

```
!pip install langchain
!pip install pinecone-client==2.2.2
!pip install sentence_transformers
!pip install pdf2image
!pip install pypdf
!pip install xformers
!pip install bitsandbytes accelerate transformers
```

```
Requirement already satisfied: langchain in /usr/local/lib/python3.10/dist-packages (0.2.11)
Requirement already satisfied: PyYAML>=5.3 in /usr/local/lib/python3.10/dist-packages (from langchain) (6.0.1)
Requirement already satisfied: SQLAlchemy<3,>=1.4 in /usr/local/lib/python3.10/dist-packages (from langchain) (2.0.31)
Requirement already satisfied: aiohttp<4.0.0,>=3.8.3 in /usr/local/lib/python3.10/dist-packages (from langchain) (3.9.5)
Requirement already satisfied: async-timeout<5.0.0,>=4.0.0 in /usr/local/lib/python3.10/dist-packages (from langchain) (4.0.3)
Requirement already satisfied: langchain-core<0.3.0,>=0.2.23 in /usr/local/lib/python3.10/dist-packages (from langchain) (0.2.23)
Requirement already satisfied: langchain-text-splitters<0.3.0,>=0.2.0 in /usr/local/lib/python3.10/dist-packages (from langchain) (0.2.0)
Requirement already satisfied: langsmith<0.2.0,>=0.1.17 in /usr/local/lib/python3.10/dist-packages (from langchain) (0.1.93)
Requirement already satisfied: numpy<2,>=1 in /usr/local/lib/python3.10/dist-packages (from langchain) (1.25.2)
Requirement already satisfied: pydantic<3,>=1 in /usr/local/lib/python3.10/dist-packages (from langchain) (2.8.2)
Requirement already satisfied: requests<3,>=2 in /usr/local/lib/python3.10/dist-packages (from langchain) (2.31.0)
Requirement already satisfied: tenacity!=8.4.0,<9.0.0,>=8.1.0 in /usr/local/lib/python3.10/dist-packages (from langchain) (8.2.3)
Requirement already satisfied: aiosignal>=1.2 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain) (1.3.1)
Requirement already satisfied: attrs>=17.3.0 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain) (23.2.0)
Requirement already satisfied: frozenlist>=1.1.1 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain) (1.4.1)
Requirement already satisfied: multidict<7.0,>=4.5 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain) (6.0.5)
Requirement already satisfied: yarl<2.0,>=1.0 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain) (1.9.7)
Requirement already satisfied: jsonpatch<2.0,>=1.33 in /usr/local/lib/python3.10/dist-packages (from langchain-core<0.3.0,>=0.2.23) (1.33)
Requirement already satisfied: packaging<25,>=23.2 in /usr/local/lib/python3.10/dist-packages (from langchain-core<0.3.0,>=0.2.23) (23.2)
Requirement already satisfied: orjson<4.0.0,>=3.9.14 in /usr/local/lib/python3.10/dist-packages (from langsmith<0.2.0,>=0.1.17) (3.9.14)
Requirement already satisfied: annotated-types>=0.4.0 in /usr/local/lib/python3.10/dist-packages (from pydantic<3,>=1->langchain) (0.6.0)
Requirement already satisfied: pydantic-core==2.20.1 in /usr/local/lib/python3.10/dist-packages (from pydantic<3,>=1->langchain) (2.20.1)
Requirement already satisfied: typing-extensions>=4.6.1 in /usr/local/lib/python3.10/dist-packages (from pydantic<3,>=1->langchain) (4.6.1)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2->langchain) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2->langchain) (3.6)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2->langchain) (2.2.1)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2->langchain) (2024.7.4)
Requirement already satisfied: greenlet!=0.4.17 in /usr/local/lib/python3.10/dist-packages (from SQLAlchemy<3,>=1.4->langchain) (3.0.3)
Requirement already satisfied: jsonpointer>=1.9 in /usr/local/lib/python3.10/dist-packages (from jsonpatch<2.0,>=1.33->langchain-core<0.3.0,>=0.2.23) (2.3)
Requirement already satisfied: pinecone-client==2.2.2 in /usr/local/lib/python3.10/dist-packages (2.2.2)
Requirement already satisfied: requests>=2.19.0 in /usr/local/lib/python3.10/dist-packages (from pinecone-client==2.2.2) (2.31.0)
Requirement already satisfied: pyyaml>=5.4 in /usr/local/lib/python3.10/dist-packages (from pinecone-client==2.2.2) (6.0.1)
Requirement already satisfied: loguru>=0.5.0 in /usr/local/lib/python3.10/dist-packages (from pinecone-client==2.2.2) (0.7.2)
Requirement already satisfied: typing-extensions>=3.7.4 in /usr/local/lib/python3.10/dist-packages (from pinecone-client==2.2.2) (4.6.1)
Requirement already satisfied: dnspython>=2.0.0 in /usr/local/lib/python3.10/dist-packages (from pinecone-client==2.2.2) (2.6.1)
Requirement already satisfied: python-dateutil>=2.5.3 in /usr/local/lib/python3.10/dist-packages (from pinecone-client==2.2.2) (2.8.2)
Requirement already satisfied: urllib3>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from pinecone-client==2.2.2) (2.2.1)
Requirement already satisfied: tqdm>=4.64.1 in /usr/local/lib/python3.10/dist-packages (from pinecone-client==2.2.2) (4.66.4)
Requirement already satisfied: numpy>=1.22.0 in /usr/local/lib/python3.10/dist-packages (from pinecone-client==2.2.2) (1.25.2)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.5.3->pinecone-client==2.2.2) (1.16.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests>=2.19.0->pinecone-client==2.2.2) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests>=2.19.0->pinecone-client==2.2.2) (3.6)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests>=2.19.0->pinecone-client==2.2.2) (2024.7.4)
Requirement already satisfied: sentence_transformers in /usr/local/lib/python3.10/dist-packages (3.0.1)
Requirement already satisfied: transformers<5.0.0,>=4.34.0 in /usr/local/lib/python3.10/dist-packages (from sentence_transformers) (4.66.4)
Requirement already satisfied: tqdm in /usr/local/lib/python3.10/dist-packages (from sentence_transformers) (4.66.4)
Requirement already satisfied: torch>=1.11.0 in /usr/local/lib/python3.10/dist-packages (from sentence_transformers) (2.4.0)
Requirement already satisfied: numpy in /usr/local/lib/python3.10/dist-packages (from sentence_transformers) (1.25.2)
Requirement already satisfied: scikit-learn in /usr/local/lib/python3.10/dist-packages (from sentence_transformers) (1.2.2)
Requirement already satisfied: scipy in /usr/local/lib/python3.10/dist-packages (from sentence_transformers) (1.11.4)
Requirement already satisfied: huggingface-hub>=0.15.1 in /usr/local/lib/python3.10/dist-packages (from sentence_transformers) (0.15.1)
Requirement already satisfied: Pillow in /usr/local/lib/python3.10/dist-packages (from sentence_transformers) (9.4.0)
Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.15.1->sentence_transformers) (3.12.2)
Requirement already satisfied: fsspec>=2023.5.0 in /usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.15.1->sentence_transformers) (2024.6.1)
Requirement already satisfied: packaging>=20.9 in /usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.15.1->sentence_transformers) (23.2)
Requirement already satisfied: pyyaml>=5.1 in /usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.15.1->sentence_transformers) (6.0.1)
Requirement already satisfied: requests in /usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.15.1->sentence_transformers) (2.31.0)
```

```
!pip install langchain-community
```

```
Requirement already satisfied: langchain-community in /usr/local/lib/python3.10/dist-packages (0.2.10)
Requirement already satisfied: PyYAML>=5.3 in /usr/local/lib/python3.10/dist-packages (from langchain-community) (6.0.1)
Requirement already satisfied: SQLAlchemy<3,>=1.4 in /usr/local/lib/python3.10/dist-packages (from langchain-community) (2.0.31)
Requirement already satisfied: aiohttp<4.0.0,>=3.8.3 in /usr/local/lib/python3.10/dist-packages (from langchain-community) (3.9.5)
Requirement already satisfied: dataclasses-json<0.7,>=0.5.7 in /usr/local/lib/python3.10/dist-packages (from langchain-community) (0.6.7)
Requirement already satisfied: langchain<0.3.0,>=0.2.9 in /usr/local/lib/python3.10/dist-packages (from langchain-community) (0.2.11)
Requirement already satisfied: langchain-core<0.3.0,>=0.2.23 in /usr/local/lib/python3.10/dist-packages (from langchain-community) (0.2.23)
Requirement already satisfied: langsmith<0.2.0,>=0.1.0 in /usr/local/lib/python3.10/dist-packages (from langchain-community) (0.1.93)
Requirement already satisfied: numpy<2,>=1 in /usr/local/lib/python3.10/dist-packages (from langchain-community) (1.25.2)
Requirement already satisfied: requests<3,>=2 in /usr/local/lib/python3.10/dist-packages (from langchain-community) (2.31.0)
Requirement already satisfied: tenacity!=8.4.0,<9.0.0,>=8.1.0 in /usr/local/lib/python3.10/dist-packages (from langchain-community) (8.2.3)
Requirement already satisfied: aiosignal>=1.2 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain-community) (1.3.1)
Requirement already satisfied: attrs>=17.3.0 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain-community) (23.2.0)
Requirement already satisfied: frozenlist>=1.1.1 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain-community) (1.4.1)
Requirement already satisfied: multidict<7.0,>=4.5 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain-community) (6.0.5)
```

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Requirement already satisfied: yarl<2.0,>=1.0 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain)
Requirement already satisfied: async-timeout<5.0,>=4.0 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain)
Requirement already satisfied: marshmallow<4.0.0,>=3.18.0 in /usr/local/lib/python3.10/dist-packages (from dataclasses-json<0.7,>=0.6.1->langchain)
Requirement already satisfied: typing-inspect<1,>=0.4.0 in /usr/local/lib/python3.10/dist-packages (from dataclasses-json<0.7,>=0.6.1->langchain)
Requirement already satisfied: langchain-text-splitters<0.3.0,>=0.2.0 in /usr/local/lib/python3.10/dist-packages (from langchain)
Requirement already satisfied: pydantic<3,>=1 in /usr/local/lib/python3.10/dist-packages (from langchain<0.3.0,>=0.2.9->langchain)
Requirement already satisfied: jsonpatch<2.0,>=1.33 in /usr/local/lib/python3.10/dist-packages (from langchain-core<0.3.0,>=0.2.10->langchain)
Requirement already satisfied: packaging<25,>=23.2 in /usr/local/lib/python3.10/dist-packages (from langchain-core<0.3.0,>=0.2.10->langchain)
Requirement already satisfied: orjson<4.0.0,>=3.9.14 in /usr/local/lib/python3.10/dist-packages (from langsmith<0.2.0,>=0.1.0->langchain)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2->langchain)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2->langchain)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2->langchain)
Requirement already satisfied: certifi<2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2->langchain)
Requirement already satisfied: typing-extensions>=4.6.0 in /usr/local/lib/python3.10/dist-packages (from SQLAlchemychemy<3,>=1.4->langchain)
Requirement already satisfied: greenlet!=0.4.17 in /usr/local/lib/python3.10/dist-packages (from SQLAlchemychemy<3,>=1.4->langchain)
Requirement already satisfied: jsonpointer>=1.9 in /usr/local/lib/python3.10/dist-packages (from jsonpatch<2.0,>=1.33->langchain)
Requirement already satisfied: annotated-types>=0.4.0 in /usr/local/lib/python3.10/dist-packages (from pydantic<3,>=1->langchain)
Requirement already satisfied: pydantic-core==2.20.1 in /usr/local/lib/python3.10/dist-packages (from pydantic<3,>=1->langchain)
Requirement already satisfied: mpyy-extensions>=0.3.0 in /usr/local/lib/python3.10/dist-packages (from typing-inspect<1,>=0.4.0->langchain)
```

```
from langchain.document_loaders import PyPDFDirectoryLoader
from langchain.text_splitter import RecursiveCharacterTextSplitter
from langchain.embeddings import HuggingFaceEmbeddings
from langchain.vectorstores import Pinecone
import pinecone
from transformers import AutoTokenizer, AutoModelForCausalLM
from transformers import pipeline
import os
import sys
```

```
⚡ /usr/local/lib/python3.10/dist-packages/pinecone/index.py:4: TqdmExperimentalWarning: Using `tqdm.autonotebook.tqdm` in notebook
  from tqdm.autonotebook import tqdm
```



```
from langchain import HuggingFacePipeline, PromptTemplate
from langchain.chains import RetrievalQA
```

```
!mkdir pdfs
```

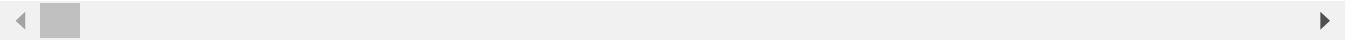
```
!pip install pypdf
```

```
⚡ Requirement already satisfied: pypdf in /usr/local/lib/python3.10/dist-packages (4.3.1)
Requirement already satisfied: typing_extensions>=4.0 in /usr/local/lib/python3.10/dist-packages (from pypdf) (4.12.2)
```

```
from langchain.document_loaders import PyPDFLoader, PyPDFDirectoryLoader
loader = PyPDFDirectoryLoader("pdfs")
data = loader.load()
```

```
print(data)
```

```
⚡ [Document(metadata={'source': 'pdfs/lecs110.pdf', 'page': 0}, page_content='In this Chapter\n »Introduction to Computer \nNetworks\n\nThe network size may vary from small to large \ndepending on the number of computers it connects. A computer network can include different types of hosts (also called nodes) like server, desktop, laptop, \nncellular phones.\nNetworking \nDevice\nFigure 10.2: A computer network\nApart from computers, networks include networking')]
```



```
text_splitter = RecursiveCharacterTextSplitter(chunk_size=500, chunk_overlap=20)
```

```
docs = text_splitter.split_documents(data)
```

```
print(len(docs))
```

```
⚡ 99
```

```
docs[3]
```

```
⚡ Document(metadata={'source': 'pdfs/lecs110.pdf', 'page': 1}, page_content='Such interconnection allows computers to share data and resources among each other. A basic network may connect a few computers placed in a room.\n\nThe network size may vary from small to large \ndepending on the number of computers it connects. A computer network can include different types of hosts (also called nodes) like server, desktop, laptop, \nncellular phones.\nNetworking \nDevice\nFigure 10.2: A computer network\nApart from computers, networks include networking')
```

```
docs[4]
```

```
Document(metadata={'source': 'pdfs/lecs110.pdf', 'page': 1}, page_content='devices like switch, router, modem, etc. Networking devices are used to connect multiple computers in different settings. For communication, data in a network is divided into smaller chunks called packets. These packets are then carried over a network. Devices in a network can be connected either through wired media like cables or wireless media like air.\n\nIn a communication network, each device that is a')
```

```
embeddings = HuggingFaceEmbeddings(model_name='sentence-transformers/all-MiniLM-L6-v2')
```

```
/usr/local/lib/python3.10/dist-packages/langchain_core/_api/deprecation.py:139: LangChainDeprecationWarning: The class `HuggingFaceEmbeddings` is deprecated. Use `HuggingFaceHubEmbeddings` instead.
warn_deprecated(
/usr/local/lib/python3.10/dist-packages/huggingface_hub/utils/_token.py:89: 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, 19.6kB/s]
config_sentence_transformers.json: 100% 116/116 [00:00<00:00, 8.19kB/s]
README.md: 100% 10.7k/10.7k [00:00<00:00, 704kB/s]
sentence_bert_config.json: 100% 53.0/53.0 [00:00<00:00, 3.56kB/s]
config.json: 100% 612/612 [00:00<00:00, 45.9kB/s]
model.safetensors: 100% 90.9M/90.9M [00:00<00:00, 195MB/s]
tokenizer_config.json: 100% 350/350 [00:00<00:00, 22.1kB/s]
vocab.txt: 100% 232k/232k [00:00<00:00, 1.82MB/s]
tokenizer.json: 100% 466k/466k [00:00<00:00, 2.47MB/s]
special_tokens_map.json: 100% 112/112 [00:00<00:00, 5.63kB/s]
1_Pooling/config.json: 100% 190/190 [00:00<00:00, 7.85kB/s]
```

```
query_result = embeddings.embed_query("Hello World")
```

```
print("Length", len(query_result))
```

```
Length 384
```

```
PINECONE_API_KEY = os.environ.get('PINECONE_API_KEY', '5d812b95-3da1-4d10-94ff-9dffe40f8a58')
PINECONE_API_ENV = os.environ.get('PINECONE_API_ENV', 'gcp-starter')
```

```
!pip install pinecone_client==2.2.2
```

```
Requirement already satisfied: pinecone_client==2.2.2 in /usr/local/lib/python3.10/dist-packages (2.2.2)
Requirement already satisfied: requests>=2.19.0 in /usr/local/lib/python3.10/dist-packages (from pinecone_client==2.2.2) (2.31.0)
Requirement already satisfied: pyyaml>=5.4 in /usr/local/lib/python3.10/dist-packages (from pinecone_client==2.2.2) (6.0.1)
Requirement already satisfied: loguru>=0.5.0 in /usr/local/lib/python3.10/dist-packages (from pinecone_client==2.2.2) (0.7.2)
Requirement already satisfied: typing-extensions>=3.7.4 in /usr/local/lib/python3.10/dist-packages (from pinecone_client==2.2.2) (4.5.0)
Requirement already satisfied: dnspython>=2.0.0 in /usr/local/lib/python3.10/dist-packages (from pinecone_client==2.2.2) (2.6.1)
Requirement already satisfied: python-dateutil>=2.5.3 in /usr/local/lib/python3.10/dist-packages (from pinecone_client==2.2.2) (2.8.2)
Requirement already satisfied: urllib3>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from pinecone_client==2.2.2) (2.0.7)
Requirement already satisfied: tqdm>=4.64.1 in /usr/local/lib/python3.10/dist-packages (from pinecone_client==2.2.2) (4.66.4)
Requirement already satisfied: numpy>=1.22.0 in /usr/local/lib/python3.10/dist-packages (from pinecone_client==2.2.2) (1.25.2)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.5.3->pinecone_client==2.2.2) (1.16.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests>=2.19.0->pinecone_client==2.2.2) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests>=2.19.0->pinecone_client==2.2.2) (3.6)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests>=2.19.0->pinecone_client==2.2.2) (2024.2.2)
```

```
pinecone.init(
    api_key=PINECONE_API_KEY, # find at app.pinecone.io
    environment=PINECONE_API_ENV # next to api key in console
)
index_name = "langchainpinecone" # put in the name of your pinecone index here

docsearch=Pinecone.from_texts([t.page_content for t in docs], embeddings, index_name=index_name)
```

```
query = "give me introduction about computer networks"
```

```
docs = docsearch.similarity_search(query, k=4)
```

Start coding or [generate](#) with AI.

```
!pip install huggingface_hub==0.16.4
```

```
Collecting huggingface_hub==0.16.4
  Downloading huggingface_hub-0.16.4-py3-none-any.whl.metadata (12 kB)
Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-packages (from huggingface_hub==0.16.4) (3.15.4)
Requirement already satisfied: fsspec in /usr/local/lib/python3.10/dist-packages (from huggingface_hub==0.16.4) (2023.6.0)
Requirement already satisfied: requests in /usr/local/lib/python3.10/dist-packages (from huggingface_hub==0.16.4) (2.31.0)
Requirement already satisfied: tqdm>=4.42.1 in /usr/local/lib/python3.10/dist-packages (from huggingface_hub==0.16.4) (4.66.4)
Requirement already satisfied: pyyaml>=5.1 in /usr/local/lib/python3.10/dist-packages (from huggingface_hub==0.16.4) (6.0.1)
Requirement already satisfied: typing-extensions>=3.7.4.3 in /usr/local/lib/python3.10/dist-packages (from huggingface_hub==0.16.4) (4.6.4)
Requirement already satisfied: packaging>=20.9 in /usr/local/lib/python3.10/dist-packages (from huggingface_hub==0.16.4) (24.1)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests->huggingface_hub==0.16.4) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests->huggingface_hub==0.16.4) (3.6)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests->huggingface_hub==0.16.4) (2.0.7)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests->huggingface_hub==0.16.4) (2023.7.22)
Downloading huggingface_hub-0.16.4-py3-none-any.whl (268 kB)
268.8/268.8 kB 6.2 MB/s eta 0:00:00
Installing collected packages: huggingface_hub
  Attempting uninstall: huggingface_hub
    Found existing installation: huggingface-hub 0.23.5
    Uninstalling huggingface-hub-0.23.5:
      Successfully uninstalled huggingface-hub-0.23.5
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is temporary and will be removed in a future version.
Successfully installed huggingface_hub-0.16.4
WARNING: The following packages were previously imported in this runtime:
[huggingface_hub]
You must restart the runtime in order to use newly installed versions.
```

RESTART SESSION

```
from huggingface_hub import notebook_login
import torch
```

```
notebook_login()
```

```
Token is valid (permission: fineGrained).

Your token has been saved in your configured git credential helpers (store).

Your token has been saved to /root/.cache/huggingface/token

Login successful
```

```
tokenizer = AutoTokenizer.from_pretrained("TheBloke/Llama-2-7B-Chat-fp16", use_auth_token=True)
```

```
/usr/local/lib/python3.10/dist-packages/transformers/models/auto/tokenization_auto.py:778: FutureWarning: The `use_auth_token`
warnings.warn(
tokenizer_config.json: 100% 770/770 [00:00<00:00, 48.2kB/s]
tokenizer.model: 100% 500k/500k [00:00<00:00, 27.4MB/s]
tokenizer.json: 100% 1.84M/1.84M [00:00<00:00, 26.2MB/s]
special_tokens_map.json: 100% 414/414 [00:00<00:00, 19.2kB/s]
```


```
pip install accelerate bitsandbytes
```

```
Requirement already satisfied: accelerate in /usr/local/lib/python3.10/dist-packages (0.32.1)
Requirement already satisfied: bitsandbytes in /usr/local/lib/python3.10/dist-packages (0.43.2)
Requirement already satisfied: numpy<2.0.0,>=1.17 in /usr/local/lib/python3.10/dist-packages (from accelerate) (1.25.2)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from accelerate) (24.1)
Requirement already satisfied: psutil in /usr/local/lib/python3.10/dist-packages (from accelerate) (5.9.5)
Requirement already satisfied: pyyaml in /usr/local/lib/python3.10/dist-packages (from accelerate) (6.0.1)
Requirement already satisfied: torch>=1.10.0 in /usr/local/lib/python3.10/dist-packages (from accelerate) (2.4.0)
Requirement already satisfied: huggingface-hub in /usr/local/lib/python3.10/dist-packages (from accelerate) (0.16.4)
Requirement already satisfied: safetensors>=0.3.1 in /usr/local/lib/python3.10/dist-packages (from accelerate) (0.4.3)
Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate) (3.15.4)
Requirement already satisfied: typing-extensions>=4.8.0 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate) (4.8.0)
```

```
Requirement already satisfied: sympy in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate) (1.13.1)
Requirement already satisfied: networkx in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate) (3.3)
Requirement already satisfied: Jinja2 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate) (3.1.4)
Requirement already satisfied: fsspec in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate) (2023.6.0)
Requirement already satisfied: nvidia-cuda-nvrtc-cu12==12.1.105 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0)
Requirement already satisfied: nvidia-cuda-runtime-cu12==12.1.105 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10)
Requirement already satisfied: nvidia-cuda-cupti-cu12==12.1.105 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0)
Requirement already satisfied: nvidia-cudnn-cu12==9.1.0.70 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate)
Requirement already satisfied: nvidia-cublas-cu12==12.1.3.1 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate)
Requirement already satisfied: nvidia-cufft-cu12==11.0.2.54 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate)
Requirement already satisfied: nvidia-curand-cu12==10.3.2.106 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate)
Requirement already satisfied: nvidia-cusolver-cu12==11.4.5.107 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate)
Requirement already satisfied: nvidia-cusparselt-cu12==12.1.0.106 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate)
Requirement already satisfied: nvidia-nccl-cu12==2.20.5 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate)
Requirement already satisfied: nvidia-nvtx-cu12==12.1.105 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate)
Requirement already satisfied: triton==3.0.0 in /usr/local/lib/python3.10/dist-packages (from torch>=1.10.0->accelerate) (3.0.0)
Requirement already satisfied: nvidia-nvjitlink-cu12 in /usr/local/lib/python3.10/dist-packages (from nvidia-cusolver-cu12==11.4.5.107)
Requirement already satisfied: requests in /usr/local/lib/python3.10/dist-packages (from huggingface-hub->accelerate) (2.31.0)
Requirement already satisfied: tqdm>=4.42.1 in /usr/local/lib/python3.10/dist-packages (from huggingface-hub->accelerate) (4.66.1)
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.10/dist-packages (from Jinja2->torch>=1.10.0->accelerate)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests->huggingface-hub->accelerate)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests->huggingface-hub->accelerate)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests->huggingface-hub->accelerate)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests->huggingface-hub->accelerate)
Requirement already satisfied: mpmath<1.4,>=1.1.0 in /usr/local/lib/python3.10/dist-packages (from sympy->torch>=1.10.0->accelerate)
```

```
model = AutoModelForCausalLM.from_pretrained("TheBloke/Llama-2-7B-Chat-fp16",
                                             device_map='auto',
                                             torch_dtype=torch.float16,
                                             use_auth_token=True,

                                             )
```

 /usr/local/lib/python3.10/dist-packages/transformers/models/auto/auto_factory.py:469: FutureWarning: The `use_auth_token` argument is deprecated, use `token` instead.

```
config.json: 100% 635/635 [00:00<00:00, 39.4kB/s]

model.safetensors.index.json: 100% 26.8k/26.8k [00:00<00:00, 2.03MB/s]

Downloading shards: 100% 2/2 [01:34<00:00, 42.77s/it]

model-00001-of-00002.safetensors: 100% 9.98G/9.98G [01:13<00:00, 215MB/s]

model-00002-of-00002.safetensors: 100% 3.50G/3.50G [00:21<00:00, 235MB/s]


Loading checkpoint shards: 100% 2/2 [00:57<00:00, 26.59s/it]

generation_config.json: 100% 167/167 [00:00<00:00, 9.62kB/s]

/usr/local/lib/python3.10/dist-packages/transformers/generation/configuration_utils.py:540: UserWarning: `do_sample` is set to False but will be ignored since `temperature` is not None.
warnings.warn(
/usr/local/lib/python3.10/dist-packages/transformers/generation/configuration_utils.py:545: UserWarning: `do_sample` is set to False but will be ignored since `temperature` is not None.
warnings.warn(
/usr/local/lib/python3.10/dist-packages/transformers/generation/configuration_utils.py:540: UserWarning: `do_sample` is set to False but will be ignored since `temperature` is not None.
warnings.warn(
/usr/local/lib/python3.10/dist-packages/transformers/generation/configuration_utils.py:545: UserWarning: `do_sample` is set to False but will be ignored since `temperature` is not None.
warnings.warn(
```

```
pipe = pipeline("text-generation",
                model=model,
                tokenizer=tokenizer,
                torch_dtype=torch.bfloat16,
                device_map="auto",
                max_new_tokens=512,
                do_sample=True,
                top_k=30,
                num_return_sequences=1,
                eos_token_id=tokenizer.eos_token_id
                )
```

```
llm=HuggingFacePipeline(pipeline=pipe, model_kwargs={'temperature':0.1})
```

 /usr/local/lib/python3.10/dist-packages/langchain_core/_api/deprecation.py:139: LangChainDeprecationWarning: The class `HuggingFacePipeline` is deprecated in favor of `HuggingFaceLocalAdapter`.

```
B_INST, E_INST = "Resource content", "BOT Answer"
```

```
instruction = ""
Question: {question}
```

```
{context}
"""
```

```
template = instruction
```

```
template
```

```
↳ '\nQuestion: {question}\n\n{context}\n'
```

```
prompt = PromptTemplate(template=template, input_variables=["question", "context"])
```

```
qa_chain = RetrievalQA.from_chain_type(
    llm=llm,
    chain_type="stuff",
    retriever=docsearch.as_retriever(search_kwargs={"k": 2}),
    return_source_documents=True,
    chain_type_kwargs={"prompt": prompt},
)
```

```
a = qa_chain("Introduction of computer networks")
```

```
a['result']
```

```
↳ 'CHAT BOT : Resource Para : \nComputer SCienCe - C laSS Xii Computer network S199\n•\tIn a communication network, each device that is \na part of a network and that can receive, create, store or send data to different network routes is called a node.\n•\tBased on the geographical area covered and data transfer rate, computer networks are broadly categorised into LAN (Local Area Network), MAN (Metropolitan Area Network) and WAN (Wide Area Network).\n\nComputer SCienCe - C laSS Xii Computer network S199\n•\tIn a communication network, each device that is \na part of a network and that can receive, create, store or send data to different network routes is called a node.\n•\tBased on the geographical area covered and data transfer rate, computer networks are broadly categorised into LAN (Local Area Network), MAN (Metropolitan Area Network) and WAN (Wide Area Network).\n\n\nQuestion: Introduction of computer networks\nAnswer: A computer network is a collection of interconnected devices t...'
```

```
!pip install -q gradio
```

```
↳ Preparing metadata (setup.py) ... done
----- 12.4/12.4 MB 66.4 MB/s eta 0:00:00
----- 318.2/318.2 kB 22.1 MB/s eta 0:00:00
----- 75.6/75.6 kB 6.5 MB/s eta 0:00:00
----- 77.9/77.9 kB 7.5 MB/s eta 0:00:00
----- 417.2/417.2 kB 31.8 MB/s eta 0:00:00
----- 10.1/10.1 MB 109.3 MB/s eta 0:00:00
----- 62.8/62.8 kB 5.7 MB/s eta 0:00:00
----- 92.2/92.2 kB 8.1 MB/s eta 0:00:00
----- 58.3/58.3 kB 5.0 MB/s eta 0:00:00
----- 71.9/71.9 kB 5.7 MB/s eta 0:00:00
----- 129.9/129.9 kB 10.9 MB/s eta 0:00:00
----- 341.4/341.4 kB 28.2 MB/s eta 0:00:00
----- 3.4/3.4 MB 94.7 MB/s eta 0:00:00
----- 1.2/1.2 MB 59.3 MB/s eta 0:00:00
Building wheel for ffmpeg (setup.py) ... done
```

```
import gradio as gr
from transformers import pipeline
```

```
# Define the function to generate a response
def generate_response(user_input):
    shan = qa_chain(user_input)
    return shan['result']
```

```
# Create the Gradio interface
iface = gr.Interface(
    fn=generate_response,
    inputs=gr.Textbox(lines=2, placeholder="Ask something from pdfs "),
    outputs=gr.Textbox(lines=5),
    title="Chatbot",
    description="Hi, I'm shanmukha!!"
)
```

```
# Launch the Gradio interface
```

```
iface.launch()
```

Setting queue=True in a Colab notebook requires sharing enabled. Setting `share=True` (you can turn this off by setting `share-

Colab notebook detected. To show errors in colab notebook, set debug=True in launch()

Running on public URL: <https://05866cd8e96f23bc5f.gradio.live>

This share link expires in 72 hours. For free permanent hosting and GPU upgrades, run `gradio deploy` from Terminal to deploy 1

Chatbot

Hi, I'm shanmukha!!

user_input

workflow of dns server

Clear

Submit

output

Question: workflow of dns server

domain entry can be searched.DNS root servers

domain entry can be searched.DNS root servers

DNS servers are responsible for translating domain names into IP addresses.

Here is a general overview of the DNS workflow:

1. A user types a domain name into their web browser or sends an email to a recipient.
2. The domain name is passed to the user's DNS resolver (usually provided by their ISP or local network).

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