

✓ Installing required library

```
1 !pip install -U langchain-community
```

```

Collecting dataclasses-json<0.6.7-py3-none-any.whl.metadata (25 kB)
Collecting pydantic-settings<3.0.0,>=2.4.0 (from langchain-community)
  Downloading pydantic_settings-2.10.1-py3-none-any.whl.metadata (3.4 kB)
Requirement already satisfied: langsmith<0.1.125 in /usr/local/lib/python3.11/dist-packages (from langchain-community) (0.4.12)
Collecting httpx-sse<1.0.0,>=0.4.0 (from langchain-community)
  Downloading httpx_sse-0.4.1-py3-none-any.whl.metadata (9.4 kB)
Requirement already satisfied: numpy<=1.26.2 in /usr/local/lib/python3.11/dist-packages (from langchain-community) (2.0.2)
Requirement already satisfied: aiohappyeyeballs<=2.5.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain-community) (2.5.0)
Requirement already satisfied: aiosignal<=1.4.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain-community) (1.4.0)
Requirement already satisfied: attrs<=17.3.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain-community) (17.3.0)
Requirement already satisfied: frozenlist<=1.1.1 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain-community) (1.1.1)
Requirement already satisfied: multidict<=7.0,>=4.5 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain-community) (7.0.0)
Requirement already satisfied: propcache<=0.2.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain-community) (0.2.0)
Requirement already satisfied: yarl<=2.0,>=1.17.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain-community) (1.17.0)
Collecting marshmallow<4.0.0,>=3.18.0 (from dataclasses-json<0.7,>=0.5.7->langchain-community)
  Downloading marshmallow-3.26.1-py3-none-any.whl.metadata (7.3 kB)
Collecting typing-inspect<1,>=0.4.0 (from dataclasses-json<0.7,>=0.5.7->langchain-community)
  Downloading typing_inspect-0.9.0-py3-none-any.whl.metadata (1.5 kB)
Requirement already satisfied: langchain-text-splitters<1.0.0,>=0.3.9 in /usr/local/lib/python3.11/dist-packages (from langchain<1.0.0,>=0.3.26->langchain-community) (0.3.9)
Requirement already satisfied: pydantic<3.0.0,>=2.7.4 in /usr/local/lib/python3.11/dist-packages (from langchain<1.0.0,>=0.3.26->langchain-community) (2.7.4)
Requirement already satisfied: jsonpatch<2.0,>=1.33 in /usr/local/lib/python3.11/dist-packages (from langchain-core<1.0.0,>=0.3.66->langchain-community) (1.33)
Requirement already satisfied: typing-extensions<=4.7 in /usr/local/lib/python3.11/dist-packages (from langchain-core<1.0.0,>=0.3.66->langchain-community) (4.7)
Requirement already satisfied: packaging<=23.2 in /usr/local/lib/python3.11/dist-packages (from langchain-core<1.0.0,>=0.3.66->langchain-community) (23.2)
Requirement already satisfied: httpx<1,>=0.23.0 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.1.125->langchain-community) (0.23.0)
Requirement already satisfied: orjson<=3.9.14 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.1.125->langchain-community) (3.9.14)
Requirement already satisfied: requests-toolbelt<=1.0.0 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.1.125->langchain-community) (1.0.0)
Requirement already satisfied: zstandard<=0.23.0 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.1.125->langchain-community) (0.23.0)
Collecting python-dotenv<=0.21.0 (from pydantic-settings<3.0.0,>=2.4.0->langchain-community)
  Downloading python_dotenv-1.1.1-py3-none-any.whl.metadata (24 kB)
Requirement already satisfied: typing-inspection<=0.4.0 in /usr/local/lib/python3.11/dist-packages (from pydantic-settings<3.0.0,>=2.4.0->langchain-community) (0.4.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2->langchain-community) (3.2)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2->langchain-community) (3.2)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2->langchain-community) (1.21.1)
Requirement already satisfied: certifi<=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2->langchain-community) (2017.4.17)
Requirement already satisfied: greenlet<=1 in /usr/local/lib/python3.11/dist-packages (from SQLAlchemy<3,>=1.4->langchain-community) (1.0)
Requirement already satisfied: anyio in /usr/local/lib/python3.11/dist-packages (from httpx<1,>=0.23.0->langsmith<0.1.125->langchain-community) (4.0.0)
Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.11/dist-packages (from httpx<1,>=0.23.0->langsmith<0.1.125->langchain-community) (1.0.0)
Requirement already satisfied: h11<=0.16 in /usr/local/lib/python3.11/dist-packages (from httpcore==1.*->httpx<1,>=0.23.0->langsmith<0.1.125->langchain-community) (0.16)
Requirement already satisfied: jsonpointer<=1.9 in /usr/local/lib/python3.11/dist-packages (from jsonpatch<2.0,>=1.33->langchain-core<1.0.0,>=0.3.66->langchain-community) (1.9)
Requirement already satisfied: annotated-types<=0.6.0 in /usr/local/lib/python3.11/dist-packages (from pydantic<3.0.0,>=2.7.4->langchain-community) (0.6.0)
Requirement already satisfied: pydantic-core<=2.33.2 in /usr/local/lib/python3.11/dist-packages (from pydantic<3.0.0,>=2.7.4->langchain-community) (2.33.2)
Collecting mypy_extensions<=0.3.0 (from typing-inspect<1,>=0.4.0->dataclasses-json<0.7,>=0.5.7->langchain-community)
  Downloading mypy_extensions-1.1.0-py3-none-any.whl.metadata (1.1 kB)
Requirement already satisfied: sniffio<=1.1 in /usr/local/lib/python3.11/dist-packages (from anyio->httpx<1,>=0.23.0->langsmith<0.1.125->langchain-community) (1.1)
Downloading langchain_community-0.3.27-py3-none-any.whl (2.5 MB)
2.5/2.5 MB 30.1 MB/s eta 0:00:00
Downloading dataclasses_json-0.6.7-py3-none-any.whl (28 kB)
Downloading httpx_sse-0.4.1-py3-none-any.whl (8.1 kB)
Downloading pydantic_settings-2.10.1-py3-none-any.whl (45 kB)
45.2/45.2 kB 2.9 MB/s eta 0:00:00
Downloading marshmallow-3.26.1-py3-none-any.whl (50 kB)
50.9/50.9 kB 3.4 MB/s eta 0:00:00
Downloading python_dotenv-1.1.1-py3-none-any.whl (20 kB)
Downloading typing_inspect-0.9.0-py3-none-any.whl (8.8 kB)
Downloading mypy_extensions-1.1.0-py3-none-any.whl (5.0 kB)
Installing collected packages: python-dotenv, mypy_extensions, marshmallow, httpx-sse, typing-inspect, pydantic-settings, dataclasses-json
Successfully installed dataclasses-json-0.6.7 httpx-sse-0.4.1 langchain-community-0.3.27 marshmallow-3.26.1 mypy_extensions-1.1.0 pyda

```

✓ Import Statements for LangChain and Transformers Setup

```

1 from transformers import AutoModelForSeq2SeqLM, AutoTokenizer, pipeline
2 from langchain.llms import HuggingFacePipeline
3 from langchain.chains import RetrievalQA
4 from langchain.vectorstores import FAISS
5 from langchain.embeddings import HuggingFaceInstructEmbeddings
6 from langchain.document_loaders import TextLoader
7 from langchain.text_splitter import CharacterTextSplitter

```

✓ Sample company refund policy text

```
1 policy_text = """
2 Our refund policy states that customers can request a refund within 30 days of purchase.
3 Refunds will be processed within 7 business days after approval.
4 Items must be returned in their original condition to be eligible for a refund.
5 Certain products may be non-refundable as specified at the time of purchase.
6 """
```

✓ Create document object from policy text

```
1 from langchain.docstore.document import Document
2
3 docs = [Document(page_content=policy_text)]
```

✓ Split document into smaller text chunks











```
1 text_splitter = CharacterTextSplitter(chunk_size=500, chunk_overlap=50)
2 texts = text_splitter.split_documents(docs)
```

```
1 !pip install InstructorEmbedding
```


Collecting InstructorEmbedding
 Downloading InstructorEmbedding-1.0.1-py2.py3-none-any.whl.metadata (20 kB)
 Downloading InstructorEmbedding-1.0.1-py2.py3-none-any.whl (19 kB)
 Installing collected packages: InstructorEmbedding
 Successfully installed InstructorEmbedding-1.0.1

✓ Load instruction-based embeddings model

```
1 embeddings = HuggingFaceInstructEmbeddings(model_name="hkunlp/instructor-base")
```

 /usr/local/lib/python3.11/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 secret
 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%  461/461 [00:00<00:00, 11.6kB/s]
 config_sentence_transformers.json: 100%  122/122 [00:00<00:00, 6.08kB/s]
 WARNING:sentence_transformers.SentenceTransformer:No sentence-transformers model found with name hkunlp/instructor-base. Creating a new
 config.json:  1.55k/? [00:00<00:00, 34.8kB/s]
 pytorch_model.bin: 100%  439M/439M [00:03<00:00, 143MB/s]
 tokenizer_config.json:  2.43k/? [00:00<00:00, 73.1kB/s]
 model.safetensors: 2%  10.5M/439M [00:00<00:24, 17.6MB/s]
 spiece.model: 100%  792k/792k [00:00<00:00, 11.1MB/s]
 tokenizer.json:  2.42M/? [00:00<00:00, 11.4MB/s]
 special_tokens_map.json:  2.20k/? [00:00<00:00, 40.7kB/s]

```
1 !pip install faiss-cpu
```

 Collecting faiss-cpu
 Downloading faiss_cpu-1.11.0.post1-cp311-cp311-manylinux_2_27_x86_64.manylinux_2_28_x86_64.whl.metadata (5.0 kB)
 Requirement already satisfied: numpy<3.0,>=1.25.0 in /usr/local/lib/python3.11/dist-packages (from faiss-cpu) (2.0.2)
 Requirement already satisfied: packaging in /usr/local/lib/python3.11/dist-packages (from faiss-cpu) (25.0)
 Downloading faiss_cpu-1.11.0.post1-cp311-cp311-manylinux_2_27_x86_64.manylinux_2_28_x86_64.whl (31.3 MB)
 _____ 31.3/31.3 MB 42.4 MB/s eta 0:00:00
 Installing collected packages: faiss-cpu
 Successfully installed faiss-cpu-1.11.0.post1

✓ Create FAISS vector store from document embedding

```
1 vectorstore = FAISS.from_documents(texts, embeddings)
```

⚠ WARNING:sentence_transformers.SentenceTransformer:`SentenceTransformer._target_device` has been deprecated, please use `SentenceTransfor

✓ Setup local FLAN-T5 model with HuggingFace pipeline

```
1 model_name = "google/flan-t5-small"
2 tokenizer = AutoTokenizer.from_pretrained(model_name)
3 model = AutoModelForSeq2SeqLM.from_pretrained(model_name)
4
5 pipe = pipeline("text2text-generation", model=model, tokenizer=tokenizer, max_length=512, temperature=0)
6 llm = HuggingFacePipeline(pipeline=pipe)
```

⚠ Device set to use cpu
The following generation flags are not valid and may be ignored: ['temperature']. Set `TRANSFORMERS_VERBOSITY=info` for more details.
/tmp/ipython-input-2417036520.py:6: LangChainDeprecationWarning: The class `HuggingFacePipeline` was deprecated in LangChain 0.0.37 and
llm = HuggingFacePipeline(pipeline=pipe)

✓ Create RetrievalQA chain using LLM and retriever

```
1 qa_chain = RetrievalQA.from_chain_type(llm=llm, retriever=vectorstore.as_retriever())
```

✓ Ask question and print answer

```
1 query = "What is the refund policy?"
2 answer = qa_chain.run(query)
3
4 print("Answer:", answer)
```

⚠ /tmp/ipython-input-3477388597.py:2: LangChainDeprecationWarning: The method `Chain.run` was deprecated in langchain 0.1.0 and will be re
answer = qa_chain.run(query)
WARNING:sentence_transformers.SentenceTransformer:`SentenceTransformer._target_device` has been deprecated, please use `SentenceTransfor
The following generation flags are not valid and may be ignored: ['temperature']. Set `TRANSFORMERS_VERBOSITY=info` for more details.
Answer: Customers can request a refund within 30 days of purchase