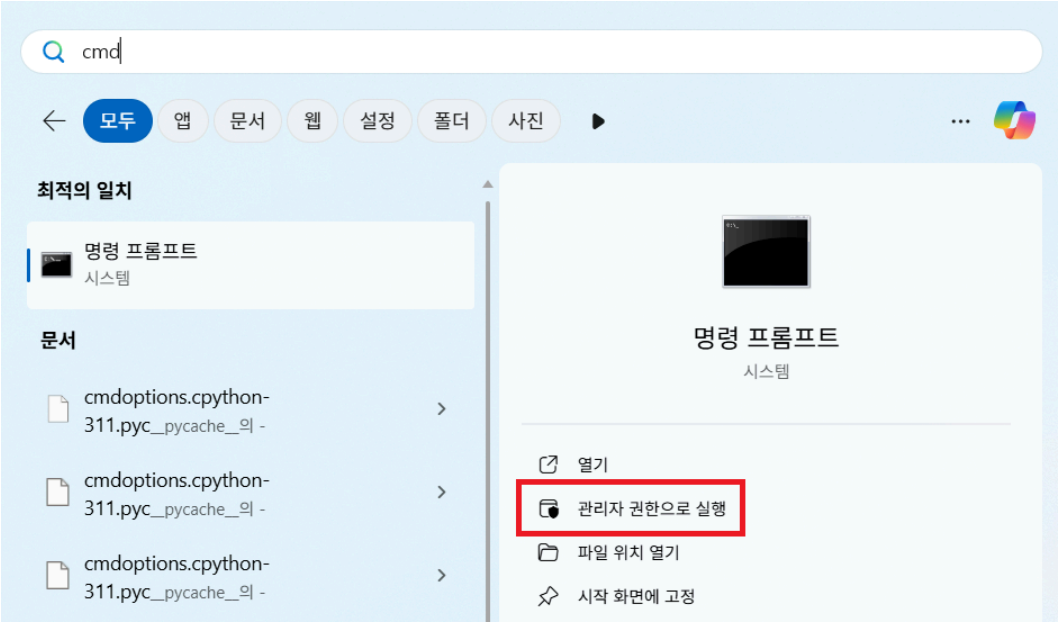
[자율PJT] AI 실습 특강 환경 설정

1. 리눅스 환경 구축

1.1 WSL 켜기

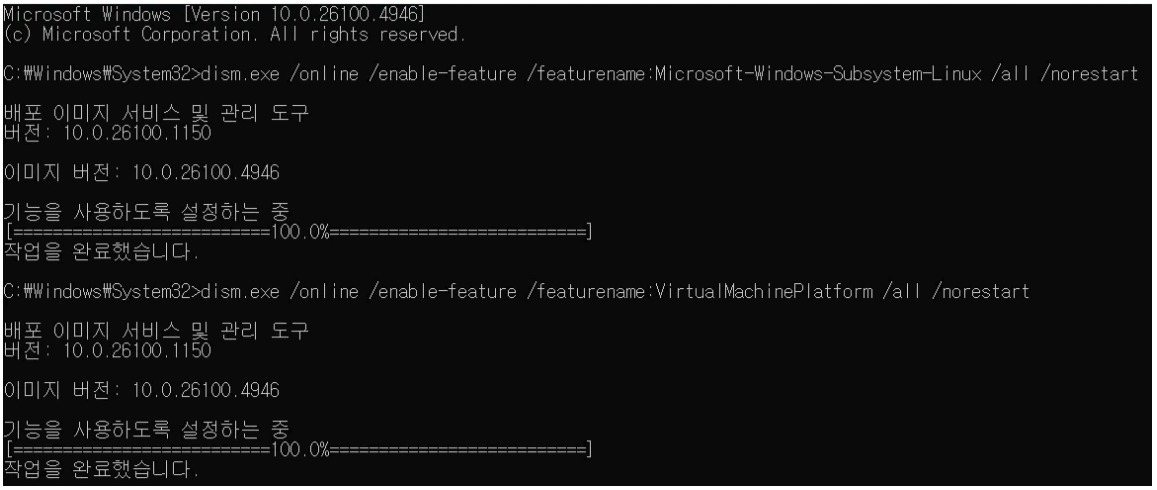
- 명령 프롬프트/PowerShell 관리자 권한으로 실행



- 커맨드 실행

```
dism.exe /online /enable-feature /featurename:Microsoft-Windows-Subsystem-Linux /all /norestart
```

```
dism.exe /online /enable-feature /featurename:VirtualMachinePlatform /all /norestart
```

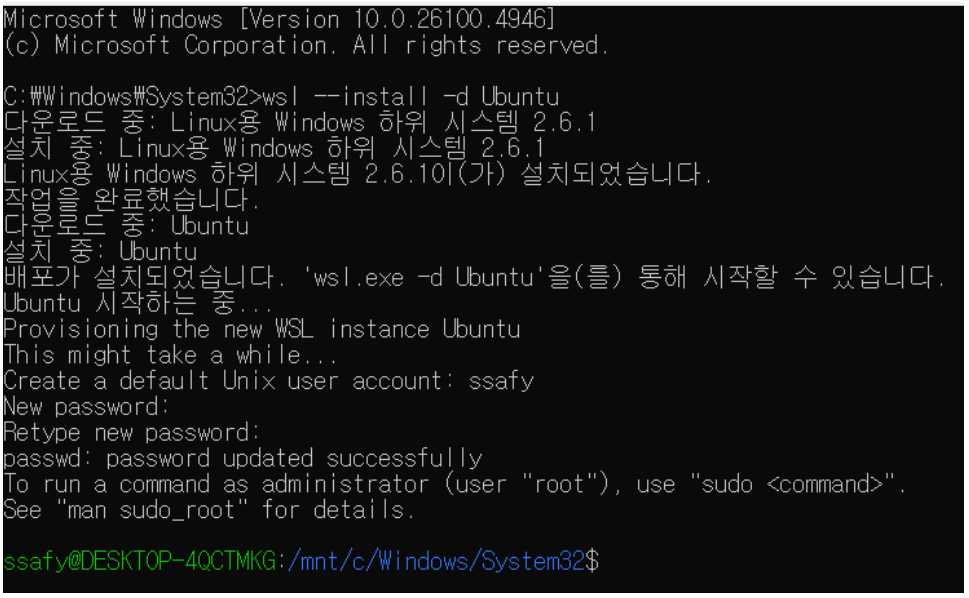


- 완료 후 Windows 재부팅(필수)

1.2 Ubuntu 설치

- 커맨드 실행 및 계정 설정

```
wsl --install -d Ubuntu
```

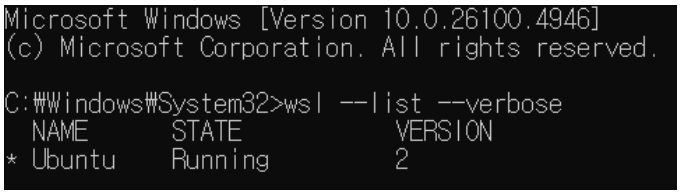


  - 설정한 계정 정보는 이후 sudo 커맨드에 이용

1.3 설치 확인

- 새로운 커맨드 창에서 실행 및 확인

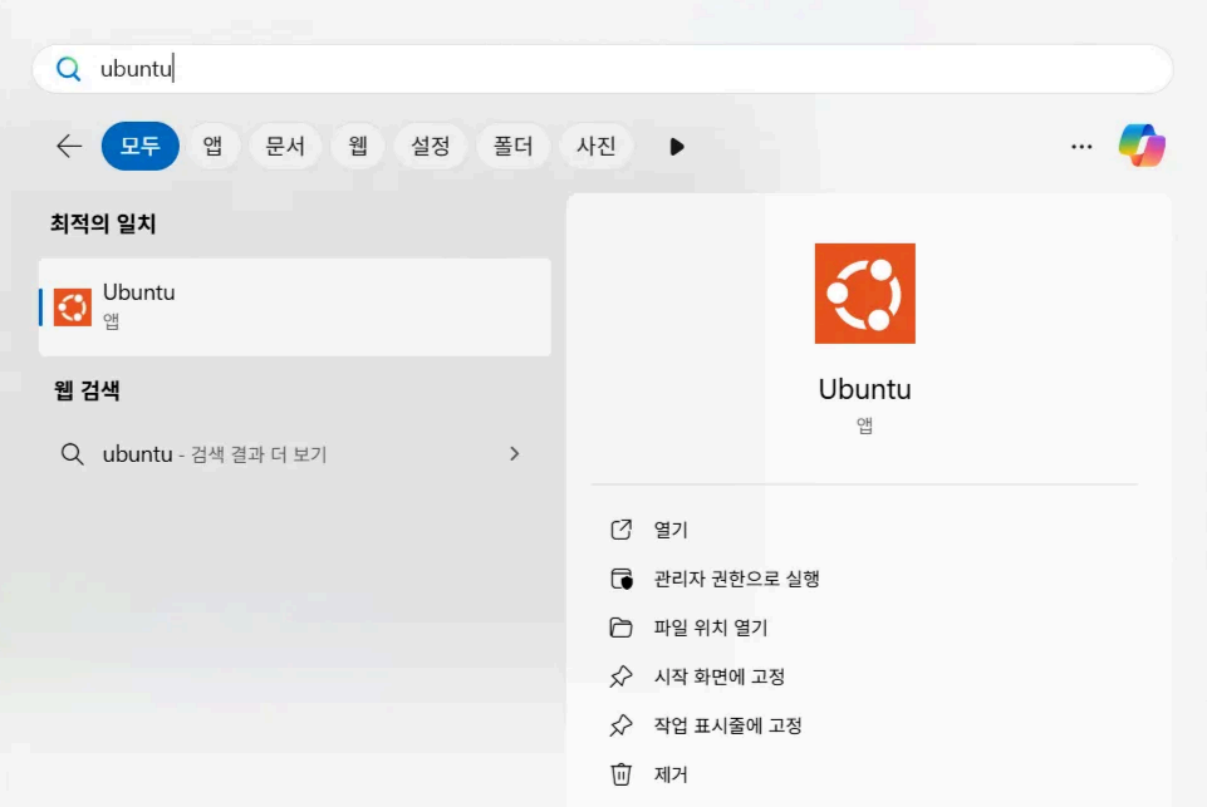
```
wsl --list --verbose
```

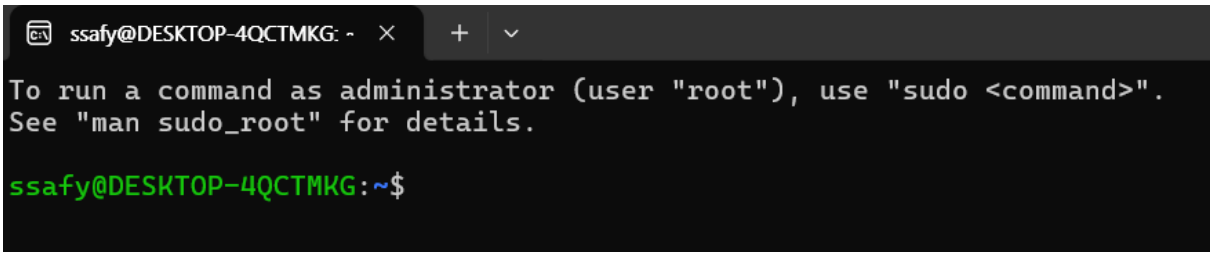



```
## Version이 1인 경우 아래 커맨드 실행
wsl --set-version Ubuntu 2
```

2. 개발 환경 세팅

2.1 Ubuntu 실행

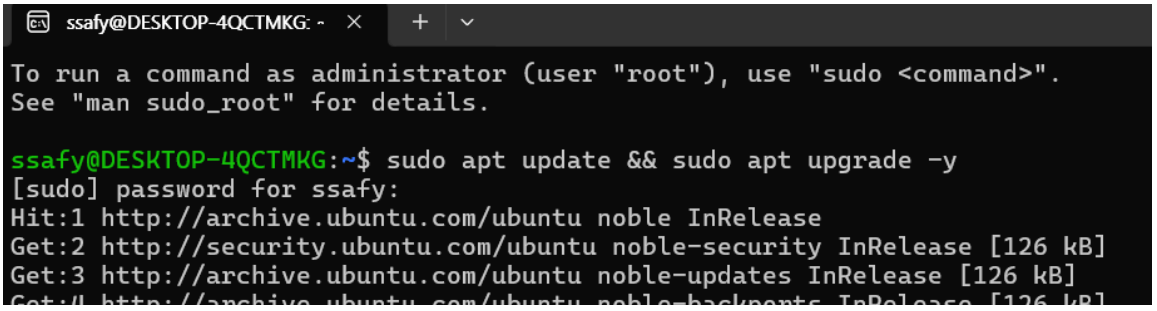




2.2 필수 패키지 설치

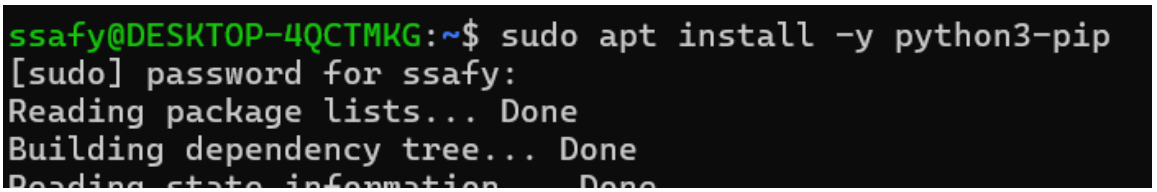
- 시스템 패키지 업데이트/업그레이드

```
sudo apt update && sudo apt upgrade -y
```



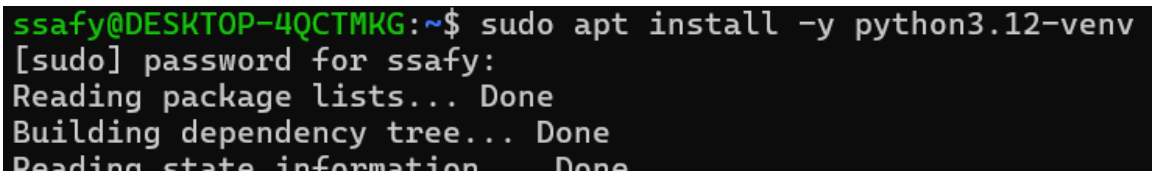
- pip 패키지 설치

```
sudo apt install -y python3-pip
```



- venv 패키지 설치

```
sudo apt install -y python3.12-venv
```



- 가상 환경 생성 및 활성화

```
python3 -m venv practice-env
source practice-env/bin/activate
```

```
ssafy@DESKTOP-4QCTMKG:~$ python3 -m venv practice-env
ssafy@DESKTOP-4QCTMKG:~$ source practice-env/bin/activate
(practice-env) ssafy@DESKTOP-4QCTMKG:~$
```

- 실습 필수 패키지 설치

```
pip3 install --upgrade pip
pip3 install vllm==0.10.2 litellm==1.77.5 datasets==4.1.1 matplotlib math-verify
```

```
(practice-env) ssafy@DESKTOP-4QCTMKG:~$ pip install --upgrade pip
Requirement already satisfied: pip in ./practice-env/lib/python3.12/site-packages (24.0)
Collecting pip
  Using cached pip-25.2-py3-none-any.whl.metadata (4.7 kB)
Using cached pip-25.2-py3-none-any.whl (1.8 MB)
Installing collected packages: pip
  Attempting uninstall: pip
    Found existing installation: pip 24.0
    Uninstalling pip-24.0:
      Successfully uninstalled pip-24.0
Successfully installed pip-25.2
```

```
(practice-env) ssafy@DESKTOP-4QCTMKG:~$ pip3 install vllm==0.10.2 litellm==1.77.5 datasets==4.1.1 matplotlib math-verify
Collecting vllm==0.10.2
  Using cached vllm-0.10.2-cp38-abi3-manylinux1_x86_64.whl.metadata (16 kB)
Collecting litellm==1.77.5
  Using cached litellm-1.77.5-py3-none-any.whl.metadata (42 kB)
Collecting datasets==4.1.1
  Using cached datasets-4.1.1-py3-none-any.whl.metadata (18 kB)
Collecting matplotlib
  Using cached matplotlib-3.10.7-cp312-cp312-manylinux2014_x86_64.manylinux_2_17_x86_64.whl.metadata (11 kB)
Collecting math-verify
  Using cached math_verify-0.8.0-py3-none-any.whl.metadata (1.6 kB)
```

2.3 세팅 확인

- GPU 활성화 확인

```
python3 -c "import torch; print('PyTorch:', torch.__version__); print('CUDA available:', torch.cuda.is_available()); [print(f'Device {i}:', torch.cuda.get_device_name(i)) for i in range(torch.cuda.device_count())]"
```

```
(practice-env) ssafy@DESKTOP-4QCTMKG:~$ python3 -c "import torch; print('PyTorch:', torch.__version__); print('CUDA available:', torch.cuda.is_available()); [print(f'Device {i}:', torch.cuda.get_device_name(i)) for i in range(torch.cuda.device_count())]"
PyTorch: 2.8.0+cu128
CUDA available: True
Device 0: NVIDIA GeForce RTX 3050 Ti Laptop GPU
```

- vllm, litellm, datasets 버전 확인

```
python3 -c "import vllm, datasets, importlib.metadata; print('vllm:', vllm.__version__); print('litellm:', importlib.metadata.version('litellm')); print('datasets:', datasets.__version__)"
```

```
(practice-env) ssafy@DESKTOP-4QCTMKG:~$ python3 -c "import vllm, datasets, importlib.metadata; print('vllm:', vllm.__version__); print('litellm:', importlib.metadata.version('litellm')); print('datasets:', datasets.__version__)"
vllm: 0.10.2
litellm: 1.77.5
datasets: 4.1.1
```

2.4 Jupyter 환경 세팅

- jupyterlab, ipkernel 설치

```
pip3 install -U jupyterlab ipykernel
```

```
(practice-env) ssafy@DESKTOP-4QCTMKG:~$ pip3 install -U jupyterlab ipykernel
Collecting jupyterlab
  Downloading jupyterlab-4.4.9-py3-none-any.whl.metadata (16 kB)
Collecting ipykernel
  Downloading ipykernel-6.30.1-py3-none-any.whl.metadata (6.2 kB)
Collecting async-lru>=1.0.0 (from jupyterlab)
  Downloading async_lru-2.0.5-py3-none-any.whl.metadata (4.5 kB)
```

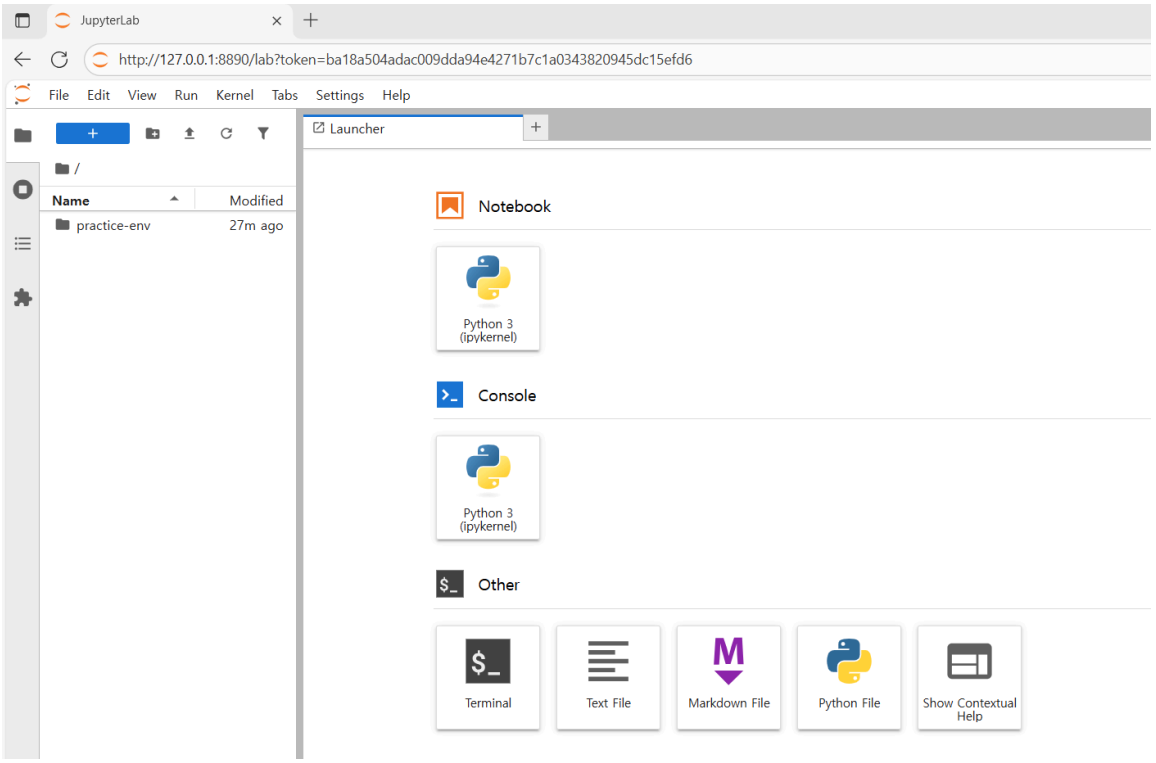
- jupyerlab 포트 설정 및 실행

```
jupyter lab --no-browser --ip=0.0.0.0 --port=8890
```

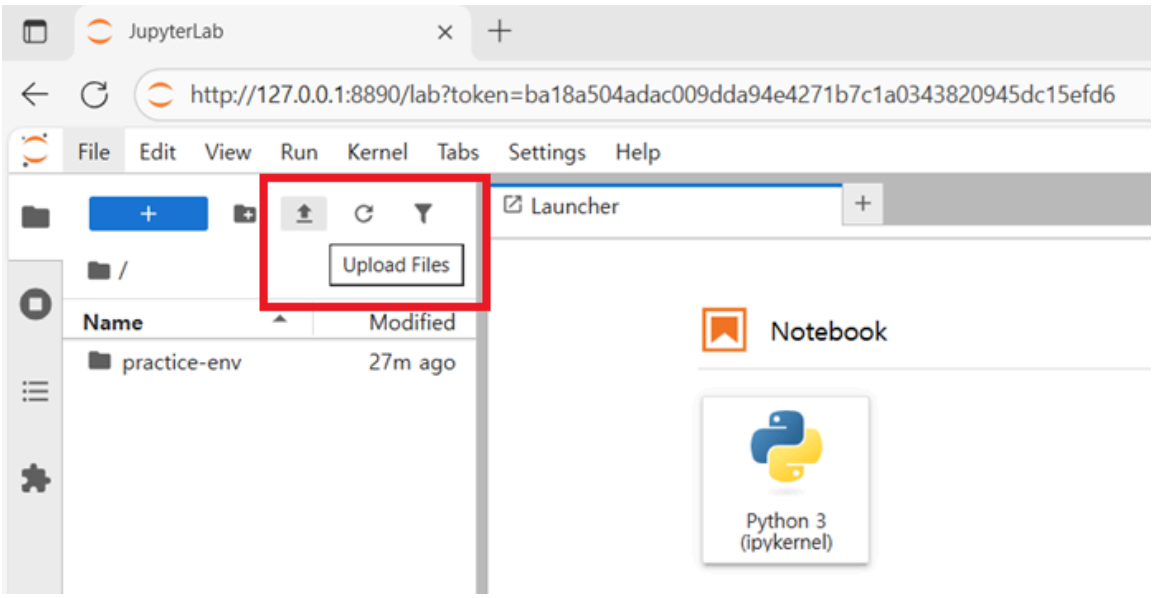
```
(practice-env) ssafy@DESKTOP-4QCTMKG:~$ jupyter lab --no-browser --ip=0.0.0.0 --port=8890
[I 2025-10-10 13:26:07.012 ServerApp] jupyter_lsp | extension was successfully linked.
[I 2025-10-10 13:26:07.015 ServerApp] jupyter_server_terminals | extension was successfully linked.
[I 2025-10-10 13:26:07.018 ServerApp] jupyterlab | extension was successfully linked.
[I 2025-10-10 13:26:07.019 ServerApp] Writing Jupyter server cookie secret to /home/ssafy/.local/shar
```

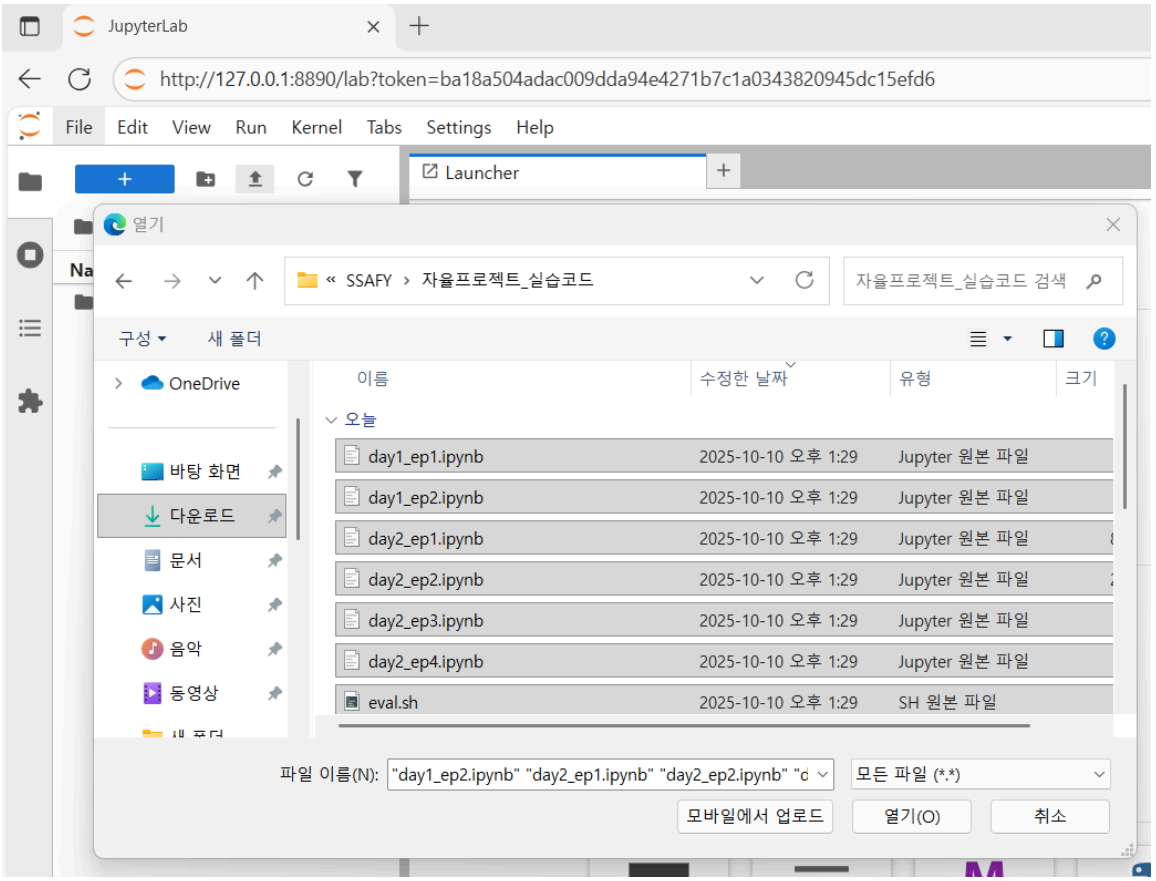
- URL 복사 및 웹 접속

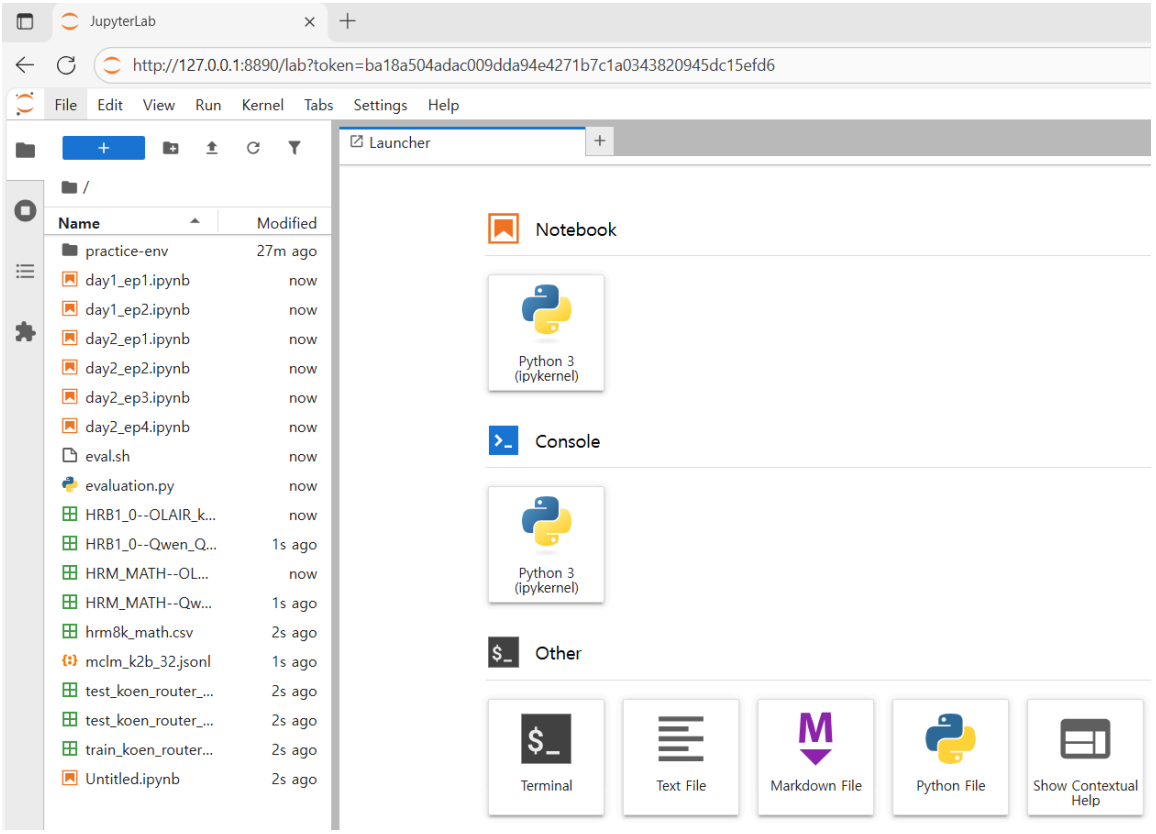
```
[I 2025-10-10 13:26:07.394 ServerApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 2025-10-10 13:26:07.397 ServerApp]

    To access the server, open this file in a browser:
        file:///home/ssafy/.local/share/jupyter/runtime/jpserver-3576-open.html
    Or copy and paste one of these URLs:
        http://127.0.0.1:8890/lab?token=ba18a504adac009dda94e4271b7c1a0343820945dc15efd6
[I 2025-10-10 13:26:07.471 ServerApp] Skipped non-installed server(s): basedpyright, bash-language-server, dockerfile-language-server-nodejs, javascript-typescript-langserver, jedi-language-server, julia-language-server, pyrefly, pyright, python-language-server, python-lsp-server, r-languageserver, sql-language-server, texlab, typescript-language-server, unified-language-server, vscode-css-languageserver-bin, vscode-html-languageserver-bin, vscode-json-languageserver-bin, yaml-language-server
[W 2025-10-10 13:26:21.202 LabApp] Could not determine jupyterlab build status without nodejs
```


JupyterLab
http://127.0.0.1:8890/lab?token=ba18a504adac009dda94e4271b7c1a0343820945dc15efd6
File Edit View Run Kernel Tabs Settings Help
Launcher
/
Name
Modified
practice-env
27m ago
Notebook
Python 3 (ipykernel)
Console
Python 3 (ipykernel)
Other
Terminal
Text File
Markdown File
Python File
Show Contextual Help

- 실습 파일 업로드


JupyterLab
http://127.0.0.1:8890/lab?token=ba18a504adac009dda94e4271b7c1a0343820945dc15efd6
File Edit View Run Kernel Tabs Settings Help
Launcher
Upload Files
/
Name
Modified
practice-env
27m ago
Notebook
Python 3 (ipykernel)


JupyterLab
http://127.0.0.1:8890/lab?token=ba18a504adac009dda94e4271b7c1a0343820945dc15efd6
File Edit View Run Kernel Tabs Settings Help
Launcher
열기
« SSAFY › 자율프로젝트_실습코드
자율프로젝트_실습코드 검색
구성 새 폴더
OneDrive
바탕 화면
다운로드
문서
사진
음악
동영상
이름 수정한 날짜 유형 크기
오늘
day1_ep1.ipynb 2025-10-10 오후 1:29 Jupyter 원본 파일
day1_ep2.ipynb 2025-10-10 오후 1:29 Jupyter 원본 파일
day2_ep1.ipynb 2025-10-10 오후 1:29 Jupyter 원본 파일
day2_ep2.ipynb 2025-10-10 오후 1:29 Jupyter 원본 파일
day2_ep3.ipynb 2025-10-10 오후 1:29 Jupyter 원본 파일
day2_ep4.ipynb 2025-10-10 오후 1:29 Jupyter 원본 파일
eval.sh 2025-10-10 오후 1:29 SH 원본 파일
파일 이름(N): "day1_ep2.ipynb" "day2_ep1.ipynb" "day2_ep2.ipynb" "d
모든 파일 (*.*)
모바일에서 업로드
열기(O)
취소


JupyterLab
http://127.0.0.1:8890/lab?token=ba18a504adac009dda94e4271b7c1a0343820945dc15efd6
File Edit View Run Kernel Tabs Settings Help
Launcher
/
Name Modified
practice-env 27m ago
day1_ep1.ipynb now
day1_ep2.ipynb now
day2_ep1.ipynb now
day2_ep2.ipynb now
day2_ep3.ipynb now
day2_ep4.ipynb now
eval.sh now
evaluation.py now
HRB1_0--OLAIR_k... now
HRB1_0--Qwen_Q... 1s ago
HRM_MATH--OL... now
HRM_MATH--Qw... 1s ago
hrm8k_math.csv 2s ago
mclm_k2b_32.jsonl 1s ago
test_koen_router_... 2s ago
test_koen_router_... 2s ago
train_koen_router... 2s ago
Untitled.ipynb 2s ago
Notebook
Python 3 (ipykernel)
Console
Python 3 (ipykernel)
Other
Terminal
Text File
Markdown File
Python File
Show Contextual Help

2.5 사전 파일 다운로드

- day1_ep1 모델 다운로드

```
!wget https://huggingface.co/unsloth/Qwen3-0.6B-GGUF/resolve/main/Qwen3-0.6B-Q2_K.gguf
!wget https://huggingface.co/Qwen/Qwen2.5-0.5B-Instruct-GGUF/resolve/main/qwen2.5-0.5b-instruct-q4_0.gguf
```