

```
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```
1 !pip install faiss-gpu
2 !pip install bitsandbytes
3 !huggingface-cli login
4 !pip install sentence-transformers langchain langchain-community tqdm pypdf faiss-gpu
5
6
```

شغل رانع

```
1 import os
2 import torch
3 from transformers import AutoTokenizer, AutoModelForCausalLM, pipeline
4 from langchain_community.vectorstores import FAISS
5 from langchain_community.document_loaders import PyPDFLoader
6 from langchain.text_splitter import RecursiveCharacterTextSplitter
7 from langchain.chains import ConversationalRetrievalChain
8 from langchain_community.embeddings import HuggingFaceEmbeddings
9 from langchain_community.llms import HuggingFacePipeline
10 from langchain.memory import ConversationBufferMemory
11
12 # إذا كان متوفراً CUDA التأكد من استخدامه
13 os.environ["PYTORCH_CUDA_ALLOC_CONF"] = "expandable_segments:True"
14 device = "cuda" if torch.cuda.is_available() else "cpu"
15 torch.set_float32_matmul_precision('high')
16
17 def get_gpu_memory():
18     if torch.cuda.is_available():
19         return torch.cuda.get_device_properties(0).total_memory / 1024**3
20     return 0
21
22 class RAGSystem:
23     def __init__(self, model_path="mistralai/Mistral-7B-Instruct-v0.2",
24                  embedding_model="BAAI/bge-large-en-v1.5"):
25         self.device = device
26         self.setup_model(model_path)
27         self.setup_embeddings(embedding_model)
28         self.vector_db = None
29         self.qa_chain = None
30
31     def setup_model(self, model_path):
32         print("تحميل النموذج...")
33         self.tokenizer = AutoTokenizer.from_pretrained(model_path, trust_remote_code=True)
34
35         gpu_memory = get_gpu_memory()
36         dtype = torch.float16 if gpu_memory < 16 else torch.bfloat16
37
38         model_kwarg = {
39             "torch_dtype": dtype,
40             "device_map": "auto",
41             "trust_remote_code": True,
42             "load_in_8bit": gpu_memory < 8,
43             "max_memory": {0: f"{int(gpu_memory * 0.9)}GB"},}
44     }
45
46     try:
47         model = AutoModelForCausalLM.from_pretrained(
48             model_path,
49             **model_kwarg
50         )
51
52         pipe = pipeline(
53             "text-generation",
54             model=model,
55             tokenizer=self.tokenizer,
56             max_new_tokens=2048,
57             temperature=0.7,
58             top_p=0.95,
59             device_map="auto",
60             batch_size=1,
61             model_kwarg={"torch_dtype": dtype}
62         )
63     except Exception as e:
```

```

53         except Exception as e:
54             print(f"خطأ أثناء تحميل النموذج {str(e)}")
55             model_kwarges.update({
56                 "load_in_8bit": True,
57                 "torch_dtype": torch.float16,
58             })
59             model = AutoModelForCausalLM.from_pretrained(
60                 model_path,
61                 **model_kwarges
62             )
63             pipe = pipeline(
64                 "text-generation",
65                 model=model,
66                 tokenizer=self.tokenizer,
67                 max_new_tokens=1024,
68                 temperature=0.7,
69                 top_p=0.95,
70                 device_map="auto",
71                 batch_size=1
72             )
73
74             self.llm = HuggingFacePipeline(pipeline=pipe)
75             print("تم تحميل النموذج بنجاح")
76
77     def setup_embeddings(self, model_name):
78         print("تحميل نموذج التضمين...")
79         self.embeddings = HuggingFaceEmbeddings(
80             model_name=model_name,
81             model_kwarges={'device': self.device},
82             encode_kwarges={'device': self.device, 'batch_size': 32}
83         )
84         print("تم تحميل نموذج التضمين بنجاح")
85
86     def load_documents(self, pdf_paths):
87         print("تحميل المستندات...")
88         loaders = [PyPDFLoader(path) for path in pdf_paths]
89         pages = []
90         for loader in loaders:
91             pages.extend(loader.load())
92
93         text_splitter = RecursiveCharacterTextSplitter(
94             chunk_size=1024,
95             chunk_overlap=64
96         )
97         doc_splits = text_splitter.split_documents(pages)
98
99         print(f"جزء تم تقسيم المستندات إلى {len(doc_splits)}")
100        return doc_splits
101
102    def create_vector_db(self, pdf_paths):
103        splits = self.load_documents(pdf_paths)
104        print("إنشاء قاعدة البيانات المتجهة...")
105        self.vector_db = FAISS.from_documents(splits, self.embeddings)
106        print("تم إنشاء قاعدة البيانات المتجهة بنجاح")
107
108        memory = ConversationBufferMemory(
109            memory_key="chat_history",
110            output_key='answer',
111            return_messages=True
112        )
113
114        self.qa_chain = ConversationalRetrievalChain.from_llm(
115            self.llm,
116            retriever=self.vector_db.as_retriever(),
117            memory=memory,
118            chain_type="stuff",
119            return_source_documents=True,
120            verbose=False
121        )
122
123        print("تم إعداد نظام الأسئلة والأجوبة بنجاح")
124
125    def save_vector_db(self, path="vector_db"):
126        if self.vector_db:
127            self.vector_db.save_local(path)
128            print(f"تم حفظ قاعدة البيانات المتجهة في {path}")
129
130    def load_vector_db(self, path="vector_db", allow_unsafe=False):
131        if os.path.exists(path):
132
133
134
135
136
137
138
139
140

```

```

141     print("...تحميل قاعدة البيانات المتجهة")
142     try:
143         self.vector_db = FAISS.load_local(
144             path,
145             self.embeddings,
146             allow_dangerous_deserialization=allow_unsafe
147         )
148         print("تم تحميل قاعدة البيانات المتجهة بنجاح")
149         return True
150     except ValueError as e:
151         print(f"تحذير: {str(e)}")
152         print("\nتأكد من أمان الملف أو استخدم allow_unsafe=True")
153         return False
154     return False
155
156 def query(self, question, chat_history=[]):
157     if not self.qa_chain:
158         raise ValueError("يجب إنشاء قاعدة البيانات المتجهة أولاً")
159
160     formatted_history = []
161     for user_msg, bot_msg in chat_history:
162         formatted_history.append(f"User: {user_msg}")
163         formatted_history.append(f"Assistant: {bot_msg}")
164
165     response = self.qa_chain.invoke({
166         "question": question,
167         "chat_history": formatted_history
168     })
169
170     answer = response["answer"]
171     if "Helpful Answer:" in answer:
172         answer = answer.split("Helpful Answer:")[1].strip()
173
174     sources = [
175         {
176             "content": doc.page_content.strip(),
177             "page": doc.metadata["page"] + 1
178         }
179         for doc in response["source_documents"][:3]
180     ]
181
182     return answer, sources
183
184 def main():
185     rag = RAGSystem()
186     pdf_files = ["/content/The_Lightning_Thief_-_Percy_Jackson_1-10.pdf"] # هنا PDF وضع مسار ملفات
187     vector_db_path = "vector_db"
188
189     # التحقق من وجود قاعدة البيانات
190     if not rag.load_vector_db(vector_db_path, allow_unsafe=True):
191         rag.create_vector_db(pdf_files)
192         rag.save_vector_db(vector_db_path)
193
194     chat_history = []
195
196     while True:
197         question = input("\n: اكتب سؤالك (أو 'خروج' للنهاية)\n")
198         if question.lower() in ['exit', 'quit', 'خروج']:
199             break
200
201         answer, sources = rag.query(question, chat_history)
202         chat_history.append((question, answer))
203
204         print(f"\nإجابة: {answer}")
205         print("\nالمصادر:")
206         for src in sources:
207             print(f"    {src['content']} - {src['page']}")
208
209 if __name__ == "__main__":
210     main()
211

```

تحميل النموذج...
 /usr/local/lib/python3.10/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(
 Loading checkpoint shards: 100% 3/3 [01:05<00:00, 21.25s/it]
 WARNING:accelerate.big_modeling:Some parameters are on the meta device because they were offloaded to the disk.
 Device set to use cuda:0
 <ipython-input-1-9263cae2ea71>:84: LangChainDeprecationWarning: The class `HuggingFacePipeline` was deprecated in LangChain 0.0.37 and will be removed in 0.1.0. Use `self.llm = HuggingFacePipeline(pipeline=pipe)` instead.
 <ipython-input-1-9263cae2ea71>:89: LangChainDeprecationWarning: The class `HuggingFaceEmbeddings` was deprecated in LangChain 0.2.2 and will be removed in 0.3.0. Use `self.embeddings = HuggingFaceEmbeddings()` instead.
 تم تحميل النموذج بنجاح...
 تحميل نموذج التضمين...
 تم تحميل نموذج التضمين بنجاح
 تحميل المستندين...
 تم تقطيع المستندات إلى 15 جزء
 إنشاء قاعدة البيانات المتجهة...
 <ipython-input-1-9263cae2ea71>:118: LangChainDeprecationWarning: Please see the migration guide at: <https://python.langchain.com/docs/v0.1.0/migration.html>
 memory = ConversationBufferMemory(
 تم إنشاء قاعدة البيانات المتجهة بنجاح
 تم إعداد نظام الأسئلة والأجوبة بنجاح
 تم حفظ قاعدة البيانات المتجهة في vector_db

(او 'خروج' للإنهاء) اكتب سؤالك (او 'خروج' للإنهاء)
 /usr/local/lib/python3.10/dist-packages/transformers/generation/configuration_utils.py:628: UserWarning: `do_sample` is set to `False`.
 warnings.warn(
 /usr/local/lib/python3.10/dist-packages/transformers/generation/configuration_utils.py:633: UserWarning: `do_sample` is set to `False`.
 warnings.warn(
 Setting `pad_token_id` to `eos_token_id`:2 for open-end generation.

الإجابة: "Mr. Brunner pointed to one of the pictures on the stele. 'Perhaps you'll tell us what this picture represents?' I looked at the classmate who had asked the question." "It's a scene from Greek mythology," he said. "A king named Kronos ate his own children."

المصادر:

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Visit www.hyperionbooksforchildren.com - 2 الصفحة:

المحتوى: think Mrs. Dodds was human. He looked at me, real serious, and said, "You're absolutely right."

Mr. Brunner kept talking about Greek funeral art.

Finally, Nancy Bobofit snickered something about the naked guy on the stele, and I turned around and said, "Will you shut up!"

It came out louder than I meant it to.

The whole group laughed. Mr. Brunner stopped his story.

"Mr. Jackson," he said, "did you have a comment?"

My face was totally red. I said, "No, sir."

Mr. Brunner pointed to one of the pictures on the stele.

"Perhaps you'll tell us what this picture represents?"

I looked at the carving, and felt a flush of relief, because I actually recognized it. "That's Kronos eating his kids, right?"

"Yes," Mr. Brunner said, obviously not satisfied. "And he did this because . . ."

"Well..." I racked my brain to remember. "Kronos was the king god, and..."

"God?" Mr. Brunner asked.

"Titan," I corrected myself. "And . . . he didn't trust his kids, who were the gods. So, um, Kronos ate them, right? - 9 الصفحة:

المحتوى: Some snickers from the group.

Behind me, Nancy Bobofit mumbled to a friend, "Like we're going to use this in real life. Like it's going to say on our job applications, 'Please explain why Kronos ate his kids.' "

"And why, Mr. Jackson," Brunner said, "to paraphrase Miss Bobofit's excellent question, does this matter in real life?"

"Busted," Grover muttered.

"Shut up," Nancy hissed, her face even brighter red than her hair.

At least Nancy got naked too. Mr. Brunner was the

At least Nancy got packed, too. Mr. Brunner was the only one who ever caught her saying anything wrong. He had radar ears.

I thought about his question, and shrugged. "I don't know, sir."

"I see." Mr. Brunner looked disappointed. "Well, half credit, Mr. Jackson. Zeus did indeed feed Kronos a mixture of mustard and wine, which made him disgorge his other five children, who, of course, being immortal gods, had been living and growing up completely undigested in the Titan's stomach. The gods defeated their father, sliced him - 10

الصفحة:

(أو 'خروج' للآلهاء): اكتب سؤالك (او 'خروج' للآلهاء): What is the content of the book?

```
/usr/local/lib/python3.10/dist-packages/transformers/generation/configuration_utils.py:628: UserWarning: `do_sample` is set to `False`.
  warnings.warn(
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  warnings.warn(
Setting `pad_token_id` to `eos_token_id`:2 for open-end generation.
```

الإجابة: The subject matter of the book on page four is Greek mythology, specifically the story of Kronos eating his children.

المصادر:

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الصفحة:

```
KeyboardInterrupt
<ipython-input-1-9263cae2ea71> in <cell line: 209>()
    208
  209 if __name__ == "__main__":
--> 210     main()

----- 2 frames -----
/usr/local/lib/python3.10/dist-packages/ipykernel/kernelbase.py in _input_request(self, prompt, ident, parent, password)
    893         except KeyboardInterrupt:
    894             # re-raise KeyboardInterrupt, to truncate traceback
--> 895             raise KeyboardInterrupt("Interrupted by user") from None
    896         except Exception as e:
    897             self.log.warning("Invalid Message:", exc_info=True)

KeyboardInterrupt: Interrupted by user
```

اكتب سؤالك (او 'خروج' للنهاية):

```
#####
#####
```

شغل رانع

```

1
2
3
4 !pip install --upgrade langchain transformers chromadb
5
6
7
8
9 from langchain.vectorstores import Chroma
10 from langchain.document_loaders import PyPDFLoader
11 from langchain.embeddings.base import Embeddings
12 from langchain.chains import RetrievalQA
13 from langchain.prompts import PromptTemplate
14 from langchain.llms import HuggingFacePipeline
15 from transformers import pipeline, AutoTokenizer, AutoModelForCausalLM
16 from sentence_transformers import SentenceTransformer
17 import torch
18
19 class SentenceTransformerEmbeddings(Embeddings):
20     """Custom embedding class for SentenceTransformer models."""
21     def __init__(self, model_name):
22         self.model = SentenceTransformer(model_name)
23
24     def embed_documents(self, texts):
25         return self.model.encode(texts, show_progress_bar=True).tolist()
26
27     def embed_query(self, text):
28         return self.model.encode(text, show_progress_bar=False).tolist()
29
30 def setup_chroma_db(pdf_path, embedding_model_name="hkunlp/instructor-large"):
31     """Load PDF, split into chunks, and set up ChromaDB with embeddings."""
32     loader = PyPDFLoader(pdf_path)
33     documents = loader.load_and_split()
34     embeddings = SentenceTransformerEmbeddings(embedding_model_name)
35     db = Chroma.from_documents(documents, embeddings)
36     return db
37
38 def setup_mistral_pipeline(model_name="mistralai/Mistral-7B-Instruct-v0.2", device="cuda"):
39     """Set up the Mistral model as a HuggingFace pipeline."""
40     tokenizer = AutoTokenizer.from_pretrained(model_name)
41     model = AutoModelForCausalLM.from_pretrained(model_name, torch_dtype=torch.bfloat16, device_map="auto")
42     pipeline_model = pipeline(
43         "text-generation",
44         model=model,
45         tokenizer=tokenizer,
46         max_length=1024,
47         temperature=0.7,
48         top_p=0.9
49    )
50    # Pass the pipeline object as a keyword argument to HuggingFacePipeline
51    return HuggingFacePipeline(pipeline=pipeline_model)
52
53 def build_qa_chain(retriever, llm):
54     """Build a QA chain with a retriever and language model."""
55     prompt_template = PromptTemplate(
56         input_variables=["context", "question"],
57         template="""
58             Use the following context to answer the question:
59             Context: {context}
60             Question: {question}
61             Answer in detail.
62             """
63    )
64    qa_chain = RetrievalQA.from_chain_type(
65        retriever=retriever,
66        llm=llm,
67        chain_type="stuff",
68        return_source_documents=True,
69        chain_type_kwargs={"prompt": prompt_template}
70    )
71    return qa_chain

```

```
72
73 if __name__ == "__main__":
74     # Define paths and model names
75     pdf_path = "/content/The_Lightning_Thief_-_Percy_Jackson_1-10.pdf"  # Path to your PDF
76     embedding_model_name = "hkunlp/instructor-large"
77     mistral_model_name = "mistralai/Mistral-7B-Instruct-v0.2"
78
79     # Step 1: Set up ChromaDB
80     print("Setting up ChromaDB...")
81     vector_db = setup_chroma_db(pdf_path, embedding_model_name)
82     retriever = vector_db.as_retriever()
83
84     # Step 2: Set up Mistral pipeline
85     print("Setting up Mistral pipeline...")
86     mistral_pipeline = setup_mistral_pipeline(mistral_model_name)
87
88     # Step 3: Build QA Chain
89     print("Building QA chain...")
90     qa_chain = build_qa_chain(retriever, mistral_pipeline)
91
92     # Step 4: Ask a question
93     question = "What is the main topic of the document?"
94     print(f"Question: {question}")
95
96     # Step 5: Get the answer
97     result = qa_chain({"query": question})
98     answer = result["result"]
99     source_documents = result["source_documents"]
100
101    # Step 6: Display the answer and sources
102    print("\nAnswer:")
103    print(answer)
104    print("\nSource Documents:")
105    for doc in source_documents:
106        print(doc.page_content)
107
```

```

Requirement already satisfied: langchain in /usr/local/lib/python3.10/dist-packages (0.3.14)
Requirement already satisfied: transformers in /usr/local/lib/python3.10/dist-packages (4.47.1)
Collecting transformers
  Using cached transformers-4.48.0-py3-none-any.whl.metadata (44 kB)
Collecting chromadb
  Using cached chromadb-0.6.2-py3-none-any.whl.metadata (6.8 kB)
Requirement already satisfied: PyYAML>=5.3 in /usr/local/lib/python3.10/dist-packages (from langchain) (6.0.2)
Requirement already satisfied: SQLAlchemy<3,>=1.4 in /usr/local/lib/python3.10/dist-packages (from langchain) (2.0.36)
Requirement already satisfied: aiohttp<4.0.0,>=3.8.3 in /usr/local/lib/python3.10/dist-packages (from langchain) (3.11.11)
Requirement already satisfied: asyncio-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<0.4.0,>=0.3.29 in /usr/local/lib/python3.10/dist-packages (from langchain) (0.3.29)
Requirement already satisfied: langchain-text-splitters<0.4.0,>=0.3.3 in /usr/local/lib/python3.10/dist-packages (from langchain) (0.3.3)
Requirement already satisfied: langsmith<0.3,>=0.1.17 in /usr/local/lib/python3.10/dist-packages (from langchain) (0.2.10)
Requirement already satisfied: numpy<2,>=1.22.4 in /usr/local/lib/python3.10/dist-packages (from langchain) (1.26.4)
Requirement already satisfied: pydantic<3.0.0,>=2.7.4 in /usr/local/lib/python3.10/dist-packages (from langchain) (2.10.4)
Requirement already satisfied: requests<3,>=2 in /usr/local/lib/python3.10/dist-packages (from langchain) (2.32.3)
Requirement already satisfied: tenacity!=8.4.0,<10,>=8.1.0 in /usr/local/lib/python3.10/dist-packages (from langchain) (9.0.0)
Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-packages (from transformers) (3.16.1)
Requirement already satisfied: huggingface-hub<1.0,>=0.24.0 in /usr/local/lib/python3.10/dist-packages (from transformers) (0.27.1)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from transformers) (24.2)
Requirement already satisfied: regex!=2019.12.17 in /usr/local/lib/python3.10/dist-packages (from transformers) (2024.11.6)
Requirement already satisfied: tokenizers<0.22,>=0.21 in /usr/local/lib/python3.10/dist-packages (from transformers) (0.21.0)
Requirement already satisfied: safetensors>=0.4.1 in /usr/local/lib/python3.10/dist-packages (from transformers) (0.5.1)
Requirement already satisfied: tqdm>=4.27 in /usr/local/lib/python3.10/dist-packages (from transformers) (4.67.1)
Collecting build>=1.0.3 (from chromadb)
  Using cached build-1.2.2.post1-py3-none-any.whl.metadata (6.5 kB)
Collecting chroma-hnswlib==0.7.6 (from chromadb)
  Using cached chroma_hnswlib-0.7.6-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (252 bytes)
Collecting fastapi>=0.95.2 (from chromadb)
  Using cached fastapi-0.115.6-py3-none-any.whl.metadata (27 kB)
Collecting uvicorn>=0.18.3 (from uvicorn[standard]>=0.18.3->chromadb)
  Using cached uvicorn-0.34.0-py3-none-any.whl.metadata (6.5 kB)
Collecting posthog>=2.4.0 (from chromadb)
  Using cached posthog-3.7.5-py2.py3-none-any.whl.metadata (2.0 kB)
Requirement already satisfied: typing_extensions>=4.5.0 in /usr/local/lib/python3.10/dist-packages (from chromadb) (4.12.2)
Collecting onnxruntime>=1.14.1 (from chromadb)
  Using cached onnxruntime-1.20.1-cp310-cp310-manylinux_2_27_x86_64.manylinux_2_28_x86_64.whl.metadata (4.5 kB)
Requirement already satisfied: opentelemetry-api>=1.2.0 in /usr/local/lib/python3.10/dist-packages (from chromadb) (1.29.0)
Collecting opentelemetry-exporter-otlp-proto-grpc>=1.2.0 (from chromadb)
  Using cached opentelemetry_exporter_otlp_proto_grpc-1.29.0-py3-none-any.whl.metadata (2.2 kB)
Collecting opentelemetry-instrumentation-fastapi>=0.41b0 (from chromadb)
  Using cached opentelemetry_instrumentation_fastapi-0.50b0-py3-none-any.whl.metadata (2.1 kB)
Requirement already satisfied: opentelemetry-sdk>=1.2.0 in /usr/local/lib/python3.10/dist-packages (from chromadb) (1.29.0)
Collecting pypika>=0.48.9 (from chromadb)
  Using cached PyPika-0.48.9.tar.gz (67 kB)
Installing build dependencies ... done
Getting requirements to build wheel ... done
Preparing metadata (pyproject.toml) ... done
Collecting overrides>=7.3.1 (from chromadb)
  Using cached overrides-7.7.0-py3-none-any.whl.metadata (5.8 kB)
Requirement already satisfied: importlib-resources in /usr/local/lib/python3.10/dist-packages (from chromadb) (6.5.2)
Requirement already satisfied: grpcio>=1.58.0 in /usr/local/lib/python3.10/dist-packages (from chromadb) (1.69.0)
Collecting bcrypt>=4.0.1 (from chromadb)
  Using cached bcrypt-4.2.1-cp39abi3-manylinux_2_28_x86_64.whl.metadata (9.8 kB)
Requirement already satisfied: typer>=0.9.0 in /usr/local/lib/python3.10/dist-packages (from chromadb) (0.15.1)
Collecting kubernetes>=28.1.0 (from chromadb)
  Using cached kubernetes-31.0.0-py2.py3-none-any.whl.metadata (1.5 kB)
Collecting mmh3>=4.0.1 (from chromadb)
  Using cached mmh3-0.0.1-cp310-cp310-manylinux_2_5_x86_64.manylinux1_x86_64.manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (Requirement already satisfied: orjson>=3.9.12 in /usr/local/lib/python3.10/dist-packages (from chromadb) (3.10.13))
Requirement already satisfied: httpx>=0.27.0 in /usr/local/lib/python3.10/dist-packages (from chromadb) (0.28.1)
Requirement already satisfied: rich>=10.11.0 in /usr/local/lib/python3.10/dist-packages (from chromadb) (13.9.4)
Requirement already satisfied: aiohappyeyeballs>=2.3.0 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain) (Requirement already satisfied: aiosignal>=1.1.2 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain) (1.1.2))
Requirement already satisfied: attrs>=17.3.0 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain) (24.3.1)
Requirement already satisfied: frozenlist>=1.1.1 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain) (1.1.1)
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) (1.1.1)
Requirement already satisfied: propcache>=0.2.0 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain) (0.2.0)
Requirement already satisfied: yarl<2.0,>=1.17.0 in /usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain) (1.17.0)
Collecting pyproject_hooks (from build>=1.0.3->chromadb)
  Using cached pyproject_hooks-1.2.0-py3-none-any.whl.metadata (1.3 kB)
Requirement already satisfied: tomli>=1.1.0 in /usr/local/lib/python3.10/dist-packages (from build>=1.0.3->chromadb) (2.2.1)
Collecting starlette<0.42.0,>=0.40.0 (from fastapi>=0.95.2->chromadb)
  Using cached starlette-0.41.3-py3-none-any.whl.metadata (6.0 kB)
Requirement already satisfied: anyio in /usr/local/lib/python3.10/dist-packages (from httpx>=0.27.0->chromadb) (3.7.1)
Requirement already satisfied: certifi in /usr/local/lib/python3.10/dist-packages (from httpx>=0.27.0->chromadb) (2024.12.14)
Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.10/dist-packages (from httpx>=0.27.0->chromadb) (1.0.7)
Requirement already satisfied: idna in /usr/local/lib/python3.10/dist-packages (from httpx>=0.27.0->chromadb) (3.18)
Requirement already satisfied: h11<0.15,>=0.13 in /usr/local/lib/python3.10/dist-packages (from httpcore==1.*->httpx>=0.27.0->chromadb) (h11)
Requirement already satisfied: fsspec>=2023.5.0 in /usr/local/lib/python3.10/dist-packages (from huggingface-hub<1.0,>=0.24.0->transformers) (fsspec)
Requirement already satisfied: six>=1.9.0 in /usr/local/lib/python3.10/dist-packages (from kubernetes>=28.1.0->chromadb) (1.17.0)
Requirement already satisfied: python-dateutil>=2.5.3 in /usr/local/lib/python3.10/dist-packages (from kubernetes>=28.1.0->chromadb) (python-dateutil)
Requirement already satisfied: google-auth>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from kubernetes>=28.1.0->chromadb) (2.27.1)
Requirement already satisfied: websocket-client!=0.40.0,!0.41.*,!0.42.*,>=0.32.0 in /usr/local/lib/python3.10/dist-packages (from kubernetes>=28.1.0->chromadb) (websocket-client)

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Requirement already satisfied: requests-oauthlib in /usr/local/lib/python3.10/dist-packages (from kubernetes>=28.1.0->chromadb) (1.3.1)
Requirement already satisfied: oauthlib>=3.2.2 in /usr/local/lib/python3.10/dist-packages (from kubernetes>=28.1.0->chromadb) (3.2.2)
Requirement already satisfied: urllib3>=1.24.2 in /usr/local/lib/python3.10/dist-packages (from kubernetes>=28.1.0->chromadb) (2.3.0)
Collecting durationpy>=0.7 (from kubernetes>=28.1.0->chromadb)
    Using cached durationpy-0.9-py3-none-any.whl.metadata (338 bytes)
Requirement already satisfied: jsonpatch<2.0,>=1.3.3 in /usr/local/lib/python3.10/dist-packages (from langchain-core<0.4.0,>=0.3.29->langchain)
Requirement already satisfied: requests-toolbelt<2.0.0,>=1.0.0 in /usr/local/lib/python3.10/dist-packages (from langsmith<0.3,>=0.1.17)
Collecting coloredlogs (from onnxruntime>=1.14.1->chromadb)
    Using cached coloredlogs-15.0.1-py3-none-any.whl.metadata (12 kB)
Requirement already satisfied: flatbuffers in /usr/local/lib/python3.10/dist-packages (from onnxruntime>=1.14.1->chromadb) (24.12.23)
Requirement already satisfied: protobuf in /usr/local/lib/python3.10/dist-packages (from onnxruntime>=1.14.1->chromadb) (4.25.5)
Requirement already satisfied: sympy in /usr/local/lib/python3.10/dist-packages (from onnxruntime>=1.14.1->chromadb) (1.13.1)
Requirement already satisfied: deprecated>=1.2.6 in /usr/local/lib/python3.10/dist-packages (from opentelemetry-api>=1.2.0->chromadb)
Requirement already satisfied: importlib-metadata<=8.5.0,>=6.0 in /usr/local/lib/python3.10/dist-packages (from opentelemetry-api>=1.2)
Requirement already satisfied: googleapis-common-protos>=1.52 in /usr/local/lib/python3.10/dist-packages (from opentelemetry-exporter)
Collecting opentelemetry-exporter-otlp-proto-common==1.29.0 (from opentelemetry-exporter-otlp-proto-grpc>=1.2.0->chromadb)
    Using cached opentelemetry_exporter_otlp_proto_common-1.29.0-py3-none-any.whl.metadata (1.8 kB)
Collecting opentelemetry-proto==1.29.0 (from opentelemetry-exporter-otlp-proto-grpc>=1.2.0->chromadb)
    Using cached opentelemetry_proto-1.29.0-py3-none-any.whl.metadata (2.3 kB)
Collecting protobuf (from onnxruntime>=1.14.1->chromadb)
    Using cached protobuf-5.29.3-cp38abi3-manylinux2014_x86_64.whl.metadata (592 bytes)
Collecting opentelemetry-instrumentation-asgi==0.50b0 (from opentelemetry-instrumentation-fastapi>=0.41b0->chromadb)
    Using cached opentelemetry_instrumentation_asgi-0.50b0-py3-none-any.whl.metadata (1.9 kB)
Collecting opentelemetry-instrumentation==0.50b0 (from opentelemetry-instrumentation-fastapi>=0.41b0->chromadb)
    Using cached opentelemetry_instrumentation-0.50b0-py3-none-any.whl.metadata (6.1 kB)
Requirement already satisfied: opentelemetry-semantic-conventions==0.50b0 in /usr/local/lib/python3.10/dist-packages (from opentelemetry-instrumentation)
Collecting opentelemetry-util-http==0.50b0 (from opentelemetry-instrumentation-fastapi>=0.41b0->chromadb)
    Using cached opentelemetry_util_http-0.50b0-py3-none-any.whl.metadata (2.5 kB)
Requirement already satisfied: wrapt<2.0.0,>=1.0.0 in /usr/local/lib/python3.10/dist-packages (from opentelemetry-instrumentation==0.50b0)
Collecting asgiref~=3.0 (from opentelemetry-instrumentation-asgi==0.50b0->opentelemetry-instrumentation-fastapi>=0.41b0->chromadb)
    Using cached asgiref-3.8.1-py3-none-any.whl.metadata (9.3 kB)
Collecting monotonic>1.5 (from posthog>=2.4.0->chromadb)
    Using cached monotonic-1.6-py2.py3-none-any.whl.metadata (1.5 kB)
Collecting backoff>=1.10.0 (from posthog>=2.4.0->chromadb)
    Using cached backoff-2.2.1-py3-none-any.whl.metadata (14 kB)
Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.10/dist-packages (from pydantic<3.0.0,>=2.7.4->langchain)
Requirement already satisfied: pydantic-core==2.27.2 in /usr/local/lib/python3.10/dist-packages (from pydantic<3.0.0,>=2.7.4->langchain)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2->langchain) (3.2.0)
Requirement already satisfied: markdown-it-py>=2.2.0 in /usr/local/lib/python3.10/dist-packages (from rich>=10.11.0->chromadb) (3.0.0)
Requirement already satisfied: pygments<3.0.0,>=2.13.0 in /usr/local/lib/python3.10/dist-packages (from rich>=10.11.0->chromadb) (2.18)
Requirement already satisfied: greenlet!=0.4.17 in /usr/local/lib/python3.10/dist-packages (from SQLAlchemy3,>=1.4->langchain) (3.1.1)
Requirement already satisfied: click>=8.0.0 in /usr/local/lib/python3.10/dist-packages (from typer>=0.9.0->chromadb) (8.1.8)
Requirement already satisfied: shellingham>=1.3.0 in /usr/local/lib/python3.10/dist-packages (from typer>=0.9.0->chromadb) (1.5.4)
Collecting httpools>0.6.3 (from uvicorn[standard]>=0.18.3->chromadb)
    Using cached httpools-0.6.4-cp310-cp310-manylinux2_5_x86_64_manylinux1_x86_64_manylinux2_17_x86_64_manylinux2014_x86_64.whl.metadata
Requirement already satisfied: python-dotenv>=0.13 in /usr/local/lib/python3.10/dist-packages (from uvicorn[standard]>=0.18.3->chromadb)
Collecting uvloop!=0.15.0,!0.15.1,>=0.14.0 (from uvicorn[standard]>=0.18.3->chromadb)
    Using cached uvloop-0.21.0-cp310-cp310-manylinux2_17_x86_64_manylinux2014_x86_64.whl.metadata (4.9 kB)
Collecting watchfiles>=0.13 (from uvicorn[standard]>=0.18.3->chromadb)
    Using cached watchfiles-1.0.4-cp310-cp310-manylinux2_17_x86_64_manylinux2014_x86_64.whl.metadata (4.9 kB)
Requirement already satisfied: websockets>=10.4 in /usr/local/lib/python3.10/dist-packages (from uvicorn[standard]>=0.18.3->chromadb)
Requirement already satisfied: cachetools<6.0,>=2.0.0 in /usr/local/lib/python3.10/dist-packages (from google-auth>=1.0.1->kubernetes)
Requirement already satisfied: pyasn1-modules>=0.2.1 in /usr/local/lib/python3.10/dist-packages (from google-auth>=1.0.1->kubernetes)
Requirement already satisfied: rsa<5,>=3.1.4 in /usr/local/lib/python3.10/dist-packages (from google-auth>=1.0.1->kubernetes) (28.1.0->)
Requirement already satisfied: zipp>=3.20 in /usr/local/lib/python3.10/dist-packages (from importlib-metadata<=8.5.0,>=6.0->opentelemetry)
Requirement already satisfied: jsonpointer>=1.9 in /usr/local/lib/python3.10/dist-packages (from jsonpatch<2.0,>=1.33->langchain)
Requirement already satisfied: mdurl=<0.1 in /usr/local/lib/python3.10/dist-packages (from markdown-it-py>=2.2.0->rich>=10.11.0->chromadb)
Requirement already satisfied: sniffio>=1.1 in /usr/local/lib/python3.10/dist-packages (from anyio>httpx>0.27.0->chromadb) (1.3.1)
Requirement already satisfied: exceptiongroup in /usr/local/lib/python3.10/dist-packages (from anyio>httpx>0.27.0->chromadb) (1.2.2)
Collecting humanfriendly>9.1 (from coloredlogs->onnxruntime>=1.14.1->chromadb)
    Using cached humanfriendly-10.0-py2.py3-none-any.whl.metadata (9.2 kB)
Requirement already satisfied: mpmath<1.4,>=1.1.0 in /usr/local/lib/python3.10/dist-packages (from sympy>onnxruntime>=1.14.1->chromadb)
Requirement already satisfied: pyasn1<0.7.0,>=0.4.6 in /usr/local/lib/python3.10/dist-packages (from pyasn1-modules>=0.2.1->google-auth)
Using cached transformers-4.48.0-py3-none-any.whl (9.7 MB)
Using cached chromadb-0.6.2-py3-none-any.whl (606 kB)
Downloading chroma_hnswlib-0.7.6-cp310-cp310-manylinux2_17_x86_64_manylinux2014_x86_64.whl (2.4 MB)
    2.4/2.4 MB 28.5 MB/s eta 0:00:00
Downloading bcrypt-4.2.1-cp39abi3-manylinux2_28_x86_64.whl (278 kB)
    278.6/278.6 kB 19.7 MB/s eta 0:00:00
Downloading build-1.2.2.post1-py3-none-any.whl (22 kB)
Downloading fastapi-0.115.6-py3-none-any.whl (94 kB)
    94.8/94.8 kB 9.3 MB/s eta 0:00:00
Downloading kubernetes-31.0.0-py2.py3-none-any.whl (1.9 MB)
    1.9/1.9 kB 57.6 MB/s eta 0:00:00
Downloading mmh3-5.0.1-cp310-cp310-manylinux2_5_x86_64_manylinux1_x86_64_manylinux2_17_x86_64_manylinux2014_x86_64.whl (93 kB)
    93.2/93.2 kB 8.5 MB/s eta 0:00:00
Downloading onnxruntime-1.20.1-cp310-cp310-manylinux2_27_x86_64_manylinux2_28_x86_64.whl (13.3 MB)
    13.3/13.3 kB 67.7 MB/s eta 0:00:00
Downloading opentelemetry_exporter_otlp_proto_grpc-1.29.0-py3-none-any.whl (18 kB)
Downloading opentelemetry_exporter_otlp_proto_common-1.29.0-py3-none-any.whl (18 kB)
Downloading opentelemetry_proto-1.29.0-py3-none-any.whl (55 kB)
    55.8/55.8 kB 5.1 MB/s eta 0:00:00
Downloading opentelemetry_instrumentation_fastapi-0.50b0-py3-none-any.whl (12 kB)
Downloading opentelemetry_instrumentation-0.50b0-py3-none-any.whl (30 kB)
Downloading opentelemetry_instrumentation_asgi-0.50b0-py3-none-any.whl (16 kB)

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Downloading opentelemetry_util_http-0.50b0-py3-none-any.whl (6.9 kB)
Downloading overrides-7.7.0-py3-none-any.whl (17 kB)
Downloading posthog-3.7.5-py2.py3-none-any.whl (54 kB)
  ━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 54.9/54.9 kB 4.9 MB/s eta 0:00:00
Downloading uvicorn-0.34.0-py3-none-any.whl (62 kB)
  ━━━━━━━━━━━━━━━━━━━━━━━━━━ 62.3/62.3 kB 3.6 MB/s eta 0:00:00
Downloading backoff-2.2.1-py3-none-any.whl (15 kB)
Downloading durationpy-0.9-py3-none-any.whl (3.5 kB)
Downloading httptools-0.6.4-cp310-cp310-manylinux_2_5_x86_64.manylinux1_x86_64.manylinux_2_17_x86_64.manylinux2014_x86_64.whl (442 kB)
  ━━━━━━━━━━━━━━━━━━━━━━━━ 442.1/442.1 kB 30.5 MB/s eta 0:00:00
Downloading monotonic-1.6-py2.py3-none-any.whl (8.2 kB)
Downloading protobuf-5.29.3-cp38-abi3-manylinux2014_x86_64.whl (319 kB)
  ━━━━━━━━━━━━━━━━━━━━ 319.7/319.7 kB 23.5 MB/s eta 0:00:00
Downloading starlette-0.41.3-py3-none-any.whl (73 kB)
  ━━━━━━━━━━━━━━━━ 73.2/73.2 kB 7.3 MB/s eta 0:00:00
Downloading uvloop-0.21.0-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (3.8 MB)
  ━━━━━━━━ 3.8/3.8 kB 66.0 MB/s eta 0:00:00
Downloading watchfiles-1.0.4-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (452 kB)
  ━━━━━━━━ 452.9/452.9 kB 29.5 MB/s eta 0:00:00
Downloading coloredlogs-15.0.1-py2.py3-none-any.whl (46 kB)
  ━━━━━━ 46.0/46.0 kB 3.5 MB/s eta 0:00:00
Downloading pyproject_hooks-1.2.0-py3-none-any.whl (10 kB)
Downloading asgiref-3.8.1-py3-none-any.whl (23 kB)
Downloading humanfriendly-10.0-py2.py3-none-any.whl (86 kB)
  ━━━━━━ 86.8/86.8 kB 7.8 MB/s eta 0:00:00

Building wheels for collected packages: pypika
  Building wheel for pypika (pyproject.toml) ... done
    Created wheel for pypika: filename=PyPika-0.48.9-py2.py3-none-any.whl size=53771 sha256=e2a22fc7c8a81cb80141b2052c2d8e8580ce48f50537
    Stored in directory: /root/.cache/pip/wheels/e1/26/51/d0bffb3d2fd82256676d7ad3003faea3bd6dddc9577af665f4
Successfully built pypika
Installing collected packages: pypika, monotonic, durationpy, uvloop, uvicorn, pyproject_hooks, protobuf, overrides, opentelemetry-util
Attempting uninstall: protobuf
  Found existing installation: protobuf 4.25.5
  Uninstalling protobuf-4.25.5:
    Successfully uninstalled protobuf-4.25.5
Attempting uninstall: transformers
  Found existing installation: transformers 4.47.1
  Uninstalling transformers-4.47.1:
    Successfully uninstalled transformers-4.47.1
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source of the TF2.1.1 requirement for protobuf!=4.21.0,!=4.21.1,!=4.21.2,!=4.21.3,!=4.21.4,!=4.21.5,<5.0.0dev,>=3.20.3, but you have protobuf 5.2.0 installed.
TensorFlow metadata 1.13.1 requires protobuf<5,>=3.20.3, but you have protobuf 5.29.3 which is incompatible.
Successfully installed asgiref-3.8.1 backoff-2.2.1 bcrypt-4.2.1 build-1.2.2.post1 chroma-hnslib-0.7.6 chromadb-0.6.2 coloredlogs-15.0.1
Setting up ChromaDB...
/usr/local/lib/python3.10/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, and 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(
pytorch_model.bin: 100%                                         1.34G/1.34G [00:10<00:00, 177MB/s]
tokenizer_config.json: 100%                                       2.41k/2.41k [00:00<00:00, 97.0kB/s]
spiece.model: 100%                                         792k/792k [00:00<00:00, 29.9MB/s]
tokenizer.json: 100%                                         2.42M/2.42M [00:00<00:00, 19.0MB/s]
special_tokens_map.json: 100%                                     2.20k/2.20k [00:00<00:00, 116kB/s]
model.safetensors: 100%                                       1.34G/1.34G [00:14<00:00, 142MB/s]
1_Pooling/config.json: 100%                                     270/270 [00:00<00:00, 13.0kB/s]
2_Dense/config.json: 100%                                       116/116 [00:00<00:00, 2.26kB/s]
pytorch_model.bin: 100%                                         3.15M/3.15M [00:00<00:00, 9.11MB/s]

Batches: 100%                                         1/1 [00:02<00:00, 2.42s/it]
Setting up Mistral pipeline...
Loading checkpoint shards: 100%                                         3/3 [00:55<00:00, 16.58s/it]
WARNING:accelerate.big_modeling:Some parameters are on the meta device because they were offloaded to the cpu.
Device set to use cuda:0
<ipython-input-1-42fee4ac0b2f>:48: LangChainDeprecationWarning: The class `HuggingFacePipeline` was deprecated in LangChain 0.0.37 and will be removed in 0.1.0. Please use `HuggingFacePipeline(pipeline=pipeline_model)` instead.
<ipython-input-1-42fee4ac0b2f>:94: LangChainDeprecationWarning: The method `Chain.__call__` was deprecated in langchain 0.1.0 and will be removed in 0.1.1. Please use `Chain().call(query)` instead.
Truncation was not explicitly activated but `max_length` is provided a specific value, please use `truncation=True` to explicitly truncate the output.
/usr/local/lib/python3.10/dist-packages/transformers/generation/configuration_utils.py:628: UserWarning: `do_sample` is set to `False` and will be removed in 4.2.0. Please set `do_sample=True` if you want sampling behavior.
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/transformers/generation/configuration_utils.py:633: UserWarning: `do_sample` is set to `False` and will be removed in 4.2.0. Please set `do_sample=True` if you want sampling behavior.
  warnings.warn(
Setting `pad_token_id` to `eos_token_id` for open-end generation.
Building QA chain...
Question: What is the main topic of the document?

```

QUESTION. WHAT IS THE MAIN TOPIC OF THE DOCUMENT?

Answer:

Use the following context to answer the question:

Context: Copyright © 2005 by Rick Riordan

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To Haley,
who heard the story first

This trip, I was determined to be good.