

PyTorch

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Torch

- 오픈 소스 머신 러닝 라이브러리
- 과학 컴퓨팅 프레임워크 및 루아(Lua) 프로그래밍 언어를 기반으로 하는 스크립트 언어
- 딥러닝을 위해 광범위한 알고리즘을 제공하며, 스크립팅 언어 LuaJIT 및 C언어로 구현하여 사용
- 2018년부터 Torch는 개발하지 않지만, Torch 라이브러리를 기반으로 PyTorch는 개발 중임
- 참고 사이트
 - [https://en.wikipedia.org/wiki/Torch_\(machine_learning\)](https://en.wikipedia.org/wiki/Torch_(machine_learning))
 - <https://github.com/torch/torch7>

PyTorch

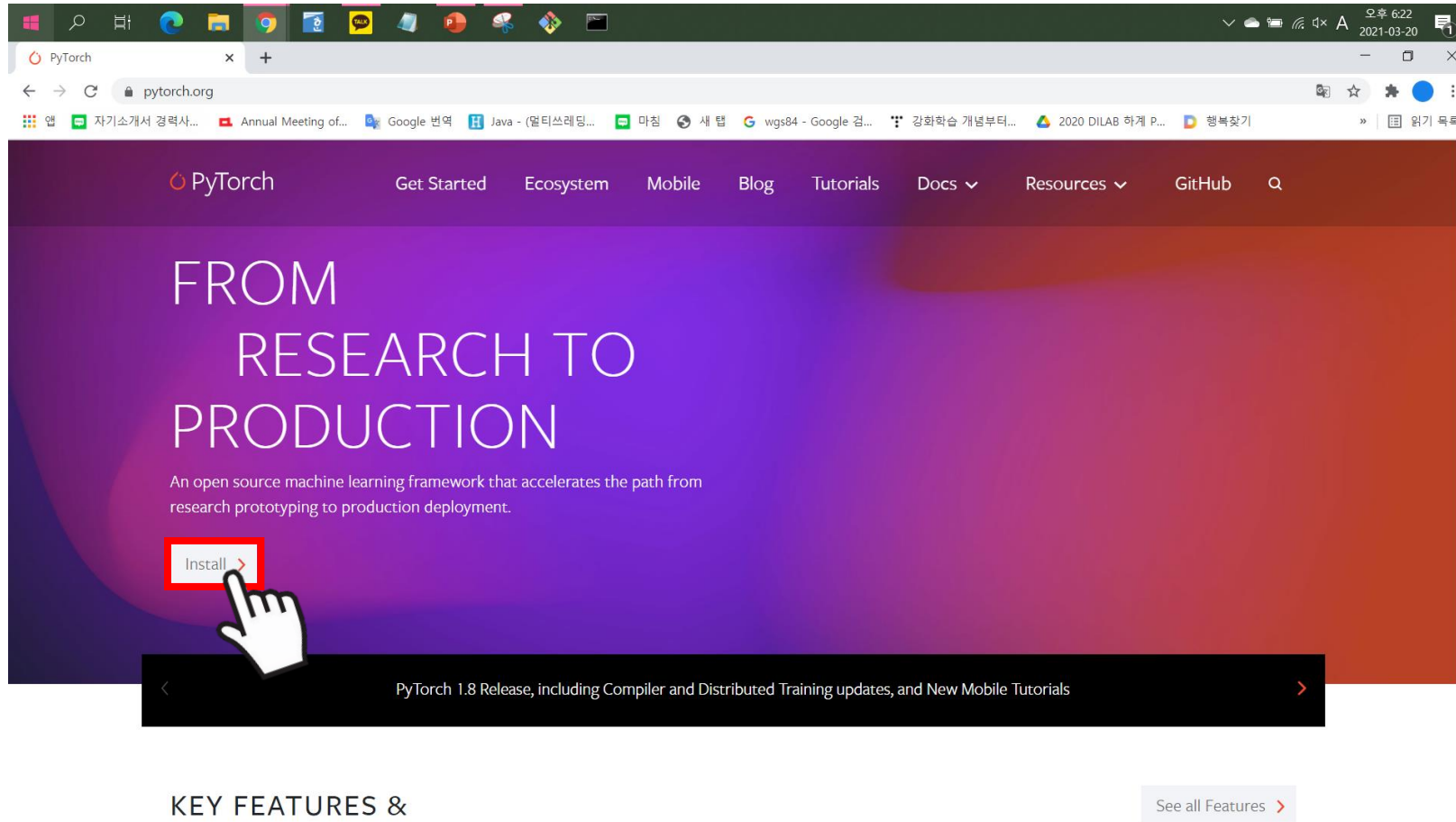


- 페이스북 AI 리서치 랩에서 만든 Python을 위한 오픈소스 머신러닝 라이브러리
- Torch를 기반으로 하며, 자연어처리와 같은 애플리케이션을 위해 사용
- 기반 언어: Python, CUDA, C++
- 참고 사이트
 - <https://ko.wikipedia.org/wiki/PyTorch>
 - <https://pytorch.org/>

PyTorch 설치하기 (1)

- 설치 환경
 - LG전자 그램 노트북 (모델명: 15Z960-LR1HK)
 - Intel(R) HD Graphics 510
 - Intel(R) Pentium(R) CPU 4405U @ 2.10GHz
- 참고 사이트
 - <https://blog.daum.net/geoscience/1565>

PyTorch 설치하기 (2)



PyTorch 설치하기 (3)

PyTorch

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START LOCALLY

Select your preferences and run the install command. Stable represents the most currently tested and supported version of PyTorch. This should be suitable for many users. Preview is available if you want the latest, not fully tested and supported, 1.9 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 (1.8.0)		Preview (Nightly)	
Your OS	Linux	Mac	Windows	
Package	Conda	Pip	LibTorch	Source
Language	Python		C++ / Java	
Compute Platform	CUDA 10.2	CUDA 11.1	ROCm 4.0 (beta)	CPU
Run this Command:	<pre>pip install torch==1.8.0+cpu torchvision==0.9.0+cpu torchaudio==0.8.0 -f http s://download.pytorch.org/whl/torch_stable.html</pre>			

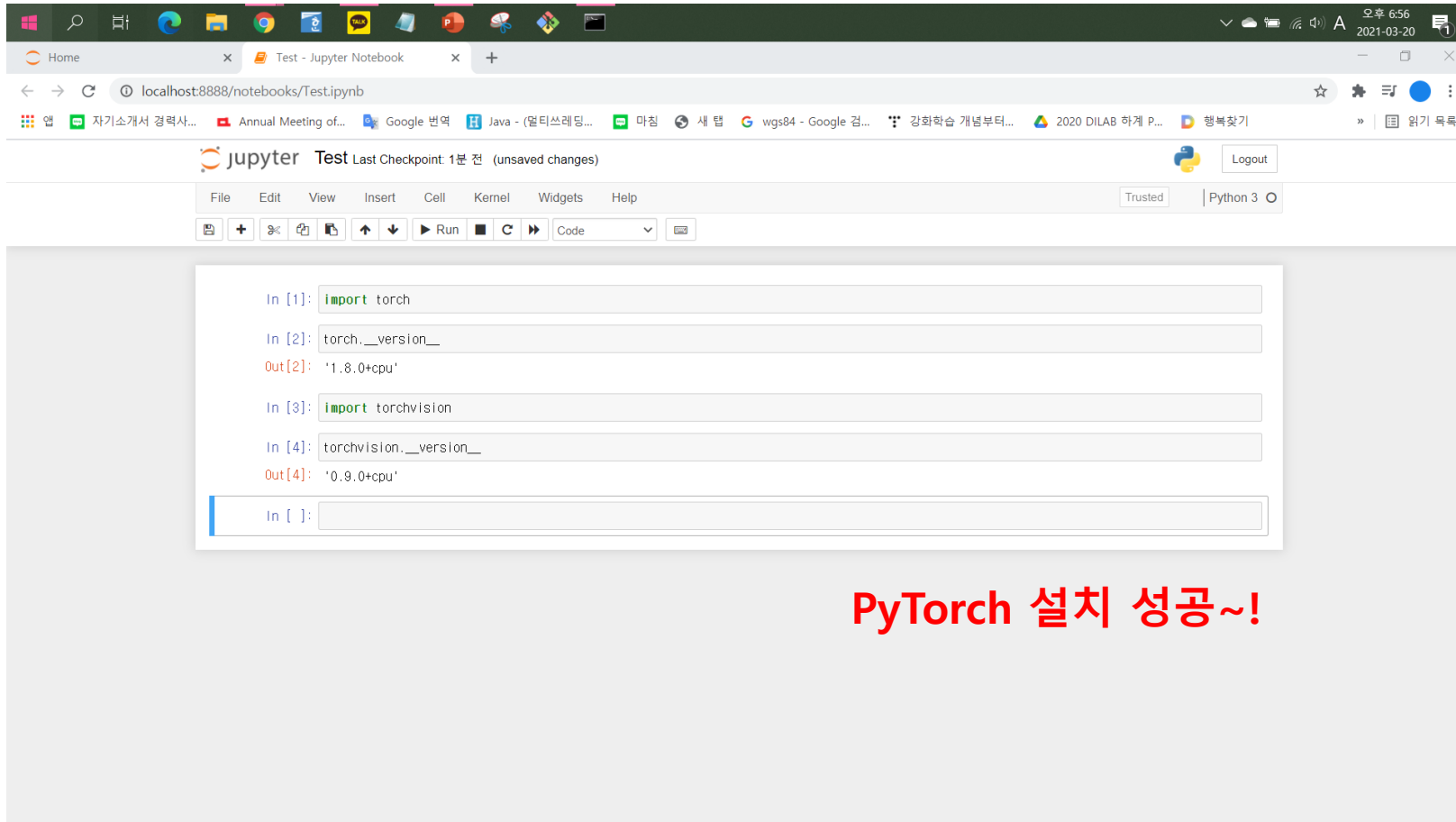
Ctrl + C

PyTorch 설치하기 (4)

```
C:\Users\luytt>pip install torch==1.8.0+cpu torchvision==0.9.0+cpu torchaudio===0.8.0 -f https://download.pytorch.org/whl/torch_stable.html
Looking in links: https://download.pytorch.org/whl/torch_stable.html
Collecting torch==1.8.0+cpu
  Downloading https://download.pytorch.org/whl/cpu/torch-1.8.0%2Bcpu-cp39-cp39-win_amd64.whl (190.3 MB)
    | 190.3 MB 33 kB/s
Collecting torchvision==0.9.0+cpu
  Downloading https://download.pytorch.org/whl/cpu/torchvision-0.9.0%2Bcpu-cp39-cp39-win_amd64.whl (845 kB)
    | 845 kB 2.2 MB/s
Collecting torchaudio===0.8.0
  Downloading torchaudio-0.8.0-cp39-none-win_amd64.whl (109 kB)
    | 109 kB 1.1 MB/s
Collecting typing-extensions
  Downloading typing_extensions-3.7.4.3-py3-none-any.whl (22 kB)
Collecting numpy
  Downloading numpy-1.20.1-cp39-cp39-win_amd64.whl (13.7 MB)
    | 13.7 MB 1.7 MB/s
Collecting pillow>=4.1.1
  Downloading Pillow-8.1.2-cp39-cp39-win_amd64.whl (2.2 MB)
    | 2.2 MB 3.3 MB/s
Installing collected packages: typing-extensions, numpy, torch, pillow, torchvision, torchaudio
Successfully installed numpy-1.20.1 pillow-8.1.2 torch-1.8.0+cpu torchaudio-0.8.0 torchvision-0.9.0+cpu typing-extensions-3.7.4.3
WARNING: You are using pip version 20.2.3; however, version 21.0.1 is available.
You should consider upgrading via the 'c:\Users\luytt\AppData\Local\Programs\Python\Python39\python.exe -m pip install --upgrade pip' command.
C:\Users\luytt>
```

Ctrl + V

PyTorch 설치하기 (5)



The screenshot shows a web browser window with a Jupyter Notebook titled 'Test - Jupyter Notebook' running on localhost:8888. The notebook interface includes a menu bar (File, Edit, View, Insert, Cell, Kernel, Widgets, Help) and a toolbar with icons for file operations and execution. The notebook content consists of four input/output pairs:

```
In [1]: import torch
```

```
In [2]: torch.__version__
```

```
Out[2]: '1.8.0+cpu'
```

```
In [3]: import torchvision
```

```
In [4]: torchvision.__version__
```

```
Out[4]: '0.9.0+cpu'
```

The final input cell is empty, showing 'In []: '.

PyTorch 설치 성공~!

공부하면서 궁금했던 점

- 라이브러리와 프레임워크의 차이점:
 - 라이브러리: 프로그램 개발을 쉽게 도와 주기 위한 기능을 제공하는 도구들
 - 프레임워크: 프로그램 개발을 위한 여러 요소들과 매뉴얼을 제공하는 프로그램
 - 참고 사이트: <https://engkimbs.tistory.com/673>
- Tensorflow와 PyTorch의 차이점
 - Tensorflow: Define-and-Run
 - 모델 따로, 데이터 따로
 - PyTorch: Define-by-Run
 - 모델과 데이터가 함께