

## ■ 파이썬

### ● 프로그래밍 언어

- 컴파일러 (Compiler) : C / C++ / C# / Java / Go  
모든 명령을 일괄 번역하여 실행  
속도가 빠른 반면 구조가 복잡함
- 인터프리터 (Interpreter) : Ruby / Perl / PHP / JavaScript  
명령어를 만날 때마다 즉시 번역하여 실행  
속도는 느리지만 단순하고 쉬움



## ■ 파이썬

- 1991년 귀도 반 로섬(Guido van Rossum) 개발
  - 1989년 12월 크리스마스가 있던 주에 자신이 출근하던 연구실의 문이 닫혀 있어서 취미삼아 만든 언어
- 2 버전과 3 버전으로 나뉘어서 사용
  - 현재 2 버전도 많이 사용되고 있지만 2020년까지만 지원될 예정
  - 2 버전과 3 버전은 서로 호환되지 않음
- 특징
  - 무료
  - 어느 운영체제에서나 사용 가능
  - 다른 언어에 비해 문법이 간결함 (학습이 쉬움)
  - 기본으로 제공되는 패키지(라이브러리) 만으로 다양한 기능 제작 가능
  - 타 언어와의 접착성이 좋음
- 활용분야
  - 데이터 분석 / 인공지능 / 웹 애플리케이션 / 코딩 교육 등

## ■ 파이썬

### ● 2018년 프로그래밍 언어 순위 (<https://www.tiobe.com/tiobe-index/>)

Sep 2018	Sep 2017	Change	Programming Language	Ratings	Change
1	1		Java	17.436%	+4.75%
2	2		C	15.447%	+8.06%
3	5	▲	Python	7.653%	+4.67%
4	3	▼	C++	7.394%	+1.83%
5	8	▲	Visual Basic .NET	5.308%	+3.33%
6	4	▼	C#	3.295%	-1.48%
7	6	▼	PHP	2.775%	+0.57%
8	7	▼	JavaScript	2.131%	+0.11%
9	-	▲▲	SQL	2.062%	+2.06%
10	18	▲▲	Objective-C	1.509%	+0.00%
11	12	▲	Delphi/Object Pascal	1.292%	-0.49%
12	10	▼	Ruby	1.291%	-0.64%
13	16	▲	MATLAB	1.276%	-0.35%
14	15	▲	Assembly language	1.232%	-0.41%
15	13	▼	Swift	1.223%	-0.54%
16	17	▲	Go	1.081%	-0.49%
17	9	▼▼	Perl	1.073%	-0.88%
18	11	▼▼	R	1.016%	-0.80%

## ■ 파이썬

### ● 2020년 1월 프로그래밍 언어 순위 (<https://www.tiobe.com/tiobe-index>)

Jan 2020	Jan 2019	Change	Programming Language	Ratings	Change
1	1		Java	16.896%	-0.01%
2	2		C	15.773%	+2.44%
3	3		Python	9.704%	+1.41%
4	4		C++	5.574%	-2.58%
5	7	▲	C#	5.349%	+2.07%
6	5	▼	Visual Basic .NET	5.287%	-1.17%
7	6	▼	JavaScript	2.451%	-0.85%
8	8		PHP	2.405%	-0.28%
9	15	▲▲	Swift	1.795%	+0.61%
10	9	▼	SQL	1.504%	-0.77%
11	18	▲▲	Ruby	1.063%	-0.03%
12	17	▲▲	Delphi/Object Pascal	0.997%	-0.10%
13	10	▼	Objective-C	0.929%	-0.85%
14	16	▲	Go	0.900%	-0.22%
15	14	▼	Assembly language	0.877%	-0.32%
16	20	▲▲	Visual Basic	0.831%	-0.20%
17	25	▲▲	D	0.825%	+0.25%
18	12	▼▼	R	0.808%	-0.52%

## ■ 개발 환경

- 파이썬 명령 프롬프트
- 파이썬 IDLE
- 주피터 노트북
- VS Code
- PyCharm
- 이클립스

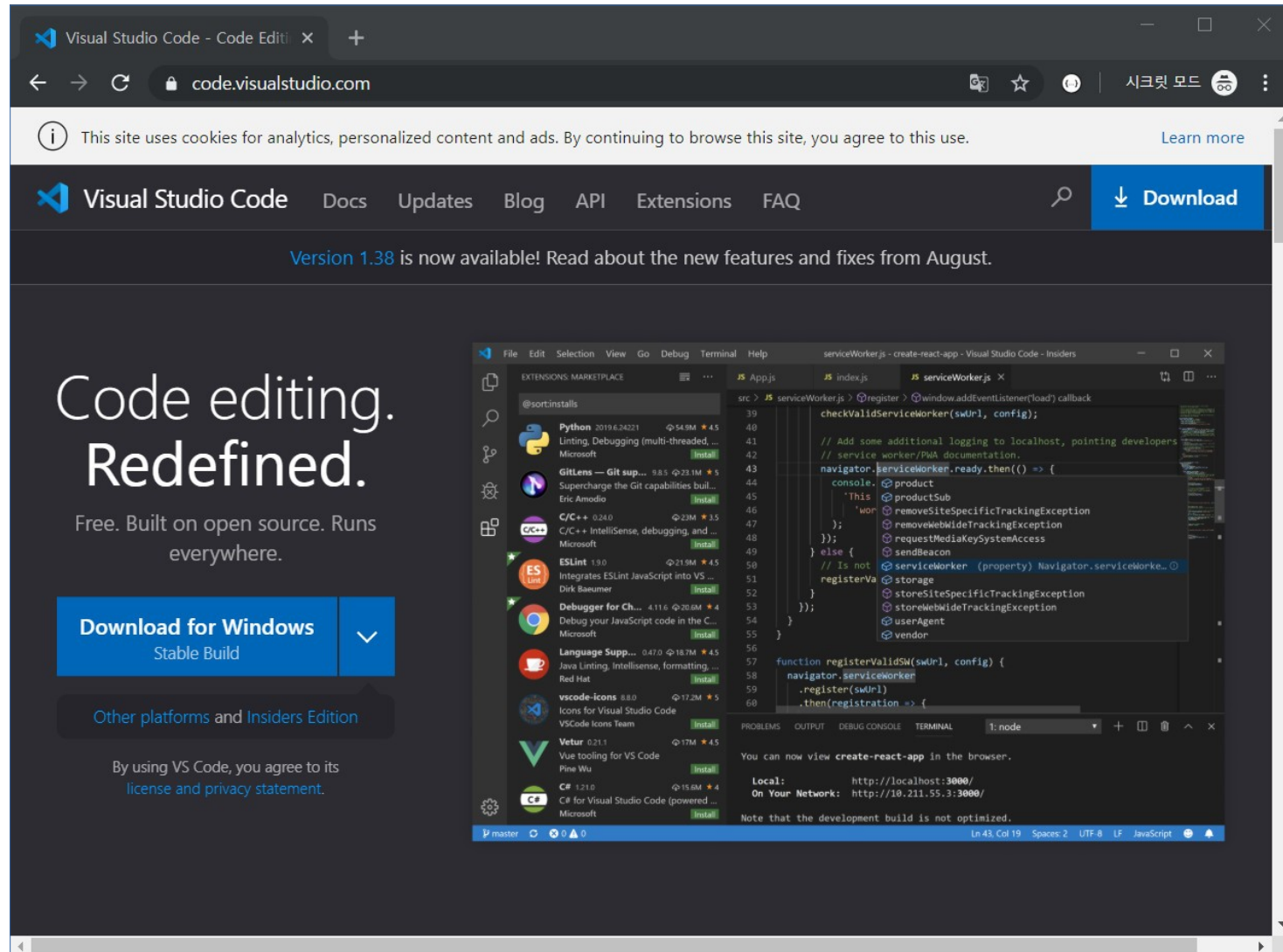
## ■ 설치

- 파이썬 다운로드 – <https://www.python.org/downloads/>
- 아나콘다 다운로드 – <https://www.anaconda.com/download/>

※ 아나콘다 설치 시 파이썬 설치 필요없음 (파이썬 포함)

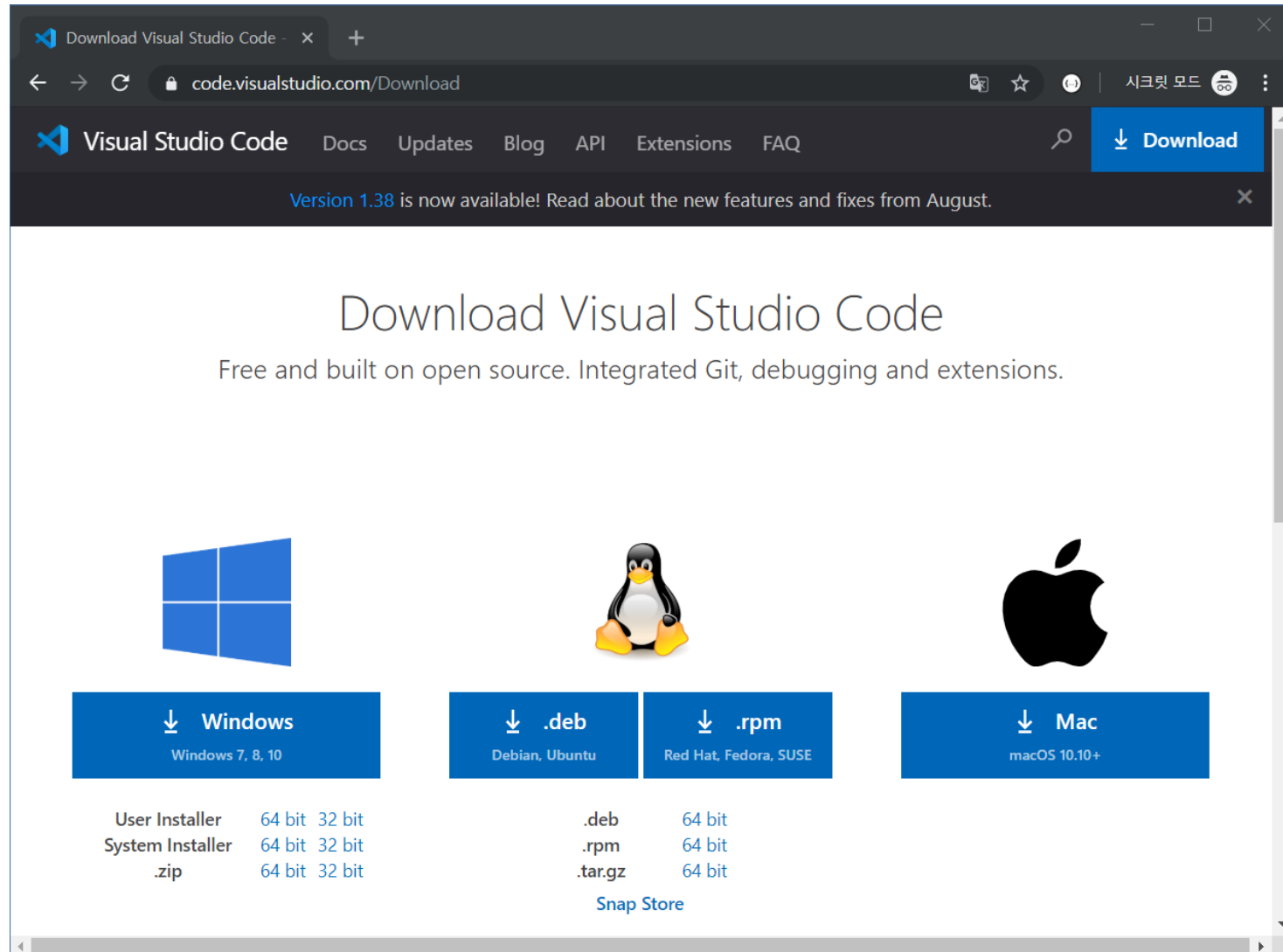
## ■ VS Code

- 다운로드 - <https://code.visualstudio.com>



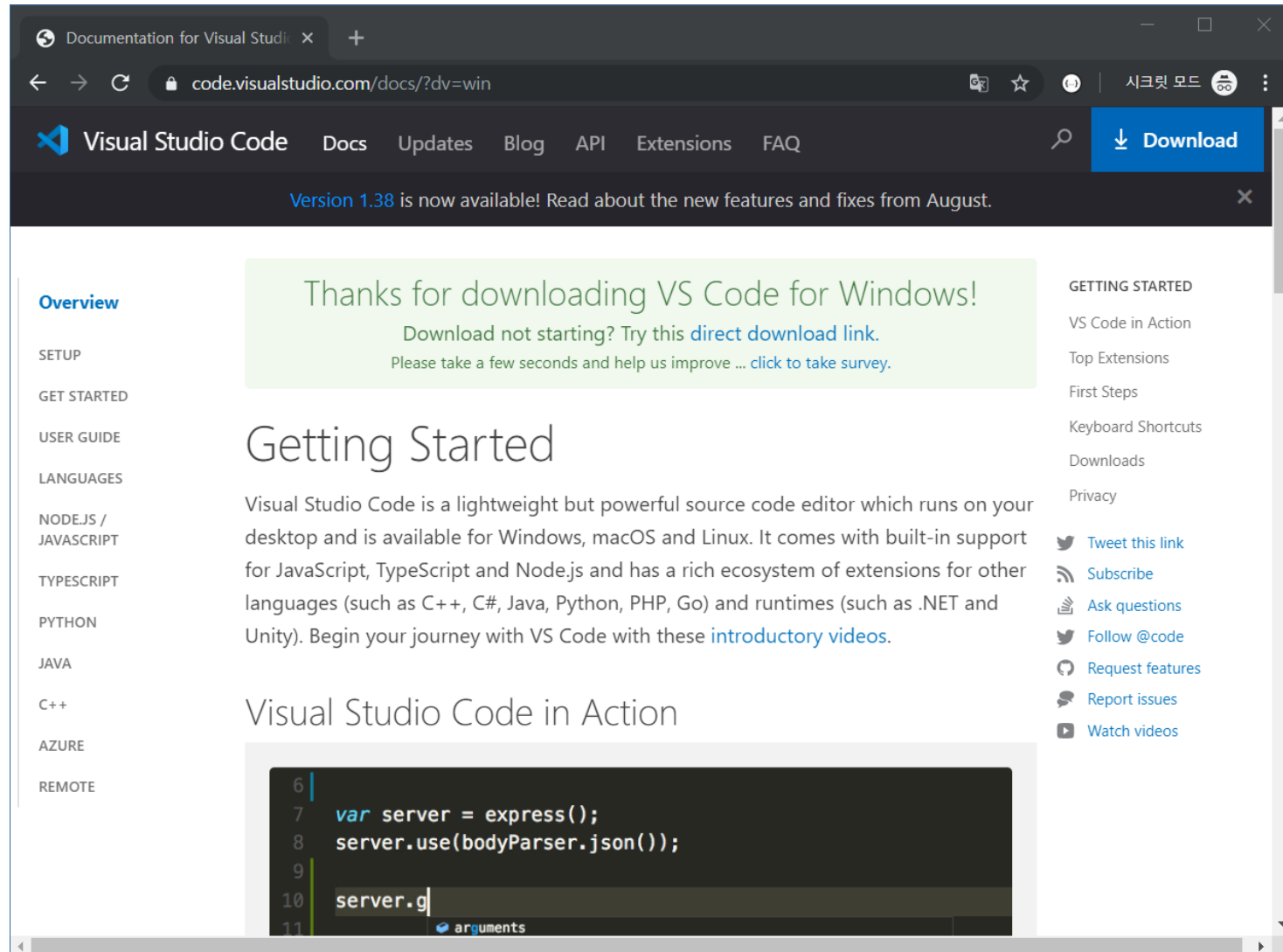
## ■ VS Code

- 다운로드 - <https://code.visualstudio.com>



## ■ VS Code

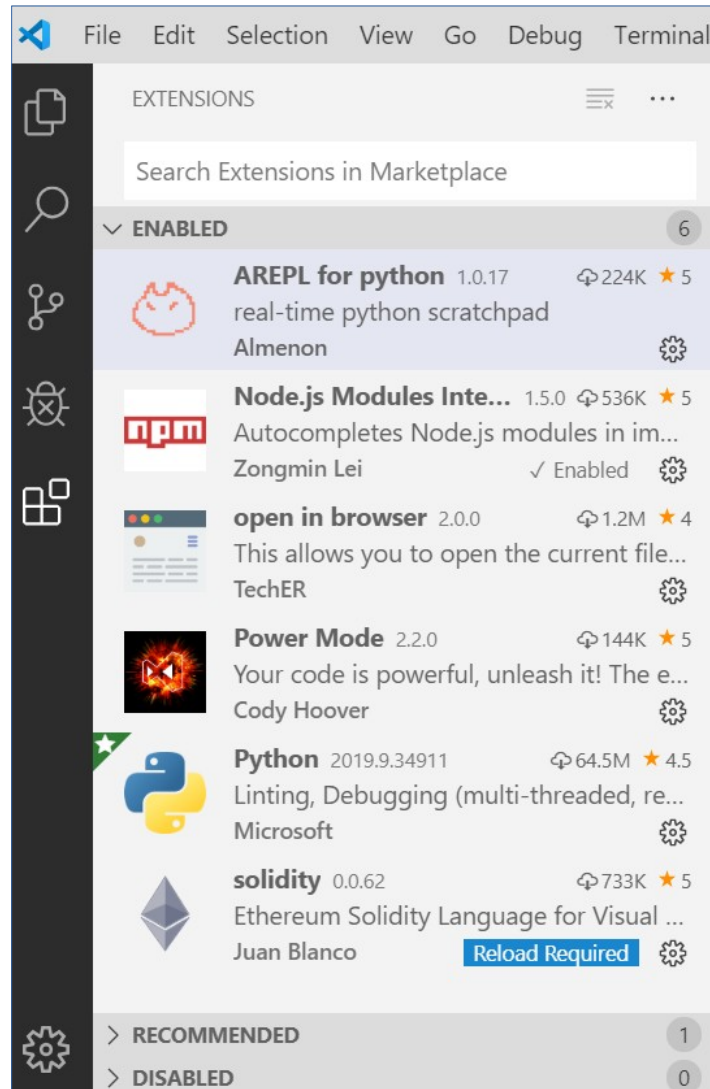
- 다운로드 - <https://code.visualstudio.com>





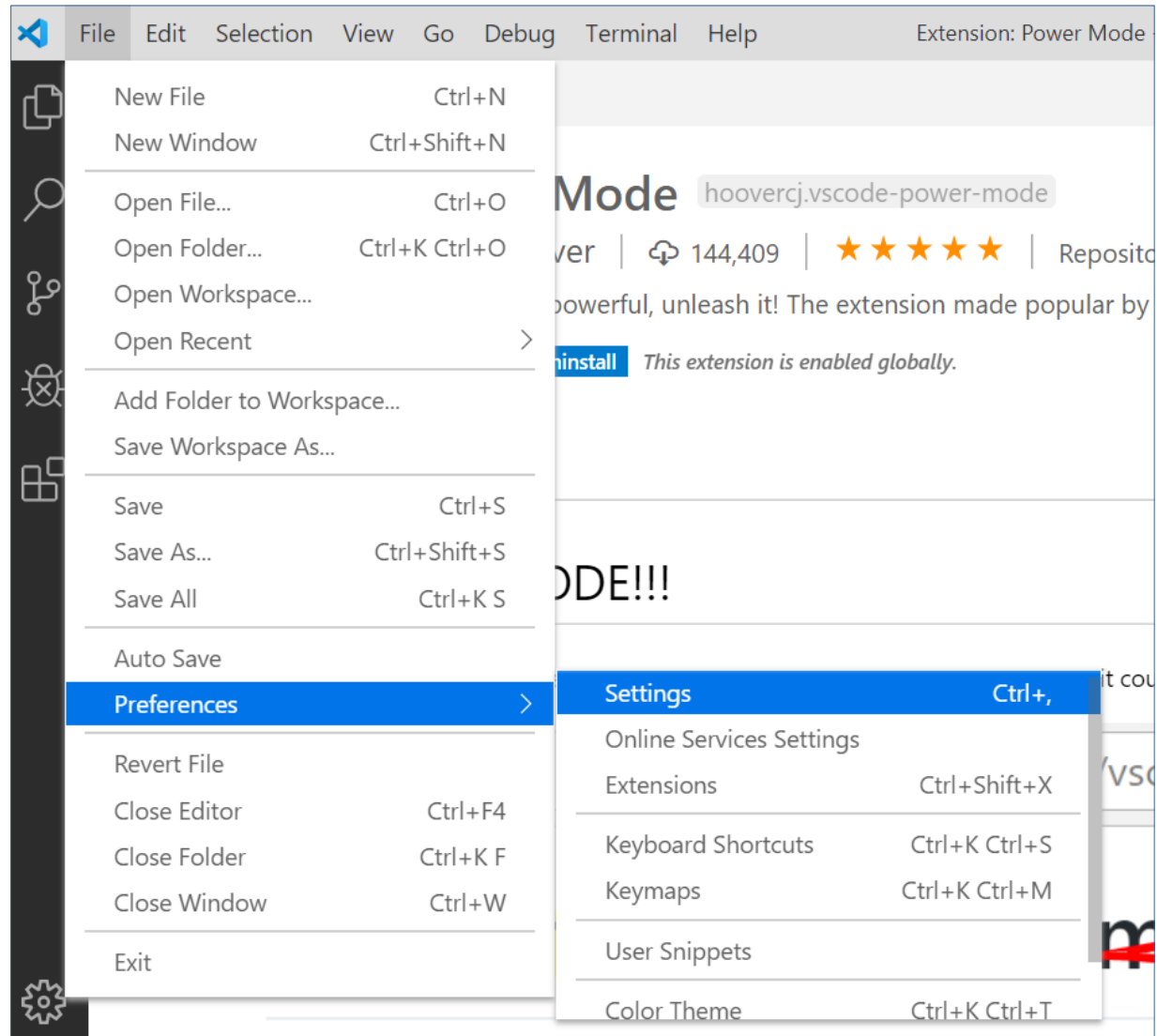
## ■ Extensions

### ● 확장 기능 추가 설치



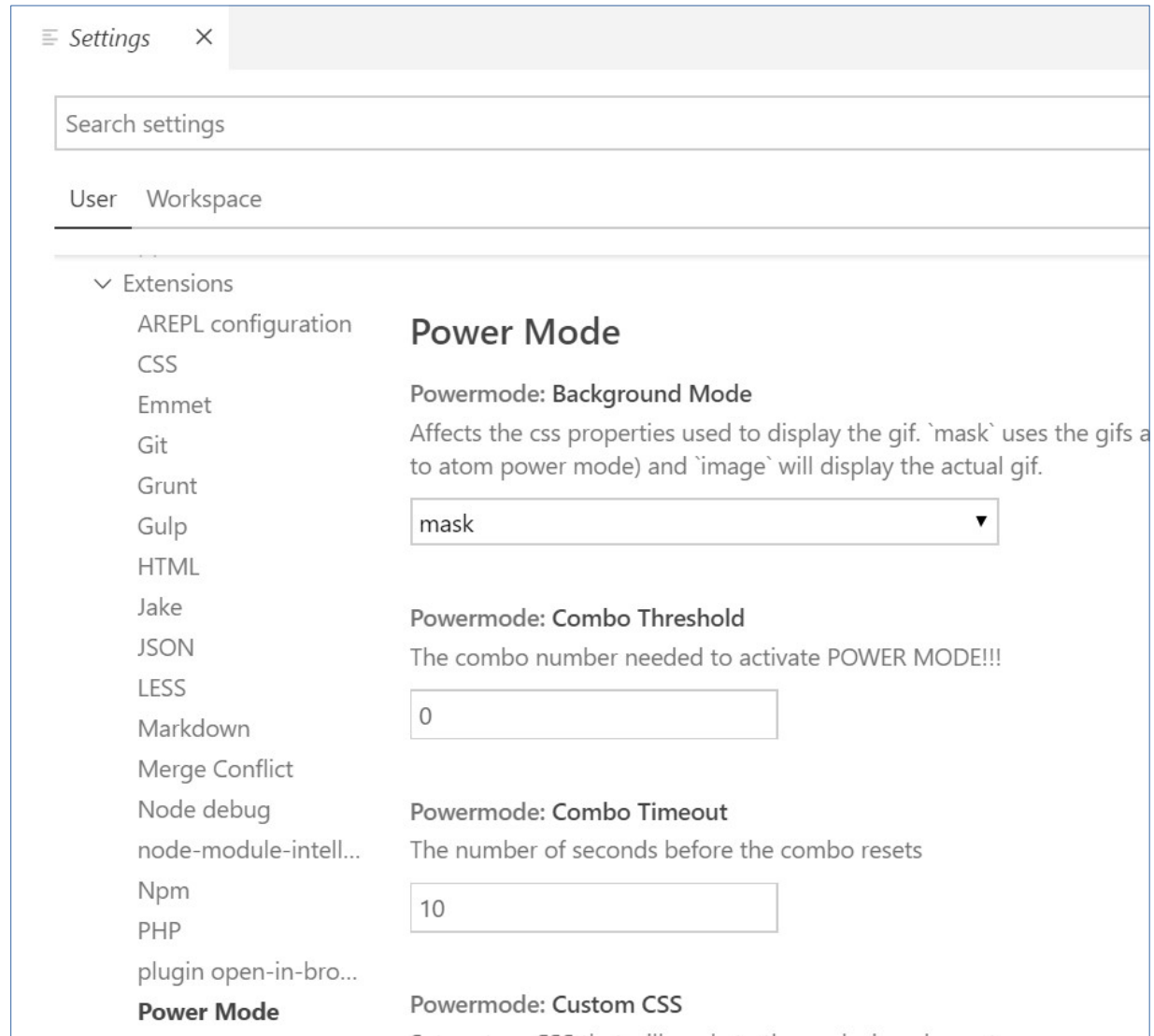
## ■ Extensions

### ● Power Mode 설정 (File – Preferences – Settings)



## ■ Extensions

### ● Power Mode 설정 (Extensions – Power Mode)



## ■ Extensions

### ● Power Mode 설정 (Presets – flames)

User Workspace

▼ Extensions

AREPL configuration

CSS

Emmet

Git

Grunt

Gulp

HTML

Jake

JSON

LESS

Markdown

Merge Conflict

Node debug

node-module-intell...

Npm

PHP

plugin open-in-bro...

**Power Mode**

Python

Reference Search V...

SCSS (Sass)

Solidity configurati...

**Powermode: Max Explosions**

The maximum number of simultaneous explosions

1

**Powermode: Presets**

Choose between different preset gifs to use when powermode is active

flames ▼

**Powermode: Shake Intensity**

The intensity with which the screen shakes

5

**Python**

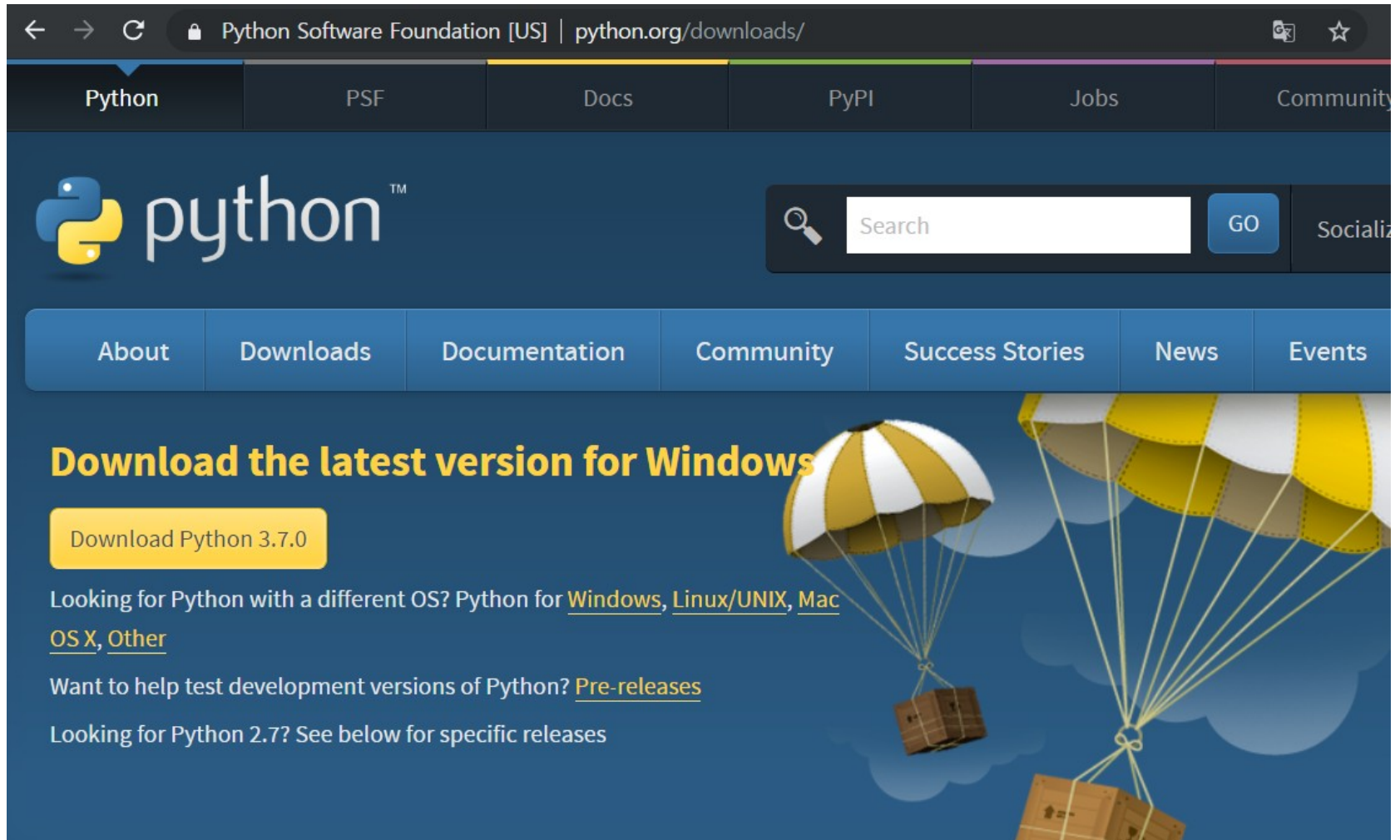
**Analysis: Cache Folder Path**

Path to a writable folder where analyzer can cache its data. Change rec...

**Analysis: Diagnostic Publish Delay**

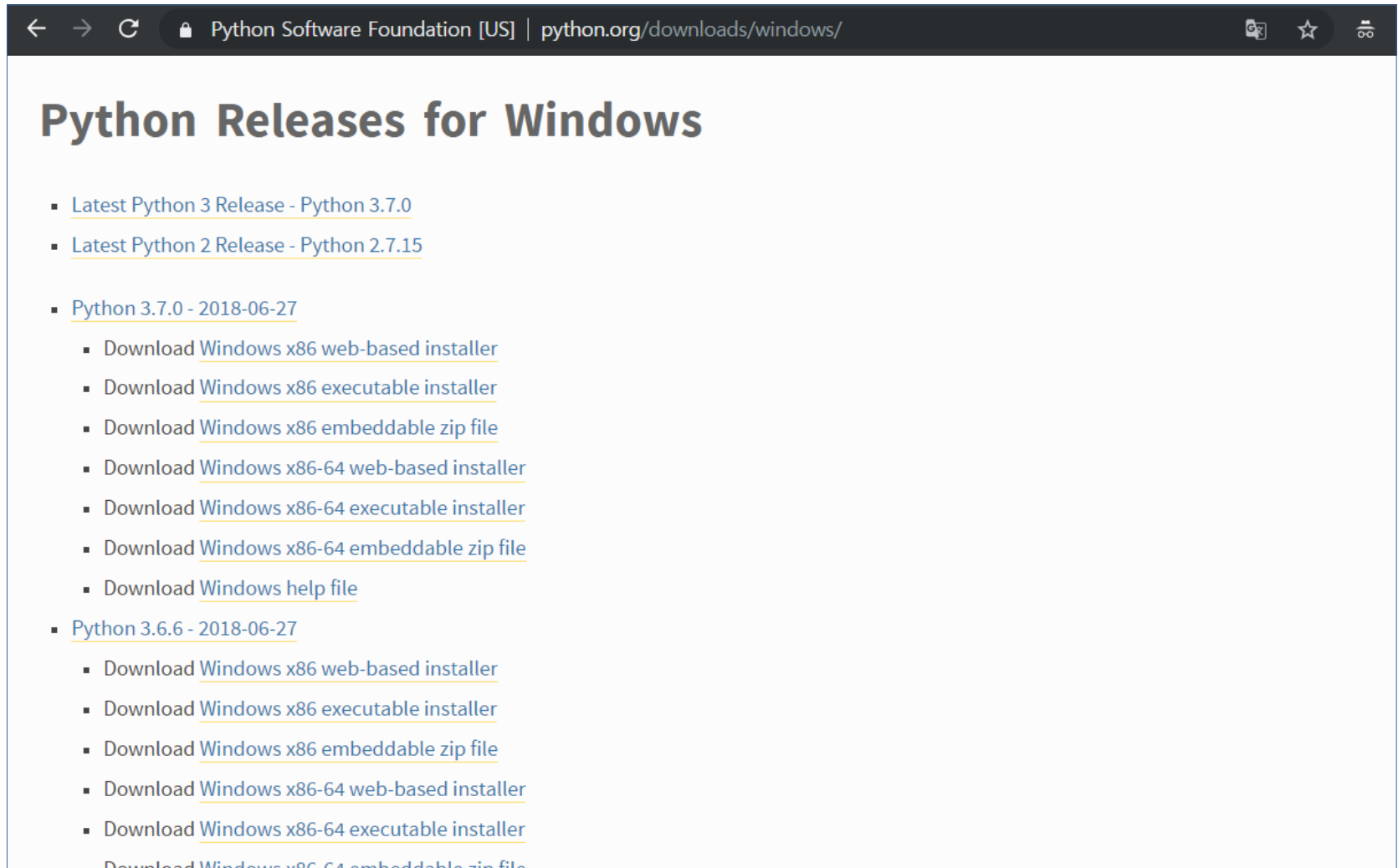
## ■ 파이썬 설치 - 1 (기본 설치)

### ● 파이썬 다운로드



## ■ 파이썬 설치 - 1 (기본 설치)

### ● 파이썬 다운로드



The screenshot shows a web browser window with the address bar displaying "Python Software Foundation [US] | python.org/downloads/windows/". The page title is "Python Releases for Windows". The content lists the latest releases for Python 3 and Python 2, along with specific release details for Python 3.7.0 and Python 3.6.6, including download links for various Windows installers and zip files.

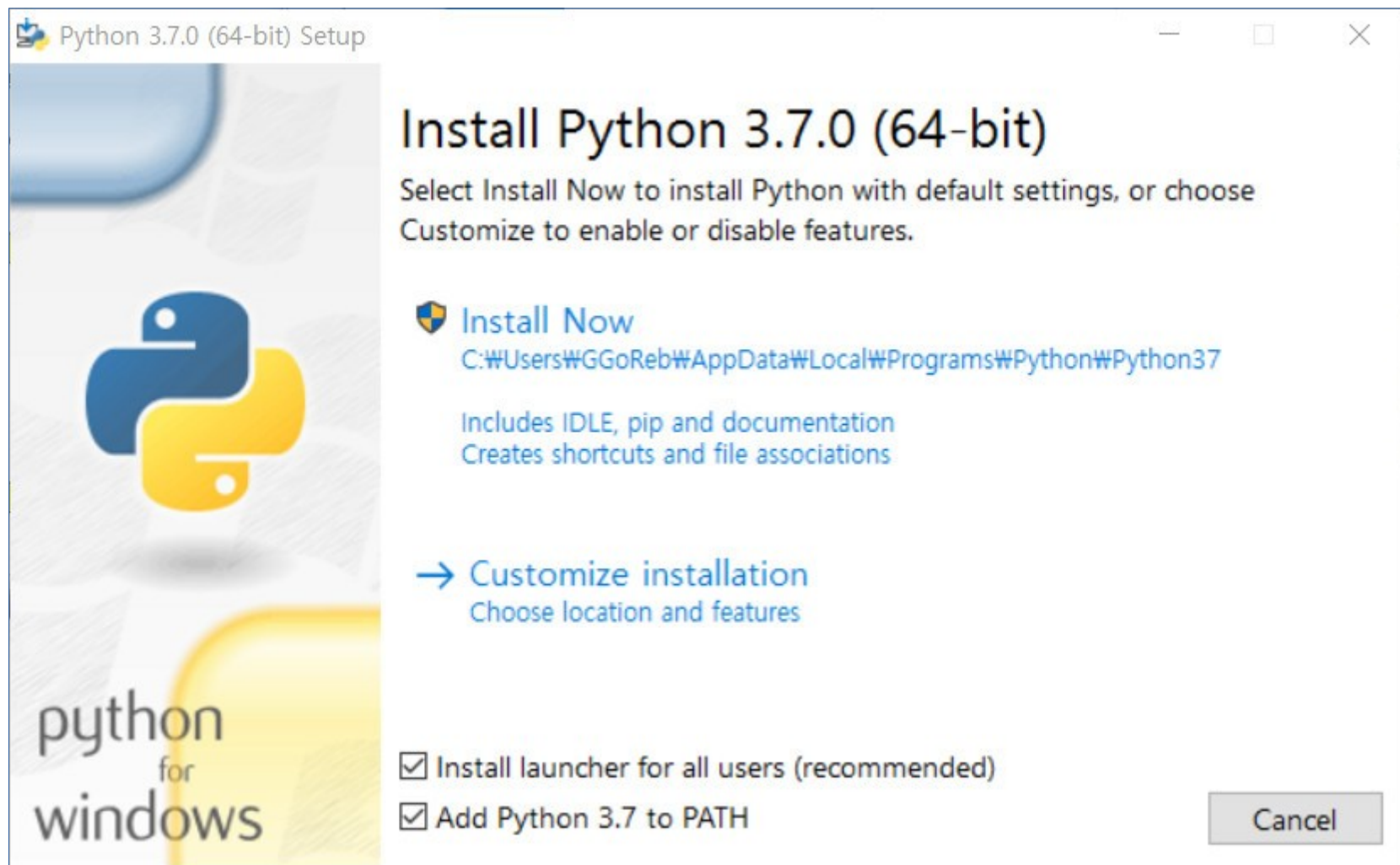
Python Software Foundation [US] | [python.org/downloads/windows/](https://python.org/downloads/windows/)

## Python Releases for Windows

- [Latest Python 3 Release - Python 3.7.0](#)
- [Latest Python 2 Release - Python 2.7.15](#)
- [Python 3.7.0 - 2018-06-27](#)
  - Download [Windows x86 web-based installer](#)
  - Download [Windows x86 executable installer](#)
  - Download [Windows x86 embeddable zip file](#)
  - Download [Windows x86-64 web-based installer](#)
  - Download [Windows x86-64 executable installer](#)
  - Download [Windows x86-64 embeddable zip file](#)
  - Download [Windows help file](#)
- [Python 3.6.6 - 2018-06-27](#)
  - Download [Windows x86 web-based installer](#)
  - Download [Windows x86 executable installer](#)
  - Download [Windows x86 embeddable zip file](#)
  - Download [Windows x86-64 web-based installer](#)
  - Download [Windows x86-64 executable installer](#)
  - Download [Windows x86-64 embeddable zip file](#)

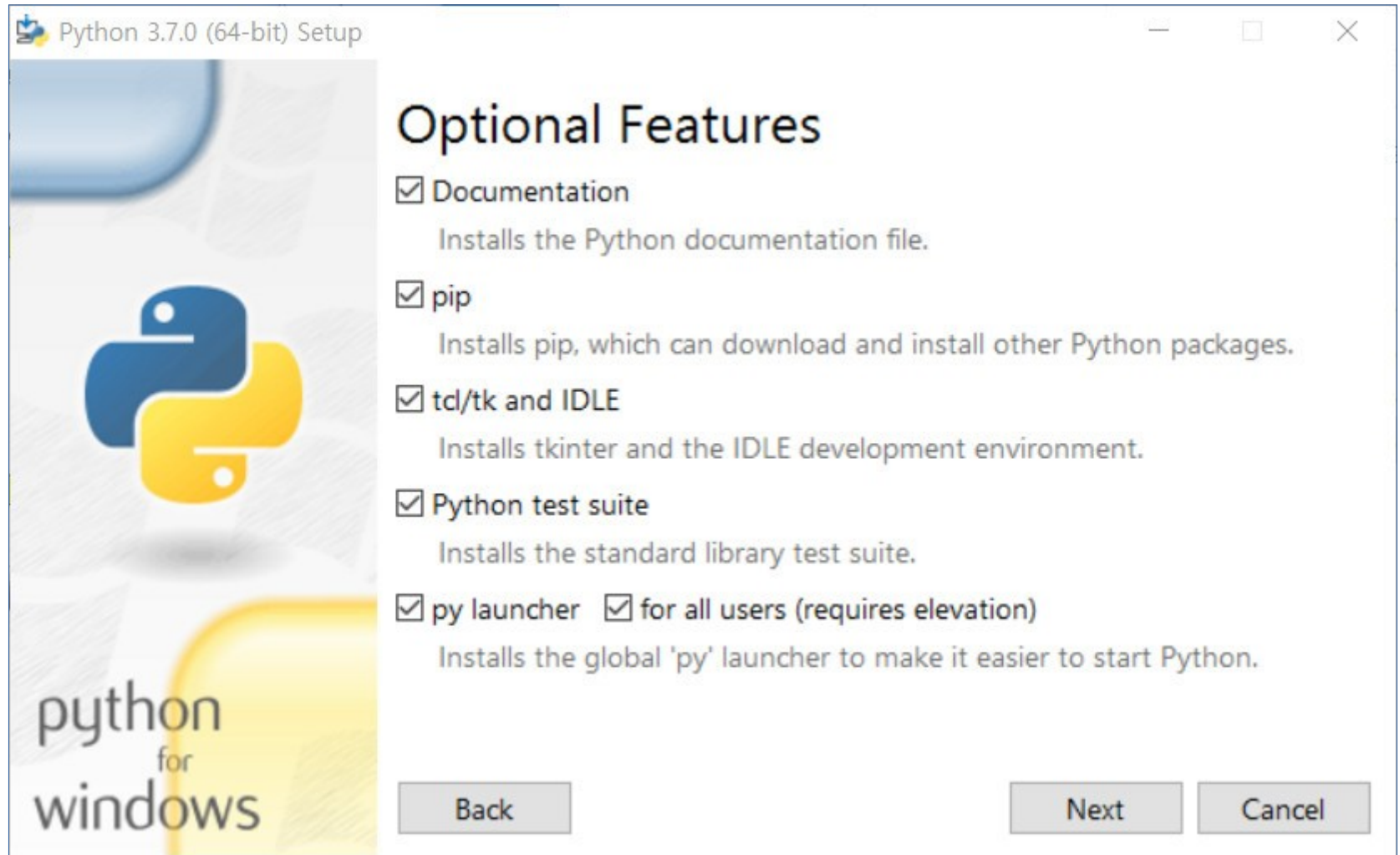
## ■ 파이썬 설치 - 1 (기본 설치)

### ● 파이썬 다운로드



## ■ 파이썬 설치 - 1 (기본 설치)

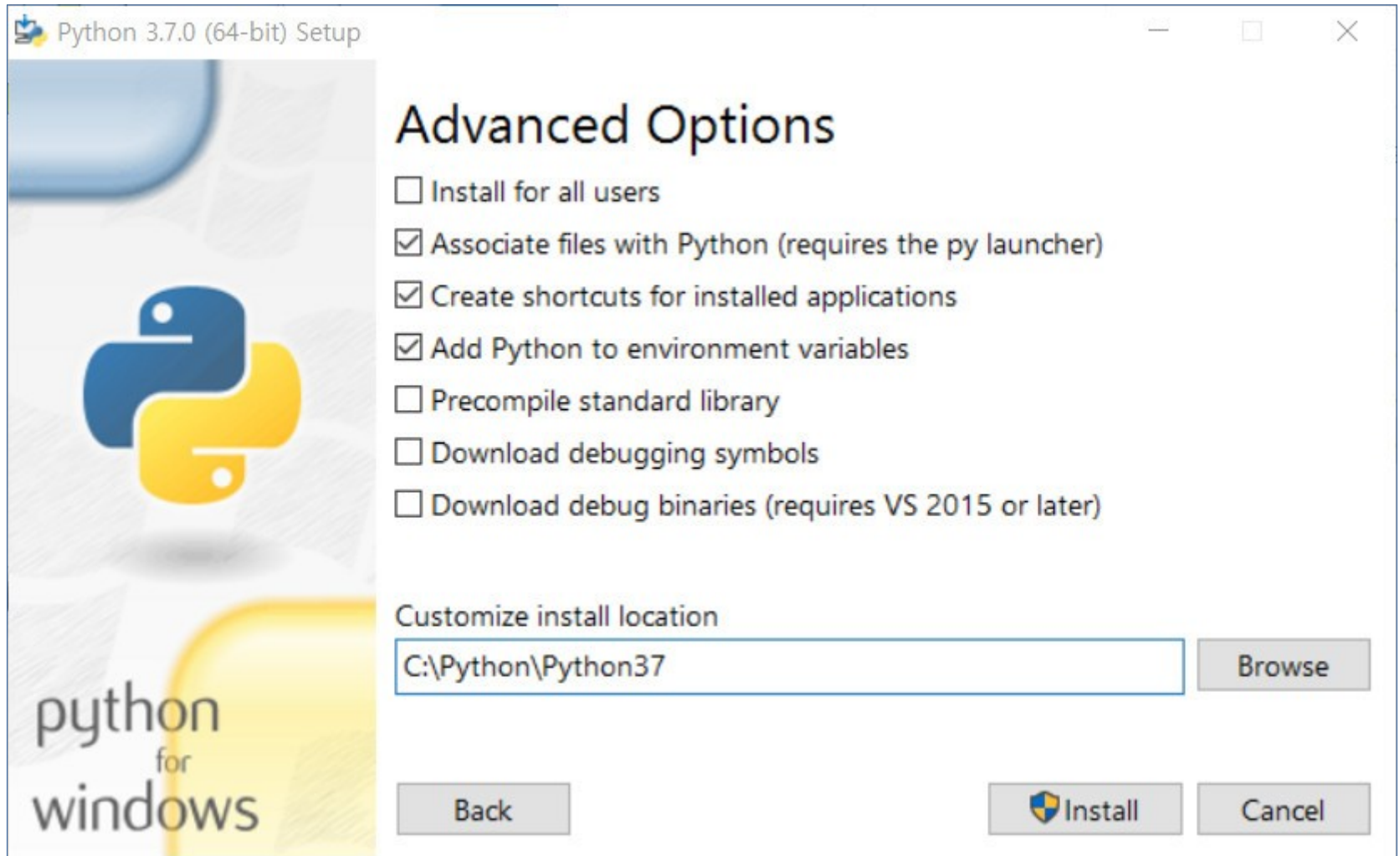
### ● 파이썬 다운로드





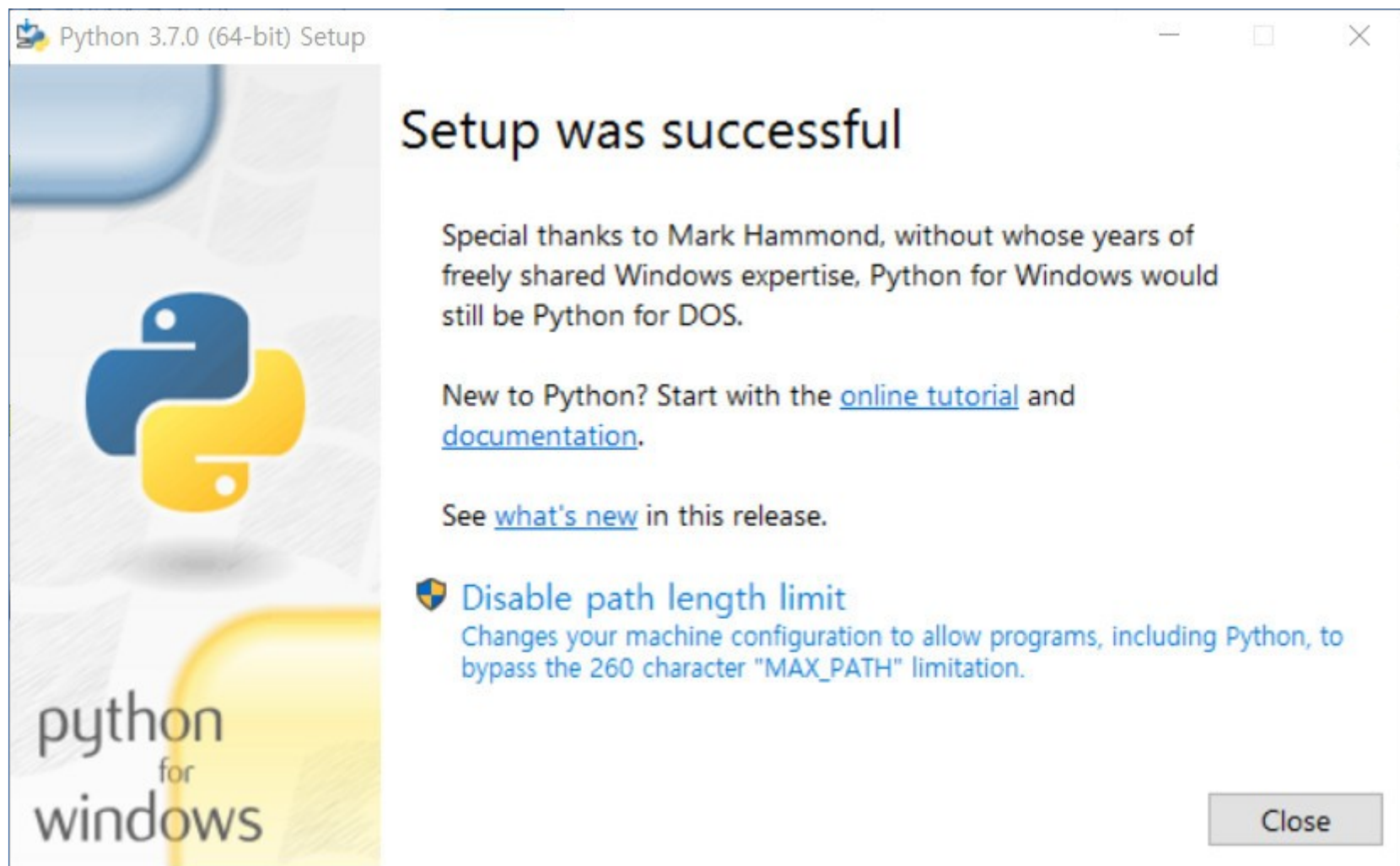
## ■ 파이썬 설치 - 1 (기본 설치)

### ● 파이썬 다운로드



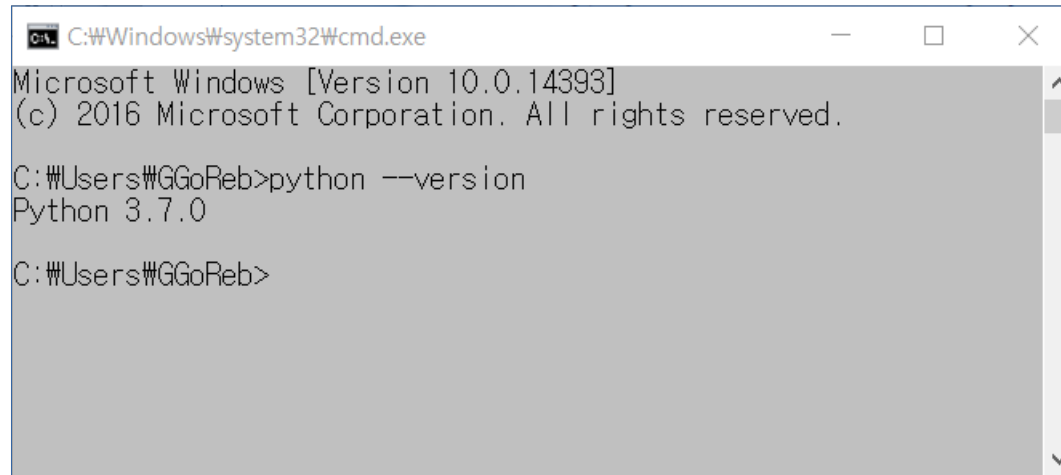
## ■ 파이썬 설치 - 1 (기본 설치)

### ● 파이썬 다운로드



## ■ 파이썬 설치 - 1 (기본 설치)

### ● 버전 확인

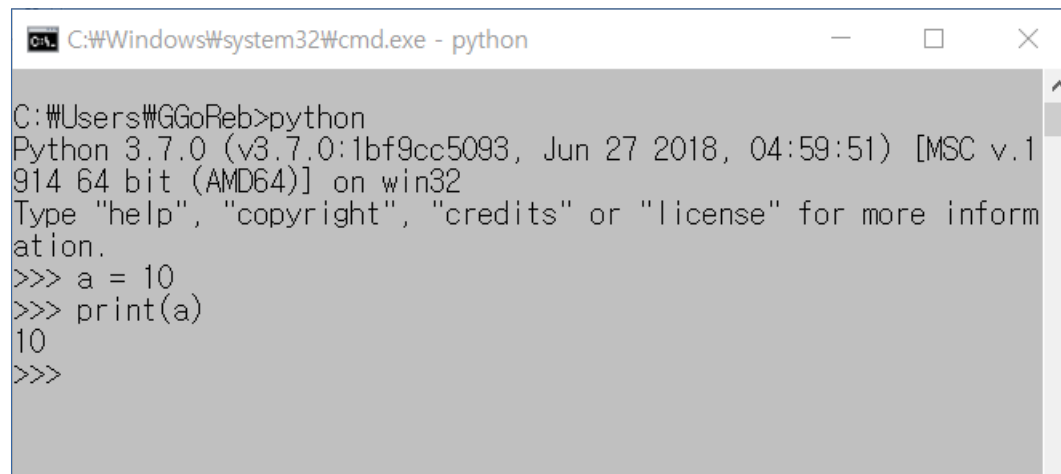


```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Users\GGoReb>python --version
Python 3.7.0

C:\Users\GGoReb>
```

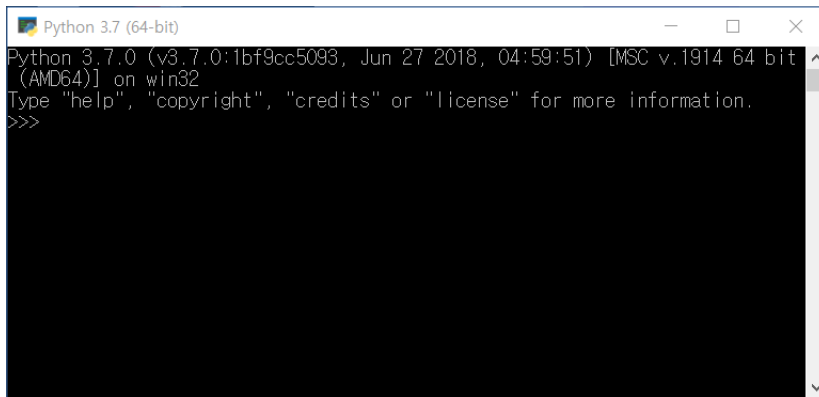
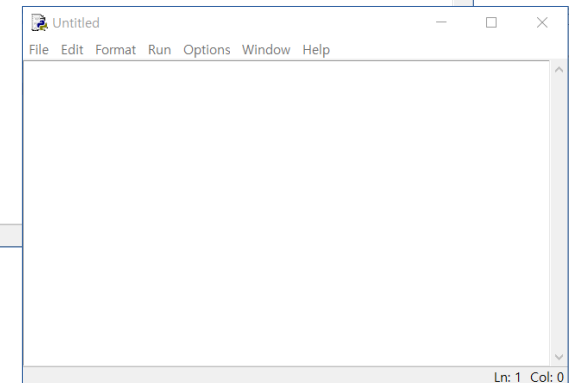
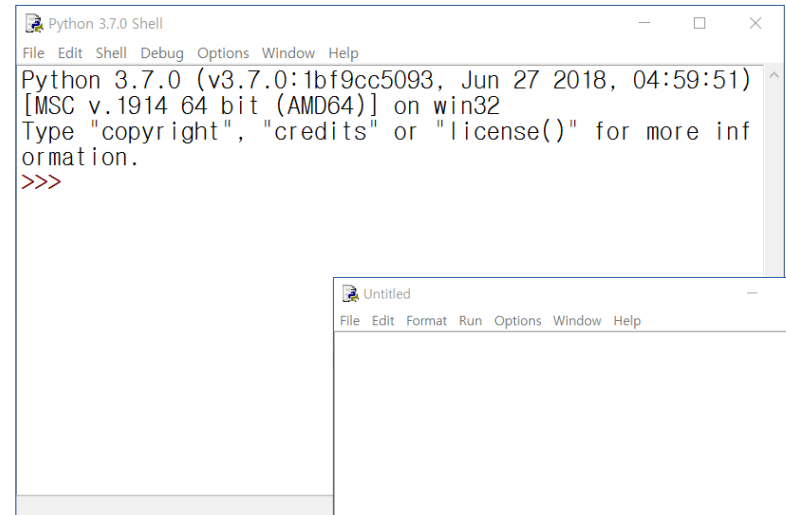
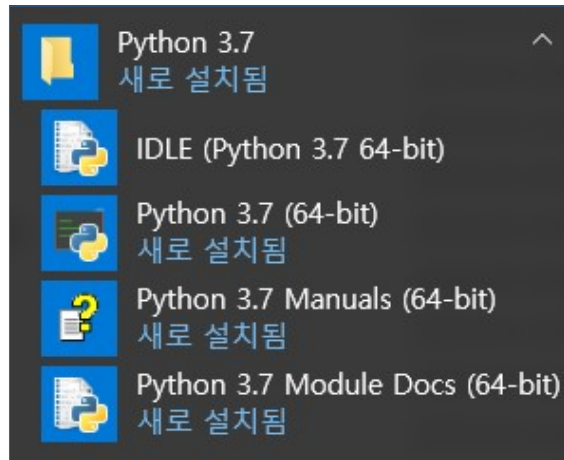
### ● 파이썬 명령 프롬프트



```
C:\Windows\system32\cmd.exe - python
C:\Users\GGoReb>python
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:59:51) [MSC v.1
914 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more inform
ation.
>>> a = 10
>>> print(a)
10
>>>
```

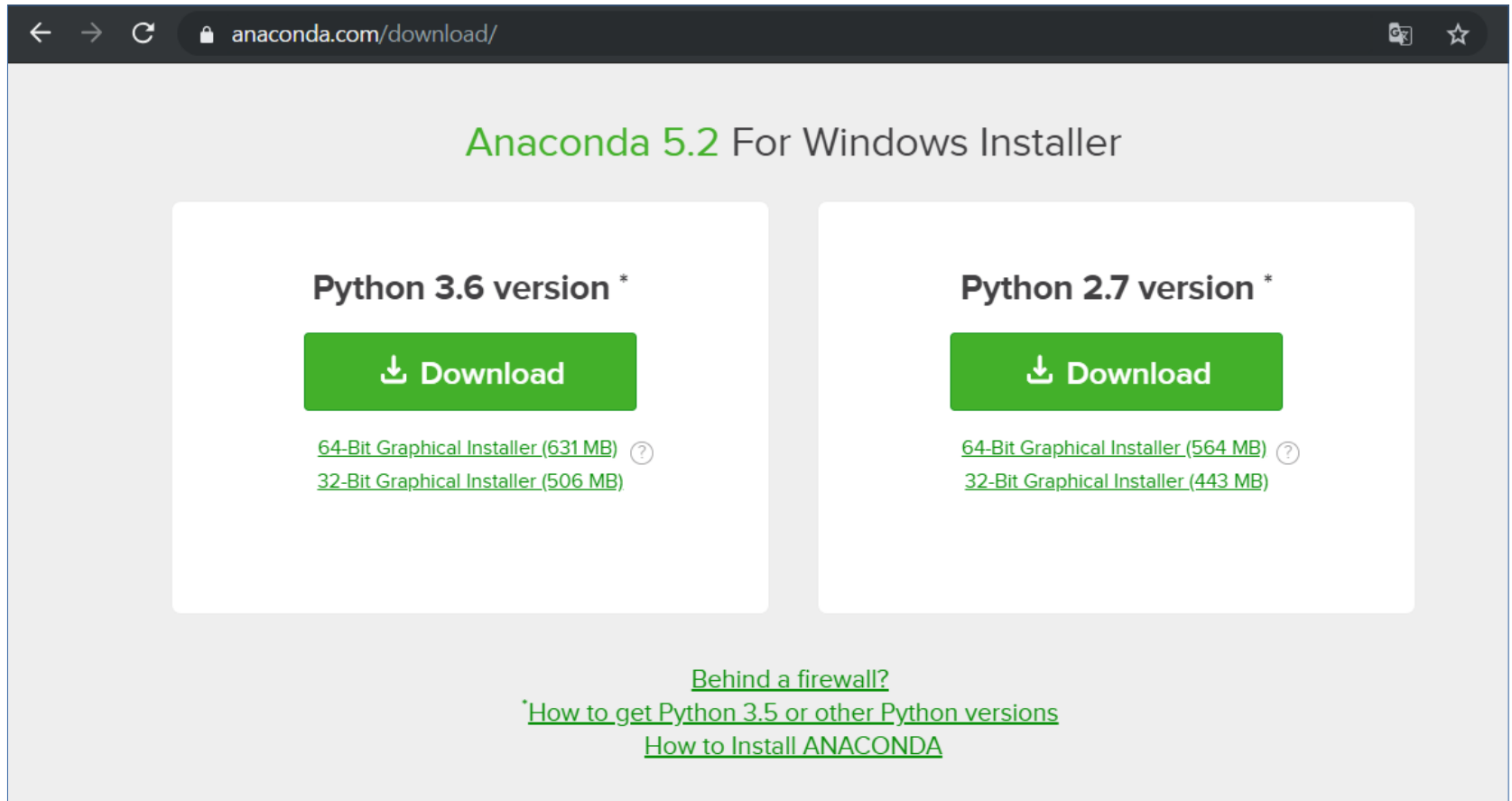
## ■ 파이썬 설치 - 1 (기본 설치)

### ● 개발 환경





## ■ 파이썬 설치 - 2 (아나콘다 설치)

### ● 아나콘다 다운로드





The screenshot shows a web browser window with the address bar displaying 'anaconda.com/download/'. The main heading is 'Anaconda 5.2 For Windows Installer'. Below this, there are two columns for different Python versions. The left column is for 'Python 3.6 version \*' and the right column is for 'Python 2.7 version \*'. Each column has a green 'Download' button with a download icon. Below the buttons, there are links for '64-Bit Graphical Installer' and '32-Bit Graphical Installer' with their respective sizes in parentheses and a question mark icon. At the bottom, there are three links: 'Behind a firewall?', '\*How to get Python 3.5 or other Python versions', and 'How to Install ANACONDA'.

← → ↻ [anaconda.com/download/](https://anaconda.com/download/)  

### Anaconda 5.2 For Windows Installer


#### Python 3.6 version \*


 **Download**

[64-Bit Graphical Installer \(631 MB\)](#) 

[32-Bit Graphical Installer \(506 MB\)](#)

#### Python 2.7 version \*

 **Download**

[64-Bit Graphical Installer \(564 MB\)](#) 

[32-Bit Graphical Installer \(443 MB\)](#)

[Behind a firewall?](#)  
[\\*How to get Python 3.5 or other Python versions](#)  
[How to Install ANACONDA](#)

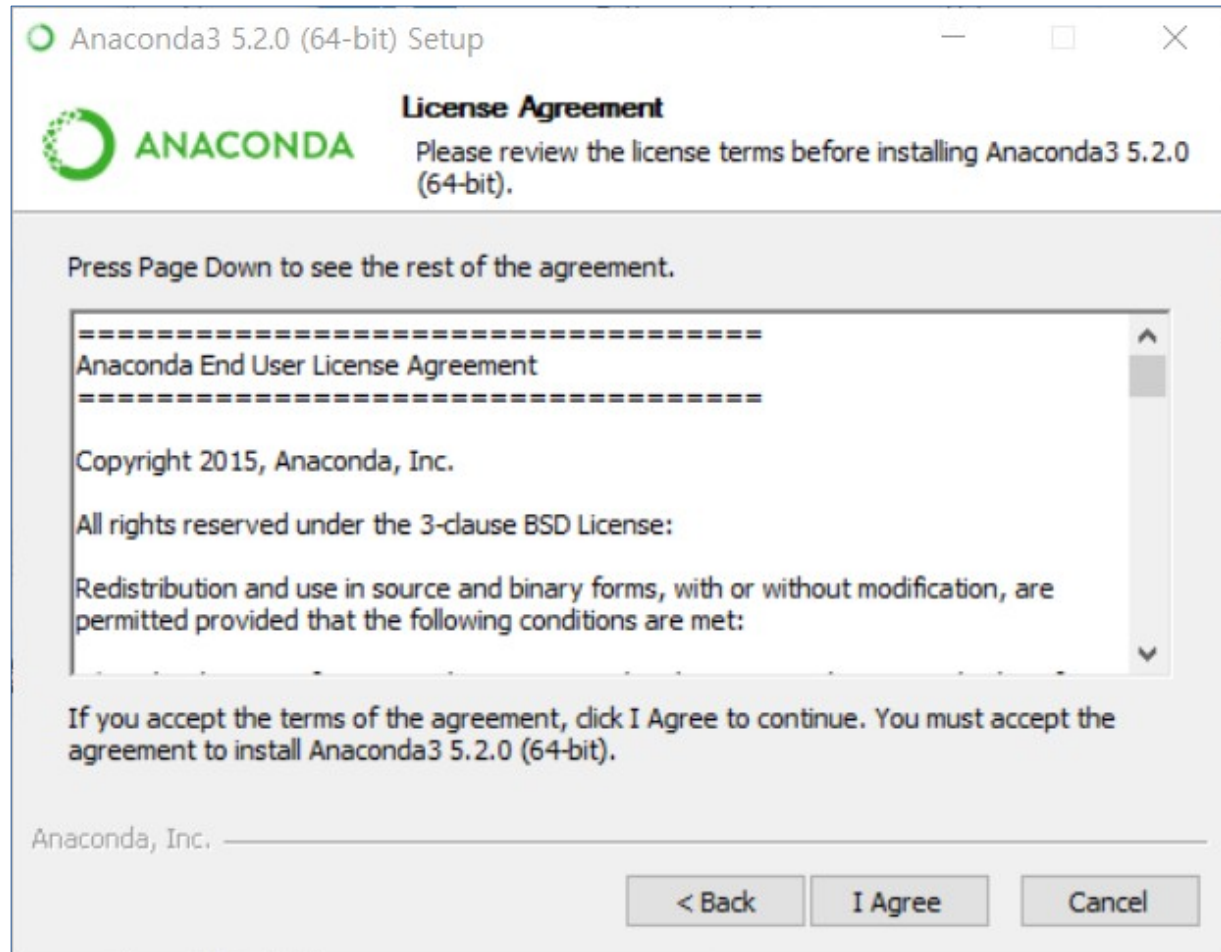
## ■ 파이썬 설치 - 2 (아나콘다 설치)

### ● 아나콘다 다운로드



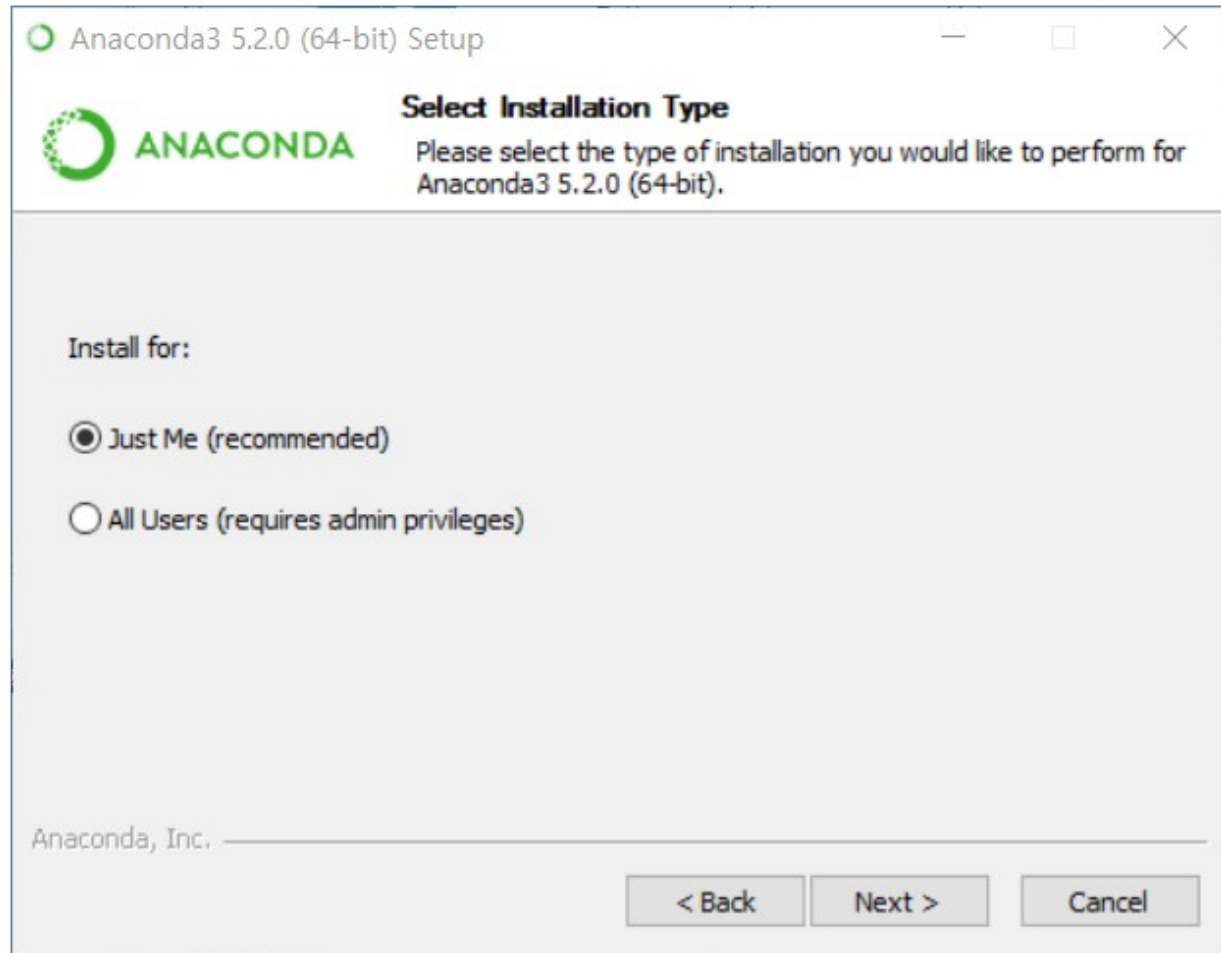
## ■ 파이썬 설치 - 2 (아나콘다 설치)

### ● 아나콘다 다운로드



## ■ 파이썬 설치 - 2 (아나콘다 설치)

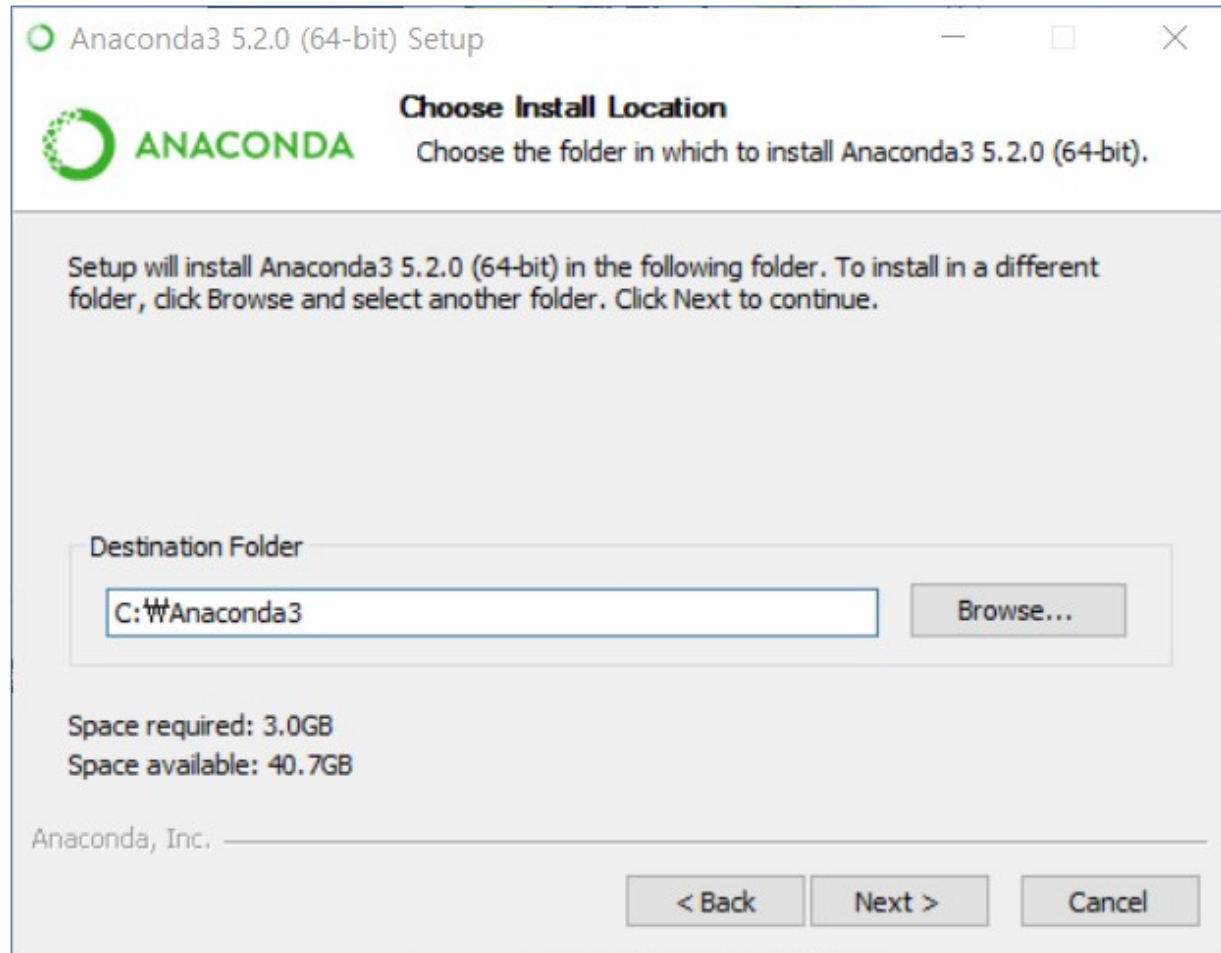
### ● 아나콘다 다운로드





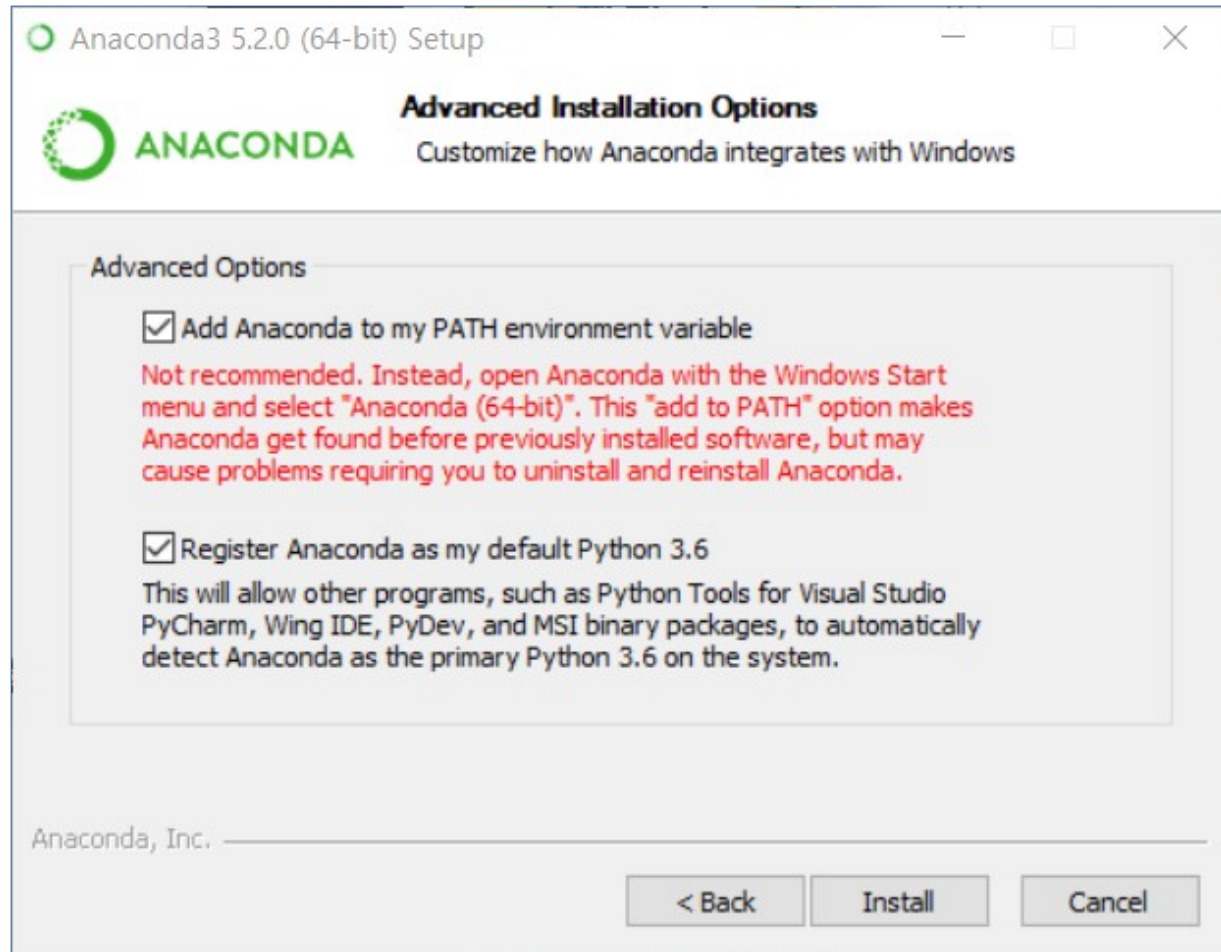
## ■ 파이썬 설치 - 2 (아나콘다 설치)

### ● 아나콘다 다운로드



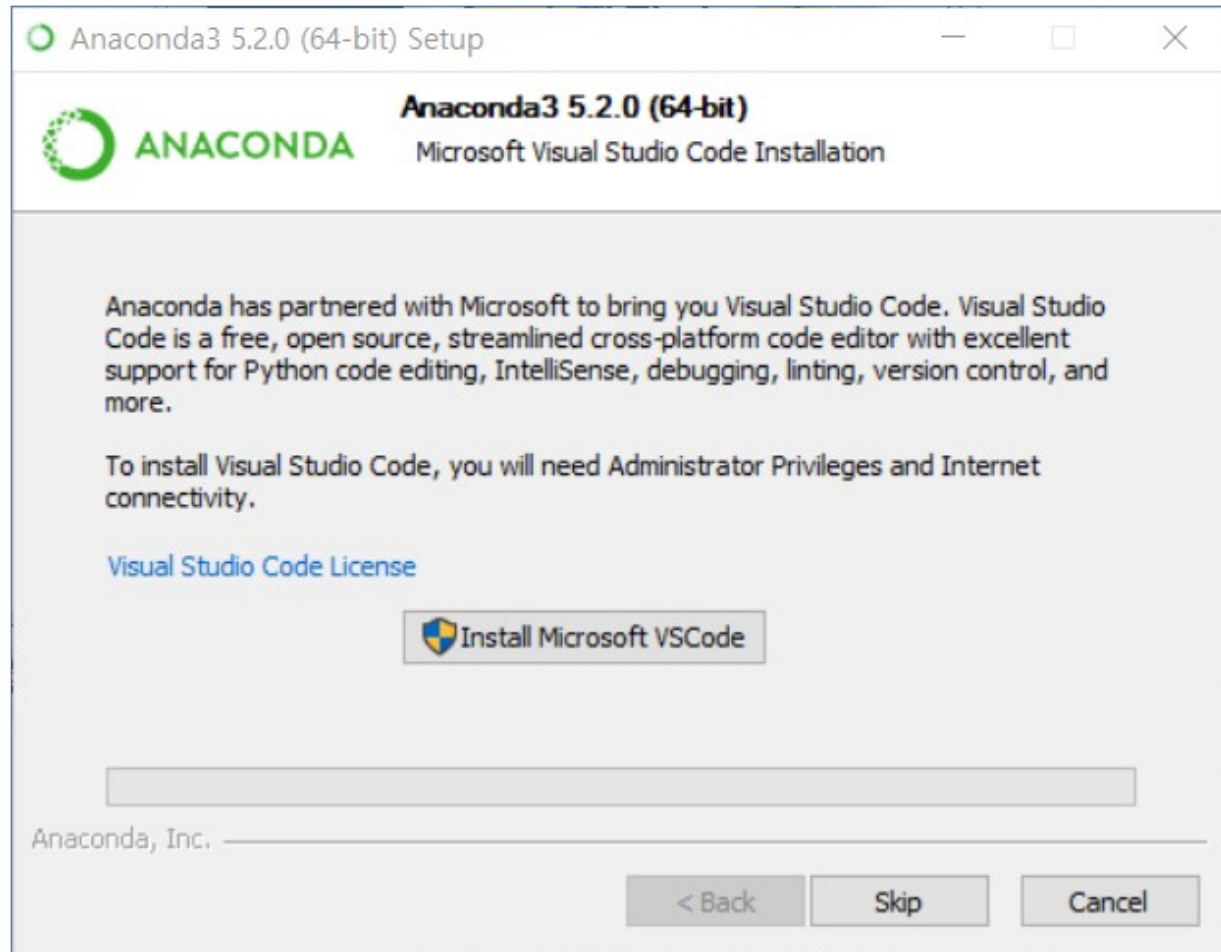
## ■ 파이썬 설치 - 2 (아나콘다 설치)

### ● 아나콘다 다운로드



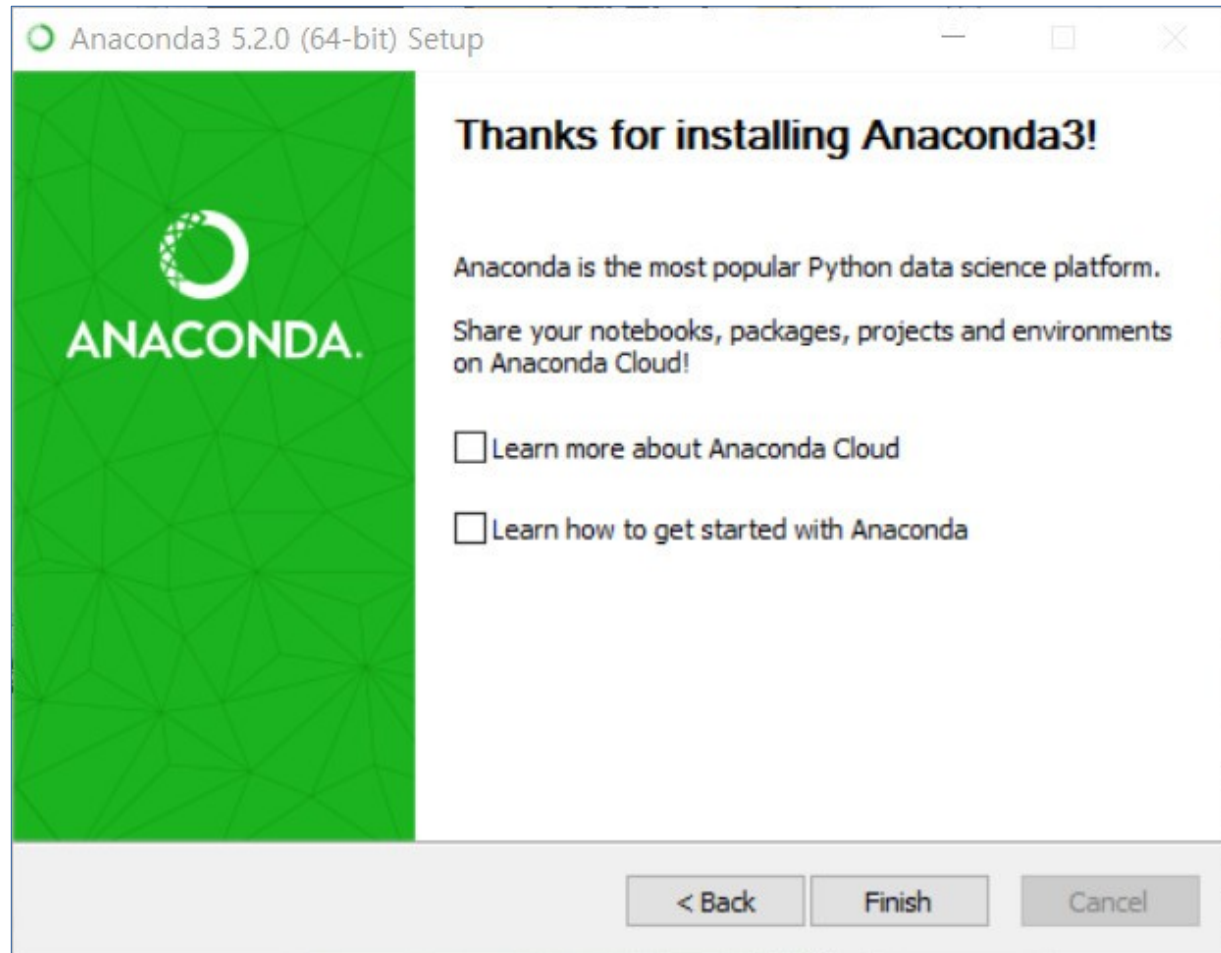
## ■ 파이썬 설치 - 2 (아나콘다 설치)

### ● 아나콘다 다운로드



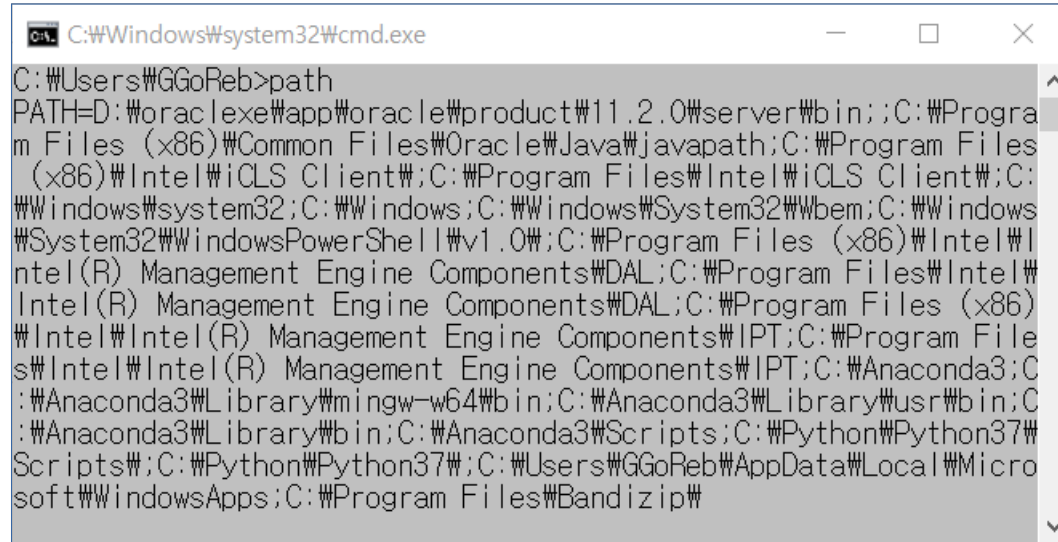
## ■ 파이썬 설치 - 2 (아나콘다 설치)

### ● 아나콘다 다운로드



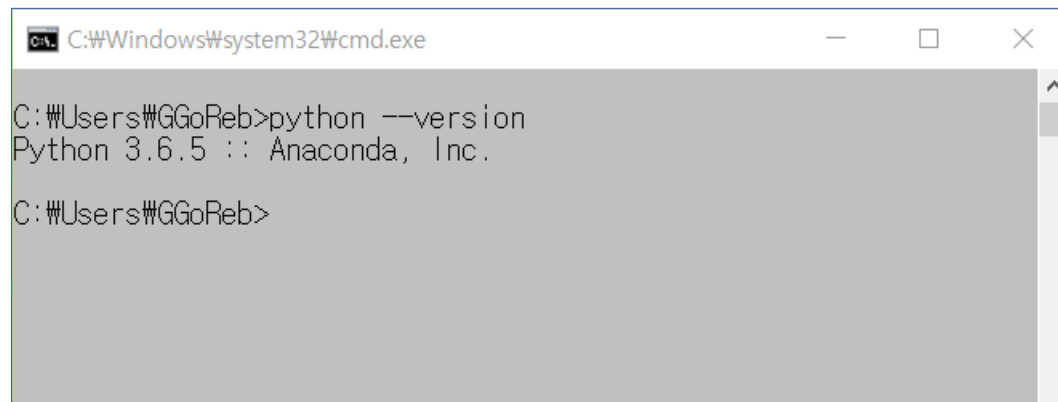
## ■ 파이썬 설치 - 2 (아나콘다 설치)

### ● 환경변수 확인



```
C:\Windows\system32\cmd.exe
C:\Users\GGoReb>path
PATH=D:\oracle\app\oracle\product\11.2.0\server\bin;;C:\Program Files (x86)\Common Files\Oracle\Java\javapath;C:\Program Files (x86)\Intel\iCLS Client\;C:\Program Files\Intel\iCLS Client\;C:\Windows\system32;C:\Windows;C:\Windows\System32\Wbem;C:\Windows\System32\WindowsPowerShell\v1.0\;C:\Program Files (x86)\Intel\Intel(R) Management Engine Components\DAL;C:\Program Files\Intel\Intel(R) Management Engine Components\DAL;C:\Program Files (x86)\Intel\Intel(R) Management Engine Components\IPT;C:\Program Files\Intel\Intel(R) Management Engine Components\IPT;C:\Anaconda3;C:\Anaconda3\Library\mingw-w64\bin;C:\Anaconda3\Library\usr\bin;C:\Anaconda3\Library\bin;C:\Anaconda3\Scripts;C:\Python\Python37\Scripts\;C:\Python\Python37\;C:\Users\GGoReb\AppData\Local\Microsoft\WindowsApps;C:\Program Files\Bandizip\
```

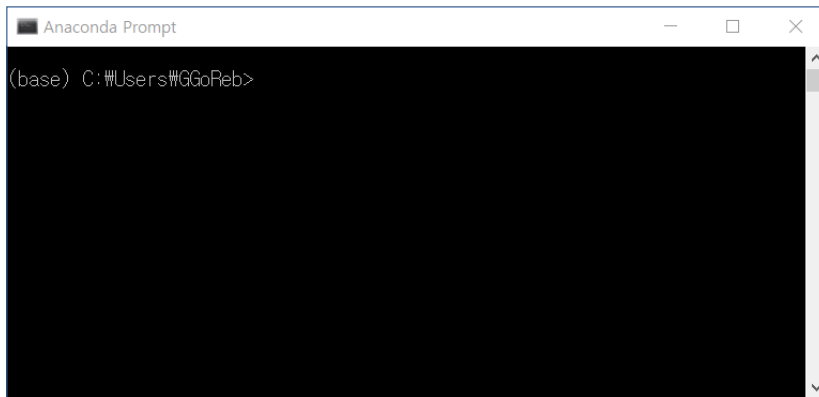
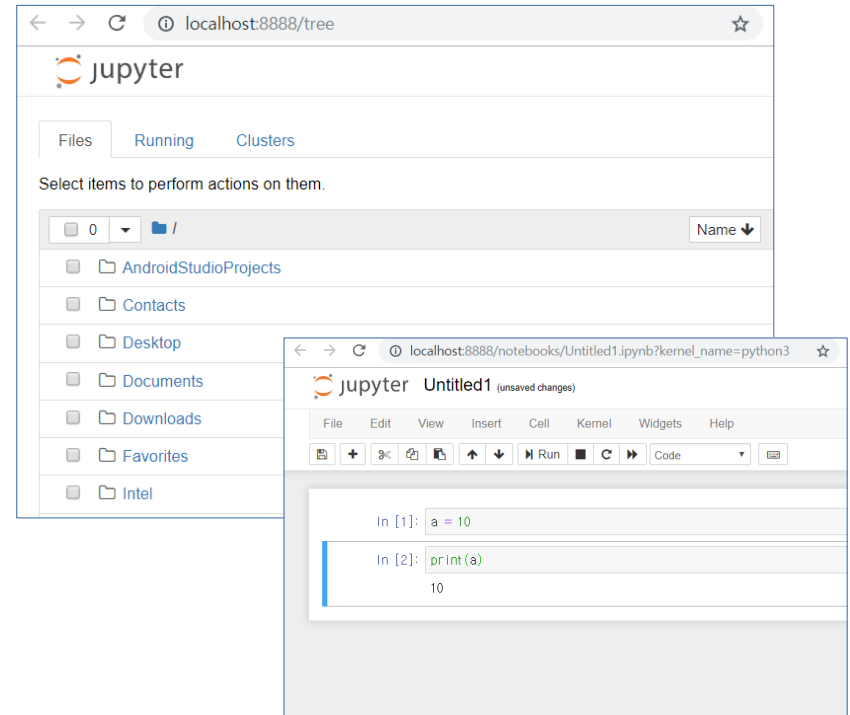
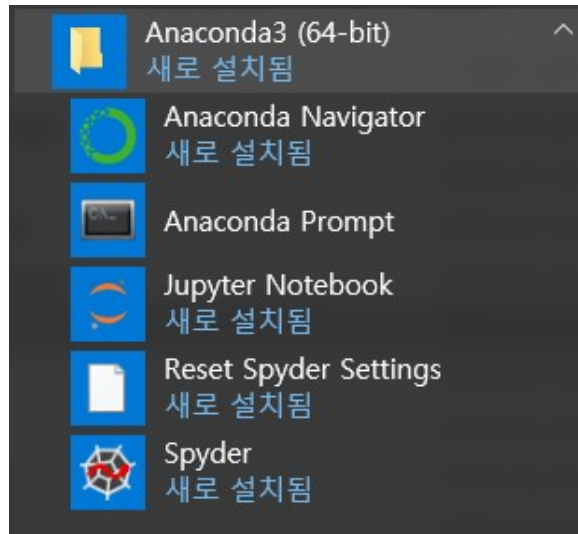
### ● 버전 확인



```
C:\Windows\system32\cmd.exe
C:\Users\GGoReb>python --version
Python 3.6.5 :: Anaconda, Inc.
C:\Users\GGoReb>
```

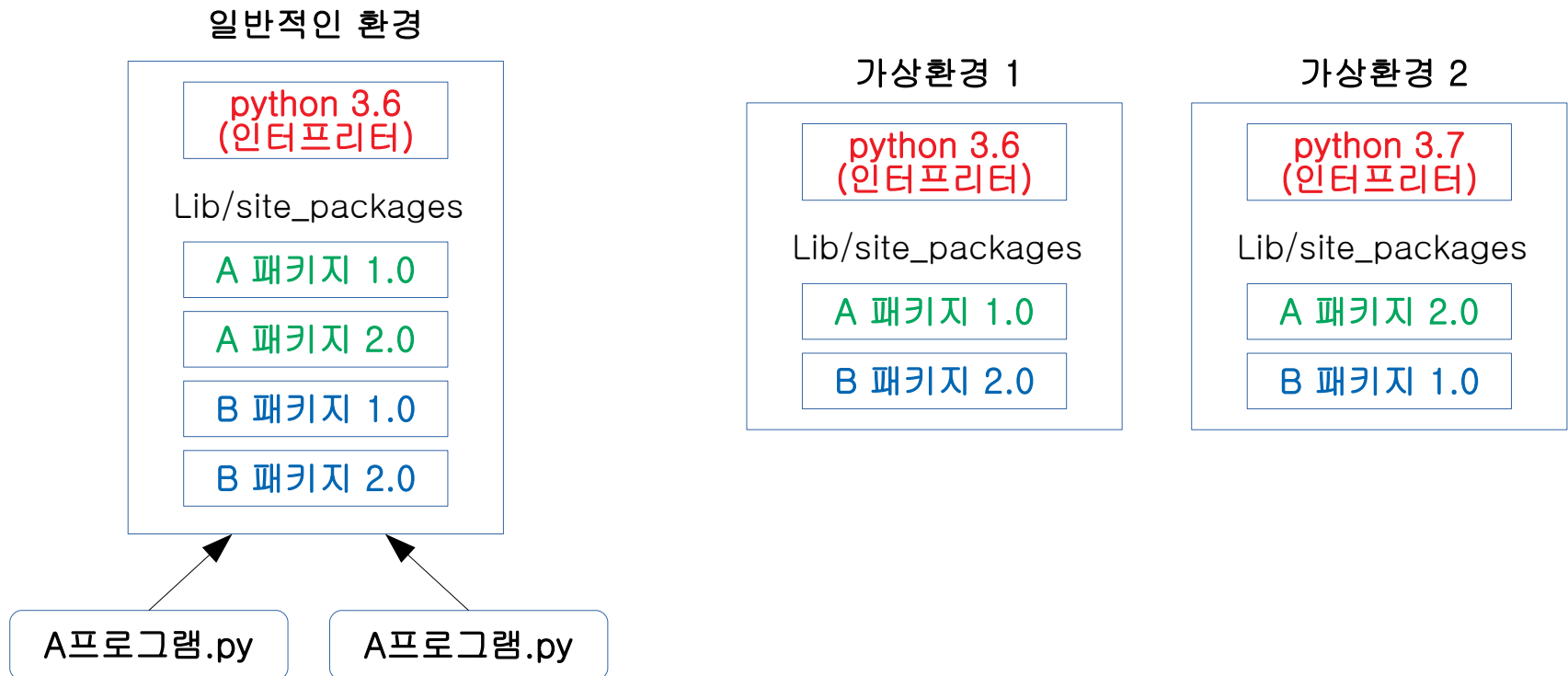
## ■ 파이썬 설치 - 2 (아나콘다 설치)

### ● 개발 환경



## ■ 가상 환경

- 파이썬 응용프로그램은 종종 표준 라이브러리 이외의 패키지와 모듈을 사용
- 최신으로 제공되는 라이브러리만으로는 동작이 불가능한 경우 발생
  - 이전 버전 또는 버그가 수정된 특정 버전을 사용하여 프로그램 작성
- 파이썬은 가상 환경이라는 해결책을 제공하여 해결



## ■ 가상 환경 만들기 - 1

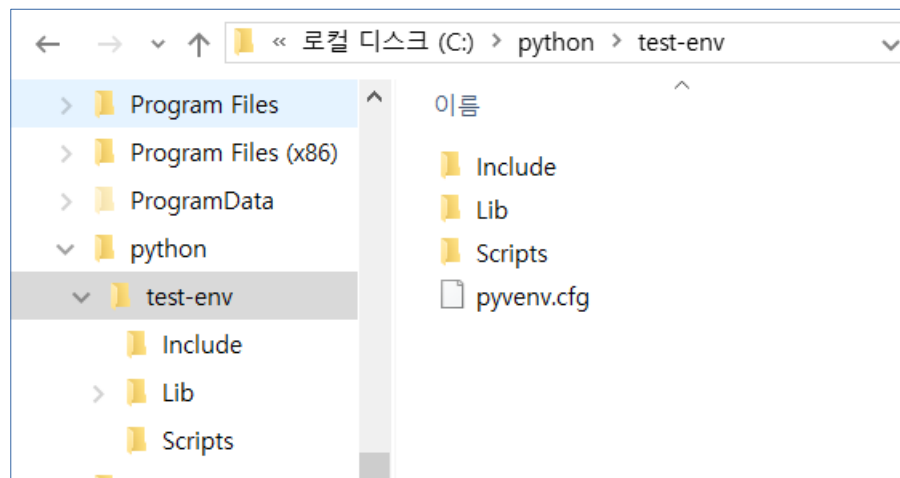
- 파이썬에서 기본적으로 제공하는 venv 모듈 사용
- 가상 환경을 만들 디렉토리로 이동 후 명령어 입력

```
C:\Windows\system32\cmd.exe

C:\python>python -m venv test-env

C:\python>
```

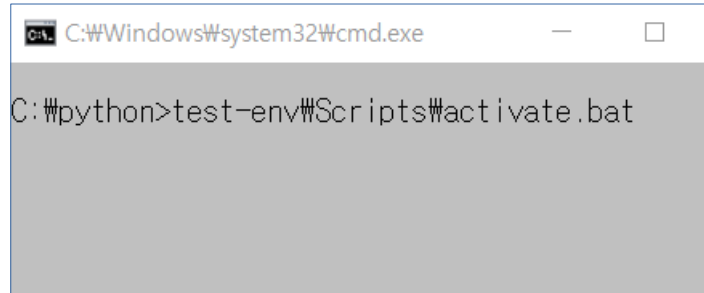
## ● 생성 결과 확인





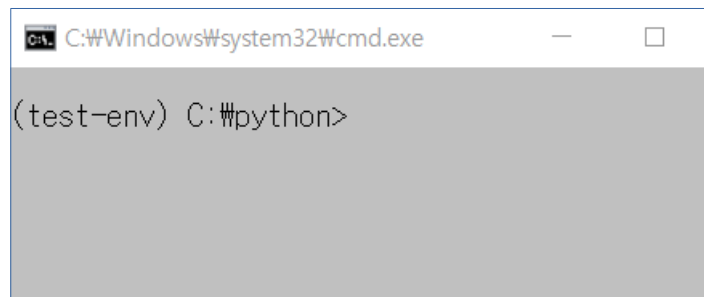
## ■ 가상 환경 만들기 - 1

### ● 가상 환경 실행



```
C:\Windows\system32\cmd.exe

C:\python>test-env\Scripts\activate.bat
```



```
C:\Windows\system32\cmd.exe

(test-env) C:\python>
```

## ■ 가상 환경 만들기 - 2

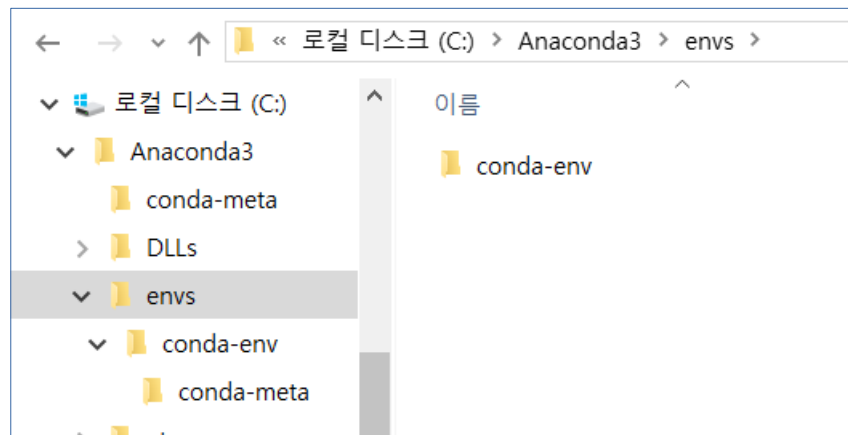
### ● 아나콘다의 명령어 사용

### ● 현재 경로와 상관없이 아나콘다 설치 디렉토리의 envs 디렉토리에 생성

```
C:\Windows\system32\cmd.exe - con...  
  
C:\python>conda create --name conda-env  
Solving environment: done  
  
## Package Plan ##  
  
  environment location: C:\Anaconda3\envs\conda-  
-env  
  
Proceed ([y]/n)?
```

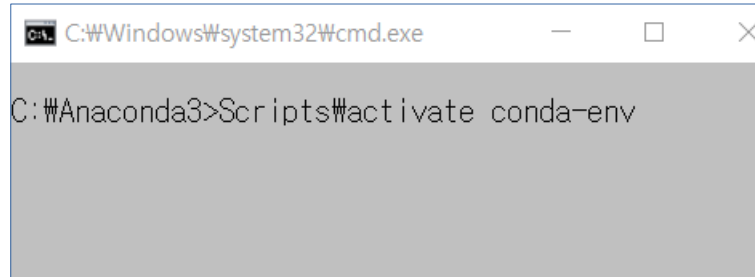
```
C:\Windows\system32\cmd.exe  
  
Preparing transaction: done  
Verifying transaction: done  
Executing transaction: done  
#  
# To activate this environment, use:  
# > activate conda-env  
#  
# To deactivate an active environment, use:  
# > deactivate  
#  
# * for power-users using bash, you must source  
#  
  
C:\python>
```

### ● 생성 결과 확인

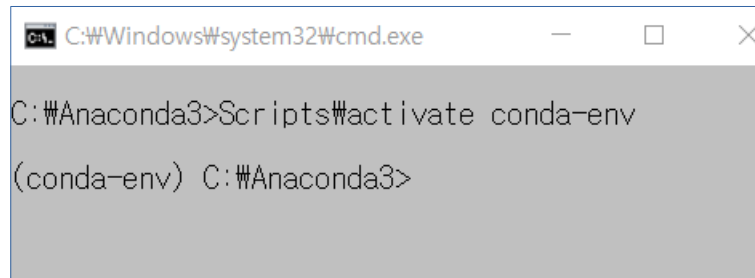


## ■ 가상 환경 만들기 - 2

### ● 가상 환경 실행



```
C:\Windows\system32\cmd.exe
C:\Anaconda3>Scripts\activate conda-env
```



```
C:\Windows\system32\cmd.exe
C:\Anaconda3>Scripts\activate conda-env
(conda-env) C:\Anaconda3>
```

## ■ 패키지 관리 - 1

- 파이썬에서 기본적으로 제공하는 pip 명령어 사용
- 검색 (search) - <https://pypi.org>

```
(tutorial-env) $ pip search astronomy
skyfield          - Elegant astronomy for Python
gary              - Galactic astronomy and gravitational dynamics.
novas              - The United States Naval Observatory NOVAS astronomy library
astroobs          - Provides astronomy ephemeris to plan telescope observations
PyAstronomy       - A collection of astronomy related tools for Python.
...
```

- 설치 (install) / 삭제 (uninstall)

```
(tutorial-env) $ pip install novas
Collecting novas
  Downloading novas-3.1.1.3.tar.gz (136kB)
Installing collected packages: novas
  Running setup.py install for novas
Successfully installed novas-3.1.1.3
```

- 설치 (install ==version)

```
(tutorial-env) $ pip install requests==2.6.0
Collecting requests==2.6.0
  Using cached requests-2.6.0-py2.py3-none-any.whl
Installing collected packages: requests
Successfully installed requests-2.6.0
```

## ■ 패키지 관리 - 1

### ● 업그레이드 (install --upgrade)

```
(tutorial-env) $ pip install --upgrade requests
Collecting requests
Installing collected packages: requests
  Found existing installation: requests 2.6.0
    Uninstalling requests-2.6.0:
      Successfully uninstalled requests-2.6.0
Successfully installed requests-2.7.0
```

### ● 설치된 패키지 정보 확인 (show)

```
(tutorial-env) $ pip show requests
---
Metadata-Version: 2.0
Name: requests
Version: 2.7.0
Summary: Python HTTP for Humans.
Home-page: http://python-requests.org
Author: Kenneth Reitz
Author-email: me@kennethreitz.com
License: Apache 2.0
Location: /Users/akuchling/envs/tutorial-env/lib/python3.4/site-packages
Requires:
```

## ■ 패키지 관리 - 1

### ● 설치된 패키지 목록 확인 (list)

```
(tutorial-env) $ pip list  
novas (3.1.1.3)  
numpy (1.9.2)  
pip (7.0.3)  
requests (2.7.0)  
setuptools (16.0)
```

### ● 설치된 패키지 목록 확인 (freeze)

- list와 비슷한 기능이지만 install에서 사용할 수 있는 형식으로 목록 생성
- text 파일로 목록을 저장해뒀다가 복구하는 용도로도 사용

```
(tutorial-env) $ pip freeze > requirements.txt  
(tutorial-env) $ cat requirements.txt  
novas==3.1.1.3  
numpy==1.9.2  
requests==2.7.0
```

## ■ 패키지 관리 - 1

### ● 설치된 패키지 목록 확인 (freeze)

- list와 비슷한 기능이지만 install에서 사용할 수 있는 형식으로 목록 생성
- text 파일로 목록을 저장해뒀다가 복구하는 용도로도 사용

```
(tutorial-env) $ pip install -r requirements.txt
Collecting novas==3.1.1.3 (from -r requirements.txt (line 1))
...
Collecting numpy==1.9.2 (from -r requirements.txt (line 2))
...
Collecting requests==2.7.0 (from -r requirements.txt (line 3))
...
Installing collected packages: novas, numpy, requests
  Running setup.py install for novas
Successfully installed novas-3.1.1.3 numpy-1.9.2 requests-2.7.0
```

사용법 <https://docs.python.org/ko/3/installing/index.html#installing-index>

패키지 목록 <https://pypi.org>

## ■ 패키지 관리 - 2

- 아나콘다 conda 명령어 사용
- 현재 환경 정보 : `conda info`
- 검색 : `conda search [패키지명]`
- 설치
  - `conda install [패키지명]`
  - `conda install [패키지명]=[버전]`
  - `conda install [패키지명]=[버전]=[파이썬버전]`
- 업그레이드 : `conda update [패키지명]`
- 삭제 : `conda remove [패키지명]`
- 설치된 목록 확인 : `conda list --export > [text 파일명]`
- 목록으로 설치 : `conda install --file [text 파일명]`