AI Assistant for Lease Management

Overview

This project implements an AI-powered assistant leveraging OpenAI's GPT and other integrations to provide intelligent querying capabilities for lease management. It uses **Streamlit** as the frontend interface and integrates with **Pinecone Vector Database**, **Cohere Embeddings**, and **Google Generative AI** to deliver precise and efficient responses to user queries.

Design

Architecture

The system employs a modular architecture comprising:

1. **Frontend**:
    - Built using **Streamlit** for an interactive, user-friendly chat interface.
    - Allows users to input questions and view responses in real-time.
2. **AI Query System**:
    - **OpenAI GPT Integration**: Processes natural language queries.
    - **Conversational Retrieval Chain**: Combines LLM output with vector-based retrieval for contextually accurate answers.
    - **Cohere Embeddings**: Ensures effective data representation in vector space.
3. **Database Integration**:
    - **Pinecone Vector Store**: Stores and retrieves domain-specific knowledge efficiently.
    - Configured for high-performance similarity search with embeddings.
4. **Backend Logic**:
    - Chat history management to maintain context across multiple queries.
    - Customizable prompts for consistent, structured responses.

Workflow

1. User inputs a query through the Streamlit interface.
2. The query and chat history are processed by the **Conversational Retrieval Chain**.
3. Relevant information is fetched from the **Pinecone Vector Database**.
4. The GPT model processes the query and retrieves documents to provide a structured response.
5. Results are displayed on the Streamlit app.

Key Features

- Natural language query support.
- Persistent chat history for maintaining context.
- Integration with Cohere and Pinecone for optimized data retrieval.

Deliverables

1. **Interactive AI Assistant**:
    - A Streamlit-based interface for querying the lease database.
2. **Query Features**:
    - "How much rent will be paid in March 2025?"
    - "What is the average monthly rent for leases active in 2025?"
    - "Which leases overlap in a given period?"
3. **AI-Powered Functionality**:
    - Context-aware responses.
    - Domain-specific knowledge retrieval.
4. **Scalability**:
    - Pinecone-based vector storage ensures smooth handling of large datasets.
    - Chat history limited to optimize model performance.

Instructions to Run the Project

1. **Install Dependencies**:
   pip install streamlit langchain langchain-pinecone langchain-google-genai cohere
2. **Set API Keys**:
    - Add the following environment variables:
        - `COHERE_API_KEY`
        - `PINECONE_API_KEY`
        - `GOOGLE_API_KEY`
3. **Run the Application**:
   streamlit run lease_assistant.py
4. **Use the Assistant**:
    - Navigate to the displayed local URL.
    - Input queries in the chat interface.

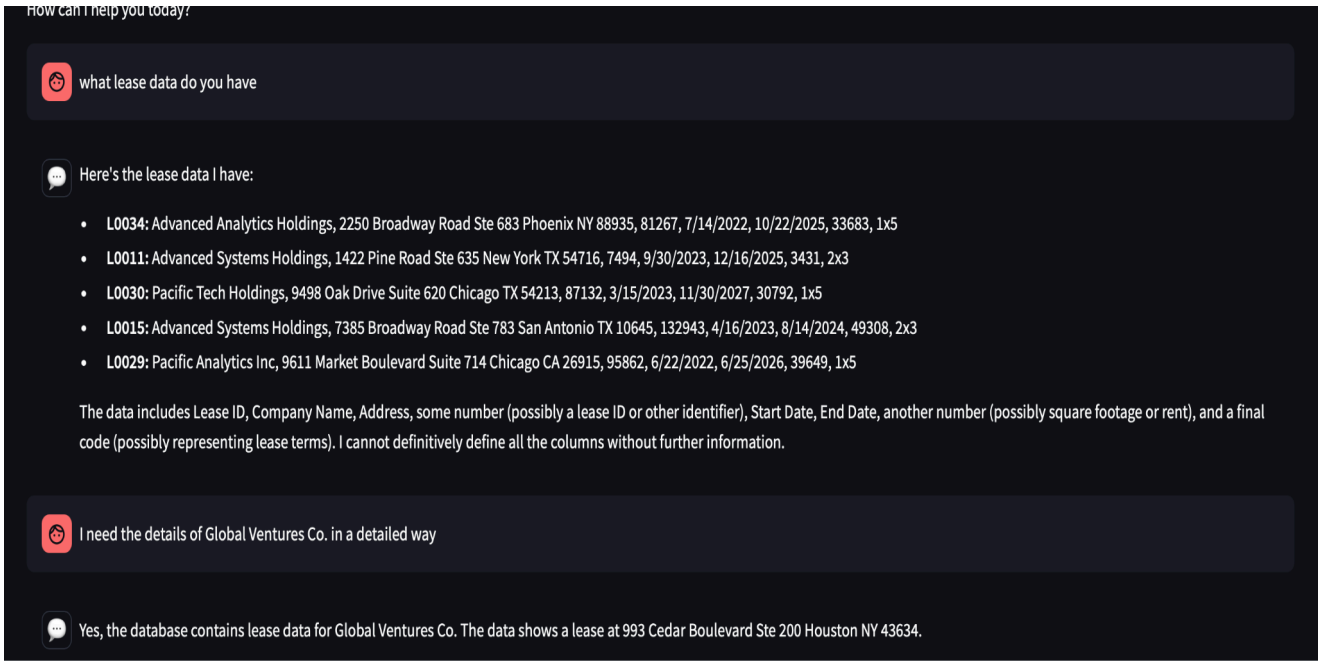
Approach and Solution

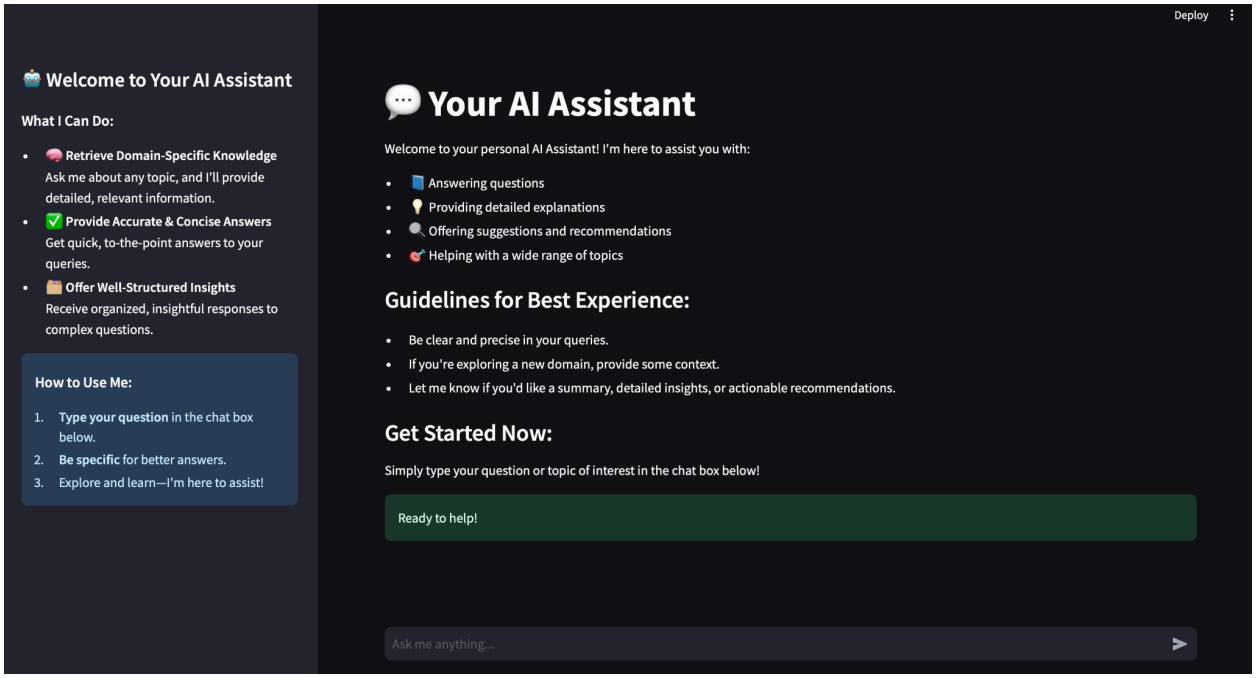
Approach

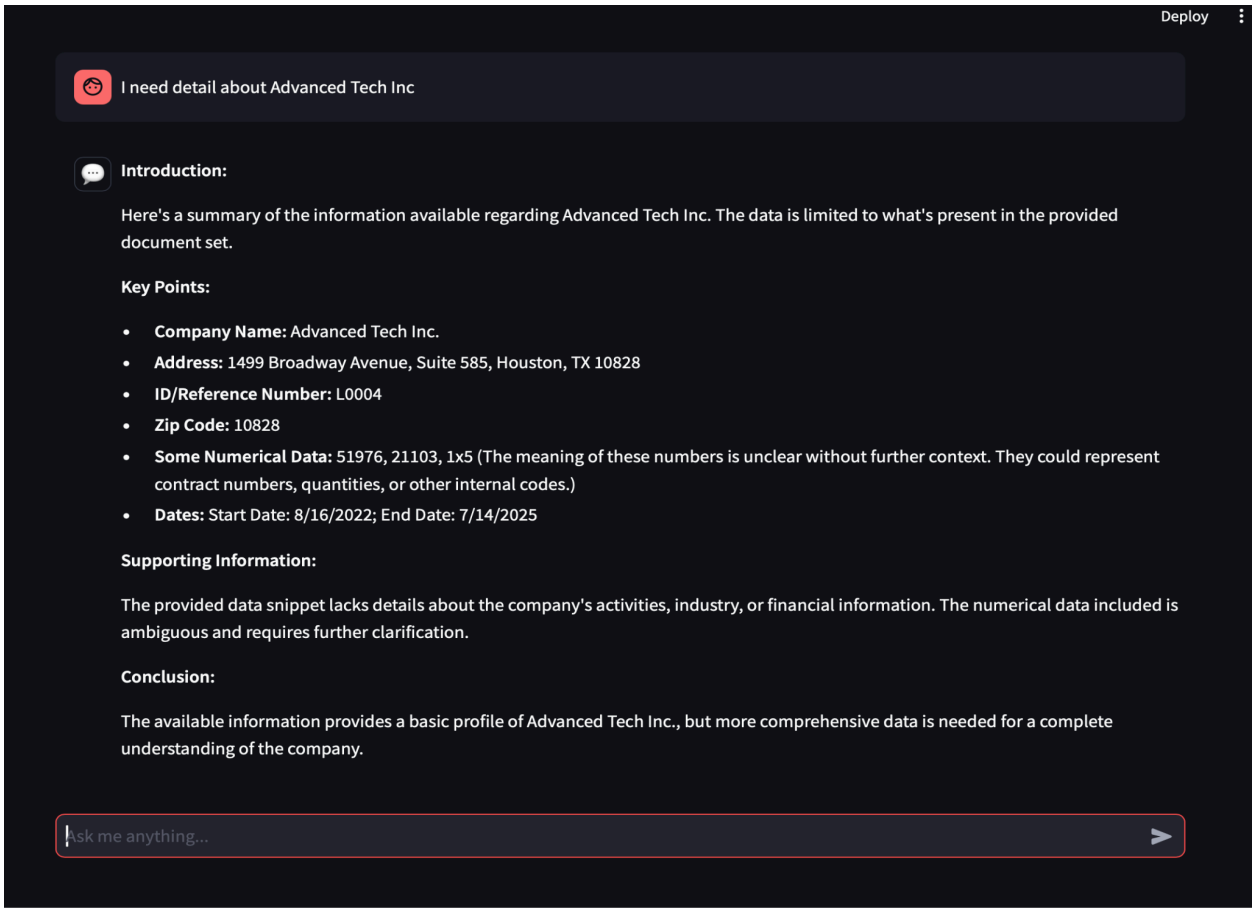
- **Natural Language Processing**: Utilizing GPT for interpreting user queries and generating structured, coherent responses.
- **Vector Database**: Leveraging Pinecone to store and retrieve domain-specific knowledge efficiently.
- **Embeddings**: Cohere embeddings ensure accurate semantic understanding of stored knowledge.
- **Scalability**: Designed to scale seamlessly by limiting chat history size and leveraging cloud-based vector storage.

Solution

- Users can query the lease database using natural language, enabling non-technical stakeholders to access insights effortlessly.
- The system ensures consistent responses by integrating custom prompts with the LLM.
- Reports such as rent collected in a specific period or overlapping leases are generated dynamically based on user input.




Deploy
Welcome to Your AI Assistant
What I Can Do:
Retrieve Domain-Specific Knowledge
Ask me about any topic, and I'll provide detailed, relevant information.
Provide Accurate & Concise Answers
Get quick, to-the-point answers to your queries.
Offer Well-Structured Insights
Receive organized, insightful responses to complex questions.
How to Use Me:
1. Type your question in the chat box below.
2. Be specific for better answers.
3. Explore and learn—I'm here to assist!
Your AI Assistant
Welcome to your personal AI Assistant! I'm here to assist you with:
Answering questions
Providing detailed explanations
Offering suggestions and recommendations
Helping with a wide range of topics
Guidelines for Best Experience:
Be clear and precise in your queries.
If you're exploring a new domain, provide some context.
Let me know if you'd like a summary, detailed insights, or actionable recommendations.
Get Started Now:
Simply type your question or topic of interest in the chat box below!
Ready to help!
Ask me anything...


Deploy
I need detail about Advanced Tech Inc
Introduction:
Here's a summary of the information available regarding Advanced Tech Inc. The data is limited to what's present in the provided document set.
Key Points:
Company Name: Advanced Tech Inc.
Address: 1499 Broadway Avenue, Suite 585, Houston, TX 10828
ID/Reference Number: L0004
Zip Code: 10828
Some Numerical Data: 51976, 21103, 1x5 (The meaning of these numbers is unclear without further context. They could represent contract numbers, quantities, or other internal codes.)
Dates: Start Date: 8/16/2022; End Date: 7/14/2025
Supporting Information:
The provided data snippet lacks details about the company's activities, industry, or financial information. The numerical data included is ambiguous and requires further clarification.
Conclusion:
The available information provides a basic profile of Advanced Tech Inc., but more comprehensive data is needed for a complete understanding of the company.
Ask me anything...

Future Enhancements

- **Analytics Dashboard**: Provide visual insights into lease data.
- **Dynamic Database Updates**: Enable real-time updates to the lease data without restarting the application.
- **Support for Multiple Languages**: Expand NLP capabilities to other languages for broader accessibility.