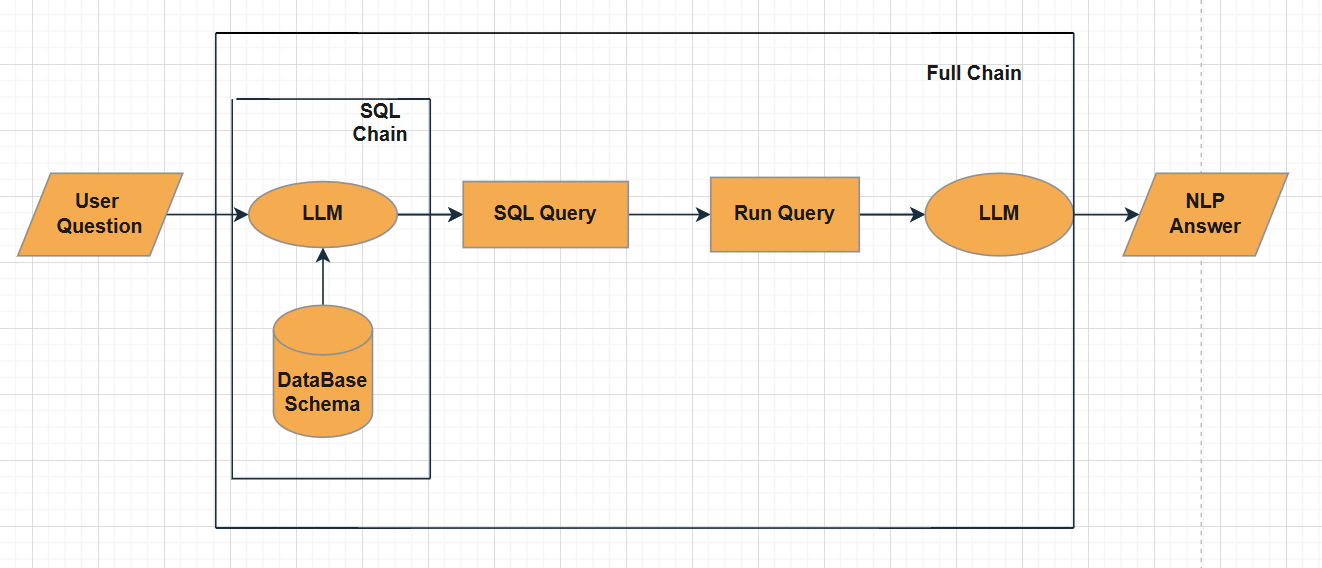
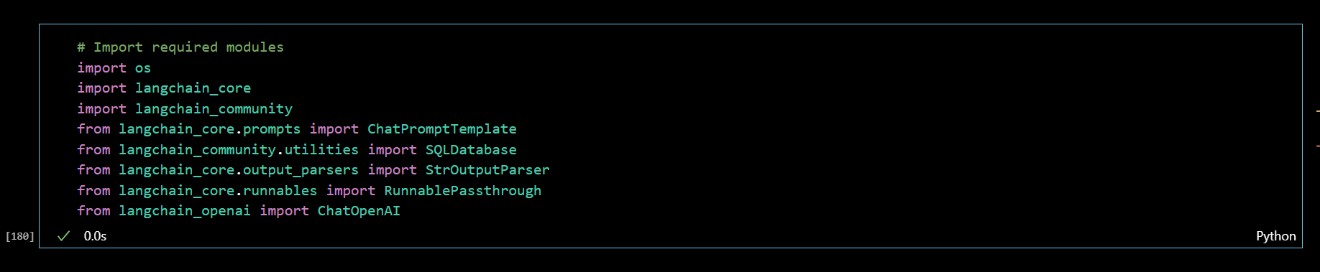
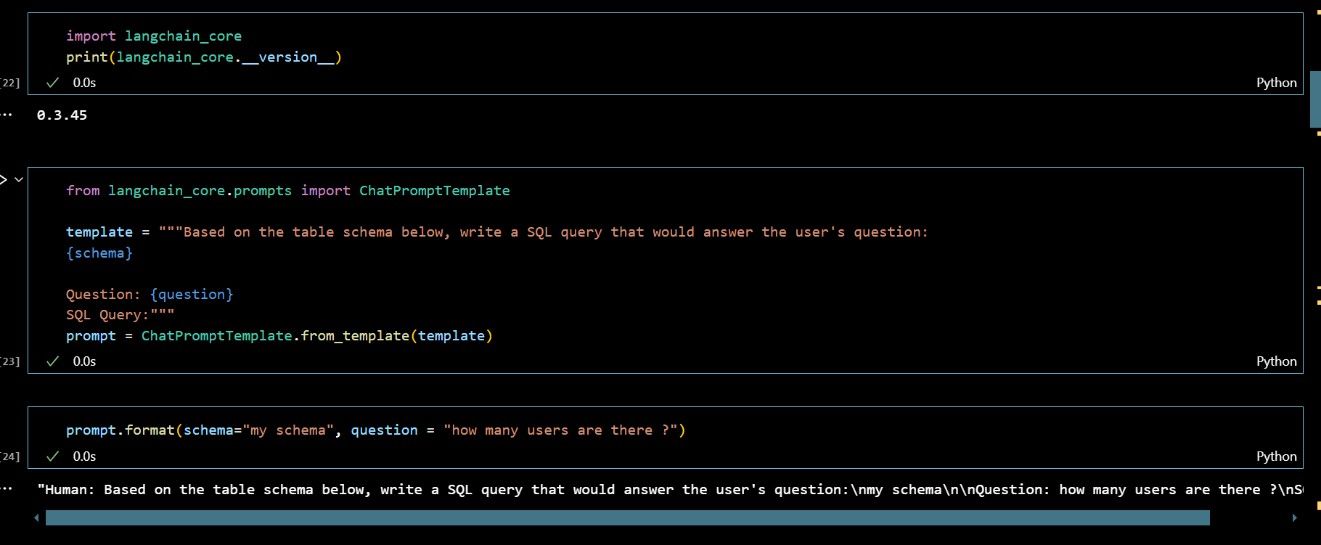
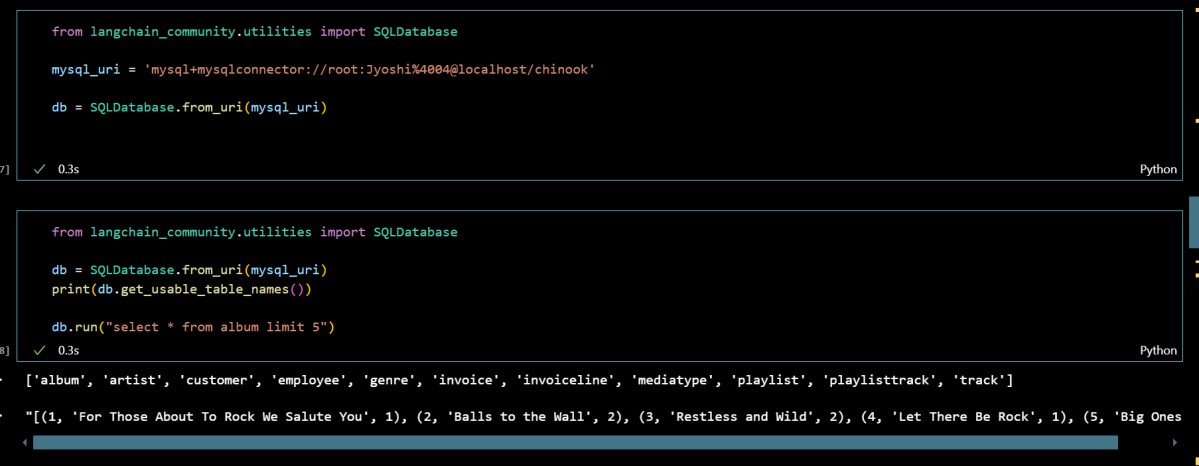
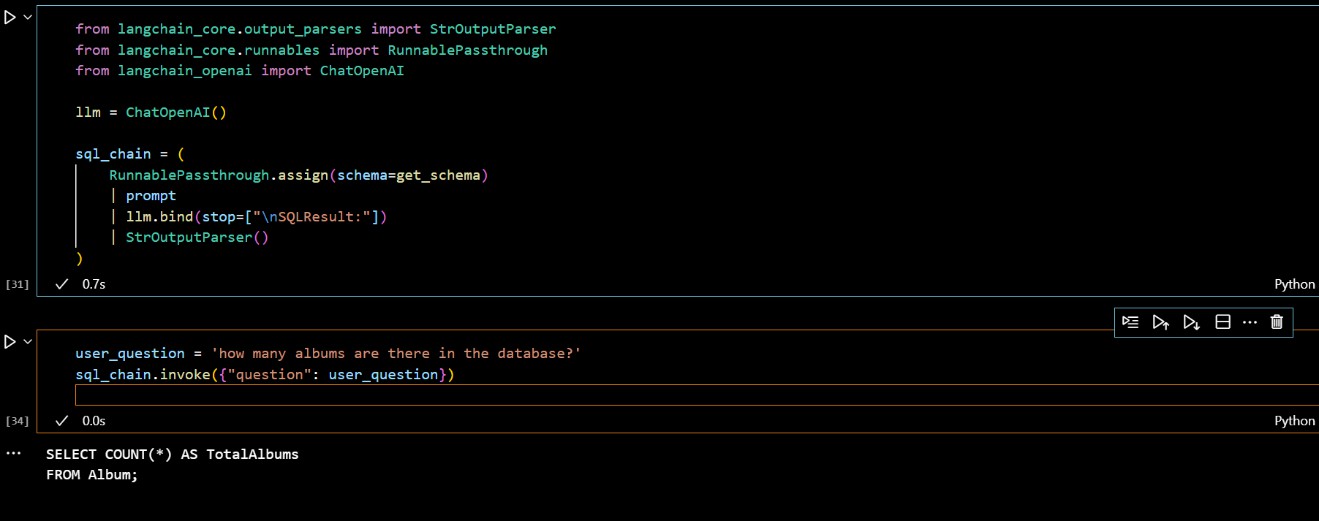
### System Architecture

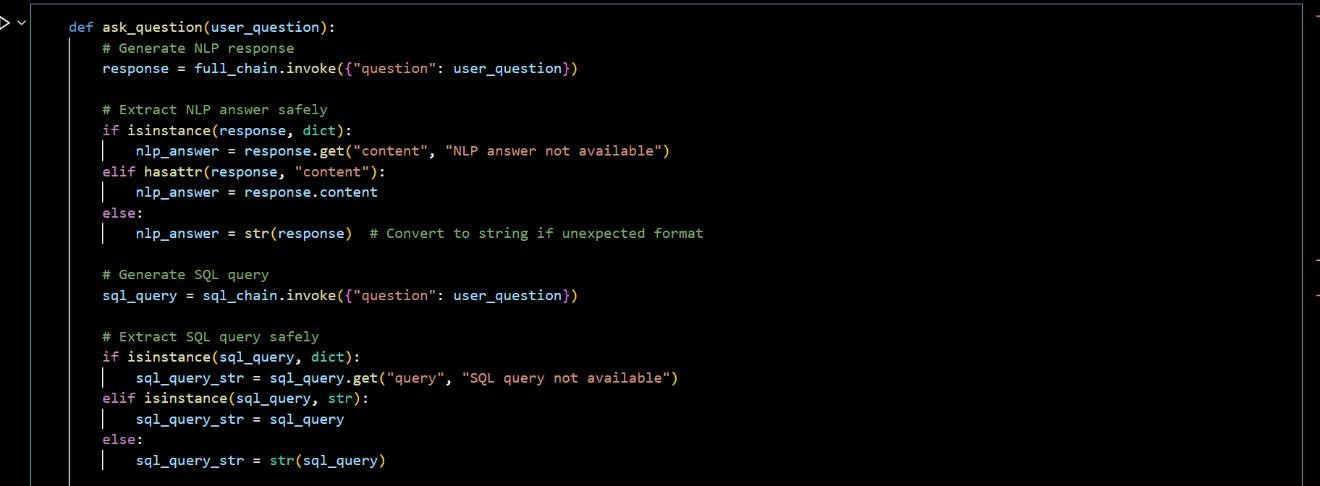
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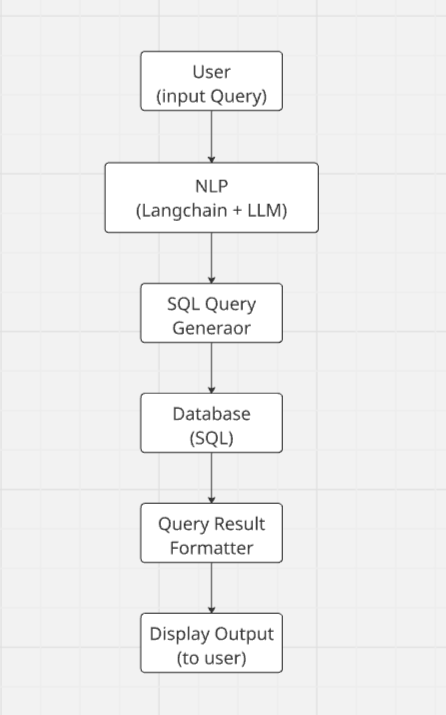
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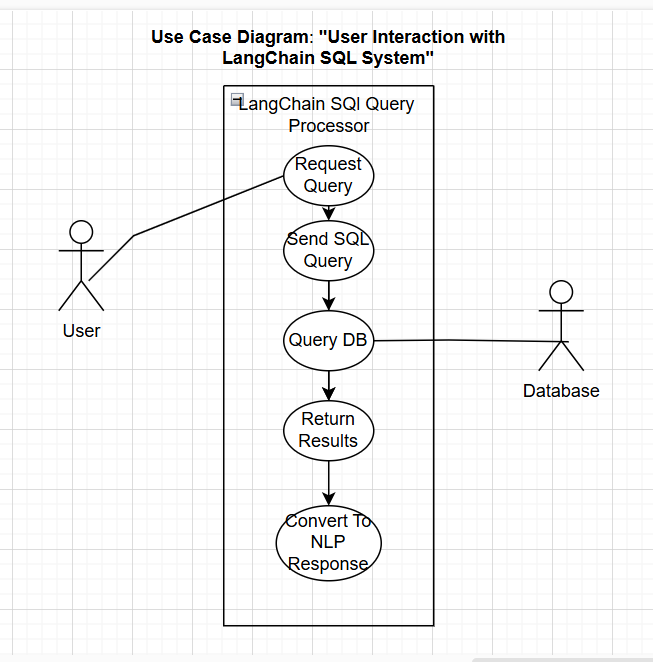




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### UML Diagrams

**Use Case Diagram**

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### Class Diagram

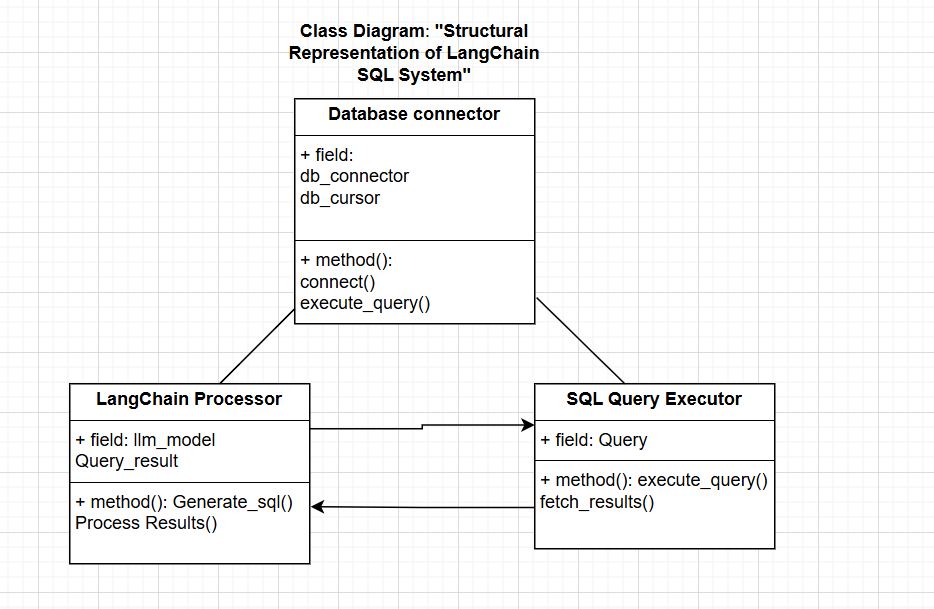
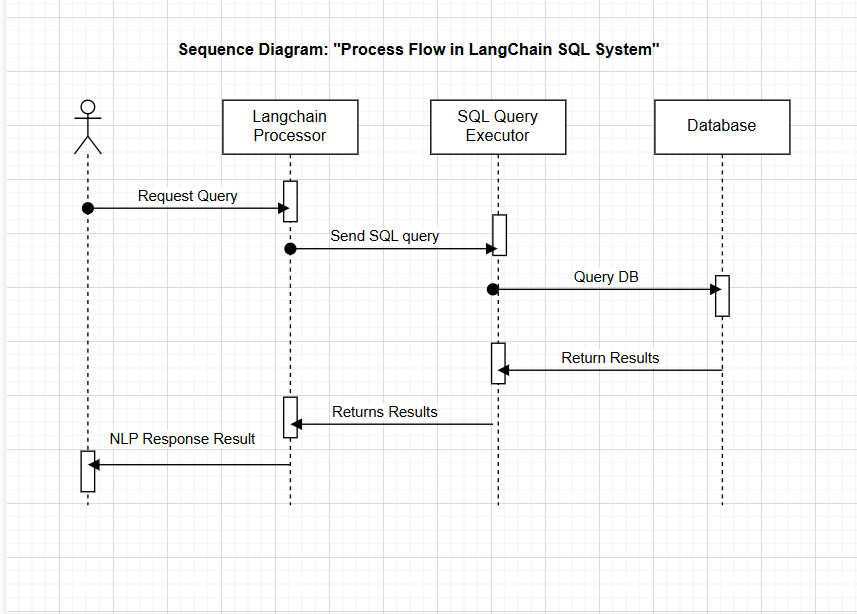
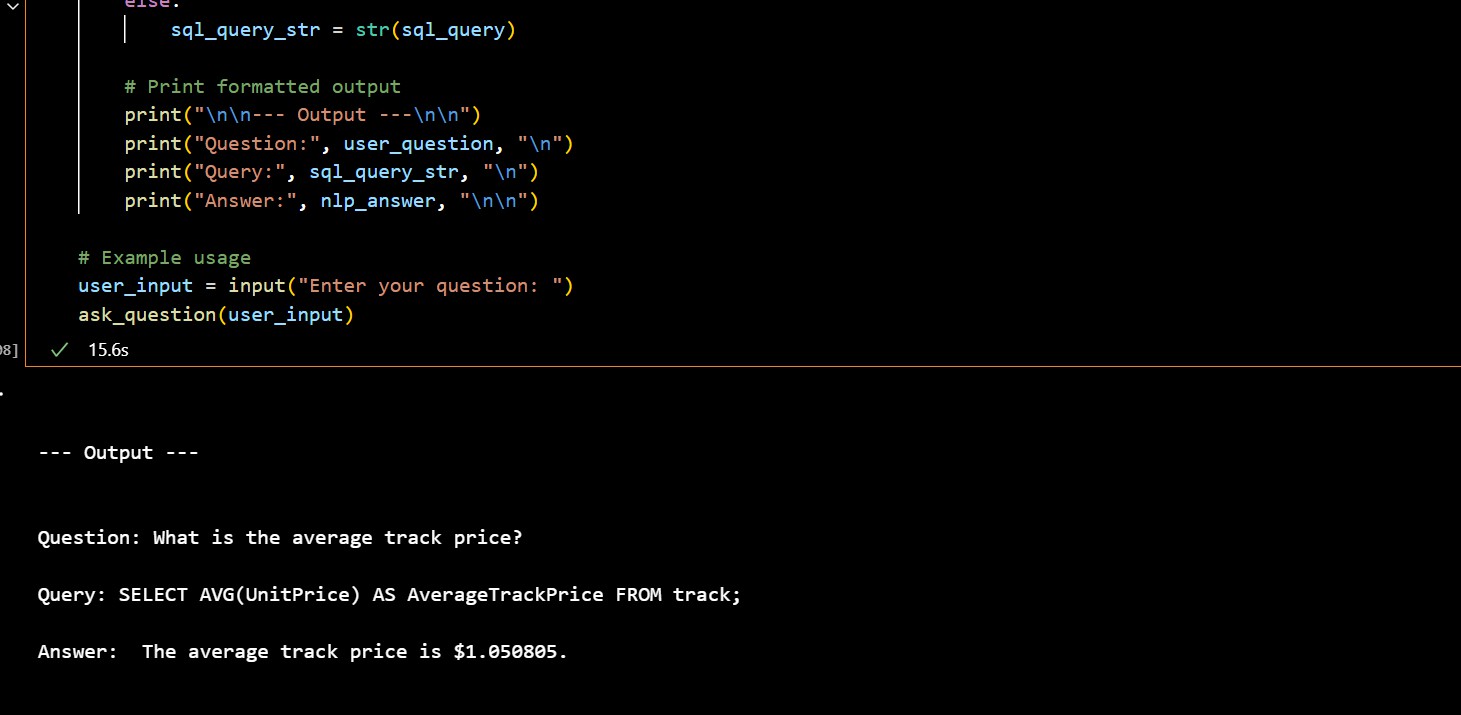
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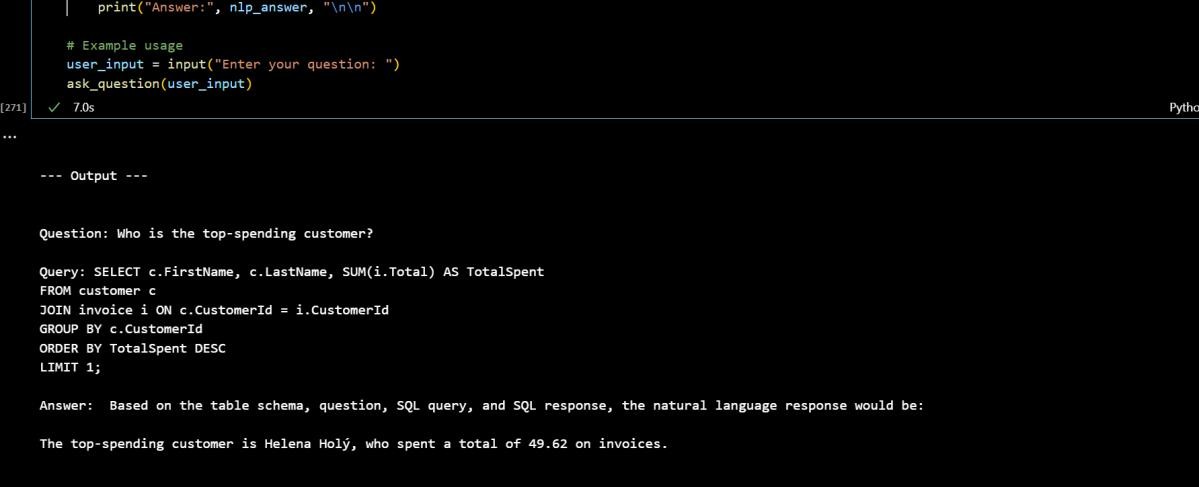
Fig 5.4.2 Class Diagram

### Sequence Diagram

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TESTING





APENDIX – Source Code

# === Conversational Database Assistant === # File: conversational\_db\_assistant.py

import os

from langchain.chat\_models import ChatOpenAI from langchain.chains import SQLDatabaseChain from langchain.sql\_database import SQLDatabase import mysql.connector

# Step 1: Set your OpenAI API Key

# Either use environment variables or replace the key directly below os.environ["OPENAI\_API\_KEY"] = "your\_openai\_api\_key\_here"

# Step 2: Connect to your MySQL database def get\_database\_connection():

# Replace these credentials with your actual DB info

db\_uri = "mysql+mysqlconnector://root:yourpassword@localhost/your\_database\_name"

return SQLDatabase.from\_uri(db\_uri)

# Step 3: Initialize the LangChain with SQL database def initialize\_langchain\_chain():

llm = ChatOpenAI(temperature=0, model="gpt-3.5-turbo") db = get\_database\_connection()

db\_chain = SQLDatabaseChain.from\_llm(llm=llm, db=db, verbose=True) return db\_chain

# Step 4: Run the chatbot interaction def start\_conversational\_interface():

print("Welcome to Conversational Database Assistant!")

print("You can ask anything like: 'List all customers from Chennai'") print("Type 'exit' to stop.\n")

db\_chain = initialize\_langchain\_chain()

while True:

user\_query = input(“ You: ")

if user\_query.lower() in ["exit", "quit"]: print(" Exiting... Have a nice day!") break

try:

response = db\_chain.run(user\_query) print("\nAssistant:\n", response)

except Exception as e: print("Error occurred:", str(e))

# Main Execution

if name == " main ": start\_conversational\_interface()