

Install from Anaconda to OpenAI Gym

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Reinforcement Learning KR

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Outline

1. Anaconda
2. PyTorch
3. TensorBoard with PyTorch
4. OpenAI Gym
5. VSCode

Anaconda

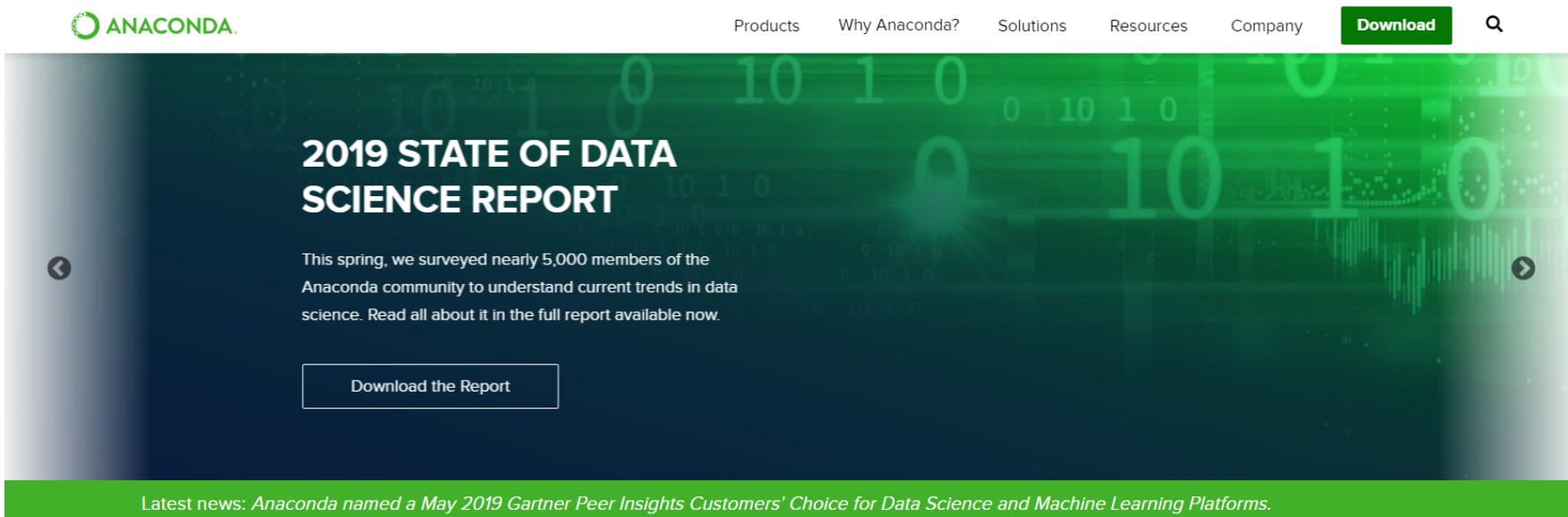


- 다양한 수학/과학, 시각화 라이브러리부터 머신러닝 라이브러리까지 쉽게 설치 가능하도록 지원하는 플랫폼
- 하나의 독립적인 환경을 만들어 라이브러리, 의존성 등을 쉽게 관리할 수 있음
- 윈도우, 맥, 리눅스 환경에서 모두 사용 가능

Anaconda

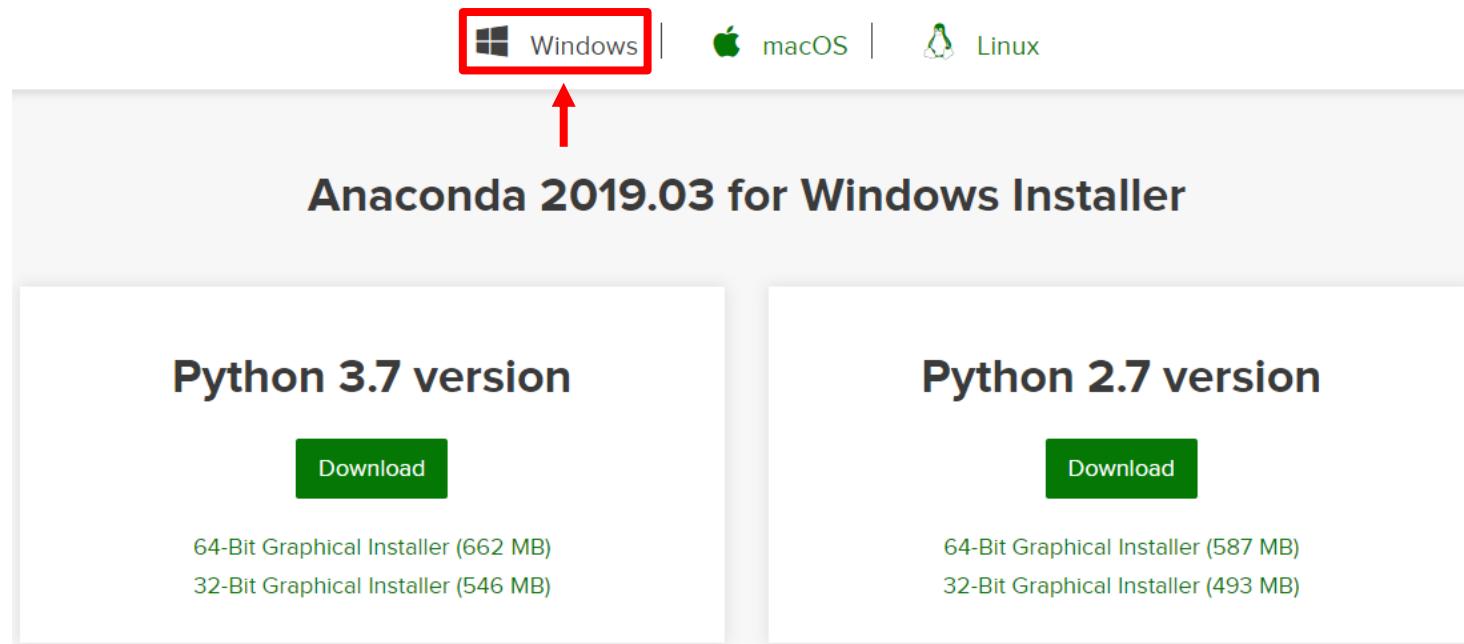
Anaconda download (운영체제 및 CPU에 맞춰서 다운로드)

- <https://www.anaconda.com>



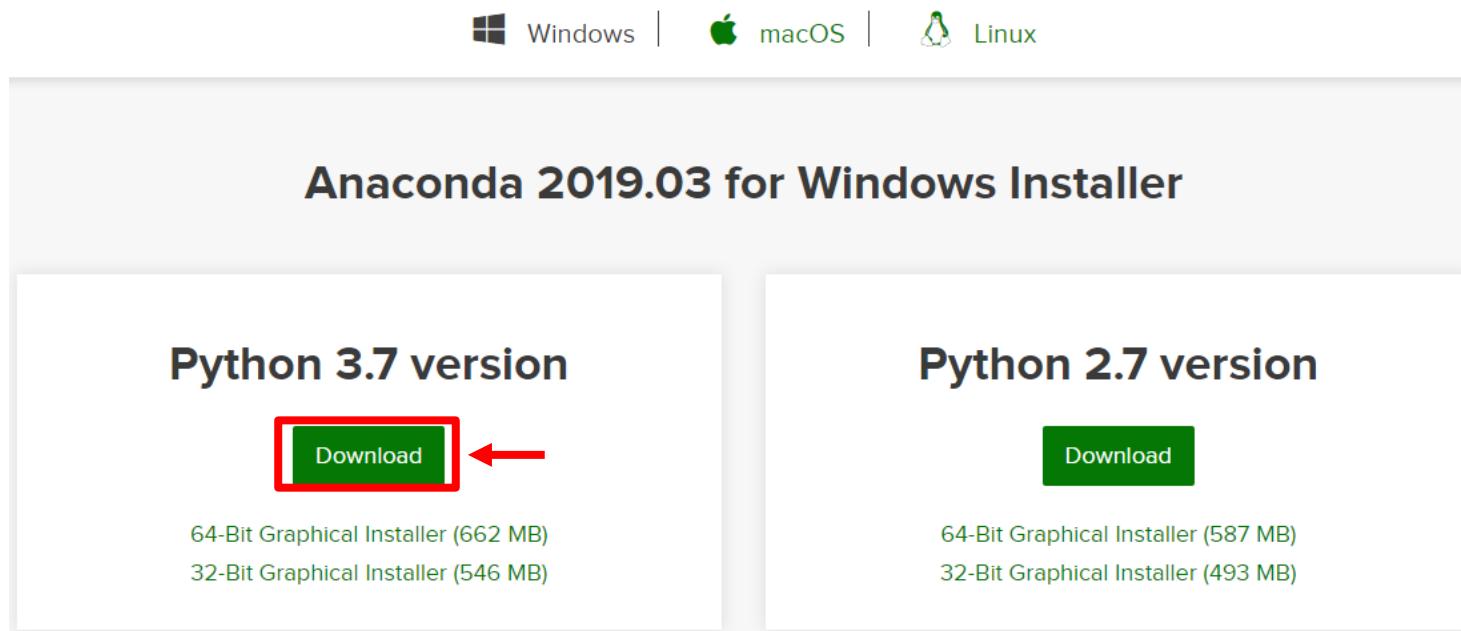
Anaconda

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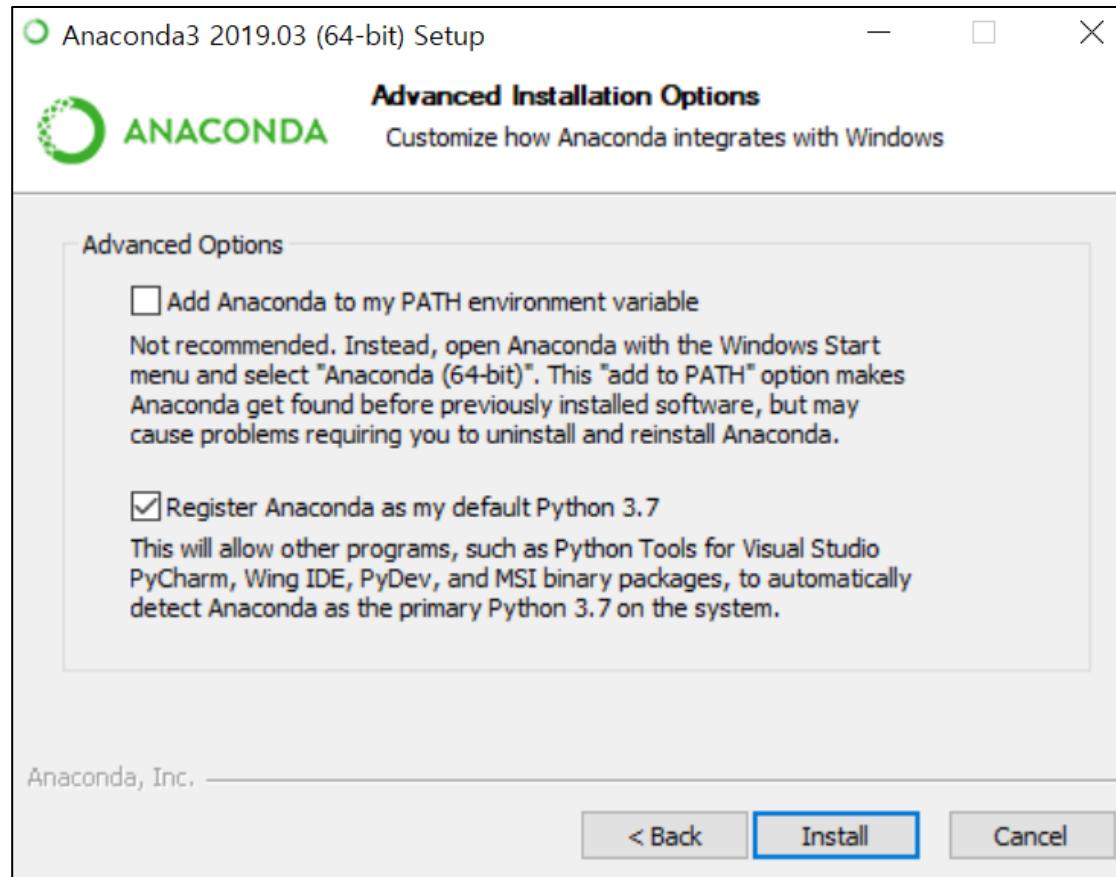
Anaconda

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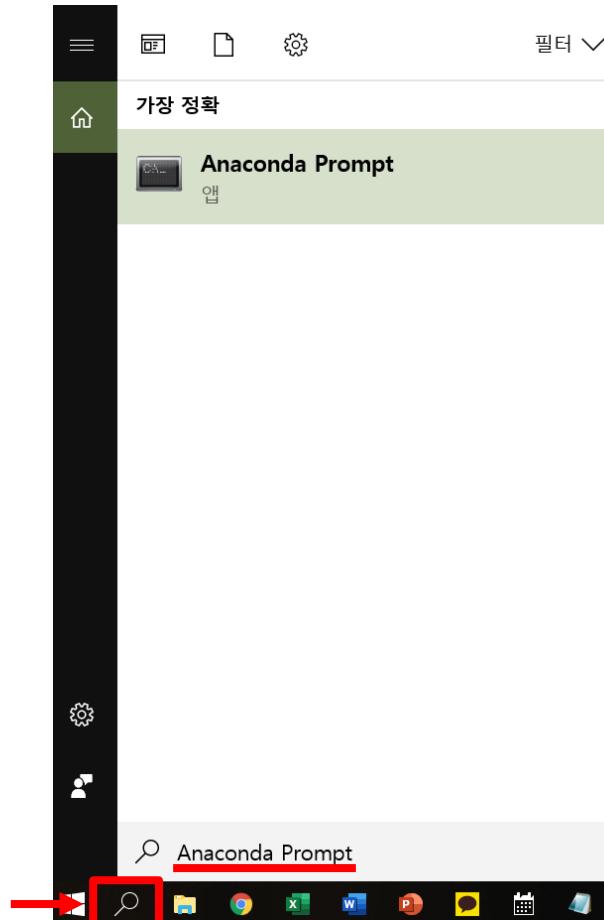
Anaconda

다운로드 폴더에서 설치파일을 클릭하여 다운로드 받기



Anaconda

Window 검색에서 Anaconda Prompt 실행



Anaconda

Anaconda version 확인

- conda -V

새로 만들 환경의 이름
자유롭게 설정 가능

새로운 환경 생성

- conda create -n env_name python=3.6 ← 새로 만들 환경의 파이썬 버전
실습에서는 3.6 사용
- y/n 나오면 y

가상환경 목록보기

- conda env list

가상환경 활성화 / 비활성화 하기

- 활성화 - conda activate env_name
- 비활성화 - conda deactivate

```
(base) C:\Users\Lee2>conda activate rl-env
(rl-env) C:\Users\Lee2>conda deactivate
```

PyTorch

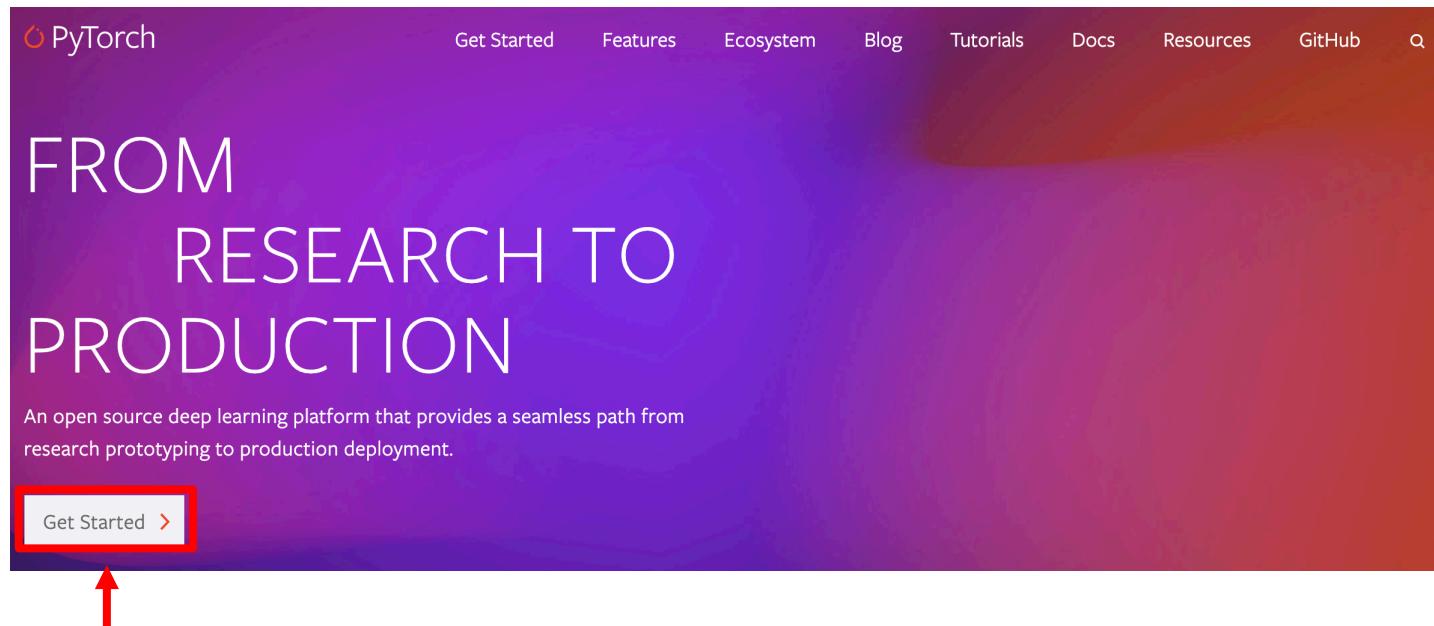


- Numpy를 대체하고 GPU를 쉽게 사용할 수 있음
- 최고의 유연성과 속도를 제공하는 딥러닝 연구 플랫폼
- 이해와 디버깅이 쉽고 직관적이며, 간결한 코드(Pythonic code)로 구성
- Define-by-Run 방식을 기반으로 한 실시간 결과값을 시각화
- 파이썬 라이브러리(Numpy, Matplotlib 등)와 높은 호환성을 가짐

PyTorch

Install PyTorch (운영체제 및 CPU에 맞춰서 다운로드)

➤ <https://pytorch.org>



PyTorch

Install PyTorch (운영체제 및 CPU에 맞춰서 다운로드)

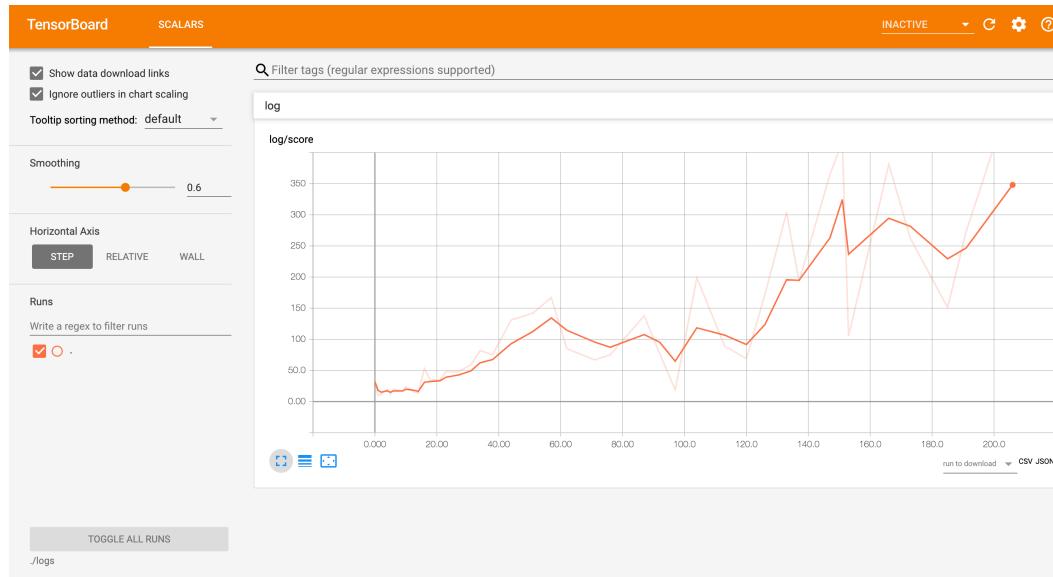
➤ `conda install pytorch-cpu torchvision-cpu -c pytorch`

START LOCALLY

Select your preferences and run the install command. Stable represents the most currently tested and supported version of PyTorch 1.1. This should be suitable for many users. Preview is available if you want the latest, not fully tested and supported, 1.1 builds that are generated nightly. Please ensure that you have **met the prerequisites below (e.g., numpy)**, depending on your package manager. Anaconda is our recommended package manager since it installs all dependencies. You can also **install previous versions of PyTorch**. Note that LibTorch is only available for C++.

PyTorch Build	Stable (1.1)	Preview (Nightly)			
Your OS	Linux	Mac	Windows		
Package	Conda	Pip	LibTorch	Source	
Language	Python 2.7	Python 3.5	Python 3.6	Python 3.7	C++
CUDA	9.0	10.0	None		
Run this Command:	<code>conda install pytorch-cpu torchvision-cpu -c pytorch</code>				

TensorBoard with PyTorch



- TensorFlow의 TensorBoard처럼 PyTorch에서도 시각적으로 볼 수 있도록 만든 라이브러리
- 강화학습 알고리즘 구현 시, episode마다 return값이 얼마나 나오는지 쉽게 볼 수 있음
- <https://pytorch.org/docs/stable/tensorboard.html>

TensorBoard with PyTorch

Install TensorBoard

- conda update pytorch torchvision -c pytorch
- pip install tensorboard
- pip install tb-nightly
- pip install future

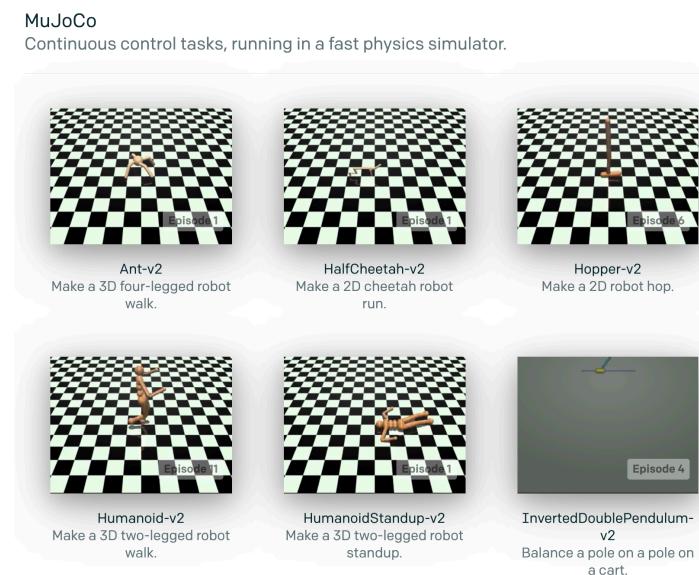
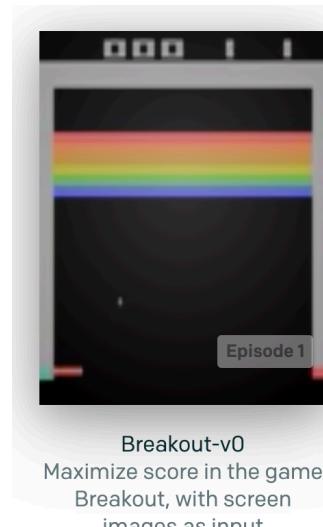
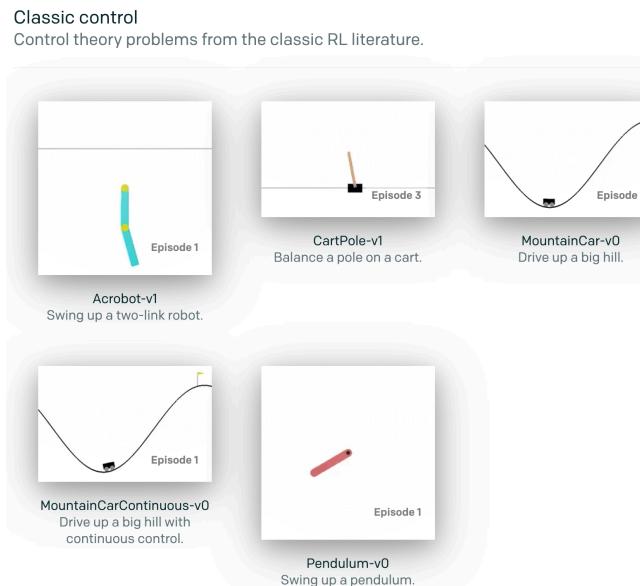
Reference

- <https://www.endtoend.ai/blog/pytorch-tensorboard/>

OpenAI Gym



- OpenAI에서 강화학습 알고리즘을 테스트할 수 있는 간단한 환경들을 제공
- Tensorflow나 PyTorch와 같은 수치 계산 라이브러리와도 호환됨



OpenAI Gym

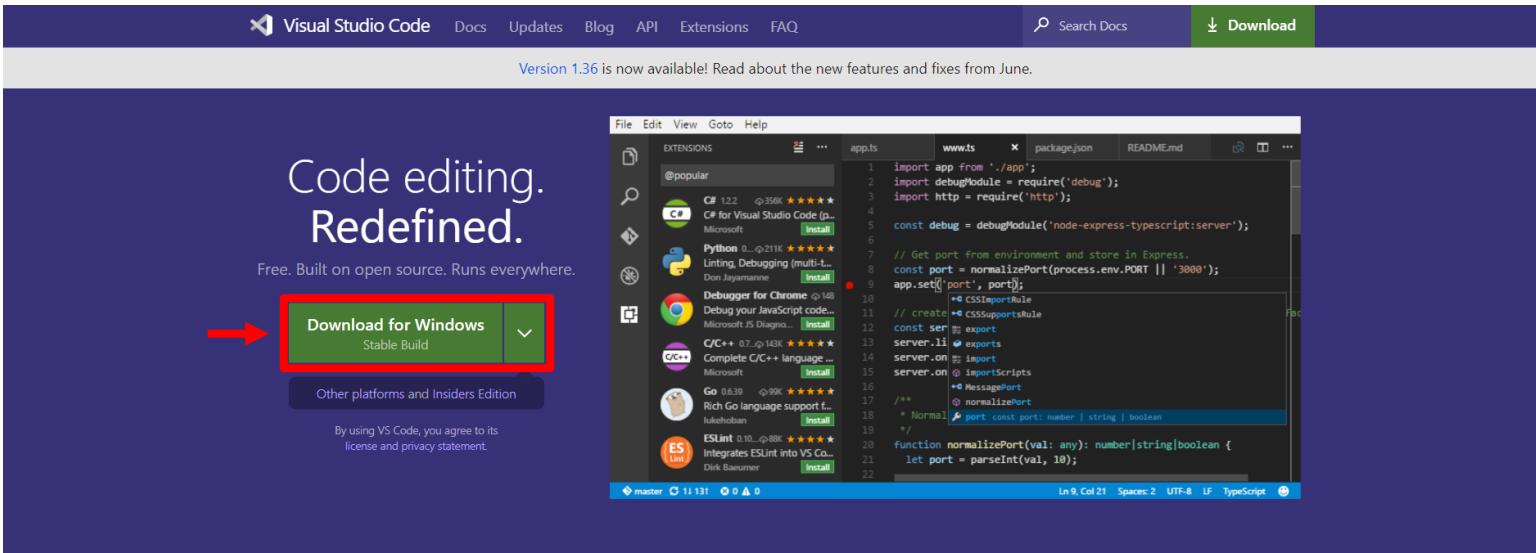
Install Gym

➤ pip install gym

VSCode

Install VSCode

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



IntelliSense



Debugging



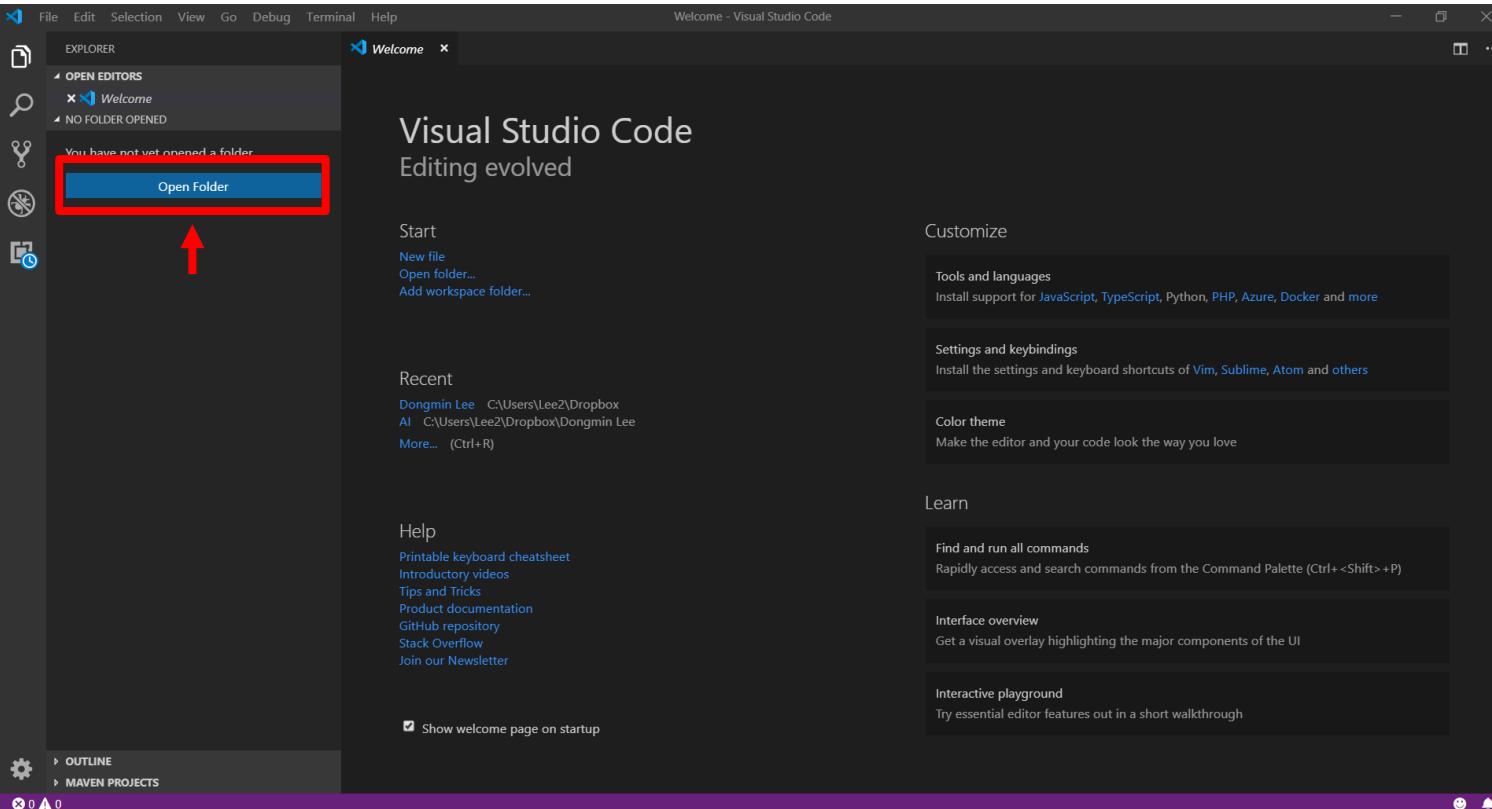
Built-in Git



Extensions

VSCode

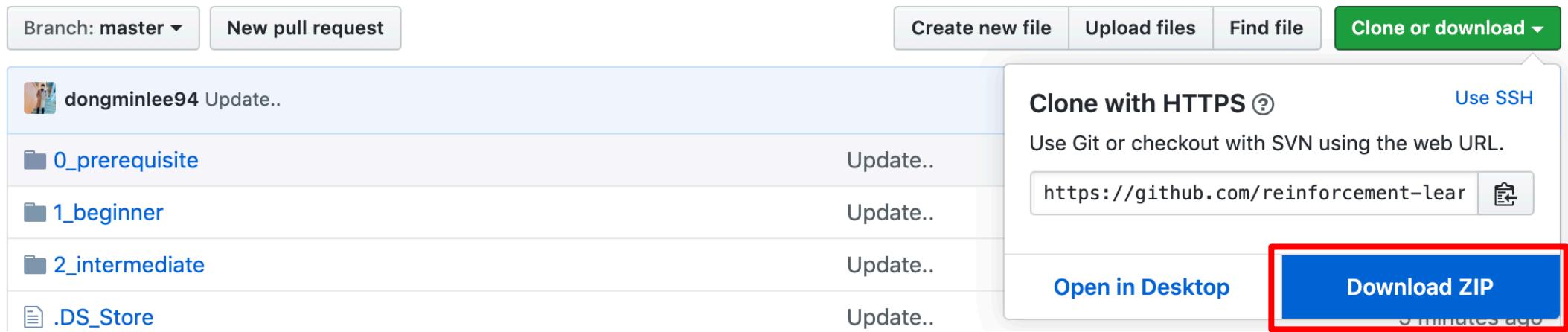
Load codes in VSCode



VSCode

Load codes in VSCode

- GitHub에서 자료들 다운로드 (https://github.com/reinforcement-learning-kr/rl_bootcamp)



VSCode

Load codes in VSCode

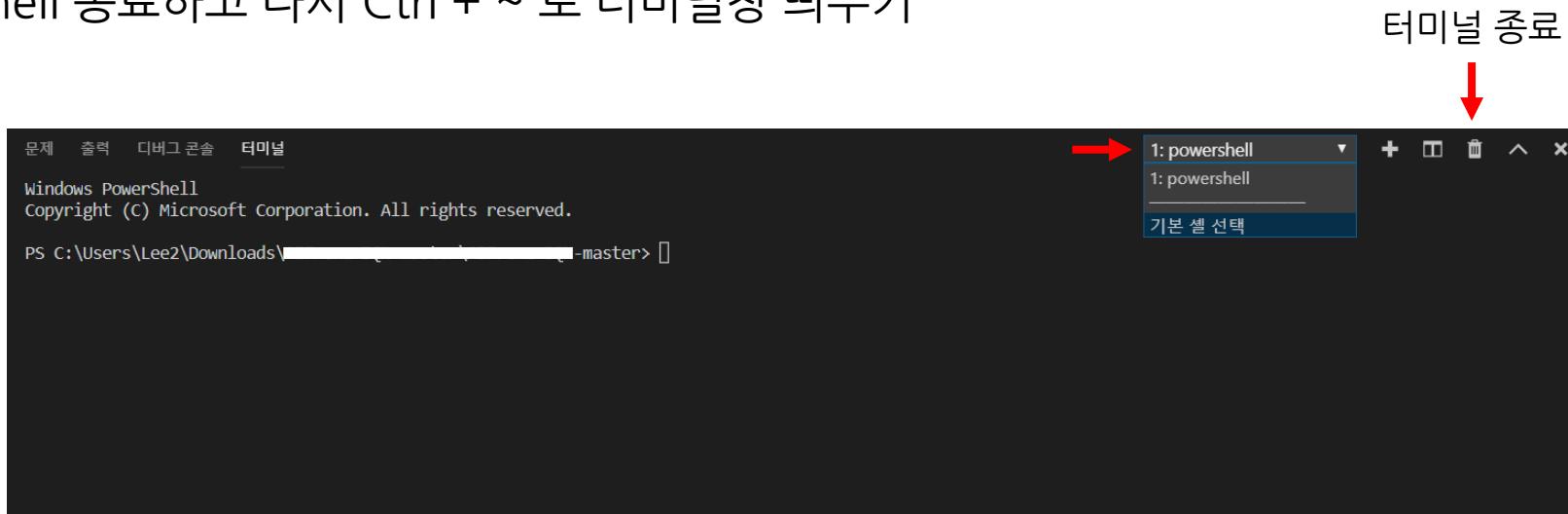
- GitHub에서 자료들 다운로드 (https://github.com/reinforcement-learning-kr/rl_bootcamp)
- VSCode에서 다운로드 폴더에 있는 'OOO-master' 폴더 선택
- OOO-master → 0-Prerequisite → env_test.py 불러오기

VSCode

Load Terminal

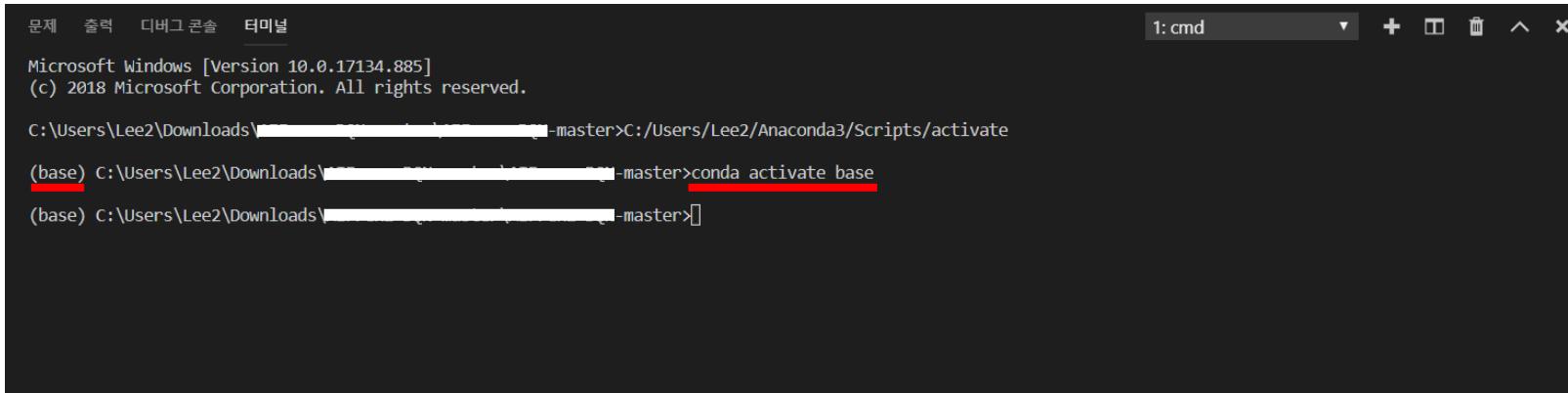
➤ Ctrl + ~ 로 터미널창 띄우기

- ‘PowerShell’에서 ‘Command Prompt’로 바꾸기 (**MacOS, Ubuntu는 건너뛰어도 됨**)
- PowerShell 종료하고 다시 Ctrl + ~로 터미널창 띄우기



VSCode

Load Terminal (Terminal setting 완료)



A screenshot of the VSCode interface showing a terminal window. The terminal tab is selected at the top left. The title bar of the terminal says "1: cmd". The terminal window displays a Windows command prompt. The output shows:

```
문제 출력 디버그 콘솔 터미널
Microsoft Windows [Version 10.0.17134.885]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Lee2\Downloads\[REDACTED]-master>C:/Users/Lee2/Anaconda3/Scripts/activate
(base) C:\Users\Lee2\Downloads\[REDACTED]-master>conda activate base
(base) C:\Users\Lee2\Downloads\[REDACTED]-master>[]
```

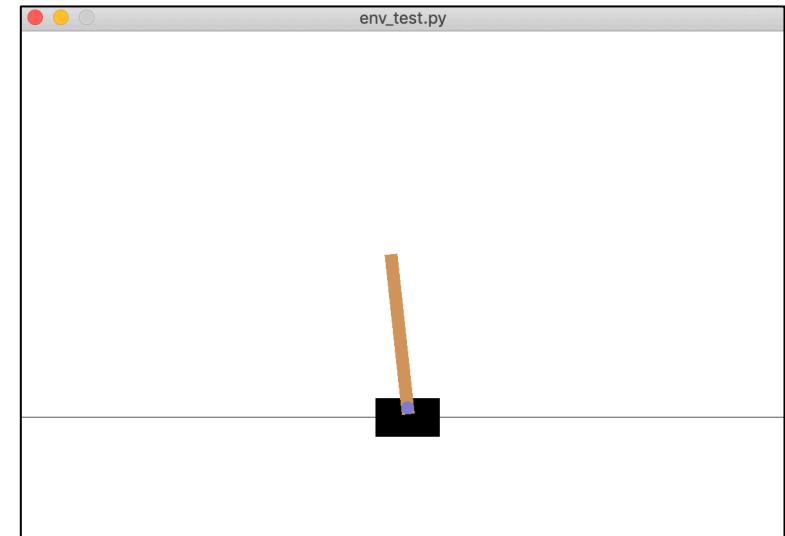
The word "base" in the environment name "(base)" is highlighted with a red box.

VSCode

Check Numpy, PyTorch, Gym installation

- conda activate env_name
- python env_test.py

```
17     import gym
18
19     env = gym.make('CartPole-v1')
20
21     for episode in range(10000):
22         done = False
23         state = env.reset()
24
25         while not done:
26             env.render()
27
28             action = env.action_space.sample()
29             next_state, reward, done, _ = env.step(action)
30
31             print('state: {} | action: {} | reward: {} | next_state: {} | done: {}'.format(
32                 state, action, reward, next_state, done))
33
34             state = next_state
```



Thank You!