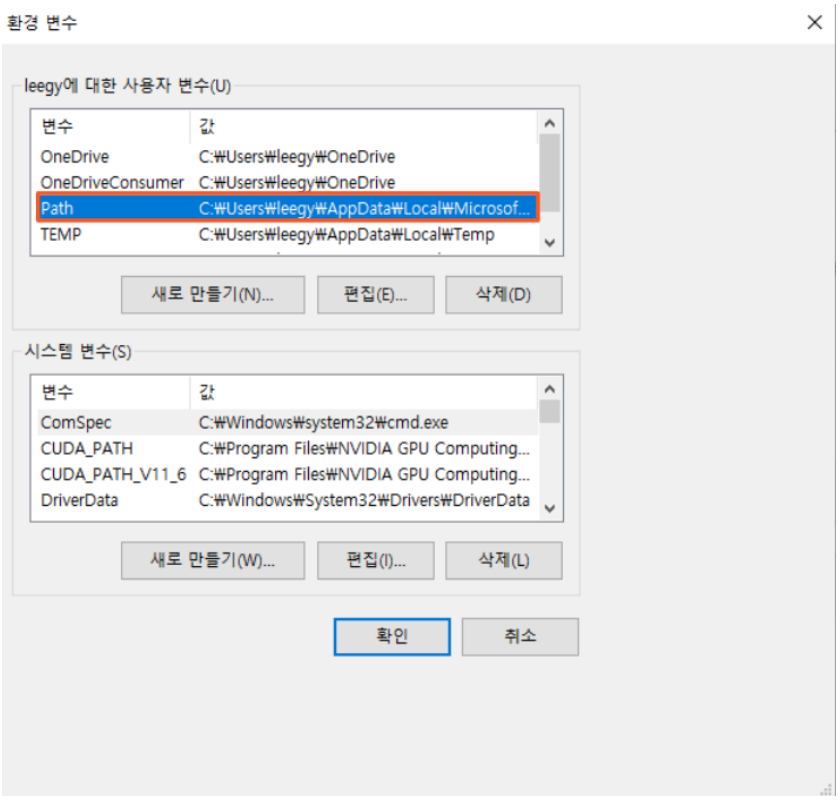
MSP 개발 환경 설정

Python 및 라이브러리

Python 3.12.0 (또는 그 이상 버전)

https://www.python.org/downloads/release/python-3120/



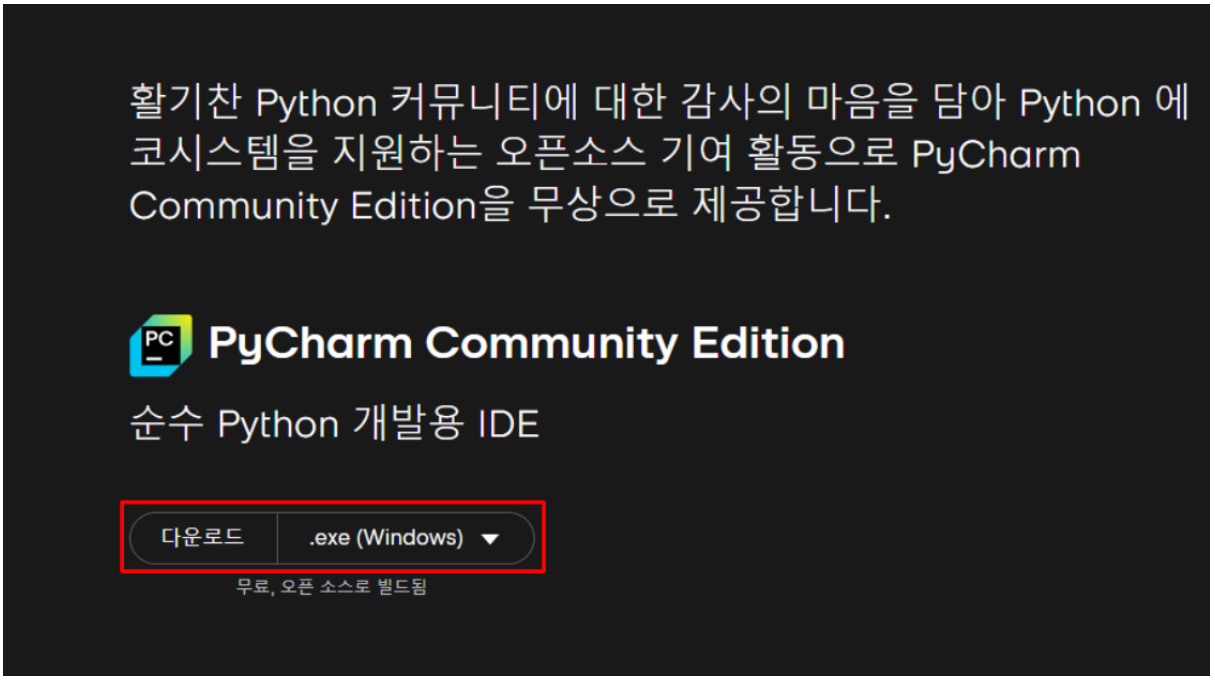
설치 완료 후 Python 이 설치된 경로를 환경 변수 PATH에 추가

PyCharm

https://www.jetbrains.com/ko-kr/pycharm/download/?section=windows

공식 홈페이지에서 가장 최신 버전의 IDE로 설치

(Community 버전)



설치된 라이브러리 (requirements.txt)

requirements.txt라는 이름으로 아래 내용 복사 후 터미널에서 설치

```
aiohappyeyeballs==2.4.4
aiohttp==3.11.11
aiosignal==1.3.2
alembic==1.14.0
annotated-types==0.7.0
anthropic==0.42.0
anyio==4.8.0
attrs==24.3.0
bcrypt==4.2.1
certifi==2024.12.14
charset-normalizer==3.4.1
click==8.1.8
colorama==0.4.6
distro==1.9.0
dnspython==2.7.0
email_validator==2.2.0
fastapi==0.115.6
filelock==3.16.1
frozenlist==1.5.0
fsspec==2024.12.0
greenlet==3.1.1
```

```
h11==0.14.0
httpcore==1.0.7
httpx==0.28.1
huggingface-hub==0.27.1
idna==3.10
Jinja2==3.1.5
jiter==0.8.2
joblib==1.4.2
jsonify==0.5
Mako==1.3.8
MarkupSafe==3.0.2
mpmath==1.3.0
multidict==6.1.0
networkx==3.4.2
numpy==2.2.1
openai==0.28.0
packaging==24.2
pgvector==0.3.6
pillow==11.1.0
pinecone==5.4.2
pinecone-plugin-inference==3.1.0
pinecone-plugin-interface==0.0.7
prettytable==3.14.0
propcache==0.2.1
psycopg==3.2.4
psycopg-binary==3.2.4
psycopg2==2.9.10
pydantic==2.10.4
pydantic_core==2.27.2
python-dateutil==2.9.0.post0
PyYAML==6.0.2
regex==2024.11.6
requests==2.32.3
safetensors==0.5.2
scikit-learn==1.6.1
scipy==1.15.1
sentence-transformers==3.3.1
setuptools==75.8.0
six==1.17.0
sniffio==1.3.1
```

```
SQLAlchemy==2.0.38
starlette==0.41.3
sympy==1.13.1
threadpoolctl==3.5.0
tokenizers==0.21.0
torch==2.6.0+cu118
torchaudio==2.6.0+cu118
torchvision==0.21.0+cu118
tqdm==4.67.1
transformers==4.48.0
typing_extensions==4.12.2
tzdata==2025.1
urllib3==2.3.0
uvicorn==0.34.0
wcwidth==0.2.13
yarl==1.18.3
```

Database

PostgreSQL 설치

https://www.postgresql.org/

16 버전 이하의 PostgreSQL 설치

PG Admin4와 함께 설치되도록 설정

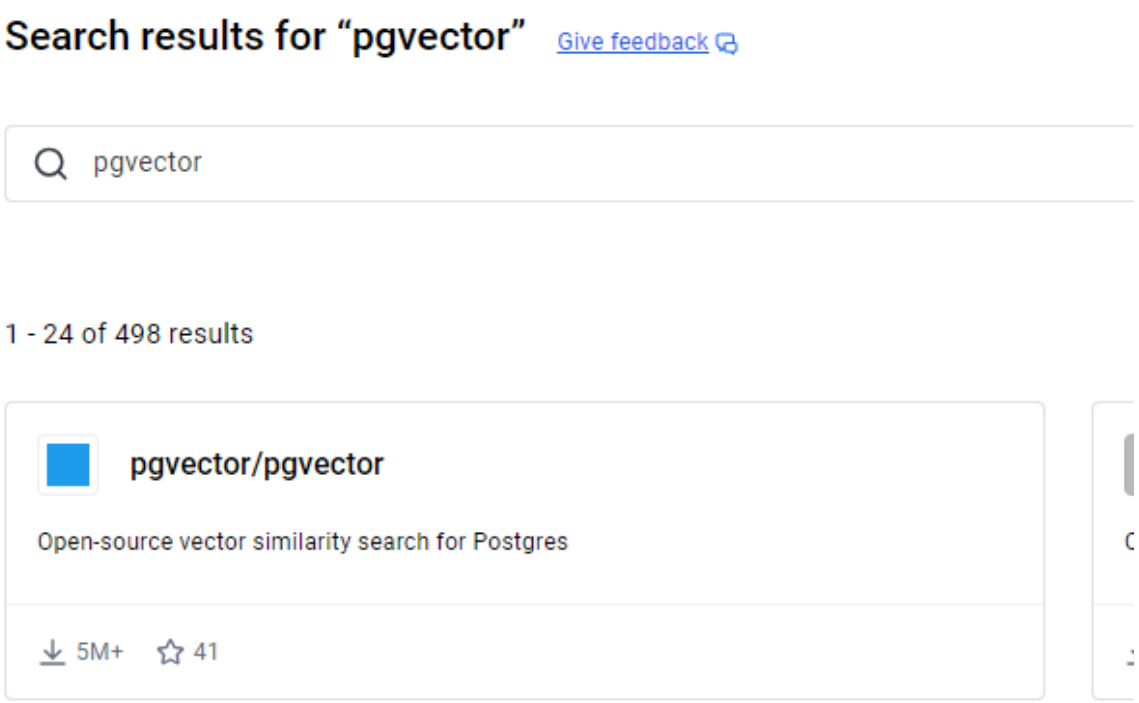
(17 버전 이후로 PG Vector 연동 안 될 가능성 있음)

Desktop 버전 Docker 설치

https://www.docker.com/

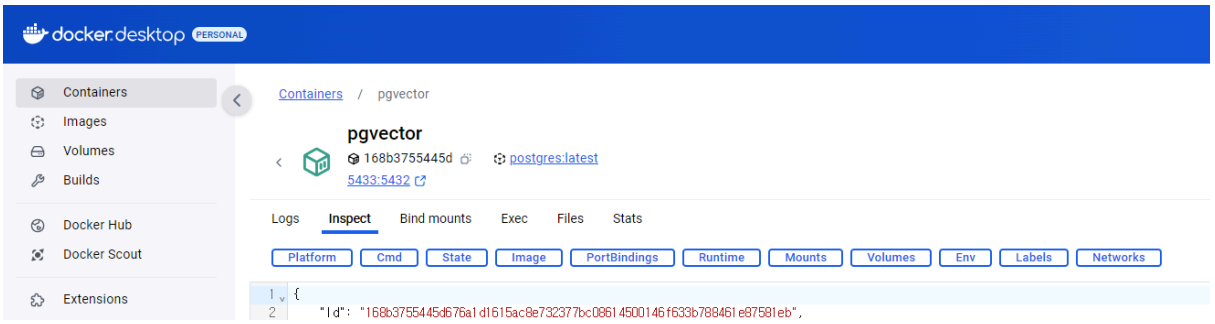
해당 링크에서 Docker Desktop 설치

Docker Desktop 설치가 완료되면 Docker Hub에서 PG Vector 설치



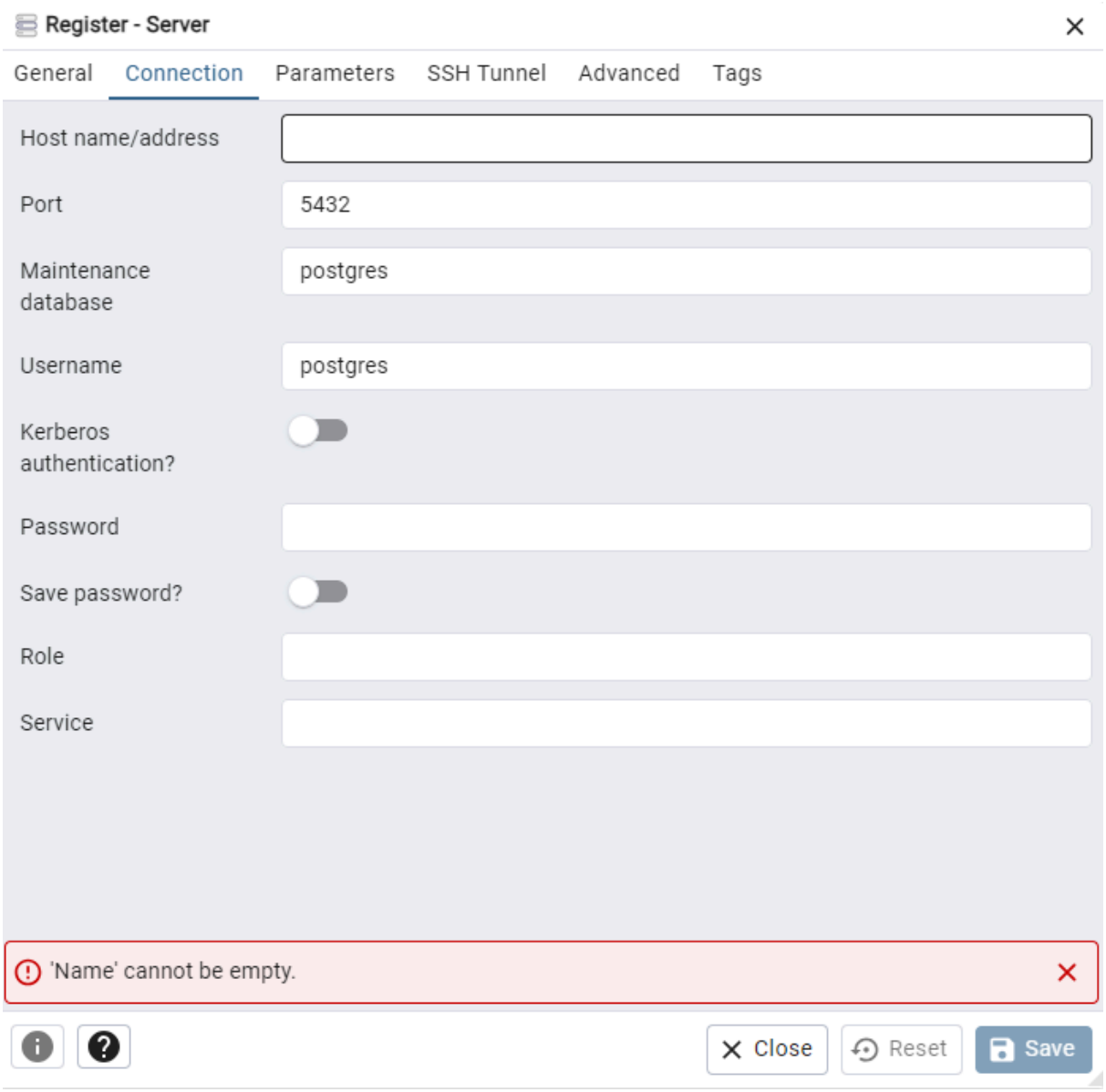
PG Vector가 설치된 후 Containers에 접속하면 PG Vector 확인됨

PG Vector의 Inspect에서 자세한 정보 확인 가능



해당 Inspect 창에서 Host name / address / Port를 확인할 수 있음

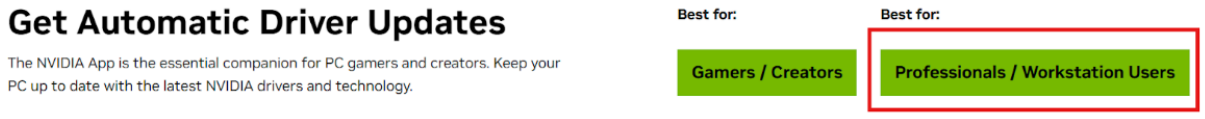
확인된 정보를 PG Admin의 서버 Connection으로 연동하면 기존 PostgreSQL DB와 같이 PG Vector가 설치된 DB를 사용할 수 있게 됨



GPU 설정

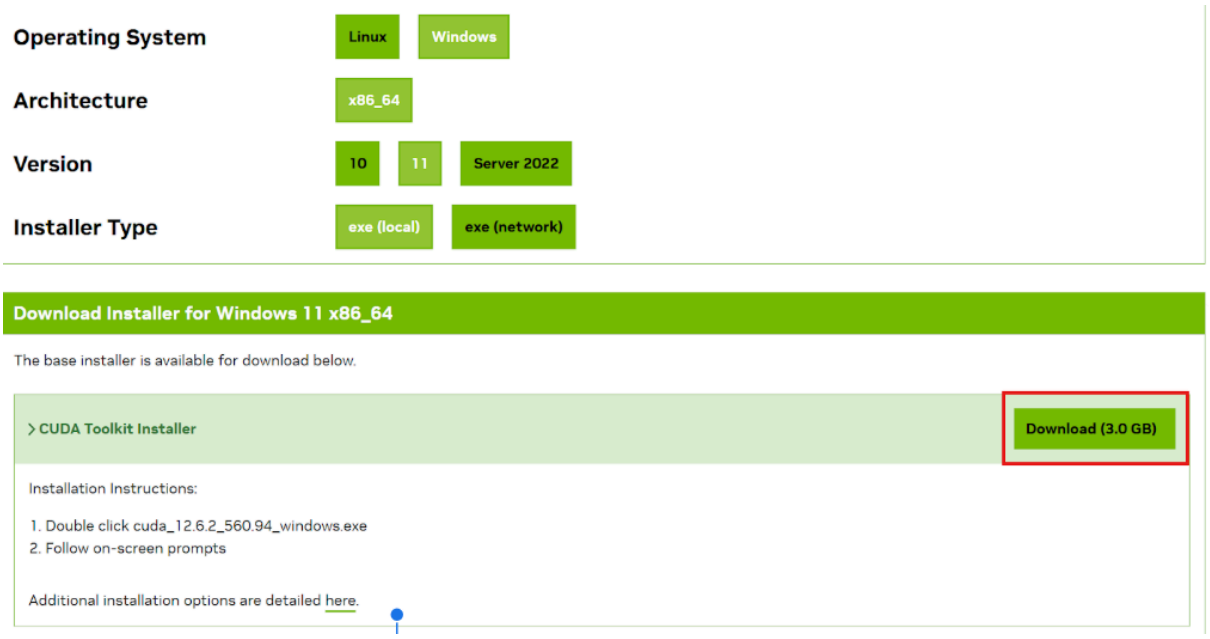
CUDA Driver

https://www.nvidia.com/en-us/drivers/



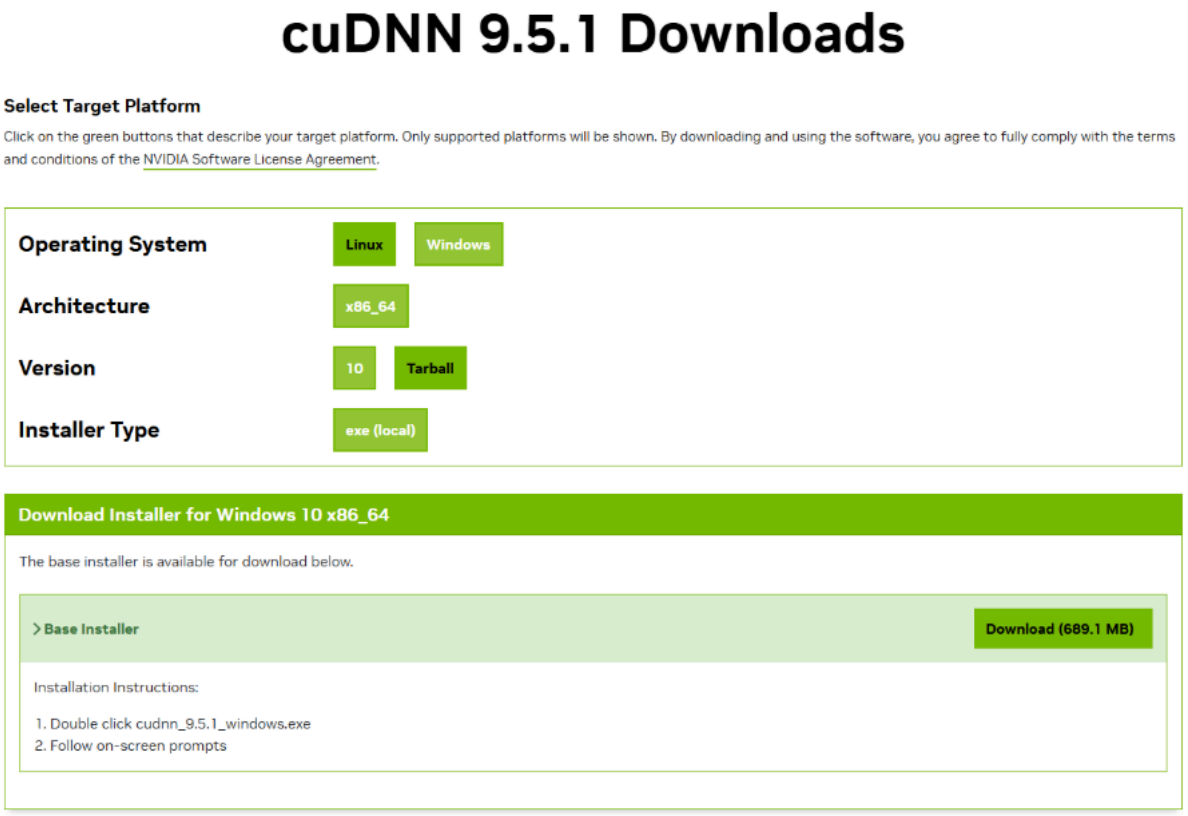
CUDA Toolkit

https://developer.nvidia.com/cuda-downloads?target_os=Windows&target_arch=x86_64&target_version=11&target_type=exe_local



CUDA DNN

https://developer.nvidia.com/cudnn-downloads



(NVIDIA 로그인 혹은 회원 가입 필요)

환경 변수 PATH

C:₩Users₩User₩AppData₩Local₩Programs₩Python₩Launcher₩
%USERPROFILE%₩AppData₩Local₩Microsoft₩WindowsApps
C:₩Users₩User₩AppData₩Local₩Programs₩Microsoft VS Code₩bin
%IntelliJ IDEA Community Edition%
%PyCharm Community Edition%
C:₩Users₩User₩AppData₩Local₩Programs₩Python₩Python312₩Scripts
C:₩Program Files₩NVIDIA GPU Computing Toolkit₩CUDA₩v12.6₩bin
C:₩Program Files₩NVIDIA GPU Computing Toolkit₩CUDA₩v12.6₩libnvvp

PATH에 CUDA Toolkit 경로 추가

```
C:\Users\User>nvidia-smi
Thu Nov 14 14:11:12 2024
+-----------------------------------------------------------------------------------------+
| NVIDIA-SMI 560.94                 Driver Version: 560.94         CUDA Version: 12.6     |
|-----------------------------------------+------------------------+----------------------+
| GPU  Name                  Driver-Model | Bus-Id          Disp.A | Volatile Uncorr. ECC |
| Fan  Temp   Perf          Pwr:Usage/Cap |           Memory-Usage | GPU-Util  Compute M. |
|                                         |                        |               MIG M. |
|=========================================+========================+======================|
|   0  NVIDIA GeForce RTX 4060 ...  WDDM  |   00000000:01:00.0 Off |                  N/A |
| N/A   39C    P0             10W /   80W |       0MiB /   8188MiB |      0%      Default |
|                                         |                        |                  N/A |
+-----------------------------------------+------------------------+----------------------+

+-----------------------------------------------------------------------------------------+
| Processes:                                                                              |
|  GPU   GI   CI        PID   Type   Process name                              GPU Memory |
|        ID   ID                                                               Usage      |
|=========================================================================================|
|  No running processes found                                                             |
+-----------------------------------------------------------------------------------------+
```

이후 nvdia-smi 명령어로 설치가 완료되었는지 확인