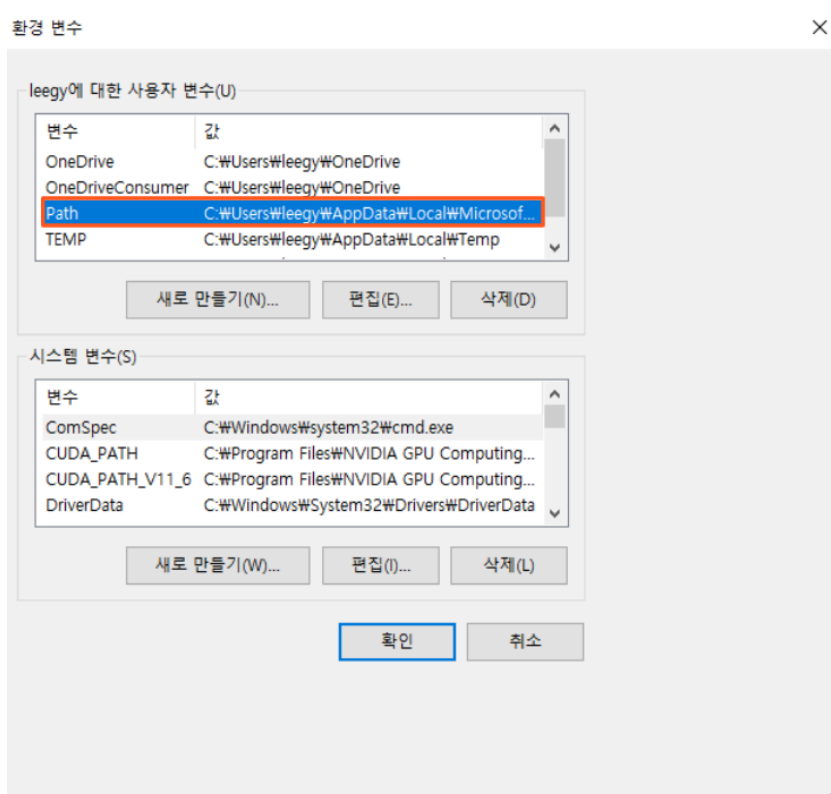


MSP 개발 환경 설정

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>

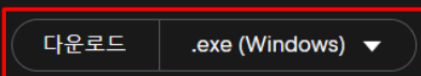
공식 홈페이지에서 가장 최신 버전의 IDE로 설치

(Community 버전)

활기찬 Python 커뮤니티에 대한 감사의 마음을 담아 Python 에코시스템을 지원하는 오픈소스 기여 활동으로 PyCharm Community Edition을 무상으로 제공합니다.



순수 Python 개발용 IDE



무료, 오픈 소스로 빌드됨

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

Search results for “pgvector” [Give feedback](#)

1 - 24 of 498 results

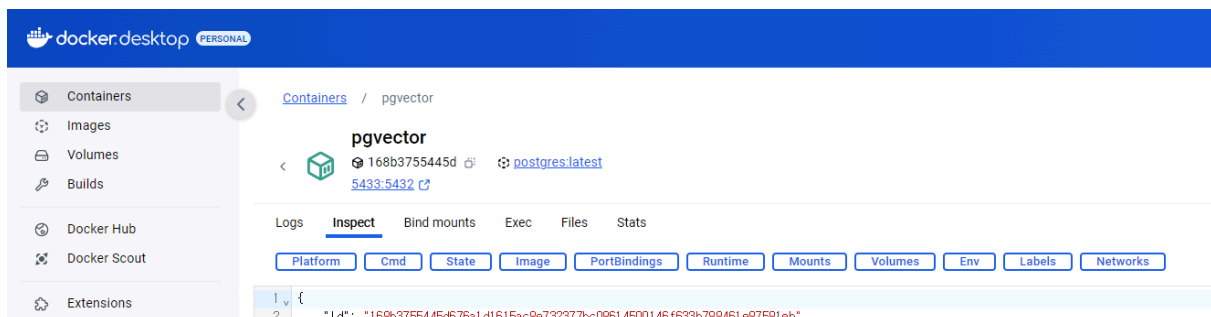
**pgvector/pgvector**

Open-source vector similarity search for Postgres

↓ 5M+ ☆ 41

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

Register - Server

General
Connection
Parameters
SSH Tunnel
Advanced
Tags

Host name/address

Port

5432

Maintenance database

postgres

Username

postgres

Kerberos authentication?

☐

Password

Save password?

☐

Role

Service

Name

'Name' cannot be empty.

i
?

Close
Reset
Save

GPU 설정

CUDA Driver

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

Get Automatic Driver Updates

The NVIDIA App is the essential companion for PC gamers and creators. Keep your PC up to date with the latest NVIDIA drivers and technology.

Best for:

Gamers / Creators

Best for:

Professionals / Workstation Users

CUDA Toolkit

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

Operating System

LinuxWindows

Architecture

x86_64

Version

1011Server 2022

Installer Type

exe (local)exe (network)

Download Installer for Windows 11 x86_64

The base installer is available for download below.

> CUDA Toolkit Installer

Download (3.0 GB)

Installation Instructions:

1. Double click cuda_12.6.2_560.94_windows.exe
2. Follow on-screen prompts

Additional installation options are detailed [here](#).

CUDA DNN

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

cuDNN 9.5.1 Downloads

Select Target Platform

Click on the green buttons that describe your target platform. Only supported platforms will be shown. By downloading and using the software, you agree to fully comply with the terms and conditions of the [NVIDIA Software License Agreement](#).

Operating System

LinuxWindows

Architecture

x86_64

Version

10Tarball

Installer Type

exe (local)

Download Installer for Windows 10 x86_64

The base installer is available for download below.

> Base Installer

Download (689.1 MB)

Installation Instructions:

1. Double click cudnn_9.5.1_windows.exe
2. Follow on-screen prompts

(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 | Perf | Driver-Model | Bus-Id | Disp.A | Volatile | Uncorr. ECC | |
| Fan | Temp | | Pwr:Usage/Cap | | Memory-Usage | GPU-Util | Compute M. | |
| | | | | | | | MIG M. | |
| 0 | NVIDIA GeForce RTX 4060 | P0 | WDDM 10W / 80W | 00000000:01:00:0 | Off | 0% | N/A | |
| N/A | 39C | | | 0MiB / 8188MiB | | | Default | |
| | | | | | | | N/A | |

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

이후 nvidia-smi 명령어로 설치가 완료되었는지 확인