Pull requests 3.

4. Mini-forge 설치

The screenshot shows the GitHub repository page for Miniforge. At the top, there are links for 'README' and 'License'. Below the title 'Miniforge', there is a button labeled 'Build miniforge' with a status of 'failing' and a 'downloads' button showing '16M'. A note states: 'This repository holds the minimal installers for Conda and Mamba specific to conda-forge, with the following features pre-configured:' followed by two bullet points: '• Packages in the base environment are obtained from the [conda-forge channel](#)' and '• The [conda-forge](#) channel is set as the default (and only) channel.' Another note says: 'We put an emphasis on supporting various CPU architectures (x86_64, ppc64le, and aarch64 including Apple Silicon). Optional support for PyPy in place of standard Python interpreter (aka "CPython") is provided in the installers with -pypy3- in their filename.' Under the 'Download' section, it says: 'Miniforge installers are available here: <https://github.com/conda-forge/miniforge/releases>'. The 'Miniforge3' section lists the latest installers with Python 3.10 (*):

OS	Architecture	Download
Linux	x86_64 (amd64)	Miniforge3-Linux-x86_64
Linux	aarch64 (arm64) (**)	Miniforge3-Linux-aarch64
Linux	ppc64le (POWER8/9)	Miniforge3-Linux-ppc64le
OS X	x86_64	Miniforge3-MacOSX-x86_64
OS X	arm64 (Apple Silicon) (***)	Miniforge3-MacOSX-arm64
Windows	x86_64	Miniforge3-Windows-x86_64

(*). The Python version is specific only to the base environment. Conda can create new environments with different Python versions and implementations.

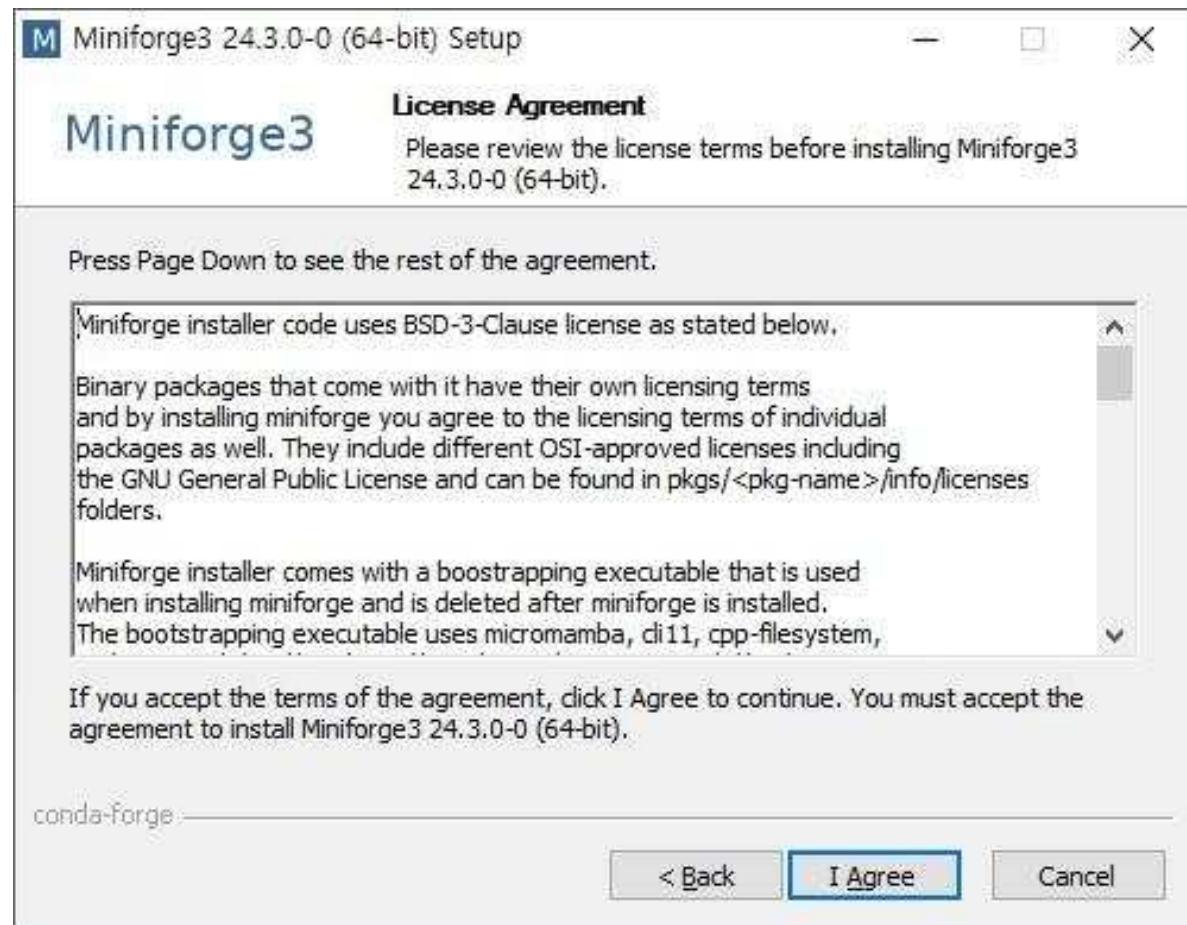
운영체제에 맞는 버전
다운 후 설치

4. Mini-forge 설치



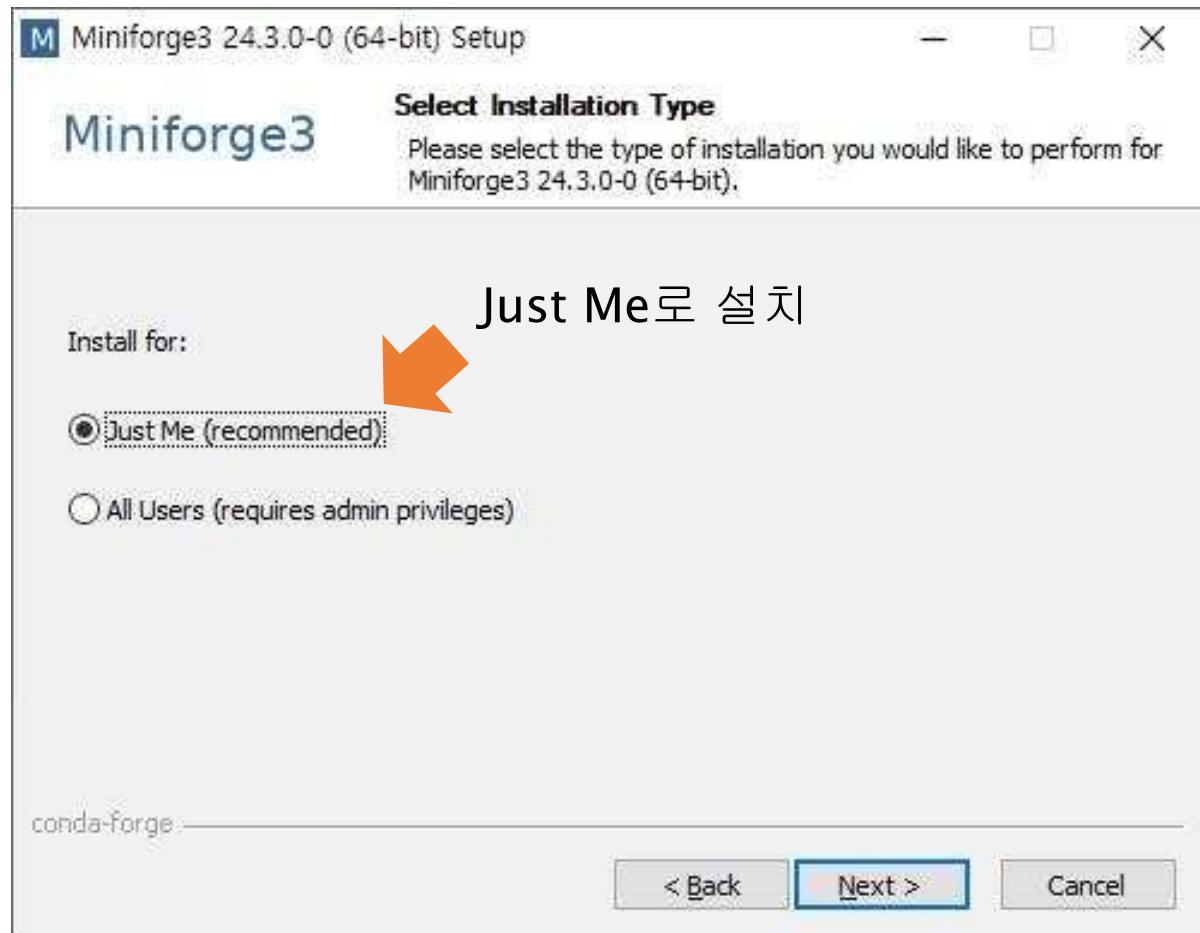
next 클릭

4. Mini-forge 설치



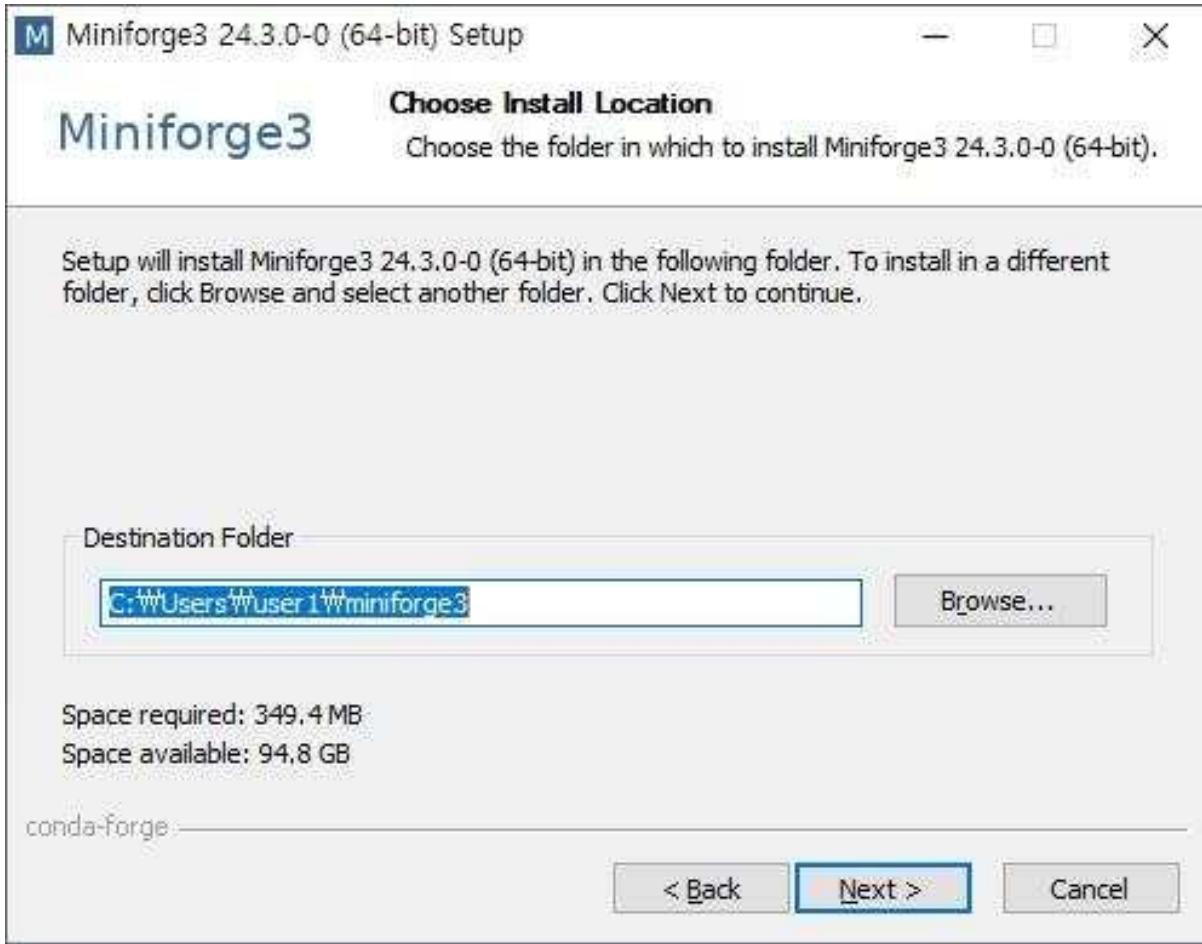
I Agree 클릭

4. Mini-forge 설치



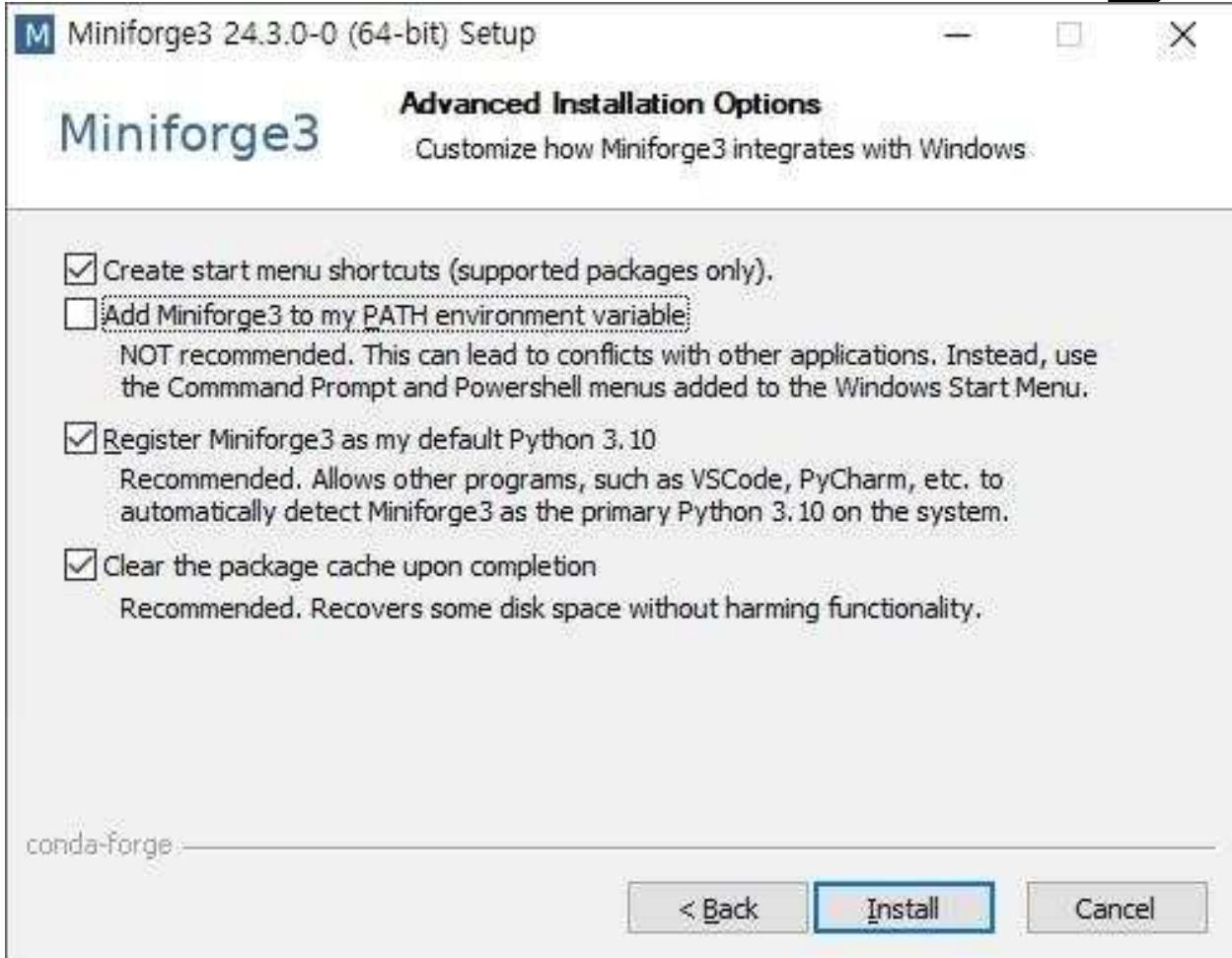
Just Me로 설치

4. Mini-forge 설치



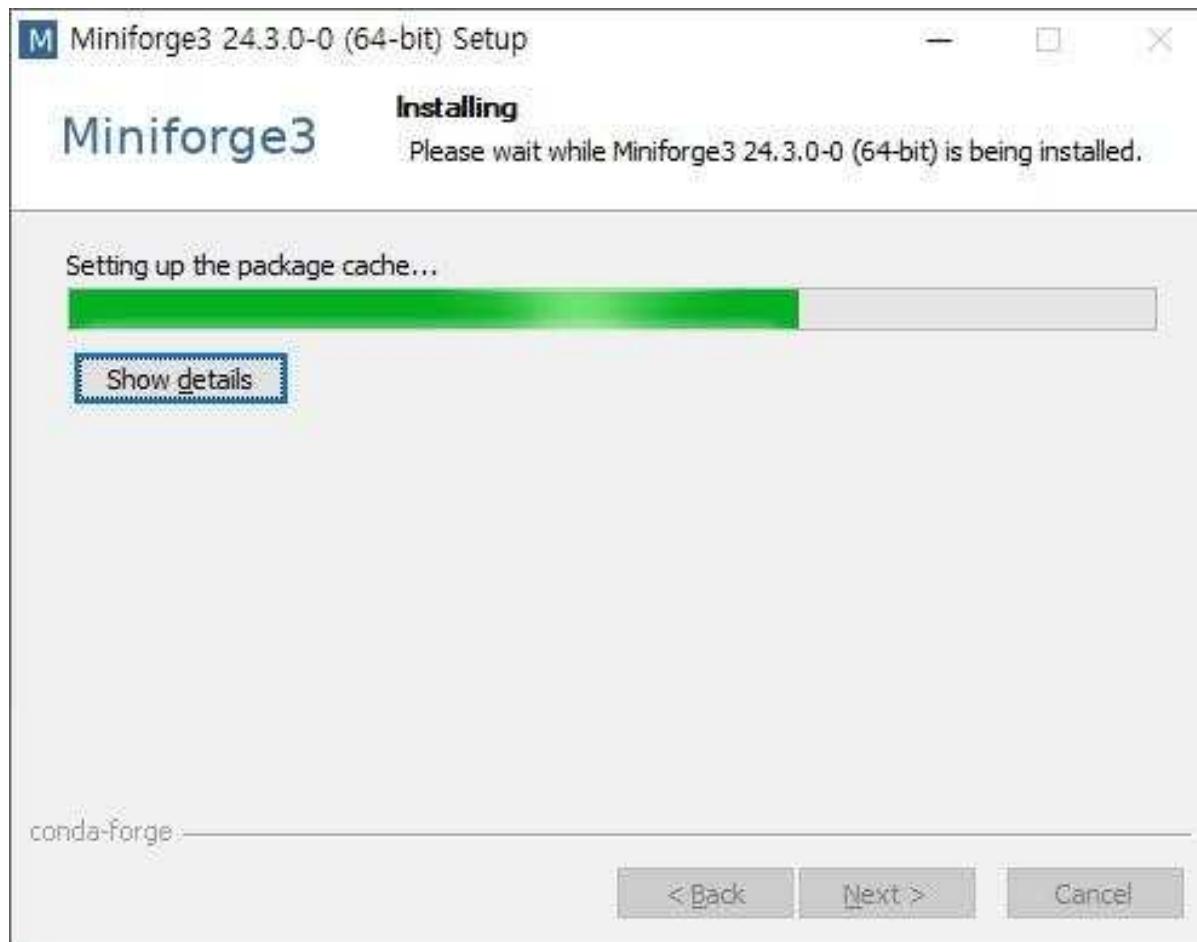
기본 경로로 설치
설치 용량 약 350MB

4. Mini-forge 설치

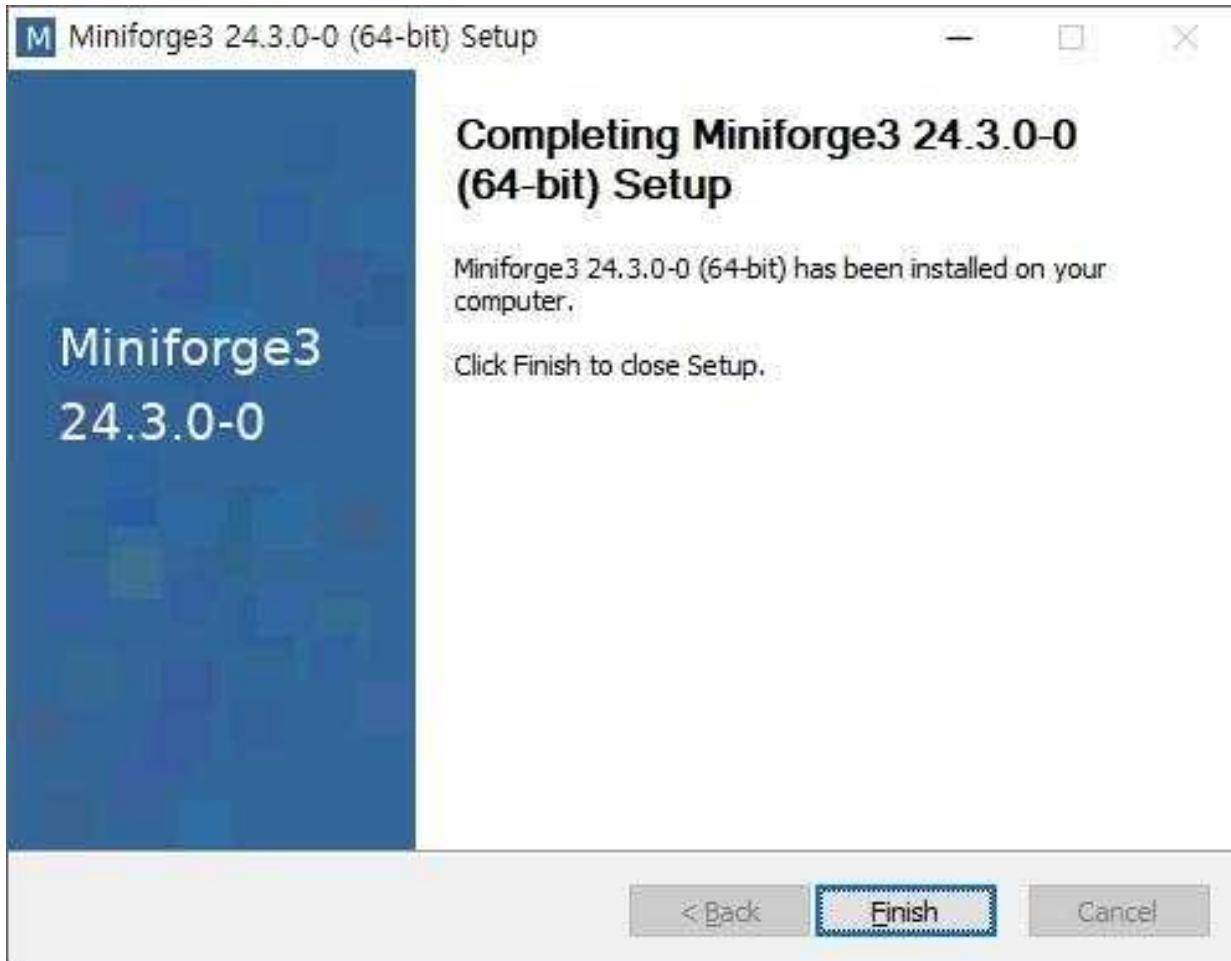


왼쪽과 같이
Add Miniforge3 to my Path만
제외하고 체크 후
Install 누름

4. Mini-forge 설치

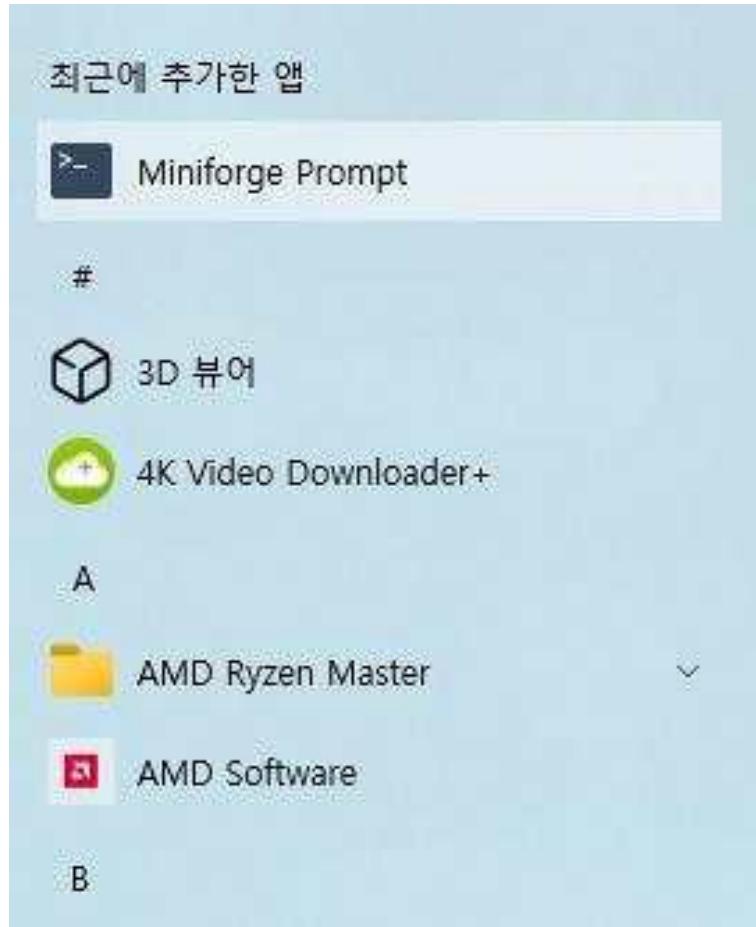


4. Mini-forge 설치



설치가 완료되면
Finish를 누르고 닫음

5. conda 가상환경 생성

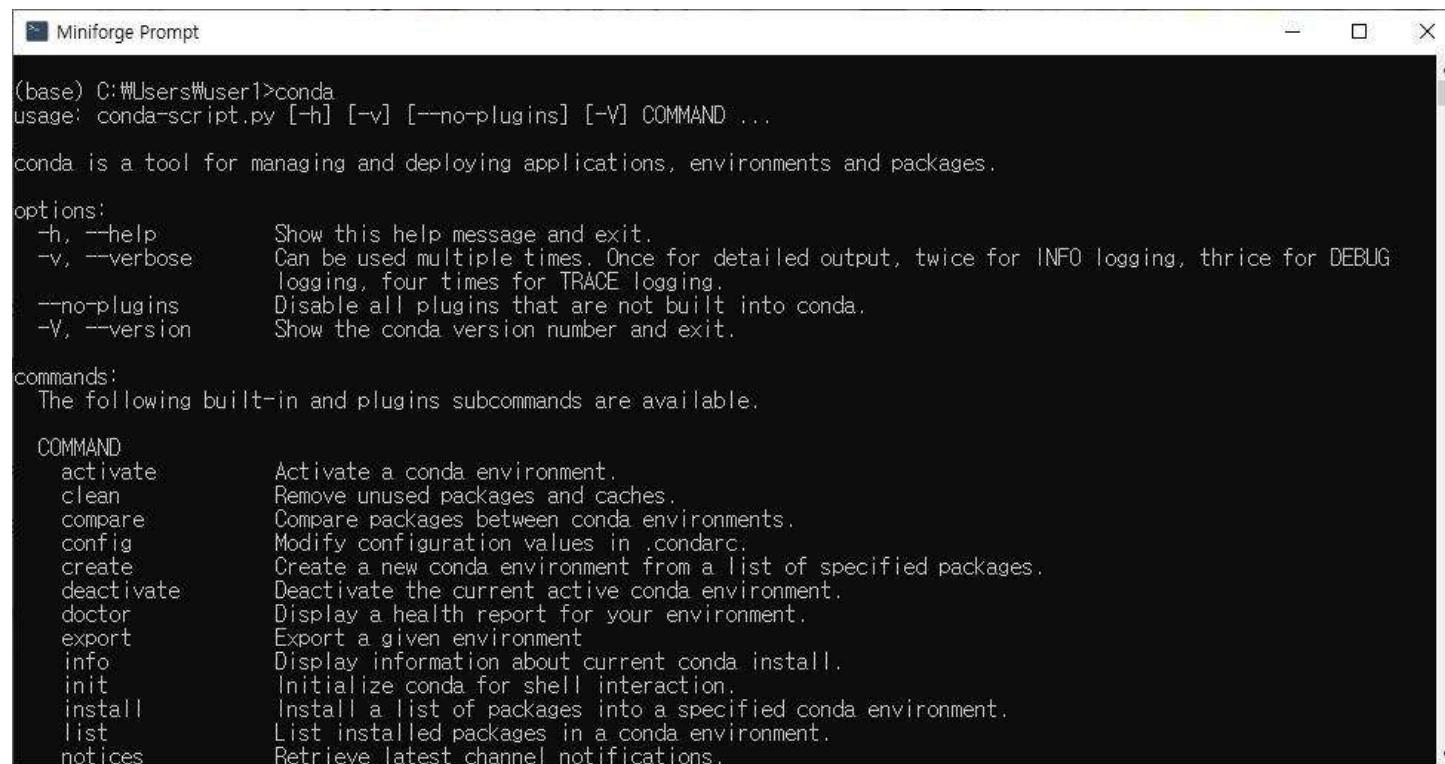


원도우 시작버튼



Miniforge Prompt 클릭

5. conda 가상환경 생성

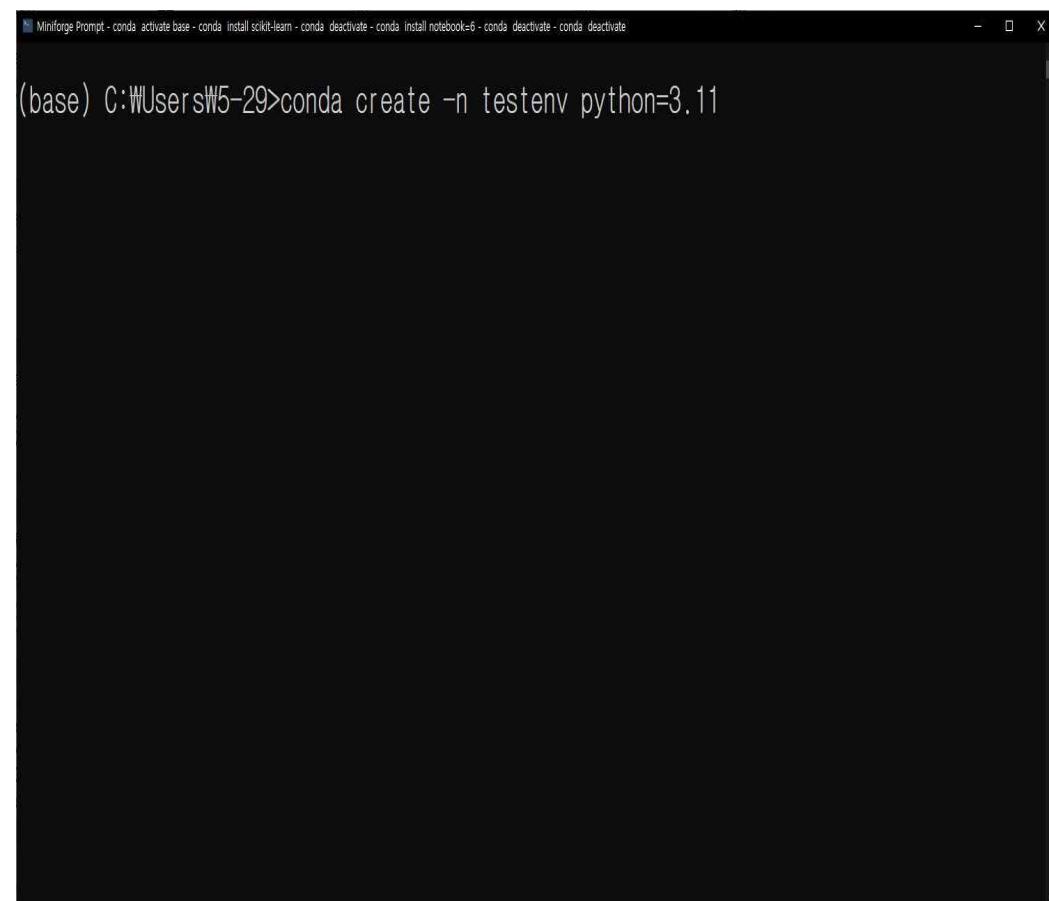


```
(base) C:\Users\user1>conda
usage: conda-script.py [-h] [-v] [--no-plugins] [-V] COMMAND ...
conda is a tool for managing and deploying applications, environments and packages.
options:
-h, --help      Show this help message and exit.
-v, --verbose   Can be used multiple times. Once for detailed output, twice for INFO logging, thrice for DEBUG
                logging, four times for TRACE logging.
--no-plugins    Disable all plugins that are not built into conda.
-V, --version   Show the conda version number and exit.
commands:
The following built-in and plugins subcommands are available.

COMMAND          DESCRIPTION
activate         Activate a conda environment.
clean            Remove unused packages and caches.
compare          Compare packages between conda environments.
config           Modify configuration values in .condarc.
create           Create a new conda environment from a list of specified packages.
deactivate       Deactivate the current active conda environment.
doctor           Display a health report for your environment.
export           Export a given environment.
info             Display information about current conda install.
init             Initialize conda for shell interaction.
install          Install a list of packages into a specified conda environment.
list             List installed packages in a conda environment.
notices          Retrieve latest channel notifications.
```

경로에 (base)가 보이고
conda 명령어를
입력했을 때 실행이 되면
성공

5.conda 가상환경 생성



```
Miniforge Prompt - conda activate base - conda install scikit-learn - conda deactivate - conda install notebook=6 - conda deactivate - conda deactivate  
(base) C:\Users\W5-29>conda create -n testenv python=3.11
```

conda create -n 가상환경명 python=버전

conda create -n testenv python=3.11

5. conda 가상환경 생성

A screenshot of a terminal window titled "Miniforge Prompt - conda activate base - conda install scikit-learn - conda deactivate - conda install notebook=6 - conda deactivate - conda deactivate - conda create -n testenv python=3.11". The window displays a list of packages and their versions being installed or updated. At the bottom of the list, it shows "Proceed ([y]/n)?".

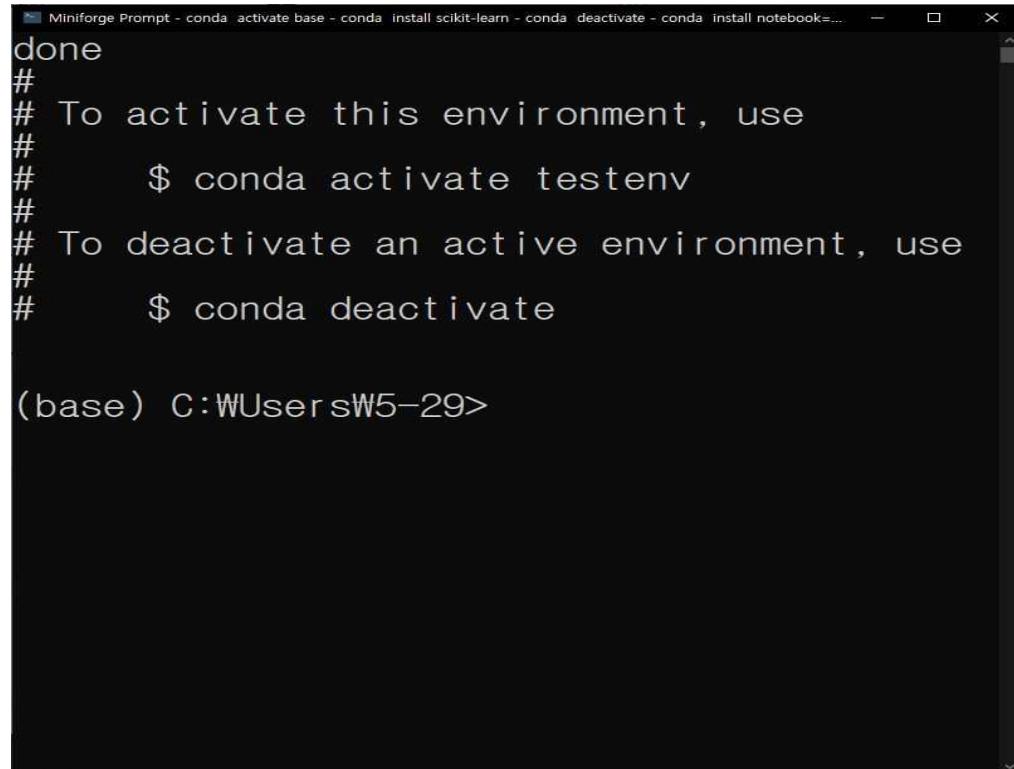
Package	Version
bzip2	conda-forge/win-64::bzip2-1.0.8-hcfcfb64_5
ca-certificates	conda-forge/win-64::ca-certificates-2024.7.4-h56e8100_0
libexpat	conda-forge/win-64::libexpat-2.6.2-h63175ca_0
libffi	conda-forge/win-64::libffi-3.4.2-h8ffe710_5
libssqlite	conda-forge/win-64::libssqlite-3.46.0-h2466b09_0
libzlib	conda-forge/win-64::libzlib-1.3.1-h2466b09_1
openssl	conda-forge/win-64::openssl-3.3.1-h2466b09_1
pip	conda-forge/noarch::pip-24.0-pyhd8ed1ab_0
python	conda-forge/win-64::python-3.11.9-h631f459_0_cpython
setuptools	conda-forge/noarch::setuptools-70.1.1-pyhd8ed1ab_0
tk	conda-forge/win-64::tk-8.6.13-h5226925_1
tzdata	conda-forge/noarch::tzdata-2024a-h0c530f3_0
ucrt	conda-forge/win-64::ucrt-10.0.22621.0-h57928b3_0
vc	conda-forge/win-64::vc-14.3-h8a93ad2_20
vc14_runtime	conda-forge/win-64::vc14_runtime-14.40.33810-ha82c5b3_20
vs2015_runtime	conda-forge/win-64::vs2015_runtime-14.40.33810-h3bf8584_20
wheel	conda-forge/noarch::wheel-0.43.0-pyhd8ed1ab_1
xz	conda-forge/win-64::xz-5.2.6-h8d14728_0

Proceed ([y]/n)?

Proceed([y]/n)? 이 나오면

y 입력 후 엔터

5.conda 가상환경 생성



A screenshot of a terminal window titled "Miniforge Prompt - conda activate base - conda install scikit-learn - conda deactivate - conda install notebook=...". The terminal shows the following text:

```
done
#
# To activate this environment, use
#
#     $ conda activate testenv
#
# To deactivate an active environment, use
#
#     $ conda deactivate

(base) C:\Users\W5-29>
```

```
done
#
# To activate this environment, use
#
#     $ conda activate testenv
#
# To deactivate an active environment,
use
#
#     $ conda deactivate
```

가 뜨면 가상환경 생성 완료

5.conda 가상 환경 생성 확인

```
선택 Miniforge Prompt - conda activate base - conda install scikit-learn - conda deactivate - conda install notebook=6 - conda deactivate - conda deactivate
# $ conda activate testenv
#
# To deactivate an active environment, use
#
# $ conda deactivate

(base) C:\Users\W5-29>conda info --envs
# conda environments:
#
base          * C:\Users\W5-29\miniforge3
fintech        C:\Users\W5-29\miniforge3\envs\fintech
testenv        C:\Users\W5-29\miniforge3\envs\testenv

(base) C:\Users\W5-29>
```

conda info --envs

아나콘다의 가상 환경 확인 가능
* 이 있는 곳이 현재의 가상 환경

가상 환경은 여러 개를 만들고 삭제 가능

가상 환경을 만드는 이유

프로젝트 별로 다른 버전의 **python**이나
패키지를 설치해서 의존성 충돌 문제를 방지

5.conda 가상 환경 활성화

```
# 선택 Miniforge Prompt - conda activate base - conda install scikit-learn - conda deactivate - conda install notebook=6 - conda deactivate - conda deactivate
# base
* C:\Users\5-29\miniforge3
C:\Users\5-29\miniforge3\envs\fintech
C:\Users\5-29\miniforge3\envs\testenv

(base) C:\Users\5-29>conda activate testenv
(testenv) C:\Users\5-29>
```

가상 환경 활성화

(base) C:\Users\5-29>conda activate testenv

가상 환경이 활성화 되면 **base**가 활성화된 가상 환경 이름으로 변경됨

(base) C:\Users\5-29>



(testenv) C:\Users\5-29>

가상 환경 비활성화

(testenv) C:\Users\5-29>conda deactivate

5. conda 가상 환경 패키지 목록

```
Miniforge Prompt - conda activate base - conda install scikit-learn - conda deactivate - conda install notebook=6 - conda deactivate - conda deactivate

libffi           3.4.2          h8ffe710_5    conda-forge
libsqLite        3.46.0         h2466b09_0    conda-forge
libzlib          1.3.1          h2466b09_1    conda-forge
openssl          3.3.1          h2466b09_1    conda-forge
pip              24.0           pyhd8ed1ab_0  conda-forge
python           3.11.9         h631f459_0_cpython  conda-forge
setuptools       70.1.1         pyhd8ed1ab_0  conda-forge
tk                8.6.13         h5226925_1    conda-forge
tzdata           2024a          h0c530f3_0    conda-forge
ucrt             10.0.22621.0   h57928b3_0    conda-forge
vc                14.3           h8a93ad2_20   conda-forge
vc14_runtime     14.40.33810   ha82c5b3_20   conda-forge
vs2015_runtime   14.40.33810   h3bf8584_20   conda-forge
wheel            0.43.0         pyhd8ed1ab_1  conda-forge
xz                5.2.6           h8d14728_0    conda-forge

(testenv) C:\Users\H5-29>
```

conda activate testenv
▼
conda list

가상환경 **testenv**에 설치된
패키지 목록 확인

5. conda 가상 환경 패키지 목록

The image shows two terminal windows side-by-side. Both are running on Windows, as indicated by the path 'C:\Users\W5-29\miniforge3\envs\testenv' and 'C:\Users\W5-29'. The left window is titled 'Miniforge Prompt - conda activate base - conda install scikit-learn - conda deactivate - conda install notebook=6 - conda deactivate - conda...' and displays the package list for the 'testenv' environment. The right window is titled 'Miniforge Prompt' and displays the package list for the 'base' environment.

testenv 가상 환경의 패키지 목록
Python 버전 3.11.9

#	Name	Version	Build	Channel	bzipped2
1	ca-certificates	1.0.8	hcfcfb64_5	conda-forge	
2	libexpat	2.6.2	h56e8100_0	conda-forge	
3	libffi	3.4.2	h8ffe710_5	conda-forge	
4	libsdl	3.46.0	h2466b09_0	conda-forge	
5	libzlib	1.3.1	h2466b09_1	conda-forge	
6	openssl	3.3.1	h2466b09_1	conda-forge	
7	pip	24.0	pyhd8ed1ab_0	conda-forge	
8	python	3.11.9	h631f459_0_cpython	conda-forge	
9	setuptools	70.1.1	pyhd8ed1ab_0	conda-forge	
10	tk	8.6.13	h5226925_1	conda-forge	
11	tzdata	2024a	h0c530f3_0	conda-forge	
12	ucrt	10.0.22621.0	h57928b3_0	conda-forge	
13	vc	14.3	h8a93ad2_20	conda-forge	
14	vc14_runtime	14.40.33810	ha82c5b3_20	conda-forge	
15	vs2015_runtime	14.40.33810	h3bf8584_20	conda-forge	
16	wheel	0.43.0	pyhd8ed1ab_1	conda-forge	
17	xz	5.2.6	h8d14728_0	conda-forge	

(testenv) C:\Users\W5-29>

base 가상 환경의 패키지 목록
Python 버전 3.10.14

#	Name	Version	Build	Channel	bzip2
1	lz4-c	1.9.4	hcfcfb64_0	conda-forge	
2	lzo	2.10	he774522_1000	conda-forge	
3	mamba	1.5.8	py310hd9d798f_0	conda-forge	
4	menuinst	2.0.2	py310h00ff61_0	conda-forge	
5	miniforge_console_shortcut	1.0	h57928b3_0	conda-forge	
6	openssl	3.2.1	hcfcfb64_1	conda-forge	
7	packaging	24.0	pyhd8ed1ab_0	conda-forge	
8	pip	24.0	pyhd8ed1ab_0	conda-forge	
9	platformdirs	4.2.0	pyhd8ed1ab_0	conda-forge	
10	pluggy	1.4.0	pyhd8ed1ab_0	conda-forge	
11	pybind11-abi	4	hd8ed1ab_3	conda-forge	
12	pycosat	0.6.6	py310h8d17308_0	conda-forge	
13	pycparser	2.22	pyhd8ed1ab_0	conda-forge	
14	pysocks	1.7.1	pyh0701188_6	conda-forge	
15	python	3.10.14	h4de0772_0_cpython	conda-forge	
16	python_abi	3.10	4_cp310	conda-forge	
17	reproc	14.2.4.post0	hcfcfb64_1	conda-forge	
18	reproc-cpp	14.2.4.post0	h63175ca_1	conda-forge	
19	requests	2.31.0	pyhd8ed1ab_0	conda-forge	
20	ruamel.yaml	0.18.6	py310h8d17308_0	conda-forge	
21	ruamel.yaml.clib	0.2.8	py310h8d17308_0	conda-forge	
22	setuptools	69.5.1	pyhd8ed1ab_0	conda-forge	
23	tk	8.6.13	h5226925_1	conda-forge	
24	tqdm	4.66.2	pyhd8ed1ab_0	conda-forge	
25	truststore	0.8.0	pyhd8ed1ab_0	conda-forge	
26	tzdata	2024a	h0c530f3_0	conda-forge	
27	ucrt	10.0.22621.0	h57928b3_0	conda-forge	
28	urllib3	2.2.1	pyhd8ed1ab_0	conda-forge	
29	vc	14.3	hcf57466_18	conda-forge	
30	vc14_runtime	14.38.33130	h82b7239_18	conda-forge	
31	vs2015_runtime	14.38.33130	hcb4865c_18	conda-forge	
32	wheel	0.43.0	pyhd8ed1ab_1	conda-forge	
33	win_inet_pton	1.1.0	pyhd8ed1ab_6	conda-forge	
34	xz	5.2.6	h8d14728_0	conda-forge	
35	yaml-cpp	0.8.0	h63175ca_0	conda-forge	
36	zstandard	0.22.0	py310h0009e47_0	conda-forge	
37	zstd	1.5.5	h12be248_0	conda-forge	

(base) C:\Users\W5-29>

testenv 가상 환경의 패키지 목록
Python 버전 3.11.9

base 가상 환경의 패키지 목록
Python 버전 3.10.14

5. conda 가상 환경 삭제

```
Miniforge Prompt - conda activate base - conda install scikit-learn - conda deactivate - conda install notebook=6 - conda deactiva... - □ ×  
(testenv) C:\Users\5-29>conda deactivate  
(base) C:\Users\5-29>conda remove -n testenv --all  
Remove all packages in environment C:\Users\5-29\miniforge3\envs\testenv:  
## Package Plan ##  
environment location: C:\Users\5-29\miniforge3\envs\testenv  
  
The following packages will be REMOVED:  
  
bzip2-1.0.8-hfcfb64_5  
ca-certificates-2024.7.4-h56e8100_0  
libexpat-2.6.2-h63175ca_0  
libffi-3.4.2-h8ffe710_5  
sqlite-3.46.0-h2466b09_0  
libzlib-1.3.1-h2466b09_1  
openssl-3.3.1-h2466b09_1  
pip-24.0-pyhd8ed1ab_0  
python-3.11.9-h631f459_0_cpython  
setuptools-70.1.1-pyhd8ed1ab_0  
tk-8.6.13-h5226925_1  
tzdata-2024a-h0c530f3_0  
ucrt-10.0.22621.0-h57928b3_0  
vc-14.3-h8a93ad2_20  
vc14_runtime-14.40.33810-ha82c5b3_20  
vs2015_runtime-14.40.33810-h3bf8584_20  
wheel-0.43.0-pyhd8ed1ab_1  
xz-5.2.6-h8d14728_0  
  
Proceed ([y]/n)? -
```

conda remove -n testenv --all

testenv 가상 환경에 있는 모든 것을 삭제

Proceed([y]/n)?가 나오면 Y

The Jupyter logo features a central white circle containing the word "jupyter" in a black, sans-serif font. Behind the text are three curved orange bands of varying shades, resembling a stylized sun or a brain. Small dark grey circles are scattered around the top and bottom of the central circle.

jupyter

php

VB



C#



F#



Spark



R



6. Jupyter Notebook 설치



Miniforge Prompt - conda activate base - conda install scikit-learn - conda deactivate - conda install notebook=6 - conda deactiva... - X

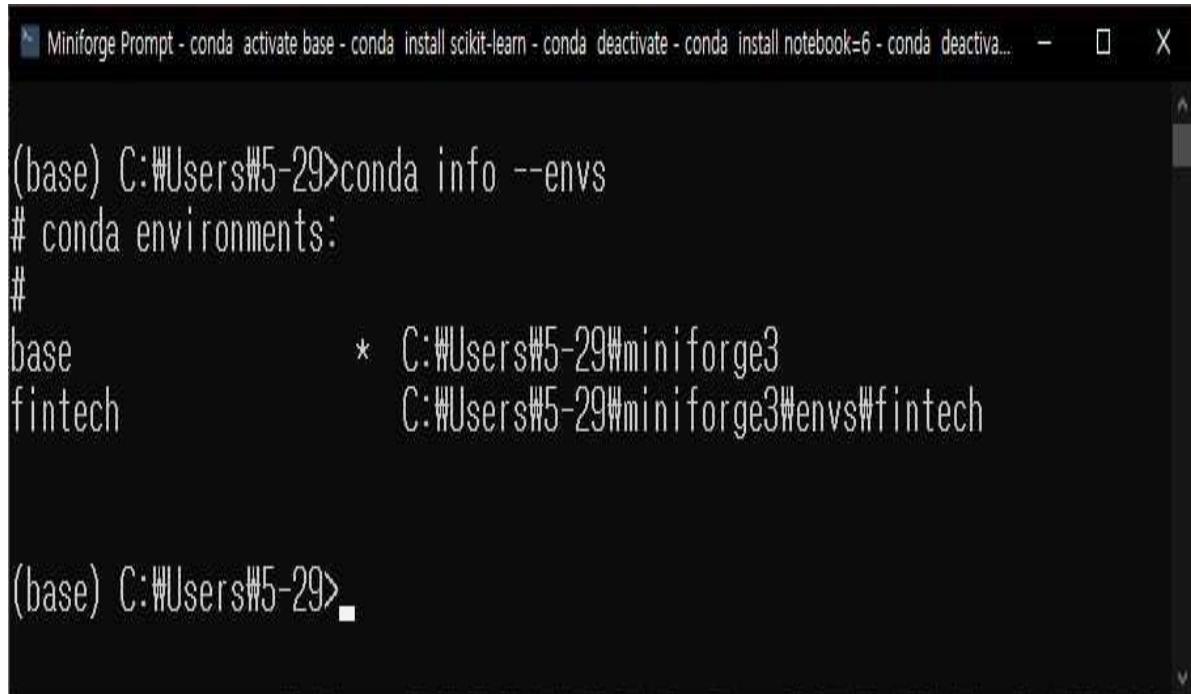
```
(base) C:\Users\H5-29>conda create -n fintech python=3.10
```

가상 환경 재설치

conda create -n 가상환경명 python=버전

conda create -n fintech python=3.10

6. Jupyter Notebook 설치



```
Miniforge Prompt - conda activate base - conda install scikit-learn - conda deactivate - conda install notebook=6 - conda deactiva... - X

(base) C:\Users\5-29>conda info --envs
# conda environments:
#
base                         * C:\Users\5-29\miniforge3
C:\Users\5-29\miniforge3\envs\fintech

(base) C:\Users\5-29>
```

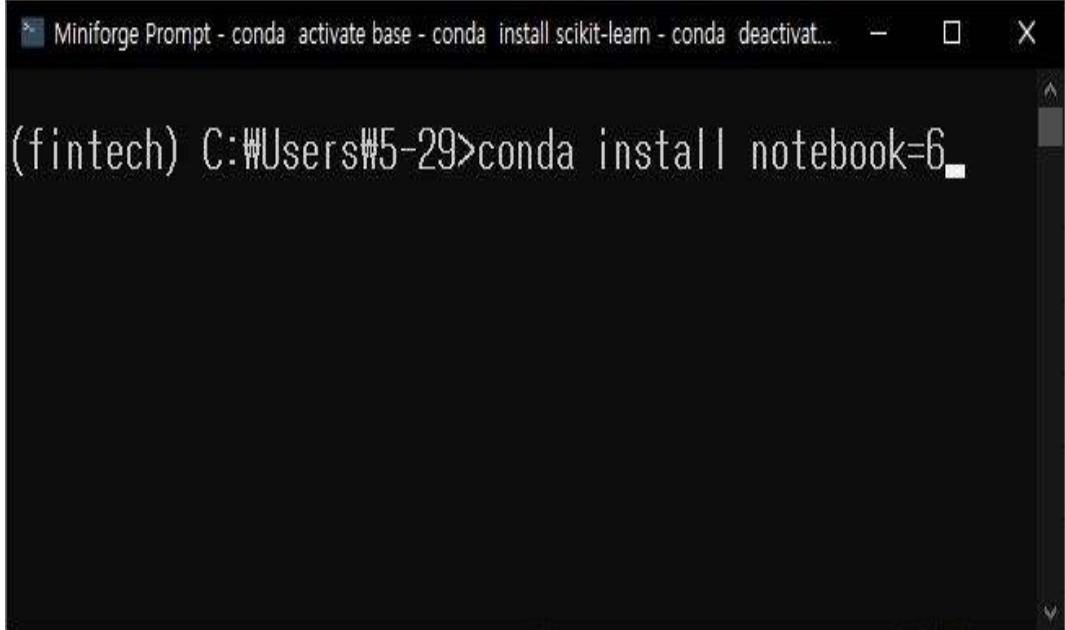
가상 환경 생성 확인

conda info --envs

아나콘다의 가상 환경 확인 가능

* 이 있는 곳이 현재의 가상 환경

6. Jupyter Notebook 설치



```
Miniforge Prompt - conda activate base - conda install scikit-learn - conda deactivat... - □ X
(base) C:\Users\5-29>conda activate fintech
(fintech) C:\Users\5-29>conda install notebook=6
```

가상 환경 활성화

(base) C:\Users\5-29>conda activate fintech

가상 환경이 활성화 되면 **base**가 활성화된 가상 환경 이름으로 변경되는 것 확인

(base) C:\Users\5-29>

▼
(fintech) C:\Users\5-29 >

6. Jupyter Notebook 설치

```
Anaconda Prompt (Anaconda3) - deactivate mdai - conda deactivate - conda deactivate - conda deacti... - □ ×  
(base) C:\Users\haram>conda info --envs  
# conda environments:  
#  
bigdata D:\ProgramData\Anaconda3\envs\bigdata  
pythonProject D:\ProgramData\Anaconda3\envs\pythonProject  
base * d:\ProgramData\Anaconda3  
bigdata d:\ProgramData\Anaconda3\envs\bigdata  
mdai d:\ProgramData\Anaconda3\envs\mdai  
mpp1 d:\ProgramData\Anaconda3\envs\mpp1  
pythonProject d:\ProgramData\Anaconda3\envs\pythonProject  
  
(base) C:\Users\haram>conda activate mpp1  
  
(mpp1) C:\Users\haram>conda list  
# packages in environment at d:\ProgramData\Anaconda3\envs\mpp1:  
#  
# Name          Version      Build  Channel  
ca-certificates 2021.7.5    haa95532_1  
certifi         2021.5.30   py38haa95532_0  
openssl         1.1.11       h2bbff1b_0  
pip             21.0.1      py38haa95532_0  
python           3.8.11      h6244533_1  
setuptools      52.0.0      py38haa95532_0  
sqlite           3.36.0      h2bbff1b_0  
vc              14.2        h21ff451_1  
vs2015_runtime  14.27.29016 h5e58377_2  
wheel            0.37.0     pyhd8eb1b0_0  
wincertstore    0.2         py38_0  
  
(mpp1) C:\Users\haram>
```

가상환경 fintech에 설치된 패키지 목록 확인

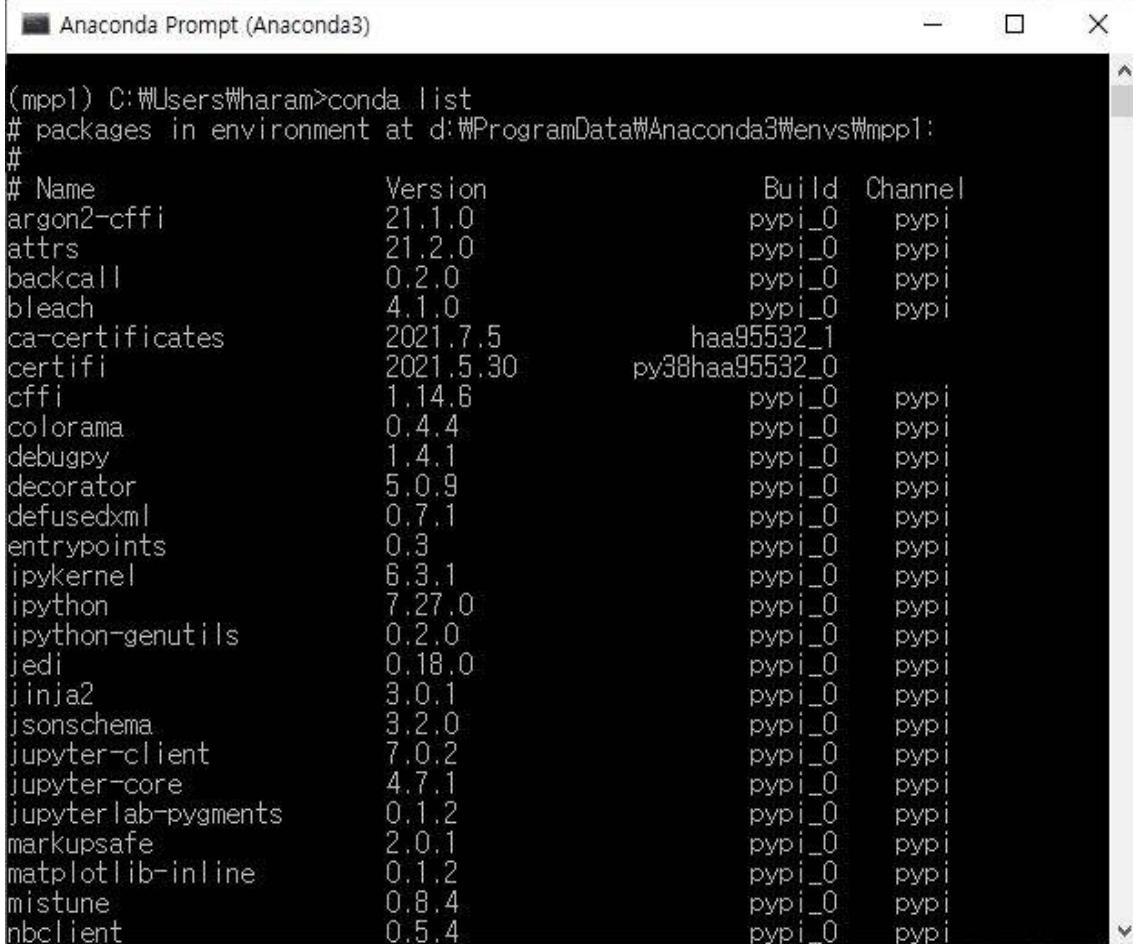
conda activate fintech

▼
conda list

Jupyter notebook이 없으므로 설치

conda install notebook=6

6. Jupyter Notebook 설치



```
(mpp1) C:\Users\haram>conda list
# packages in environment at d:\ProgramData\Anaconda3\envs\mpp1:
#
# Name           Version    Build  Channel
argon2-cffi     21.1.0      pypi_0  pypi
attrs           21.2.0      pypi_0  pypi
backcall         0.2.0       pypi_0  pypi
bleach           4.1.0       pypi_0  pypi
ca-certificates 2021.7.5   haa95532_1
certifi          2021.5.30  py38haa95532_0
cffi              1.14.6      pypi_0  pypi
colorama         0.4.4       pypi_0  pypi
debugpy           1.4.1       pypi_0  pypi
decorator        5.0.9       pypi_0  pypi
defusedxml       0.7.1       pypi_0  pypi
entrypoints      0.3        pypi_0  pypi
ipykernel         6.3.1       pypi_0  pypi
ipython           7.27.0      pypi_0  pypi
ipython-genutils 0.2.0       pypi_0  pypi
jedi              0.18.0      pypi_0  pypi
jinja2             3.0.1      pypi_0  pypi
jsonschema        3.2.0       pypi_0  pypi
jupyter-client    7.0.2       pypi_0  pypi
jupyter-core      4.7.1       pypi_0  pypi
jupyterlab-pygments 0.1.2      pypi_0  pypi
markupsafe        2.0.1       pypi_0  pypi
matplotlib-inline 0.1.2       pypi_0  pypi
mistune            0.8.4       pypi_0  pypi
nbclient           0.5.4      pypi_0  pypi
```

conda list

List 중에 jupyter 설치 확인

7. Jupyter Notebook 환경설정

Anaconda Prompt (Anaconda3)

Package	Version	Location
sqlite	3.36.0	h2bbff1b_0
terminado	0.11.1	pypi_0
testpath	0.5.0	pypi_0
tornado	6.1	pypi_0
traitlets	5.1.0	pypi_0
vc	14.2	h21ff451_1
vs2015_runtime	14.27.29016	h5e58377_2
wcwidth	0.2.5	pypi_0
webencodings	0.5.1	pypi_0
wheel	0.37.0	pyhd3eb1b0_0
wincertstore	0.2	py38_0

(mpp1) C:\Users\haram>jupyter notebook --generate-config

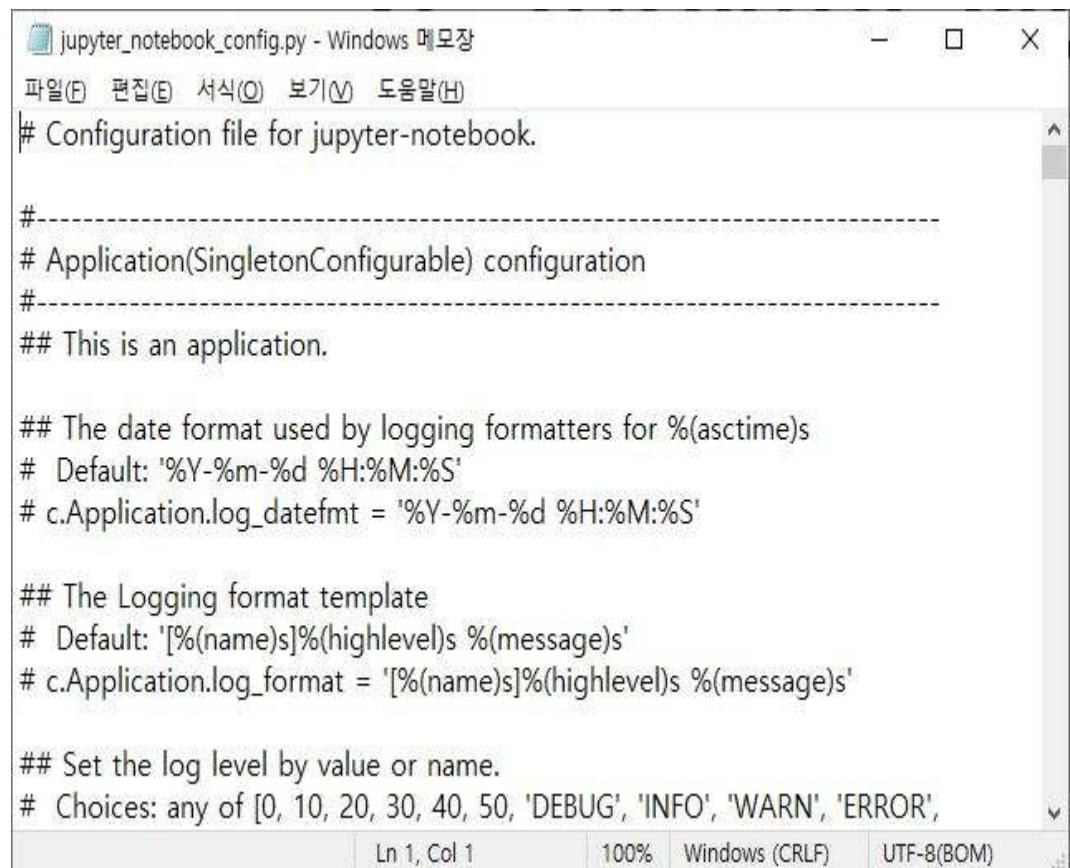
주피터 노트북을 실행하면
시작 폴더가 c:/로되어 있어 불편

1. 프로젝트 폴더를 따로 만들고
2. Jupyter Notebook 시작 폴더를
프로젝트 폴더로 변경

Jupyter notebook --generate-config
로 설정파일 생성

Writing default config to: 뒤에 나오는
경로 복사 후 윈도우 탐색기 경로창에
붙여넣기

7. Jupyter Notebook 환경설정



jupyter_notebook_config.py - Windows 메모장

파일(F) 편집(E) 서식(O) 보기(V) 도움말(H)

```
# Configuration file for jupyter-notebook.

#-----
# Application(SingletonConfigurable) configuration
#-----
## This is an application.

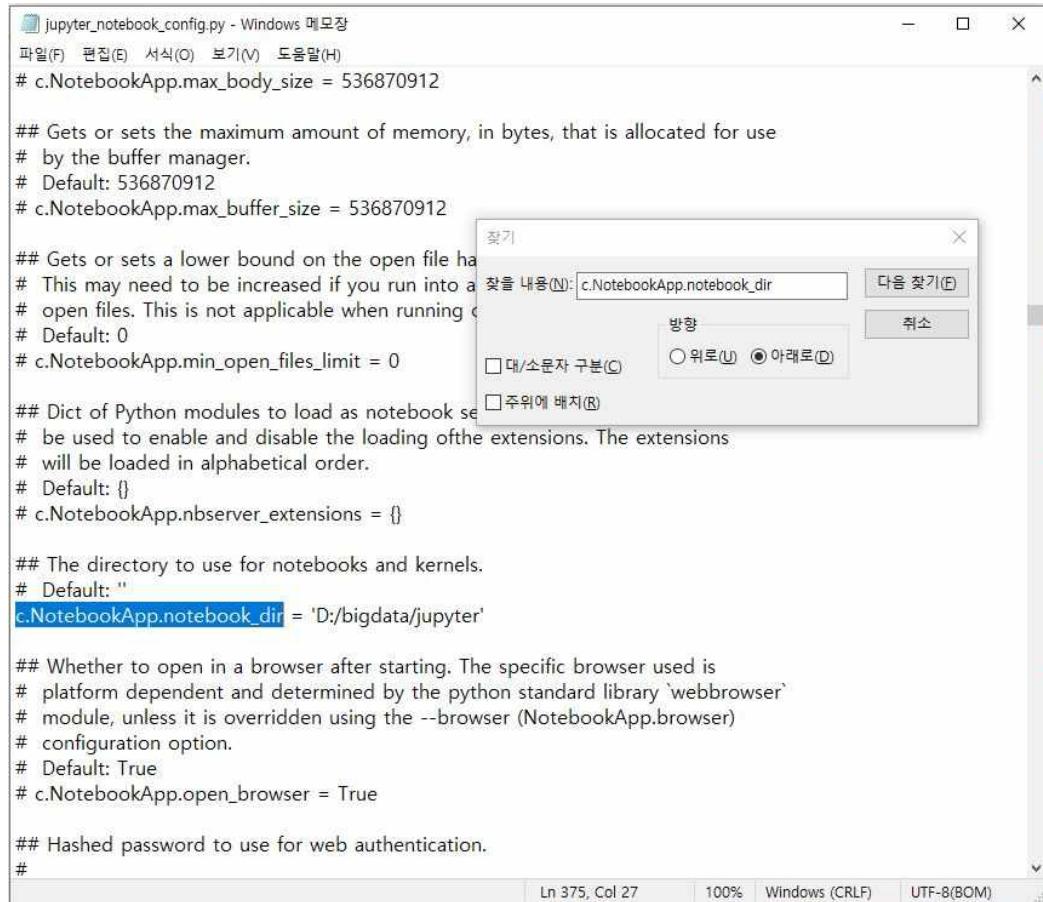
## The date format used by logging formatters for %(asctime)s
# Default: '%Y-%m-%d %H:%M:%S'
# c.Application.log_datefmt = '%Y-%m-%d %H:%M:%S'

## The Logging format template
# Default: '[%(name)s]%(highlevel)s %(message)s'
# c.Application.log_format = '[%(name)s]%(highlevel)s %(message)s'

## Set the log level by value or name.
# Choices: any of [0, 10, 20, 30, 40, 50, 'DEBUG', 'INFO', 'WARN', 'ERROR',
# Ln 1, Col 1 100% Windows (CRLF) UTF-8(BOM)
```

메모장 혹은 다른 텍스트 에디터를 이용해서
jupyter_notebook_config.py 열기

7. Jupyter Notebook 환경설정



```
jupyter_notebook_config.py - Windows 메모장
파일(F) 편집(E) 서식(O) 보기(V) 도움말(H)
# c.NotebookApp.max_body_size = 536870912

## Gets or sets the maximum amount of memory, in bytes, that is allocated for use
# by the buffer manager.
# Default: 536870912
# c.NotebookApp.max_buffer_size = 536870912

## Gets or sets a lower bound on the open file ha
# This may need to be increased if you run into a
# open files. This is not applicable when running c
# Default: 0
# c.NotebookApp.min_open_files_limit = 0

## Dict of Python modules to load as notebook se
# used to enable and disable the loading of the extensions. The extensions
# will be loaded in alphabetical order.
# Default: {}
# c.NotebookApp.nbserver_extensions = {}

## The directory to use for notebooks and kernels.
# Default: ''
c.NotebookApp.notebook_dir = 'D:/bigdata/jupyter'

## Whether to open in a browser after starting. The specific browser used is
# platform dependent and determined by the python standard library `webbrowser`
# module, unless it is overridden using the --browser (NotebookApp.browser)
# configuration option.
# Default: True
# c.NotebookApp.open_browser = True

## Hashed password to use for web authentication.
#
```

1. F3키를 누른 뒤 찾을 내용에

notebook_dir

입력 후 **다음 찾기** 클릭

2. 앞에 **# 삭제** 후 **공백 없이 왼쪽 끝으로** 붙임

3. dir = “**따옴표 안쪽**에 프로젝트 경로 지정

예) 'C:/fintech_service'

4. **#삭제** 후 **공백 없애기**, ‘**’안에 경로 설정 확인**

5. 파일 → 저장