

Simple_Rag

!nvidia-smi

Sun Dec 7 05:22:13 2025

NVIDIA-SMI 550.54.15				Driver Version: 550.54.15				CUDA Version: 12.4			
GPU Name		Persistence-M		Bus-Id	Disp.A		Volatile Uncorr. ECC	GPU-Util		Compute M.	
Fan	Temp	Perf	Pwr:Usage/Cap		Memory-Usage			MIG M.			
0	Tesla T4		Off	00000000:00:04.0	Off			0			
N/A	44C	P8	9W / 70W		0MiB / 15360MiB			0%		Default	N/A

Processes:

GPU ID	GI ID	PID	Type	Process name	GPU Memory Usage
No running processes found					

!pip uninstall -y chromadb langchain langchain-groq langchain-community langchain-chroma langchain-text-splitters transformers
!pip install -U chromadb langchain==0.1.18 langchain-groq==0.1.5 langchain-community==0.0.18 langchain-chroma==0.1.5 langchain

WARNING: Skipping chromadb as it is not installed.
WARNING: Skipping langchain as it is not installed.
WARNING: Skipping langchain-groq as it is not installed.
WARNING: Skipping langchain-community as it is not installed.
WARNING: Skipping langchain-chroma as it is not installed.
WARNING: Skipping langchain-text-splitters as it is not installed.
Found existing installation: transformers 4.57.3
Uninstalling transformers-4.57.3:
Successfully uninstalled transformers-4.57.3
WARNING: Skipping sentence-transformers as it is not installed.
Found existing installation: unstructured 0.18.21
Uninstalling unstructured-0.18.21:
Successfully uninstalled unstructured-0.18.21
WARNING: Skipping langchain-huggingface as it is not installed.
Collecting chromadb
Using cached chromadb-1.3.5-cp39-abi3-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (7.2 kB)
ERROR: Could not find a version that satisfies the requirement langchain==0.1.18 (from versions: 0.0.1, 0.0.2, 0.0.3, 0.0.4,
ERROR: No matching distribution found for langchain==0.1.18

#!apt-get install poppler-utils

Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
poppler-utils is already the newest version (22.02.0-2ubuntu0.12).
0 upgraded, 0 newly installed, 0 to remove and 41 not upgraded.

#!pip install --upgrade unstructured[local-inference]

```
Requirement already satisfied: nvidia-cuda-cupti-cu12==12.6.80 in /usr/local/lib/python3.12/dist-packages (from torch>uns
Requirement already satisfied: nvidia-cudnn-cu12==9.10.2.21 in /usr/local/lib/python3.12/dist-packages (from torch>unstru
Requirement already satisfied: nvidia-cublas-cu12==12.6.4.1 in /usr/local/lib/python3.12/dist-packages (from torch>unstru
Requirement already satisfied: nvidia-cufft-cu12==11.3.0.4 in /usr/local/lib/python3.12/dist-packages (from torch>unstru
Requirement already satisfied: nvidia-curand-cu12==10.3.7.77 in /usr/local/lib/python3.12/dist-packages (from torch>unstr
Requirement already satisfied: nvidia-cusolver-cu12==11.7.1.2 in /usr/local/lib/python3.12/dist-packages (from torch>unst
Requirement already satisfied: nvidia-cusparselt-cu12==0.7.1 in /usr/local/lib/python3.12/dist-packages (from torch>unstr
Requirement already satisfied: nvidia-nccl-cu12==2.27.5 in /usr/local/lib/python3.12/dist-packages (from torch>unstructur
Requirement already satisfied: nvidia-nvshmem-cu12==3.3.20 in /usr/local/lib/python3.12/dist-packages (from torch>unstruct
Requirement already satisfied: nvidia-nvtx-cu12==12.6.77 in /usr/local/lib/python3.12/dist-packages (from torch>unstructu
Requirement already satisfied: nvidia-nvjitlink-cu12==12.6.85 in /usr/local/lib/python3.12/dist-packages (from torch>unst
Requirement already satisfied: nvidia-cufile-cu12==1.11.1.6 in /usr/local/lib/python3.12/dist-packages (from torch>unstru
Requirement already satisfied: triton==3.5.0 in /usr/local/lib/python3.12/dist-packages (from torch>unstructured-inferenc
Requirement already satisfied: mpmath<1.4,>=1.1.0 in /usr/local/lib/python3.12/dist-packages (from sympy>onnxruntime==1.1
Requirement already satisfied: tokenizers<0.23.0,>=0.22.0 in /usr/local/lib/python3.12/dist-packages (from transformers>=
Requirement already satisfied: hf-xet<2.0.0,>=1.1.3 in /usr/local/lib/python3.12/dist-packages (from huggingface-hub>unst
Requirement already satisfied: mpy-extensions>=0.3.0 in /usr/local/lib/python3.12/dist-packages (from typing-inspect<1,>=
Requirement already satisfied: humanfriendly>=9.1 in /usr/local/lib/python3.12/dist-packages (from coloredlogs>onnxruntime
Requirement already satisfied: contourpy==1.0.1 in /usr/local/lib/python3.12/dist-packages (from matplotlib>unstructured-
Requirement already satisfied: cycycler>=0.10 in /usr/local/lib/python3.12/dist-packages (from matplotlib>unstructured-infe
Requirement already satisfied: fonttools==4.22.0 in /usr/local/lib/python3.12/dist-packages (from matplotlib>unstructured
Requirement already satisfied: kiwisolver==1.3.1 in /usr/local/lib/python3.12/dist-packages (from matplotlib>unstructured
Requirement already satisfied: pyparsing==2.3.1 in /usr/local/lib/python3.12/dist-packages (from matplotlib>unstructured-
Requirement already satisfied: pycparser in /usr/local/lib/python3.12/dist-packages (from cffi>=1.12->cryptography>=39.0->
Requirement already satisfied: pyasn1<0.7.0,>=0.6.1 in /usr/local/lib/python3.12/dist-packages (from pyasn1-modules>=0.2.1
Requirement already satisfied: sniffio==1.1 in /usr/local/lib/python3.12/dist-packages (from anyio->httpx>=0.27.0->unstruc
Requirement already satisfied: MarkupSafe==2.0 in /usr/local/lib/python3.12/dist-packages (from jinja2->torch>unstructure
Using cached unstructured-0.18.21-py3-none-any.whl (1.8 MB)
Using cached transformers-4.57.3-py3-none-any.whl (12.0 MB)
Installing collected packages: unstructured, transformers
Successfully installed transformers-4.57.3 unstructured-0.18.21
```

```
!pip install langchain
!pip install langchain-community
!pip install langchain-text-splitters
!pip install langchain-chroma
```

```
Collecting langchain
  Downloading langchain-1.1.2-py3-none-any.whl.metadata (4.9 kB)
Requirement already satisfied: langchain-core<2.0.0,>=1.1.0 in /usr/local/lib/python3.12/dist-packages (from langchain) (1
Requirement already satisfied: langgraph<1.1.0,>=1.0.2 in /usr/local/lib/python3.12/dist-packages (from langchain) (1.0.3)
Requirement already satisfied: pydantic<3.0.0,>=2.7.4 in /usr/local/lib/python3.12/dist-packages (from langchain) (2.12.3)
Requirement already satisfied: jsonpatch<2.0.0,>=1.33.0 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.
Requirement already satisfied: langsmith<1.0.0,>=0.3.45 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.
Requirement already satisfied: packaging<26.0.0,>=23.2.0 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2
Requirement already satisfied: pyyaml<7.0.0,>=5.3.0 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.0,
Requirement already satisfied: tenacity!=8.4.0,<10.0.0,>=8.1.0 in /usr/local/lib/python3.12/dist-packages (from langchain-
Requirement already satisfied: typing-extensions<5.0.0,>=4.7.0 in /usr/local/lib/python3.12/dist-packages (from langchain-
Requirement already satisfied: langgraph-checkpoint<4.0.0,>=2.1.0 in /usr/local/lib/python3.12/dist-packages (from langgra
Requirement already satisfied: langgraph-prebuilt<1.1.0,>=1.0.2 in /usr/local/lib/python3.12/dist-packages (from langgraph
Requirement already satisfied: langgraph-sdk<0.3.0,>=0.2.2 in /usr/local/lib/python3.12/dist-packages (from langgraph<1.1.
Requirement already satisfied: xxhash>=3.5.0 in /usr/local/lib/python3.12/dist-packages (from langgraph<1.1.0,>=1.0.2->lan
Requirement already satisfied: annotated-types==0.6.0 in /usr/local/lib/python3.12/dist-packages (from pydantic<3.0.0,>=2.
Requirement already satisfied: pydantic-core==2.41.4 in /usr/local/lib/python3.12/dist-packages (from pydantic<3.0.0,>=2.7
Requirement already satisfied: typing-inspection==0.4.2 in /usr/local/lib/python3.12/dist-packages (from pydantic<3.0.0,>=
Requirement already satisfied: jsonpointer==1.9 in /usr/local/lib/python3.12/dist-packages (from jsonpatch<2.0.0,>=1.33.0-
Requirement already satisfied: ormsgpack==1.12.0 in /usr/local/lib/python3.12/dist-packages (from langgraph-checkpoint<4.0
Requirement already satisfied: httpx>=0.25.2 in /usr/local/lib/python3.12/dist-packages (from langgraph-sdk<0.3.0,>=0.2.2-
Requirement already satisfied: orjson==3.10.1 in /usr/local/lib/python3.12/dist-packages (from langgraph-sdk<0.3.0,>=0.2.2
Requirement already satisfied: requests-toolbelt==1.0.0 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>
Requirement already satisfied: requests>=2.0.0 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->
Requirement already satisfied: zstandard==0.23.0 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45
Requirement already satisfied: anyio in /usr/local/lib/python3.12/dist-packages (from httpx>=0.25.2->langgraph-sdk<0.3.0,>
Requirement already satisfied: certifi in /usr/local/lib/python3.12/dist-packages (from httpx>=0.25.2->langgraph-sdk<0.3.0
Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.12/dist-packages (from httpx>=0.25.2->langgraph-sdk
Requirement already satisfied: idna in /usr/local/lib/python3.12/dist-packages (from httpx>=0.25.2->langgraph-sdk<0.3.0,>=
Requirement already satisfied: h11==0.16 in /usr/local/lib/python3.12/dist-packages (from httpcore==1.*->httpx>=0.25.2->la
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.12/dist-packages (from requests>=2.0.0->
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.12/dist-packages (from requests>=2.0.0->langsm
Requirement already satisfied: sniffio==1.1 in /usr/local/lib/python3.12/dist-packages (from anyio->httpx>=0.25.2->langgra
Downloading langchain-1.1.2-py3-none-any.whl (102 kB)
102.1/102.1 kB 9.5 MB/s eta 0:00:00
Installing collected packages: langchain
Successfully installed langchain-1.1.2
Collecting langchain-community
  Downloading langchain_community-0.4.1-py3-none-any.whl.metadata (3.0 kB)
Requirement already satisfied: langchain-core<2.0.0,>=1.0.1 in /usr/local/lib/python3.12/dist-packages (from langchain-com
Collecting langchain-classic<2.0.0,>=1.0.0 (from langchain-community)
  Downloading langchain_classic-1.0.0-py3-none-any.whl.metadata (3.9 kB)
Requirement already satisfied: SQLAlchemy<3.0.0,>=1.4.0 in /usr/local/lib/python3.12/dist-packages (from langchain-communi
Collecting requests<3.0.0,>=2.32.5 (from langchain-community)
  Downloading requests-2.32.5-py3-none-any.whl.metadata (4.9 kB)
Requirement already satisfied: PyYAML<7.0.0,>=5.3.0 in /usr/local/lib/python3.12/dist-packages (from langchain-community)
Requirement already satisfied: aiohttp<4.0.0,>=3.8.3 in /usr/local/lib/python3.12/dist-packages (from langchain-community)
Requirement already satisfied: tenacity!=8.4.0,<10.0.0,>=8.1.0 in /usr/local/lib/python3.12/dist-packages (from langchain-
Requirement already satisfied: dataclasses-json<0.7.0,>=0.6.7 in /usr/local/lib/python3.12/dist-packages (from langchain-c
Requirement already satisfied: pydantic-settings<3.0.0,>=2.10.1 in /usr/local/lib/python3.12/dist-packages (from langchain
Requirement already satisfied: langsmith<1.0.0,>=0.1.125 in /usr/local/lib/python3.12/dist-packages (from langchain-commun
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Requirement already satisfied: httpx-sse<1.0.0,>=0.4.0 in /usr/local/lib/python3.12/dist-packages (from langchain-community)
Requirement already satisfied: numpy>=1.26.2 in /usr/local/lib/python3.12/dist-packages (from langchain-community) (2.0.2)
Requirement already satisfied: aiohappyeyeballs>=2.5.0 in /usr/local/lib/python3.12/dist-packages (from aiohttp<4.0.0,>=3.8.3)
Requirement already satisfied: aiosignal>=1.4.0 in /usr/local/lib/python3.12/dist-packages (from aiohttp<4.0.0,>=3.8.3->aiohttp)
Requirement already satisfied: attrs>=17.3.0 in /usr/local/lib/python3.12/dist-packages (from aiohttp<4.0.0,>=3.8.3->aiohttp)
Requirement already satisfied: frozenlist>=1.1.1 in /usr/local/lib/python3.12/dist-packages (from aiohttp<4.0.0,>=3.8.3->aiohttp)
```

```
!pip install sentence-transformers
```

```
Collecting sentence-transformers
```

```
  Downloading sentence_transformers-5.1.2-py3-none-any.whl.metadata (16 kB)
Requirement already satisfied: transformers<5.0.0,>=4.41.0 in /usr/local/lib/python3.12/dist-packages (from sentence-transformers) (4.46.1)
Requirement already satisfied: tqdm in /usr/local/lib/python3.12/dist-packages (from sentence-transformers) (4.67.1)
Requirement already satisfied: torch>=1.11.0 in /usr/local/lib/python3.12/dist-packages (from sentence-transformers) (2.9.0+cu124)
Requirement already satisfied: scikit-learn in /usr/local/lib/python3.12/dist-packages (from sentence-transformers) (1.6.1)
Requirement already satisfied: scipy in /usr/local/lib/python3.12/dist-packages (from sentence-transformers) (1.16.3)
Requirement already satisfied: huggingface-hub>=0.20.0 in /usr/local/lib/python3.12/dist-packages (from sentence-transformers) (0.27.0)
Requirement already satisfied: Pillow in /usr/local/lib/python3.12/dist-packages (from sentence-transformers) (11.3.0)
Requirement already satisfied: typing_extensions>=4.5.0 in /usr/local/lib/python3.12/dist-packages (from sentence-transformers) (4.12.0)
Requirement already satisfied: filelock in /usr/local/lib/python3.12/dist-packages (from huggingface-hub>=0.20.0->sentence-transformers) (3.16.1)
Requirement already satisfied: fsspec>=2023.5.0 in /usr/local/lib/python3.12/dist-packages (from huggingface-hub>=0.20.0->sentence-transformers) (2025.3.0)
Requirement already satisfied: packaging>=20.9 in /usr/local/lib/python3.12/dist-packages (from huggingface-hub>=0.20.0->sentence-transformers) (25.0)
Requirement already satisfied: pyyaml>=5.1 in /usr/local/lib/python3.12/dist-packages (from huggingface-hub>=0.20.0->sentence-transformers) (6.0.2)
Requirement already satisfied: requests in /usr/local/lib/python3.12/dist-packages (from huggingface-hub>=0.20.0->sentence-transformers) (2.32.3)
Requirement already satisfied: hf-xet<2.0.0,>=1.1.3 in /usr/local/lib/python3.12/dist-packages (from huggingface-hub>=0.20.0->sentence-transformers) (1.1.7)
Requirement already satisfied: setuptools in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (75.8.1)
Requirement already satisfied: sympy>=1.13.3 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (1.13.3)
Requirement already satisfied: networkx>=2.5.1 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (3.4.1)
Requirement already satisfied: Jinja2 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (3.1.4)
Requirement already satisfied: nvidia-cuda-nvrtc-cu12==12.6.77 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (12.6.77)
Requirement already satisfied: nvidia-cuda-runtime-cu12==12.6.77 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (12.6.77)
Requirement already satisfied: nvidia-cuda-cupti-cu12==12.6.80 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (12.6.80)
Requirement already satisfied: nvidia-cudnn-cu12==9.10.2.21 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (9.10.2.21)
Requirement already satisfied: nvidia-cublas-cu12==12.6.4.1 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (12.6.4.1)
Requirement already satisfied: nvidia-cufft-cu12==11.3.0.4 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (11.3.0.4)
Requirement already satisfied: nvidia-curand-cu12==10.3.7.77 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (10.3.7.77)
Requirement already satisfied: nvidia-cusolver-cu12==11.7.1.2 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (11.7.1.2)
Requirement already satisfied: nvidia-cusparselt-cu12==12.5.4.2 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (12.5.4.2)
Requirement already satisfied: nvidia-cusparse-cu12==12.5.4.2 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (12.5.4.2)
Requirement already satisfied: nvidia-cusparselt-cu12==0.7.1 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (0.7.1)
Requirement already satisfied: nvidia-nccl-cu12==2.27.5 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (2.27.5)
Requirement already satisfied: nvidia-nvshmem-cu12==3.3.20 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (3.3.20)
Requirement already satisfied: nvidia-nvtx-cu12==12.6.77 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (12.6.77)
Requirement already satisfied: nvidia-nvjitlink-cu12==12.6.85 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (12.6.85)
Requirement already satisfied: nvidia-cufile-cu12==1.11.1.6 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (1.11.1.6)
Requirement already satisfied: triton==3.5.0 in /usr/local/lib/python3.12/dist-packages (from torch>=1.11.0->sentence-transformers) (3.5.0)
Requirement already satisfied: numpy>=1.17 in /usr/local/lib/python3.12/dist-packages (from transformers<5.0.0,>=4.41.0->sentence-transformers) (2.0.2)
Requirement already satisfied: regex!=2019.12.17 in /usr/local/lib/python3.12/dist-packages (from transformers<5.0.0,>=4.41.0->sentence-transformers) (2024.11.6)
Requirement already satisfied: tokenizers<0.23.0,>=0.22.0 in /usr/local/lib/python3.12/dist-packages (from transformers<5.0.0,>=4.41.0->sentence-transformers) (0.22.0)
Requirement already satisfied: safetensors>=0.4.3 in /usr/local/lib/python3.12/dist-packages (from transformers<5.0.0,>=4.41.0->sentence-transformers) (0.5.2)
Requirement already satisfied: joblib>=1.2.0 in /usr/local/lib/python3.12/dist-packages (from scikit-learn->sentence-transformers) (1.4.2)
Requirement already satisfied: threadpoolctl>=3.1.0 in /usr/local/lib/python3.12/dist-packages (from scikit-learn->sentence-transformers) (3.5.0)
Requirement already satisfied: mpmath<1.4,>=1.1.0 in /usr/local/lib/python3.12/dist-packages (from sympy>=1.13.3->torch>=1.11.0->sentence-transformers) (1.3.0)
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.12/dist-packages (from Jinja2->torch>=1.11.0->sentence-transformers) (3.0.2)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.12/dist-packages (from requests->huggingface-hub>=0.20.0->sentence-transformers) (3.10.1)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.12/dist-packages (from requests->huggingface-hub>=0.20.0->sentence-transformers) (2.3.0)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.12/dist-packages (from requests->huggingface-hub>=0.20.0->sentence-transformers) (2025.11.12)
Downloading sentence_transformers-5.1.2-py3-none-any.whl (488 kB)
488.0/488.0 kB 34.3 MB/s eta 0:00:00
```

```
Installing collected packages: sentence-transformers
```

```
Successfully installed sentence-transformers-5.1.2
```

```
!pip install langchain-groq
```

```
Collecting langchain-groq
```

```
  Downloading langchain_groq-1.1.0-py3-none-any.whl.metadata (2.4 kB)
```

```
Collecting groq<1.0.0,>=0.30.0 (from langchain-groq)
```

```
  Downloading groq-0.37.1-py3-none-any.whl.metadata (16 kB)
```

```
Requirement already satisfied: langchain-core<2.0.0,>=1.1.0 in /usr/local/lib/python3.12/dist-packages (from langchain-groq) (2.0.0)
Requirement already satisfied: anyio<5,>=3.5.0 in /usr/local/lib/python3.12/dist-packages (from groq<1.0.0,>=0.30.0->langchain-groq) (4.8.0)
Requirement already satisfied: distro<2,>=1.7.0 in /usr/local/lib/python3.12/dist-packages (from groq<1.0.0,>=0.30.0->langchain-groq) (1.9.0)
Requirement already satisfied: httpx<1,>=0.23.0 in /usr/local/lib/python3.12/dist-packages (from groq<1.0.0,>=0.30.0->langchain-groq) (0.28.1)
Requirement already satisfied: pydantic<3,>=1.9.0 in /usr/local/lib/python3.12/dist-packages (from groq<1.0.0,>=0.30.0->langchain-groq) (2.10.6)
Requirement already satisfied: sniffio in /usr/local/lib/python3.12/dist-packages (from groq<1.0.0,>=0.30.0->langchain-groq) (1.3.1)
Requirement already satisfied: typing-extensions<5,>=4.10 in /usr/local/lib/python3.12/dist-packages (from groq<1.0.0,>=0.30.0->langchain-groq) (4.12.0)
Requirement already satisfied: jsonpatch<2.0.0,>=1.33.0 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.0,>=1.1.0->langchain-groq) (1.33.0)
Requirement already satisfied: langsmith<1.0.0,>=0.3.45 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.0,>=1.1.0->langchain-groq) (0.3.45)
Requirement already satisfied: packaging<26.0.0,>=23.2.0 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.0,>=1.1.0->langchain-groq) (25.0)
Requirement already satisfied: pyyaml<7.0.0,>=5.3.0 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.0,>=1.1.0->langchain-groq) (6.0.2)
Requirement already satisfied: tenacity<8.4.0,<10.0.0,>=8.1.0 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.0,>=1.1.0->langchain-groq) (9.0.0)
Requirement already satisfied: idna>=2.8 in /usr/local/lib/python3.12/dist-packages (from anyio<5,>=3.5.0->groq<1.0.0,>=0.30.0->langchain-groq) (3.10.1)
Requirement already satisfied: certifi in /usr/local/lib/python3.12/dist-packages (from httpx<1,>=0.23.0->groq<1.0.0,>=0.30.0->langchain-groq) (2025.11.12)
Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.12/dist-packages (from httpx<1,>=0.23.0->groq<1.0.0,>=0.30.0->langchain-groq) (1.0.7)
Requirement already satisfied: h11>=0.16 in /usr/local/lib/python3.12/dist-packages (from httpcore==1.*->httpx<1,>=0.23.0->groq<1.0.0,>=0.30.0->langchain-groq) (0.14.0)
Requirement already satisfied: jsonpointer>=1.9 in /usr/local/lib/python3.12/dist-packages (from jsonpatch<2.0.0,>=1.33.0->langchain-core<2.0.0,>=1.1.0->langchain-groq) (3.0.0)
Requirement already satisfied: orjson>=3.9.14 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->langchain-core<2.0.0,>=1.1.0->langchain-groq) (3.10.15)
Requirement already satisfied: requests-toolbelt>=1.0.0 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->langchain-core<2.0.0,>=1.1.0->langchain-groq) (1.0.0)
```

```
Requirement already satisfied: requests>=2.0.0 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->langsmith)
Requirement already satisfied: zstandard>=0.23.0 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->langsmith)
Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.12/dist-packages (from pydantic<3,>=1.9.0->pydantic)
Requirement already satisfied: pydantic-core==2.41.4 in /usr/local/lib/python3.12/dist-packages (from pydantic<3,>=1.9.0->pydantic)
Requirement already satisfied: typing-inspection>=0.4.2 in /usr/local/lib/python3.12/dist-packages (from pydantic<3,>=1.9.0->pydantic)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.12/dist-packages (from requests>=2.0.0->requests)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.12/dist-packages (from requests>=2.0.0->requests)
Downloading langchain-groq-1.1.0-py3-none-any.whl (19 kB)
Downloading groq-0.37.1-py3-none-any.whl (137 kB)
137.5/137.5 kB 12.7 MB/s eta 0:00:00
Installing collected packages: groq, langchain-groq
Successfully installed groq-0.37.1 langchain-groq-1.1.0
```

```
!pip install unstructured
!pip install unstructured[pdf]
```

```
Requirement already satisfied: aiofiles>=24.1.0 in /usr/local/lib/python3.12/dist-packages (from unstructured-client->unstructured-client)
Requirement already satisfied: httpcore>=1.0.9 in /usr/local/lib/python3.12/dist-packages (from unstructured-client->unstructured-client)
Requirement already satisfied: httpx>=0.27.0 in /usr/local/lib/python3.12/dist-packages (from unstructured-client->unstructured-client)
Requirement already satisfied: pydantic>=2.11.2 in /usr/local/lib/python3.12/dist-packages (from unstructured-client->unstructured-client)
Requirement already satisfied: requests-toolbelt>=1.0.0 in /usr/local/lib/python3.12/dist-packages (from unstructured-client->unstructured-client)
Requirement already satisfied: cffi>=1.12 in /usr/local/lib/python3.12/dist-packages (from cryptography>=36.0.0->pdfminer)
Requirement already satisfied: googleapis-common-protos<2.0.0,>=1.56.2 in /usr/local/lib/python3.12/dist-packages (from google-auth!=2.24.0,!=2.25.0->google-auth)
Requirement already satisfied: grpcio-status<2.0.0,>=1.33.2 in /usr/local/lib/python3.12/dist-packages (from google-api-core)
Requirement already satisfied: cachetools<7.0,>=2.0.0 in /usr/local/lib/python3.12/dist-packages (from google-auth!=2.24.0,!=2.25.0->google-auth)
Requirement already satisfied: pyasn1-modules>=0.2.1 in /usr/local/lib/python3.12/dist-packages (from google-auth!=2.24.0,!=2.25.0->google-auth)
Requirement already satisfied: rsa<5,>=3.1.4 in /usr/local/lib/python3.12/dist-packages (from google-auth!=2.24.0,!=2.25.0->google-auth)
Requirement already satisfied: h11>=0.16 in /usr/local/lib/python3.12/dist-packages (from httpcore>=1.0.9->unstructured-client)
Requirement already satisfied: anyio in /usr/local/lib/python3.12/dist-packages (from httpx>=0.27.0->unstructured-client)
Requirement already satisfied: antlr4-python3-runtime==4.9.* in /usr/local/lib/python3.12/dist-packages (from omegaconf>=2.11.2->unstructured-client)
Requirement already satisfied: PyYAML>=5.1.0 in /usr/local/lib/python3.12/dist-packages (from omegaconf>=2.11.2->unstructured-client)
Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.12/dist-packages (from pydantic>=2.11.2->unstructured-client)
Requirement already satisfied: pydantic-core==2.41.4 in /usr/local/lib/python3.12/dist-packages (from pydantic>=2.11.2->unstructured-client)
Requirement already satisfied: typing-inspection>=0.4.2 in /usr/local/lib/python3.12/dist-packages (from pydantic>=2.11.2->unstructured-client)
Requirement already satisfied: safetensors in /usr/local/lib/python3.12/dist-packages (from timm->unstructured-inference)
Requirement already satisfied: filelock in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: setuptools in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: networkx>=2.5.1 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: Jinja2 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: fsspec>=0.8.5 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: nvidia-cuda-nvrtc-cu12==12.6.77 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: nvidia-cuda-runtime-cu12==12.6.77 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: nvidia-cudnn-cu12==9.10.2.21 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: nvidia-cublas-cu12==12.6.4.1 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: nvidia-cufft-cu12==11.3.0.4 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: nvidia-curand-cu12==10.3.7.7 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: nvidia-cusolver-cu12==11.7.1.2 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: nvidia-cusparselt-cu12==0.7.1 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: nvidia-nccl-cu12==2.27.5 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: nvidia-nvshmem-cu12==3.3.20 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: nvidia-nvtx-cu12==12.6.77 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: nvidia-nvjitlink-cu12==12.6.85 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: nvidia-cufile-cu12==1.11.1.6 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: triton==3.5.0 in /usr/local/lib/python3.12/dist-packages (from torch->unstructured-inference)
Requirement already satisfied: mpmath<1.4,>=1.1.0 in /usr/local/lib/python3.12/dist-packages (from sympy->onnxruntime)
Requirement already satisfied: tokenizers<0.23.0,>=0.22.0 in /usr/local/lib/python3.12/dist-packages (from transformers)
Requirement already satisfied: hf-xet<2.0.0,>=1.1.3 in /usr/local/lib/python3.12/dist-packages (from huggingface-hub)
Requirement already satisfied: mypy-extensions>=0.3.0 in /usr/local/lib/python3.12/dist-packages (from typing-inspect)
Requirement already satisfied: humanfriendly>=9.1 in /usr/local/lib/python3.12/dist-packages (from coloredlogs)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.12/dist-packages (from matplotlib)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.12/dist-packages (from matplotlib)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.12/dist-packages (from matplotlib)
Requirement already satisfied: kiwisolver>=1.3.1 in /usr/local/lib/python3.12/dist-packages (from matplotlib)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.12/dist-packages (from matplotlib)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.12/dist-packages (from matplotlib)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.12/dist-packages (from pandas)
Requirement already satisfied: tzdata>=2022.7 in /usr/local/lib/python3.12/dist-packages (from pandas)
Requirement already satisfied: pycparser in /usr/local/lib/python3.12/dist-packages (from cffi>=1.12->cryptography)
Requirement already satisfied: pyasn1<0.7.0,>=0.6.1 in /usr/local/lib/python3.12/dist-packages (from pyasn1-modules)
Requirement already satisfied: sniffio>=1.1 in /usr/local/lib/python3.12/dist-packages (from anyio)
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.12/dist-packages (from Jinja2->torch->unstructured)
```

```
import os
os.environ["OPENAI_API_KEY"] = "gsk_x1SiJhn9bvHFndaEXANWgdyb3FYRTb4XAiEDIKCL0dHCqIS0YE2"
```

```
import requests
url = "https://courses.cs.umbc.edu/671/fall12/notes/python/04_python_functions.pdf"

response = requests.get(url)
```

```
response
```


<Response [200]>

```
#save the pdf local file
```

```
with open("python_inbuildfunctions.pdf", "wb") as f:
    f.write(response.content)
```

```
from langchain_community.document_loaders import UnstructuredFileIOLoader
```

```
with open("python_inbuildfunctions.pdf", "rb") as f:
    loader = UnstructuredFileIOLoader(file=f)
    documents = loader.load()
```

```
documents # This will be a list of Document objects
```

```

/tmp/ipython-input-1778148066.py:4: LangChainDeprecationWarning: The class 'UnstructuredFileIOLoader' was deprecated in LLa
Loader = UnstructuredFileIOLoader(file=f)
Warning: No languages specified, defaulting to English.
[Document(metadata={}, page_content='Functions in Python\n\nDefining Functions\n\nFunction definition begins with “def.”
Function name and its arguments.\n\ndef get_final_answer(filename): “““Documentation String”””\n\nline1 line2 return
total_counter\n\nThe indentation matters... First line with less indentation is considered to be outside of the function
definition.\n\nThe keyword ‘return’ indicates the value to be sent back to the caller.\n\nNo header file or declaration
of types of function or arguments\n\nColon.\n\nPython and Types\n\nDynamic typing: Python determines the data types of
variable bindings in a program automatically\n\nStrong typing: But Python’s not casual about types, it enforces the types
of objects\n\nFor example, you can’t just append an integer to a string, but must first convert it to a string\n\nx =
“the answer is ” # x bound to a string y = 23 # y bound to an integer. print x + y # Python will complain!\n\nCalling a
Function\n\nThe syntax for a function call is: >>> def myfun(x, y): return x * y >>> myfun(3, 4) 12\n\nParameters in
Python are Call by Assignment •\u02f0ld values for the variables that are parameter names are hidden, and these
variables are simply made to refer to the new values\n\nAll assignment in Python, including binding function parameters,
uses reference semantics.\n\nFunctions without returns\n\nAll functions in Python have a return value, even if no return
line inside the code\n\nFunctions without a return return the special value None •\u02f0ne is a special constant in the
language •\u02f0ne is used like NULL, void, or nil in other\n\nlanguages\n\nNone is also logically equivalent to False
•\u02f0The interpreter’s REPL doesn’t print None\n\nFunction overloading? No.\n\nThere is no function overloading in
Python\n\nUnlike C++, a Python function is specified by its name alone\n\nThe number, order, names, or types of arguments
cannot be used to distinguish between two functions with the same name\n\nTwo different functions can’t have the same
name, even if they have different arguments\n\nBut: see operator overloading in later slides (Note: van Rossum playing
with function overloading for the future)\n\nDefault Values for Arguments\n\nYou can provide default values for a
function’s arguments\n\nThese arguments are optional when the function is called\n\n>>> def myfun(b, c=3,
d=“hello”):\n\nreturn b + c >>> myfun(5,3,“hello”) >>> myfun(5,3) >>> myfun(5)\n\nAll of the above function calls return
8\n\nKeyword Arguments\n\nCan call a function with some/all of its arguments out of order as long as you specify their
names >>> def foo(x,y,z): return(2*x,4*y,8*z) >>> foo(2,3,4) (4, 12, 32) >>> foo(z=4, y=2, x=3) (6, 8, 32) >>> foo(-2,
z=-4, y=-3) (-4, -12, -32)\n\nCan be combined with defaults, too\n\n>>> def foo(x=1,y=2,z=3): return(2*x,4*y,8*z) >>>
foo() (2, 8, 24) >>> foo(z=100) (2, 8, 800)\n\nFunctions are first-class objects\n\nFunctions can be used as any
other\n\nndatatype, eg: •\u02f0Arguments to function •\u02f0Return values of functions •\u02f0Assigned to variables
•\u02f0Parts of tuples, lists, etc\n\n>>> def square(x): return x*x\n\n>>> def applier(q, x): return q(x)\n\n>>>
applier(square, 7) 49\n\nLambda Notation\n\nPython’s lambda creates anonymous functions >>> applier(lambda z: z * 42, 7)
14 •\u02f0Note: only one expression in the lambda\n\nbody; its value is always returned\n\nPython supports functional
programming idioms: map, filter, closures, continuations, etc.\n\nLambda Notation\n\nBe careful with the syntax >>> f =
lambda x,y : 2 * x + y >>> f <function <lambda> at 0x87d30>>> f(3, 4) 10 >>> v = lambda x: x*x(100) >>> v <function
<lambda> at 0x87df0> >>> v = (lambda x: x*x)(100) >>> v 10000\n\nExample: composition\n\n>>> def square(x): return x*x
>>> def twice(f): return lambda x: f(f(x)) >>> twice <function twice at 0x87db0> >>> quad = twice(square) >>> quad
<function <lambda> at 0x87d30>>> quad(5) 625\n\nExample: closure\n\n>>> def counter(start=0, step=1): x = [start] def
_inc(): x[0] += step return x[0] return _inc >>> c1 = counter() >>> c2 = counter(100, -10) >>> c1() 1 >>> c2() 90\n\nmap,
filter, reduce\n\n>>> def add1(x): return x+1 >>> def odd(x): return x%2 == 1 >>> def add(x,y): return x + y >>>
map(add1, [1,2,3,4]) [2, 3, 4, 5] >>> map(+,[1,2,3,4],[100,200,300,400]) map(+,[1,2,3,4],[100,200,300,400]) ^
SyntaxError: invalid syntax >>> map(add,[1,2,3,4],[100,200,300,400]) [101, 202, 303, 404] >>> reduce(add, [1,2,3,4]) 10
>>> filter(odd, [1,2,3,4]) [1, 3]\n\nPython\n\nfunctional programming\n\nFunctions are first-class objects\n\nFunctions
can be used as any other\n\nndatatype, eg: •\u02f0Arguments to function •\u02f0Return values of functions •\u02f0Assigned
to variables •\u02f0Parts of tuples, lists, etc\n\n>>> def square(x): return x*x\n\n>>> def applier(q, x): return
q(x)\n\n>>> applier(square, 7) 49\n\nLambda Notation\n\nPython’s lambda creates anonymous functions >>> lambda x: x + 1
<function <lambda> at 0x1004e6ed8> >>> f = lambda x: x + 1 >>> f <function <lambda> at 0x1004e6f50> >>> f(100)
101\n\nLambda Notation\n\nBe careful with the syntax >>> f = lambda x,y: 2 * x + y >>> f <function <lambda> at 0x87d30>
>>> f(3, 4) 10 >>> v = lambda x: x*x(100) >>> v <function <lambda> at 0x87df0> >>> v = (lambda x: x*x)(100) >>> v
10000\n\nLambda Notation Limitations\n\nNote: only one expression in the lambda body; Its value is always returned\n\nThe
lambda expression must fit on one line!\n\nLambda will probably be deprecated in future versions of python\n\nGuido is
not a lambda fanboy\n\nFunctional programming\n\nPython supports functional programming idioms\n\nBuiltins for map,
reduce, filter, closures, continuations, etc.\n\nThese are often used with lambda\n\nExample: composition\n\n>>> def
square(x): return x*x >>> def twice(f): return lambda x: f(f(x)) >>> twice <function twice at 0x87db0> >>> quad =
twice(square) >>> quad <function <lambda> at 0x87d30> >>> quad(5) 625\n\nExample: closure\n\n>>> def counter(start=0,
step=1): x = [start] def _inc(): x[0] +=step return x[0] return _inc >>> c1 = counter() >>> c2 = counter(100, -10) >>>
c1() 1 >>> c2() 90\n\nmap\n\n>>> def add1(x): return x+1 >>> map(add1, [1,2,3,4]) [2, 3, 4, 5] >>> map(lambda x: x+1,
[1,2,3,4]) [2, 3, 4, 5] >>> map(+,[1,2,3,4],[100,200,300,400]) map(+,[1,2,3,4],[100,200,300,400]) ^ SyntaxError:

```

```
!pip install langchain-text-splitters
```

```
Requirement already satisfied: langchain-text-splitters in /usr/local/lib/python3.12/dist-packages (1.0.0)
Requirement already satisfied: langchain-core<2.0.0,>=1.0.0 in /usr/local/lib/python3.12/dist-packages (from langchain-text-
Requirement already satisfied: jsonpatch<2.0.0,>=1.33.0 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.
Requirement already satisfied: langsmith<1.0.0,>=0.3.45 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.
Requirement already satisfied: packaging<26.0.0,>=23.2.0 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.
Requirement already satisfied: pydantic<3.0.0,>=2.7.4 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.0,
Requirement already satisfied: pyyaml<7.0.0,>=5.3.0 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.0,>=
Requirement already satisfied: tenacity<=8.4.0,<10.0.0,>=8.1.0 in /usr/local/lib/python3.12/dist-packages (from langchain-co
Requirement already satisfied: typing-extensions<5.0.0,>=4.7.0 in /usr/local/lib/python3.12/dist-packages (from langchain-co
Requirement already satisfied: jsonpointer<=1.9 in /usr/local/lib/python3.12/dist-packages (from jsonpatch<2.0.0,>=1.33.0->l
Requirement already satisfied: httpx<1,>=0.23.0 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->l
```

```
Requirement already satisfied: orjson>=3.9.14 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->langsmith)
Requirement already satisfied: requests-toolbelt>=1.0.0 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->langsmith)
Requirement already satisfied: requests>=2.0.0 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->langsmith)
Requirement already satisfied: zstandard>=0.23.0 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->langsmith)
Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.12/dist-packages (from pydantic<3.0.0,>=2.7.4->pydantic)
Requirement already satisfied: pydantic-core==2.41.4 in /usr/local/lib/python3.12/dist-packages (from pydantic<3.0.0,>=2.7.4->pydantic)
Requirement already satisfied: typing-inspection>=0.4.2 in /usr/local/lib/python3.12/dist-packages (from pydantic<3.0.0,>=2.7.4->pydantic)
Requirement already satisfied: anyio in /usr/local/lib/python3.12/dist-packages (from httpx<1,>=0.23.0->langsmith<1.0.0,>=0.3.45->langsmith)
Requirement already satisfied: certifi in /usr/local/lib/python3.12/dist-packages (from httpx<1,>=0.23.0->langsmith<1.0.0,>=0.3.45->langsmith)
Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.12/dist-packages (from httpx<1,>=0.23.0->langsmith<1.0.0,>=0.3.45->langsmith)
Requirement already satisfied: idna in /usr/local/lib/python3.12/dist-packages (from httpx<1,>=0.23.0->langsmith<1.0.0,>=0.3.45->langsmith)
Requirement already satisfied: h11>=0.16 in /usr/local/lib/python3.12/dist-packages (from httpcore==1.*->httpx<1,>=0.23.0->langsmith<1.0.0,>=0.3.45->langsmith)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.12/dist-packages (from requests>=2.0.0->langsmith<1.0.0,>=0.3.45->langsmith)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.12/dist-packages (from requests>=2.0.0->langsmith<1.0.0,>=0.3.45->langsmith)
Requirement already satisfied: sniffio>=1.1 in /usr/local/lib/python3.12/dist-packages (from anyio->httpx<1,>=0.23.0->langsmith<1.0.0,>=0.3.45->langsmith)
```

```
from langchain_text_splitters import CharacterTextSplitter
text_splitter = CharacterTextSplitter(chunk_size = 100, chunk_overlap = 50)
```

```
text_splitter
```

```
<langchain_text_splitters.character.CharacterTextSplitter at 0x7b591d155880>
```

```
texts = text_splitter.split_documents(documents)
```

```
WARNING:langchain_text_splitters.base:Created a chunk of size 113, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 110, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 174, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 149, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 179, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 113, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 238, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 120, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 121, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 214, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 191, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 163, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 358, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 120, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 178, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 213, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 191, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 163, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 218, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 169, which is longer than the specified 100
WARNING:langchain_text_splitters.base:Created a chunk of size 187, which is longer than the specified 100
```

```
type(texts)
```

```
list
```

```
texts[10]
```

```
Document(metadata={}, page_content='Calling a Function')
```

```
Start coding or generate with AI.
```

✓ pip install langchain-huggingface

```
!pip install langchain-huggingface
```

```
Collecting langchain-huggingface
  Downloading langchain_huggingface-1.1.0-py3-none-any.whl.metadata (2.8 kB)
Requirement already satisfied: huggingface-hub<1.0.0,>=0.33.4 in /usr/local/lib/python3.12/dist-packages (from langchain-huggingface)
Requirement already satisfied: langchain-core<2.0.0,>=1.1.0 in /usr/local/lib/python3.12/dist-packages (from langchain-huggingface)
Requirement already satisfied: tokenizers<1.0.0,>=0.19.1 in /usr/local/lib/python3.12/dist-packages (from langchain-huggingface)
Requirement already satisfied: filelock in /usr/local/lib/python3.12/dist-packages (from huggingface-hub<1.0.0,>=0.33.4->langchain-huggingface)
Requirement already satisfied: fsspec>=2023.5.0 in /usr/local/lib/python3.12/dist-packages (from huggingface-hub<1.0.0,>=0.33.4->langchain-huggingface)
Requirement already satisfied: packaging>=20.9 in /usr/local/lib/python3.12/dist-packages (from huggingface-hub<1.0.0,>=0.33.4->langchain-huggingface)
Requirement already satisfied: pyyaml>=5.1 in /usr/local/lib/python3.12/dist-packages (from huggingface-hub<1.0.0,>=0.33.4->langchain-huggingface)
Requirement already satisfied: requests in /usr/local/lib/python3.12/dist-packages (from huggingface-hub<1.0.0,>=0.33.4->langchain-huggingface)
Requirement already satisfied: tqdm>=4.42.1 in /usr/local/lib/python3.12/dist-packages (from huggingface-hub<1.0.0,>=0.33.4->langchain-huggingface)
Requirement already satisfied: typing-extensions>=3.7.4.3 in /usr/local/lib/python3.12/dist-packages (from huggingface-hub<1.0.0,>=0.33.4->langchain-huggingface)
Requirement already satisfied: hf-xet<2.0.0,>=1.1.3 in /usr/local/lib/python3.12/dist-packages (from huggingface-hub<1.0.0,>=0.33.4->langchain-huggingface)
Requirement already satisfied: jsonpatch<2.0.0,>=1.33.0 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.0,>=1.1.0->langchain-huggingface)
Requirement already satisfied: langsmith<1.0.0,>=0.3.45 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.0,>=1.1.0->langchain-huggingface)
Requirement already satisfied: pydantic<3.0.0,>=2.7.4 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.0,>=1.1.0->langchain-huggingface)
Requirement already satisfied: tenacity!=8.4.0,<10.0.0,>=8.1.0 in /usr/local/lib/python3.12/dist-packages (from langchain-core<2.0.0,>=1.1.0->langchain-huggingface)
Requirement already satisfied: jsonpointer>=1.9 in /usr/local/lib/python3.12/dist-packages (from jsonpatch<2.0.0,>=1.33.0->langchain-core<2.0.0,>=1.1.0->langchain-huggingface)
Requirement already satisfied: httpx<1,>=0.23.0 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->langchain-huggingface)
Requirement already satisfied: orjson>=3.9.14 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->langchain-huggingface)
```

```
Requirement already satisfied: requests-toolbelt>=1.0.0 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->0.3.45)
Requirement already satisfied: zstandard>=0.23.0 in /usr/local/lib/python3.12/dist-packages (from langsmith<1.0.0,>=0.3.45->0.3.45)
Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.12/dist-packages (from pydantic<3.0.0,>=2.7.4->2.7.4)
Requirement already satisfied: pydantic-core==2.41.4 in /usr/local/lib/python3.12/dist-packages (from pydantic<3.0.0,>=2.7.4->2.7.4)
Requirement already satisfied: typing-inspection>=0.4.2 in /usr/local/lib/python3.12/dist-packages (from pydantic<3.0.0,>=2.7.4->2.7.4)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.12/dist-packages (from requests->huggingface-hub<1.0.0,>=0.23.0->0.23.0)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.12/dist-packages (from requests->huggingface-hub<1.0.0,>=0.23.0->0.23.0)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.12/dist-packages (from requests->huggingface-hub<1.0.0,>=0.23.0->0.23.0)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.12/dist-packages (from requests->huggingface-hub<1.0.0,>=0.23.0->0.23.0)
Requirement already satisfied: anyio in /usr/local/lib/python3.12/dist-packages (from httpx<1,>=0.23.0->langsmith<1.0.0,>=0.3.45->0.3.45)
Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.12/dist-packages (from httpx<1,>=0.23.0->langsmith<1.0.0,>=0.3.45->0.3.45)
Requirement already satisfied: h11>=0.16 in /usr/local/lib/python3.12/dist-packages (from httpcore==1.*->httpx<1,>=0.23.0->langsmith<1.0.0,>=0.3.45->0.3.45)
Requirement already satisfied: sniffio>=1.1 in /usr/local/lib/python3.12/dist-packages (from anyio->httpx<1,>=0.23.0->langsmith<1.0.0,>=0.3.45->0.3.45)
Downloading langchain_huggingface-1.1.0-py3-none-any.whl (29 kB)
Installing collected packages: langchain-huggingface
Successfully installed langchain-huggingface-1.1.0
```

```
from langchain_huggingface import HuggingFaceEmbeddings
embeddings = HuggingFaceEmbeddings(model_name="sentence-transformers/all-MiniLM-L6-v2")
persist_directory = "vector_db"
```

```
/usr/local/lib/python3.12/dist-packages/huggingface_hub/utils/_auth.py:94: UserWarning:
The secret `HF_TOKEN` does not exist in your Colab secrets.
To authenticate with the Hugging Face Hub, create a token in your settings tab (https://huggingface.co/settings/tokens), set it as an environment variable 'HF_TOKEN' or add it to your Colab secrets.
You will be able to reuse this secret in all of your notebooks.
Please note that authentication is recommended but still optional to access public models or datasets.
warnings.warn(
modules.json: 100% 349/349 [00:00<00:00, 35.3kB/s]
config_sentence_transformers.json: 100% 116/116 [00:00<00:00, 13.5kB/s]
README.md: 10.5k/? [00:00<00:00, 1.04MB/s]
sentence_bert_config.json: 100% 53.0/53.0 [00:00<00:00, 5.23kB/s]
config.json: 100% 612/612 [00:00<00:00, 36.4kB/s]
model.safetensors: 100% 90.9M/90.9M [00:03<00:00, 30.3MB/s]
tokenizer_config.json: 100% 350/350 [00:00<00:00, 40.9kB/s]
vocab.txt: 232k/? [00:00<00:00, 14.7MB/s]
tokenizer.json: 466k/? [00:00<00:00, 28.0MB/s]
special_tokens_map.json: 100% 112/112 [00:00<00:00, 12.0kB/s]
config.json: 100% 190/190 [00:00<00:00, 23.0kB/s]
```

```
from langchain_chroma import Chroma

vectordb = Chroma.from_documents(
    documents=texts,
    embedding=embeddings,
    persist_directory=persist_directory
)
```

```
print(vectordb)
```

```
<langchain_chroma.vectorstores.Chroma object at 0x7b58bce4df10>
```

```
# Retrieval
```

```
retriever = vectordb.as_retriever()
```

```
from langchain_groq import ChatGroq
llm = ChatGroq(model = "llama-3.3-70b-versatile",temperature=0.2)
```

```
!pip install -U langchain langchain-community langchain-groq chromadb
```

```
Requirement already satisfied: langchain in /usr/local/lib/python3.12/dist-packages (1.1.2)
Requirement already satisfied: langchain-community in /usr/local/lib/python3.12/dist-packages (0.4.1)
Requirement already satisfied: langchain-groq in /usr/local/lib/python3.12/dist-packages (1.1.0)
Requirement already satisfied: chromadb in /usr/local/lib/python3.12/dist-packages (1.3.5)
Requirement already satisfied: langchain-core<2.0.0,>=1.1.0 in /usr/local/lib/python3.12/dist-packages (from langchain) (1.1.0)
Requirement already satisfied: langgraph<1.1.0,>=1.0.2 in /usr/local/lib/python3.12/dist-packages (from langchain) (1.0.3)
Requirement already satisfied: pydantic<3.0.0,>=2.7.4 in /usr/local/lib/python3.12/dist-packages (from langchain) (2.12.3)
Requirement already satisfied: langchain-classic<2.0.0,>=1.0.0 in /usr/local/lib/python3.12/dist-packages (from langchain) (1.1.0)
Requirement already satisfied: SQLAlchemy<3.0.0,>=1.4.0 in /usr/local/lib/python3.12/dist-packages (from langchain-community) (2.0.36)
Requirement already satisfied: requests<3.0.0,>=2.32.5 in /usr/local/lib/python3.12/dist-packages (from langchain-community) (2.32.5)
Requirement already satisfied: PyYAML<7.0.0,>=5.3.0 in /usr/local/lib/python3.12/dist-packages (from langchain-community) (6.0.2)
Requirement already satisfied: aiohttp<4.0.0,>=3.8.3 in /usr/local/lib/python3.12/dist-packages (from langchain-community) (3.10.11)
```

Requirement already satisfied: tenacity!=8.4.0,<10.0.0,>=8.1.0 in /usr/local/lib/python3.12/dist-packages (from langchain-
 Requirement already satisfied: dataclasses-json<0.7.0,>=0.6.7 in /usr/local/lib/python3.12/dist-packages (from langchain-c
 Requirement already satisfied: pydantic-settings<3.0.0,>=2.10.1 in /usr/local/lib/python3.12/dist-packages (from langchain
 Requirement already satisfied: langsmith<1.0.0,>=0.1.125 in /usr/local/lib/python3.12/dist-packages (from langchain-commun
 Requirement already satisfied: httpx-sse<1.0.0,>=0.4.0 in /usr/local/lib/python3.12/dist-packages (from langchain-communit
 Requirement already satisfied: numpy>=1.26.2 in /usr/local/lib/python3.12/dist-packages (from langchain-community) (2.0.2)
 Requirement already satisfied: groq<1.0.0,>=0.30.0 in /usr/local/lib/python3.12/dist-packages (from langchain-groq) (0.37.
 Requirement already satisfied: build>=1.0.3 in /usr/local/lib/python3.12/dist-packages (from chromadb) (1.3.0)
 Requirement already satisfied: pybase64>=1.4.1 in /usr/local/lib/python3.12/dist-packages (from chromadb) (1.4.3)
 Requirement already satisfied: uvicorn>=0.18.3 in /usr/local/lib/python3.12/dist-packages (from uvicorn[standard]>=0.18.3-
 Requirement already satisfied: posthog<6.0.0,>=2.4.0 in /usr/local/lib/python3.12/dist-packages (from chromadb) (5.4.0)
 Requirement already satisfied: typing-extensions>=4.5.0 in /usr/local/lib/python3.12/dist-packages (from chromadb) (4.15.0)
 Requirement already satisfied: onnxruntime>=1.14.1 in /usr/local/lib/python3.12/dist-packages (from chromadb) (1.23.2)
 Requirement already satisfied: opentelemetry-api>=1.2.0 in /usr/local/lib/python3.12/dist-packages (from chromadb) (1.39.0)
 Requirement already satisfied: opentelemetry-exporter-otlp-proto-grpc>=1.2.0 in /usr/local/lib/python3.12/dist-packages (f
 Requirement already satisfied: opentelemetry-sdk>=1.2.0 in /usr/local/lib/python3.12/dist-packages (from chromadb) (1.39.0)
 Requirement already satisfied: tokenizers>=0.13.2 in /usr/local/lib/python3.12/dist-packages (from chromadb) (0.22.1)
 Requirement already satisfied: pypika>=0.48.9 in /usr/local/lib/python3.12/dist-packages (from chromadb) (0.48.9)
 Requirement already satisfied: tqdm>=4.65.0 in /usr/local/lib/python3.12/dist-packages (from chromadb) (4.67.1)
 Requirement already satisfied: overrides>=7.3.1 in /usr/local/lib/python3.12/dist-packages (from chromadb) (7.7.0)
 Requirement already satisfied: importlib-resources in /usr/local/lib/python3.12/dist-packages (from chromadb) (6.5.2)
 Requirement already satisfied: grpcio>=1.58.0 in /usr/local/lib/python3.12/dist-packages (from chromadb) (1.76.0)
 Requirement already satisfied: bcrypt>=4.0.1 in /usr/local/lib/python3.12/dist-packages (from chromadb) (5.0.0)
 Requirement already satisfied: typer>=0.9.0 in /usr/local/lib/python3.12/dist-packages (from chromadb) (0.20.0)
 Requirement already satisfied: kubernetes>=28.1.0 in /usr/local/lib/python3.12/dist-packages (from chromadb) (34.1.0)
 Requirement already satisfied: mmh3>=4.0.1 in /usr/local/lib/python3.12/dist-packages (from chromadb) (5.2.0)
 Requirement already satisfied: orjson>=3.9.12 in /usr/local/lib/python3.12/dist-packages (from chromadb) (3.11.4)
 Requirement already satisfied: httpx>=0.27.0 in /usr/local/lib/python3.12/dist-packages (from chromadb) (0.28.1)
 Requirement already satisfied: rich>=10.11.0 in /usr/local/lib/python3.12/dist-packages (from chromadb) (13.9.4)
 Requirement already satisfied: jsonschema>=4.19.0 in /usr/local/lib/python3.12/dist-packages (from chromadb) (4.25.1)
 Requirement already satisfied: aiohappyeyeballs>=2.5.0 in /usr/local/lib/python3.12/dist-packages (from aiohttp<4.0.0,>=3.
 Requirement already satisfied: aiosignal>=1.4.0 in /usr/local/lib/python3.12/dist-packages (from aiohttp<4.0.0,>=3.8.3->la
 Requirement already satisfied: attrs>=17.3.0 in /usr/local/lib/python3.12/dist-packages (from aiohttp<4.0.0,>=3.8.3->langc
 Requirement already satisfied: frozenlist>=1.1.1 in /usr/local/lib/python3.12/dist-packages (from aiohttp<4.0.0,>=3.8.3->l
 Requirement already satisfied: multidict<7.0,>=4.5 in /usr/local/lib/python3.12/dist-packages (from aiohttp<4.0.0,>=3.8.3-
 Requirement already satisfied: propcache>=0.2.0 in /usr/local/lib/python3.12/dist-packages (from aiohttp<4.0.0,>=3.8.3->la
 Requirement already satisfied: yarl<2.0,>=1.17.0 in /usr/local/lib/python3.12/dist-packages (from aiohttp<4.0.0,>=3.8.3->l
 Requirement already satisfied: packaging>=19.1 in /usr/local/lib/python3.12/dist-packages (from build>=1.0.3->chromadb) (2
 Requirement already satisfied: pyproject_hooks in /usr/local/lib/python3.12/dist-packages (from build>=1.0.3->chromadb) (1
 Requirement already satisfied: marshmallow<4.0.0,>=3.18.0 in /usr/local/lib/python3.12/dist-packages (from dataclasses-jso
 Requirement already satisfied: typing-inspect<1,>=0.4.0 in /usr/local/lib/python3.12/dist-packages (from dataclasses-json<
 Requirement already satisfied: anyio<5,>=3.5.0 in /usr/local/lib/python3.12/dist-packages (from groq<1.0.0,>=0.30.0->langc
 Requirement already satisfied: distro<2,>=1.7.0 in /usr/local/lib/python3.12/dist-packages (from groq<1.0.0,>=0.30.0->lang
 Requirement already satisfied: sniffio in /usr/local/lib/python3.12/dist-packages (from groq<1.0.0,>=0.30.0->langchain-gro
 Requirement already satisfied: certifi in /usr/local/lib/python3.12/dist-packages (from httpx<0.27.0->chromadb) (2025.11.

```
from langchain_classic.chains import RetrievalQA
```

```
qa_chain = RetrievalQA.from_chain_type(
    llm=llm,
    chain_type="stuff",
    retriever=retriever,
    return_source_documents=True
)
```

```
query = 'explain about filter, map, reduce'
qa_result = qa_chain.invoke({"query":query})
```

```
print(qa_result)
```

```
{'query': 'explain about filter, map, reduce', 'result': "`filter`, `map`, and `reduce` are three fundamental functions in f
```

```
print(qa_result['result'])
```

```
`filter`, `map`, and `reduce` are three fundamental functions in functional programming, commonly used in languages like Pyt
```

1. ****Filter**:**
 - * Purpose: To select a subset of elements from a collection (e.g., list, tuple) based on a condition.
 - * Syntax: ``filter(function, iterable)``
 - * Function: Takes a function and an iterable as arguments. Applies the function to each element in the iterable, and
 - * Example: ``filter(odd, [1, 2, 3, 4])`` would return `[1, 3]` if `'odd'` is a function that checks if a number is odd.
2. ****Map**:**
 - * Purpose: To apply a transformation to each element in a collection.
 - * Syntax: ``map(function, iterable)``
 - * Function: Takes a function and an iterable as arguments. Applies the function to each element in the iterable, and
 - * Example: ``map(square, [1, 2, 3, 4])`` would return `[1, 4, 9, 16]` if `'square'` is a function that squares a number.
3. ****Reduce**:**
 - * Purpose: To combine all elements in a collection into a single output.
 - * Syntax: ``reduce(function, iterable)``
 - * Function: Takes a function and an iterable as arguments. Applies the function to the first two elements in the ite
 - * Example: ``reduce(add, [1, 2, 3, 4])`` would return `10` if `'add'` is a function that adds two numbers.

These functions are often used together to perform complex data transformations. They can also be used with lambda functions

Here's an example that uses all three:


```
```python
from functools import reduce

numbers = [1, 2, 3, 4, 5]

Filter out even numbers
odd_numbers = list(filter(lambda x: x % 2 != 0, numbers))

Map each odd number to its square
squares = list(map(lambda x: x ** 2, odd_numbers))

Reduce the squares to their sum
sum_of_squares = reduce(lambda x, y: x + y, squares)

print(sum_of_squares) # Output: 35
```
```

Note that in Python 3, ``map``, ``filter``, and ``reduce`` return iterators, so you need to convert them to lists or other data st

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