Local AI agent with Ollama

Introduction

This complete code workflow sets up a chatbot that uses LangChain, Ollama, and Chroma to answer questions about a pizza restaurant by retrieving and summarizing relevant reviews.

How the Solution Works

- Review Data & Embeddings: Loads reviews from `restaurant_reviews.csv`, embeds them using Ollama's `"mxbai-embed-large"` model, and stores them in a Chroma vector database.
- Retriever Setup: Creates a retriever to find the most relevant review when asked a question, supporting retrieval-augmented generation.
- LLM & Prompt Chain: Uses `OllamaLLM` with `"llama3.2"` to process questions alongside retrieved reviews via a conversational chain.
- Chat Loop: Allows repeated user interaction; for each question, finds relevant reviews and provides an expert answer using the LLM model and prompt template.

Main Modules Used

- langchain_ollama:
  - OllamaLLM: Handles large language model responses.
  - OllamaEmbeddings: Generates embeddings for review texts.
- langchain_core:
  - ChatPromptTemplate: Manages custom prompts for the chatbot.
  - Document: Wraps reviews as structured documents.
- langchain_chroma:
  - Chroma: Provides persistent vector database capabilities.
- Pandas:
  - Handles CSV data loading and processing.

Workflow Summary

1. Preprocessing:
   - Reviews converted to documents with metadata (rating, date).
   - Documents embedded and stored in Chroma if not already present.
2. Interactive Chat:
   - Receives a user question.
   - Retrieves most relevant review(s) using the retriever (semantic search).

- Combines reviews with the question using a custom prompt.
- Sends to the LLM model for expert answer generation.
3. Continuous Interface:
   - Users can ask multiple questions until quitting.

Code


```python
from langchain_ollama import OllamaLLM
from langchain_core.prompts import ChatPromptTemplate
from Vector import retriever

model = OllamaLLM(model="llama3.2")

template = """
You are an exeprt in answering questions about a pizza r

Here are some relevant reviews: {reviews}

Here is the question to answer: {question}
"""
prompt = ChatPromptTemplate.from_template(template)
chain = prompt | model

while True:
    print("\n\n-------------------------------")
    question = input("Ask your question (q to quit): ")
    print("\n\n")
    if question == "q":
        break

    reviews = retriever.invoke(question)
    result = chain.invoke({"reviews": reviews, "question
    print(result)
```

```python
from langchain_ollama import OllamaEmbeddings
from langchain_core.documents import Document
from langchain_chroma import Chroma
import os
import pandas as pd

df = pd.read_csv("restaurant_reviews.csv")
embeddings = OllamaEmbeddings(model="mxbai-embed-large")
db_location = "./chrome_langchain_db"
add_documents = not os.path.exists(db_location)
if add_documents:
    documents = []
    ids = []
    for i, row in df.iterrows():
        document = Document(
            page_content=row["Title"] + " " + row["Revie
            metadata={"rating": row["Rating"], "date": r
            id=str(i)
        )
        ids.append(str(i))
        documents.append(document)
vector_store = Chroma(
    collection_name="restaurant_reviews",
    persist_directory=db_location,
    embedding_function=embeddings
)
if add_documents:
    vector_store.add_documents(documents=documents, ids=

retriever = vector_store.as_retriever(
    search_kwargs={"k": 1}
)
```

Output


```
PS C:\Users\anbu0\Desktop\AI Agent-2> & "C:/Users/anbu0/Desktop/AI Agent-2/venv/Scripts/python.exe" "c:/Users/anbu0/Desktop/AI Agent-2/main.py
"


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Ask your question (q to quit): how is the quality of the pizza


At our pizzeria, we're extremely proud of the high-quality pizzas that we serve. Our dough is made fresh daily using a secret recipe that has
been perfected over years of tradition and innovation.

Our sauce is made from crushed San Marzano tomatoes, which are sweeter and less acidic than regular tomatoes, resulting in a rich and tangy fl
avor. We also use a blend of mozzarella and parmesan cheese to create the perfect balance of creaminess and sharpness.

We offer a variety of toppings to suit every taste, from classic pepperoni and mushrooms to more adventurous options like prosciutto and arugu
la. Our pizza makers take great care in crafting each pie to ensure that it's cooked to perfection in our brick oven, giving it a crispy crust
 and a smoky flavor.

In terms of customer feedback, we've received consistently high ratings on quality from our customers. We're proud to say that many of our reg
ulars have been coming back for years because they know they can always count on us for delicious and authentic Italian-style pizzas.

To give you a better idea, I'd be happy to highlight some specific praises from our reviews:

* "Hands down the best pizza in town! The crust is perfectly crispy and the sauce is tangy without being too sweet." - Emily W.
* "I've tried pizzas all over the city, but none compare to this place. The quality of the ingredients and the care that goes into making each pie is evident in every
  bite." - Mark K.
* "We came here on a Friday night and were blown away by the flavors and the service. It's clear that the staff takes pride in what they do!" - Rachel G.

Overall, we're confident that you'll love our pizzas just as much as our customers have come to adore them!


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Ask your question (q to quit): q


PS C:\Users\anbu0\Desktop\AI Agent-2>
```