



Library ChatBot

(https://github.com/AMRedichkina/Chat_bot)

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and developer AI-based FileBrain.Pro*

RAG (Retrieval-Augmented Generation) App

- Searching for books and information about books
- Searching for books and information **solely within the library catalog.**
- Searching for books based on **their content.**
- Taking into account the **context of the conversation.**

Library ChatBot



Hi, I'm the Library Chatbot! How can I help you?



Do you have any science fiction books that explore space colonization?



In the realm of science fiction, we have some fascinating explorations of space colonization. One notable title is "**Red Mars**" by Kim Stanley Robinson. This novel follows a group of scientists and astronauts as they embark on a mission to colonize and terraform Mars. As they work to establish a new society, they confront various challenges, including political ideologies and environmental ethics. The narrative intricately weaves themes of human ambition and the complexities of establishing life on another planet.

Another remarkable work is "**2312**," also by Kim Stanley Robinson, which is set in the 24th century where humanity has successfully colonized much of the solar system. The story revolves

Ask me to find your next book...



TECH STACK

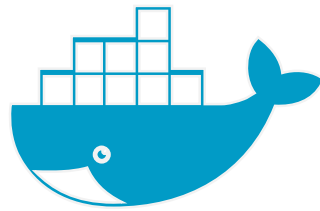


Streamlit



OpenAI

neo4j



docker



LangChain

Overview

Language-specific guides

Use-case guides

Overview

Machine learning & AI

PDF analysis and chat

Video transcription and chat

Face detection with TensorFlow.js

Natural language processing

Data science with JupyterLab

Suppress CVEs with VEX

Use containerized databases

Build with Docker

Deployment and orchestration


[Guides](#) / [Use-case guides](#) / [Machine learning & AI](#) / [PDF analysis and chat](#) / Containerize your app

Containerize a generative AI application

Prerequisites



Note

GenAI applications can often benefit from GPU acceleration. Currently Docker Desktop supports GPU acceleration only on [Windows with the WSL2 backend](#). Linux users can also access GPU acceleration using a native installation of the [Docker Engine](#).

- You have installed the latest version of [Docker Desktop](#) or, if you are a Linux user and are planning to use GPU acceleration, [Docker Engine](#). Docker adds new features regularly and some parts of this guide may work only with the latest version of Docker Desktop.
- You have a [git client](#) . The examples in this section use a command-line based git client, but you can use any client.

Data Set

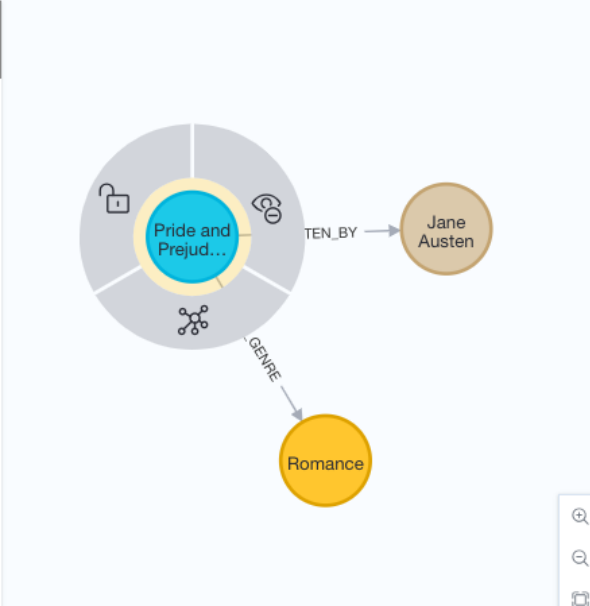
△ Title ≡	△ Author ≡	△ Genre ≡	△ Summary ≡	△ Reviews ≡	# Ratings ≡
252 unique values	Thakazhi Sivasank... 3% Vaikom Muhamma... 3% Other (238) 94%	Fiction 30% Fantasy 6% Other (162) 64%	250 unique values	[] 4% A masterpiece of L... 1% Other (241) 96%	 2.7 4.9
Harry Potter and the Sorcerer's Stone	J.K. Rowling	Fantasy	Rescued from the outrageous neglect of his aunt and uncle, a young boy with a great destiny proves h...	Fantastic read! Couldn't put it down!	4.8

# Publication Year ≡	# Number of Pages ≡	△ Language ≡	△ ISBN ≡
 -150 2024	 32 3342	English 57% Malayalam 21% Other (56) 22%	9.79E+12 29% 9.78E+12 16% Other (139) 55%
1997	320	English	978-0-7475-3269-6

<https://www.kaggle.com/datasets/shijo96john/books-dataset>

Database Neo4j

```
1 MATCH (n)-[r]→(m)
2 RETURN n, r, m LIMIT 10
```

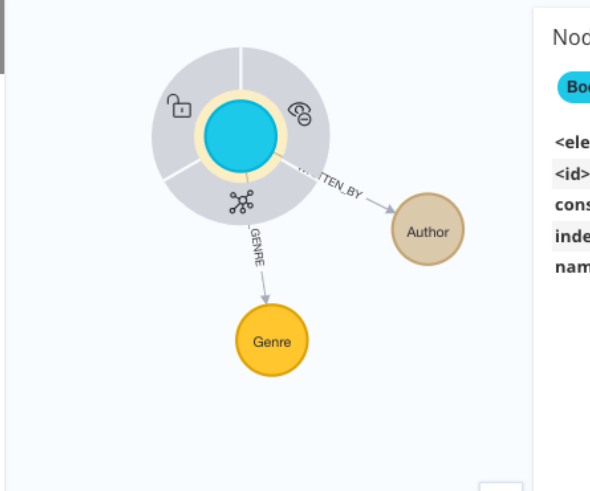


The graph visualization shows a central node labeled "Pride and Prejud..." (Pride and Prejudice) connected to two other nodes: "Jane Austen" (author) and "Romance" (genre). The relationships are labeled "TEN_BY" and "GENRE" respectively. The interface includes a sidebar with icons for Graph, Table, Text, and Code.

Node properties

Book	
<elementId>	4:38db045c-8a79-4b60-b328-fcdd1cfc958b:10
<id>	10
language	English
plotEmbeddingSummary	[0.013920973986387253,0.01520504616200924,0.01784452795982361,0.004843296483159065,-0.004649666137993336,0.03895018994808197,-0.019729871302843094,-0.0...
publication_year	1813
rating	4.4
summary	The story follows the tumultuous relationship between Elizabeth Bennet, the daughter of a country gentleman, and Mr. Darcy, a wealthy and aloof aristo... Show all
title	Pride and Prejudice

```
neo4j$ CALL db.schema.visualization()
```

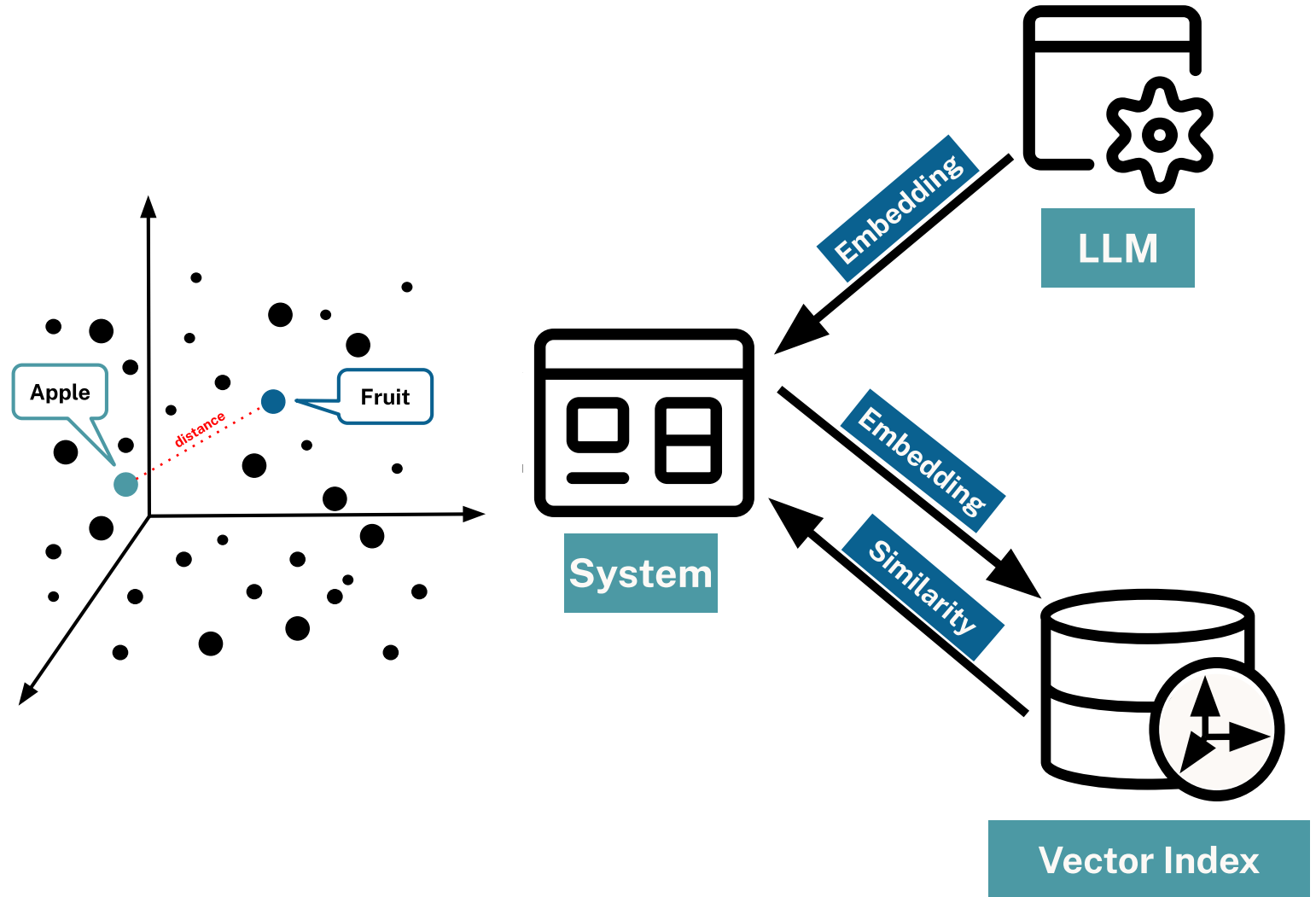


The schema visualization shows a central node labeled "Book" connected to two other nodes: "Author" and "Genre". The relationships are labeled "TEN_BY" and "GENRE" respectively. The interface includes a sidebar with icons for Graph, Table, Text, and Code.

Node properties

Book	
<elementId>	-100
<id>	-100
constraints	[]
indexes	[plotEmbeddingSummary]
name	Book

Data to Database (Embeddings)



- *Use a consistent embedding model across all applications.*
- *Indexing allows pre-calculating relationships between embeddings for faster retrieval of similar vectors.*

Streamlit

```
st.chat_message(role,  
avatar=avatar)
```

```
st.chat_input("Ask me to find your  
next book...")
```

```
st.session_state.messages.append({"  
role": role, "content": content})
```

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"Runnable" protocol + history management



LangChain

```
def get_memory(session_id):  
    """return Neo4jChatMessageHistory(session_id=session_id, graph=graph)"""
```

```
chat_agent = RunnableWithMessageHistory(  
    """agent_executor,  
    """get_memory,  
    """input_messages_key="input",  
    """history_messages_key="chat_history",  
)
```

Executor

```
agent_executor = AgentExecutor(  
    """agent=agent,  
    """tools=tools,  
    """verbose=True  
    """
```

Agent

- Identity (prompt)
- Knowledge (LLM)
- Capabilities (tools)

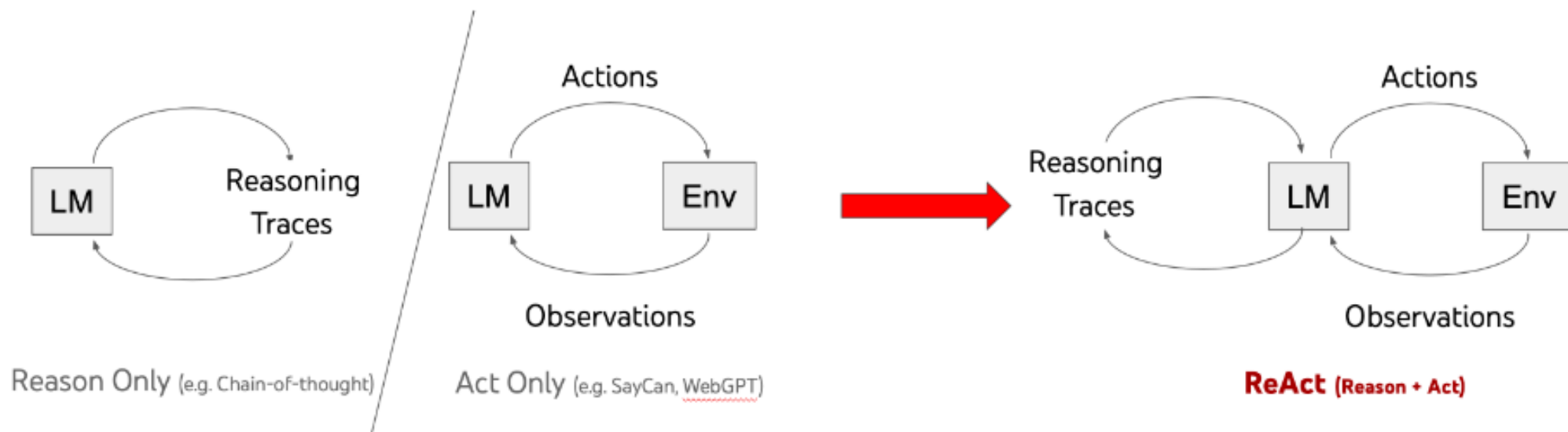


```
agent = create_react_agent(llm, tools, agent_prompt)
```

ReAct: Synergizing Reasoning and Acting in Language Models

Shunyu Yao, Jeffrey Zhao, Dian Yu, Nan Du, Izhak Shafran, Karthik Narasimhan, Yuan Cao

[\[Paper\]](#) [\[Code\]](#) [\[Blogpost\]](#) [\[BibTex\]](#)



Language models are getting better at reasoning (e.g. chain-of-thought prompting) and acting (e.g. WebGPT, SayCan, ACT-1), but these two directions have remained separate.

ReAct asks, what if these two fundamental capabilities are combined?

<https://react-lm.github.io/>

AgentAction

This is a dataclass that represents the action an agent should take. It has a `tool` property (which is the name of the tool that should be invoked) and a `tool_input` property (the input to that tool)

AgentFinish

This represents the final result from an agent, when it is ready to return to the user. It contains a `return_values` key-value mapping, which contains the final agent output. Usually, this contains an `output` key containing a string that is the agent's response.

Intermediate Steps

These represent previous agent actions and corresponding outputs from this CURRENT agent run. These are important to pass to future iteration so the agent knows what work it has already done. This is typed as a `List[Tuple[AgentAction, Any]]`. Note that observation is currently left as type `Any` to be maximally flexible. In practice, this is often a string.

```
tools = [  
    Tool.from_function(  
        name="General Chat",  
        description="For general books chat not covered by other tools",  
        func=book_chat.invoke,  
    ),  
    Tool.from_function(  
        name="Books Plot Search",  
        description="For when you need to find information about books based on a plot or find the book if it's  
            not covered by other tools",  
        func=get_book_plot,  
    ),  
    Tool.from_function(  
        name="Book information",  
        description="Search for books based on author, genre, rating, year, recommend the book (you have to find  
            one random book) or provide detailed book information using Cypher queries",  
        func=cypher_qa,  
    )  
]
```

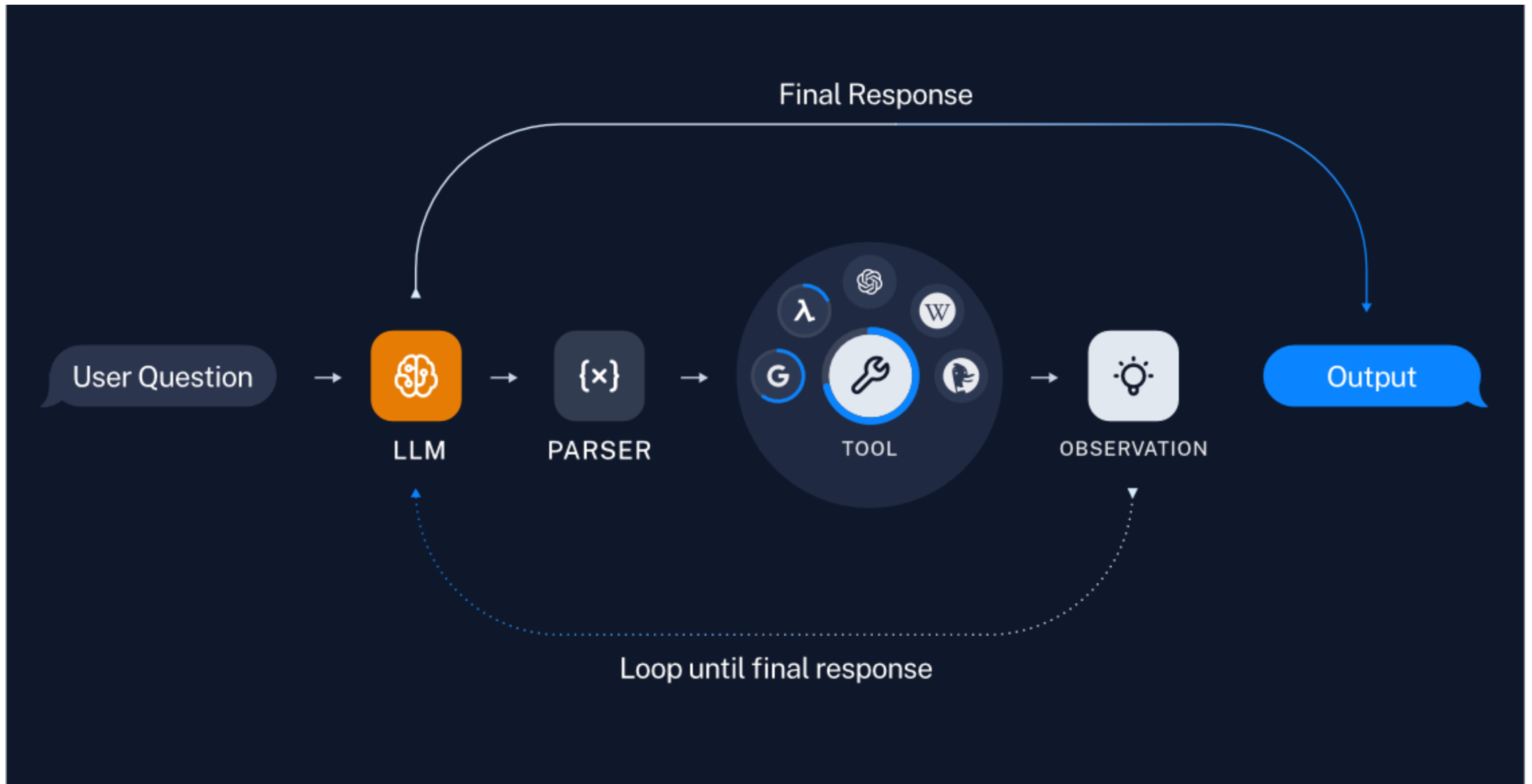
```

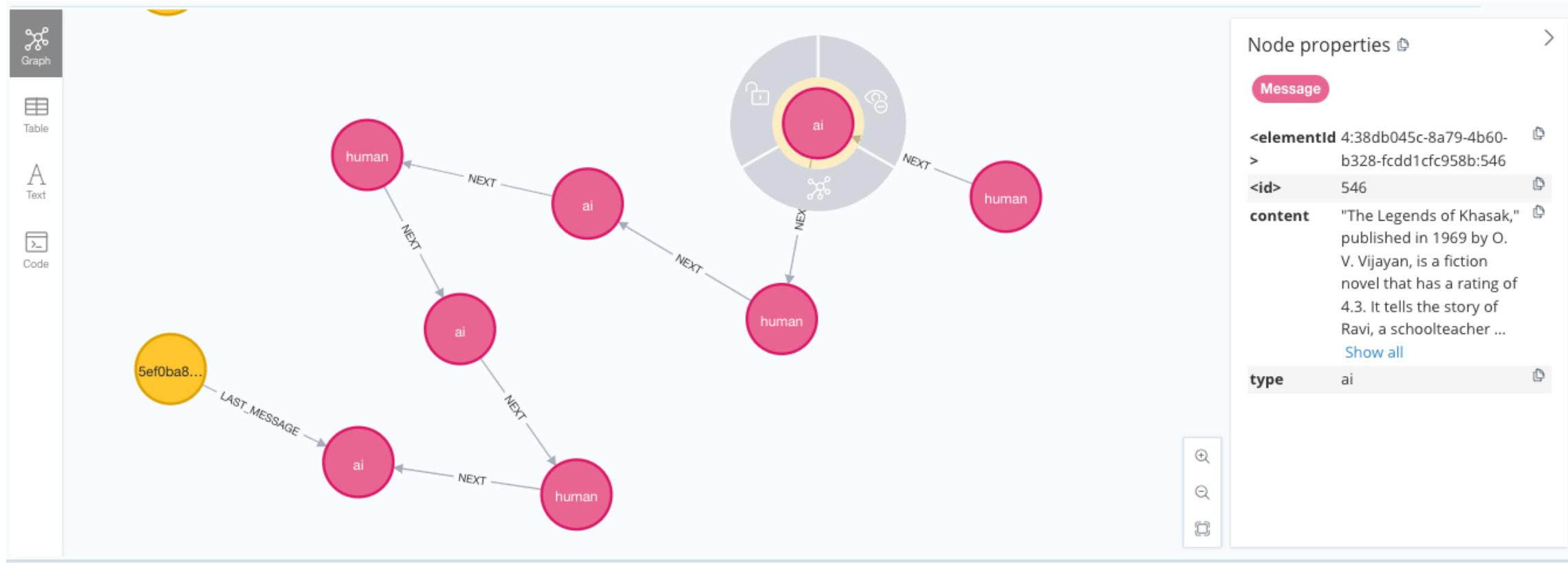
chat-1
chat-1
chat-1      > Entering new AgentExecutor chain...
chat-1      ```
chat-1      | Thought: Do I need to use a tool? Yes
chat-1      | Action: Books Plot Search
chat-1      | Action Input: "prince"
chat-1      | ```
chat-1
chat-1      > Entering new AgentExecutor chain...
chat-1      ```
chat-1      | Thought: Do I need to use a tool? Yes
chat-1      | Action: Books Plot Search
chat-1      | Action Input: "prince"
chat-1      | ```
chat-1      | {'input': 'prince\n```\n', 'context': [Document(metadata={'author': ['Antoine de Saint-Exupéry'], 'book_title': 'The Little Prince'}, page_content='A philosophical tale narrated by a young prince who travels to different planets, encountering various characters.'), Document(metadata={'author': ['Antoine de Saint-Exupéry'], 'book_title': 'Le Petit Prince (The Little Prince)'}, page_content='A classic French novella that tells the story of a young prince who travels to different planets and learns about life, love, and friendship.'), Document(metadata={'author': ['Kathleen E. Woodiwiss'], 'book_title': 'The Elusive Flame'}, page_content='"The Elusive Flame' is a passionate historical romance set in medieval England. The story follows Brandon Birmingham, a dashing knight known for his prowess on the battlefield, and Regina Ashton, a spirited young woman with a troubled past. Despite their initial animosity, Brandon and Regina are drawn to each other, but dark secrets and political intrigue threaten to tear them apart."), Document(metadata={'author': ['R.K. Narayan'], 'book_title': 'The Guide'}, page_content='The story of Raju, a tour guide who becomes a spiritual guru, exploring themes of identity, morality, and destiny.')]}, 'answer': 'It seems you are referring to the young prince from the philosophical tale who travels to different planets. This character explores important themes such as life, love, and friendship through his encounters with various characters. If you have a specific question about the prince or the story, feel free to ask!'}
chat-1      | }No
chat-1      | Final Answer: It seems you are referring to the young prince from the philosophical tale "The Little Prince" by Antoine de Saint-Exupéry. This enchanting narrative follows a young prince who travels to different planets, encountering various characters along the way. Through these encounters, he explores profound themes of life, love, and friendship. If you have a specific question about the prince or the story, feel free to ask!
chat-1
chat-1      > Finished chain.

```

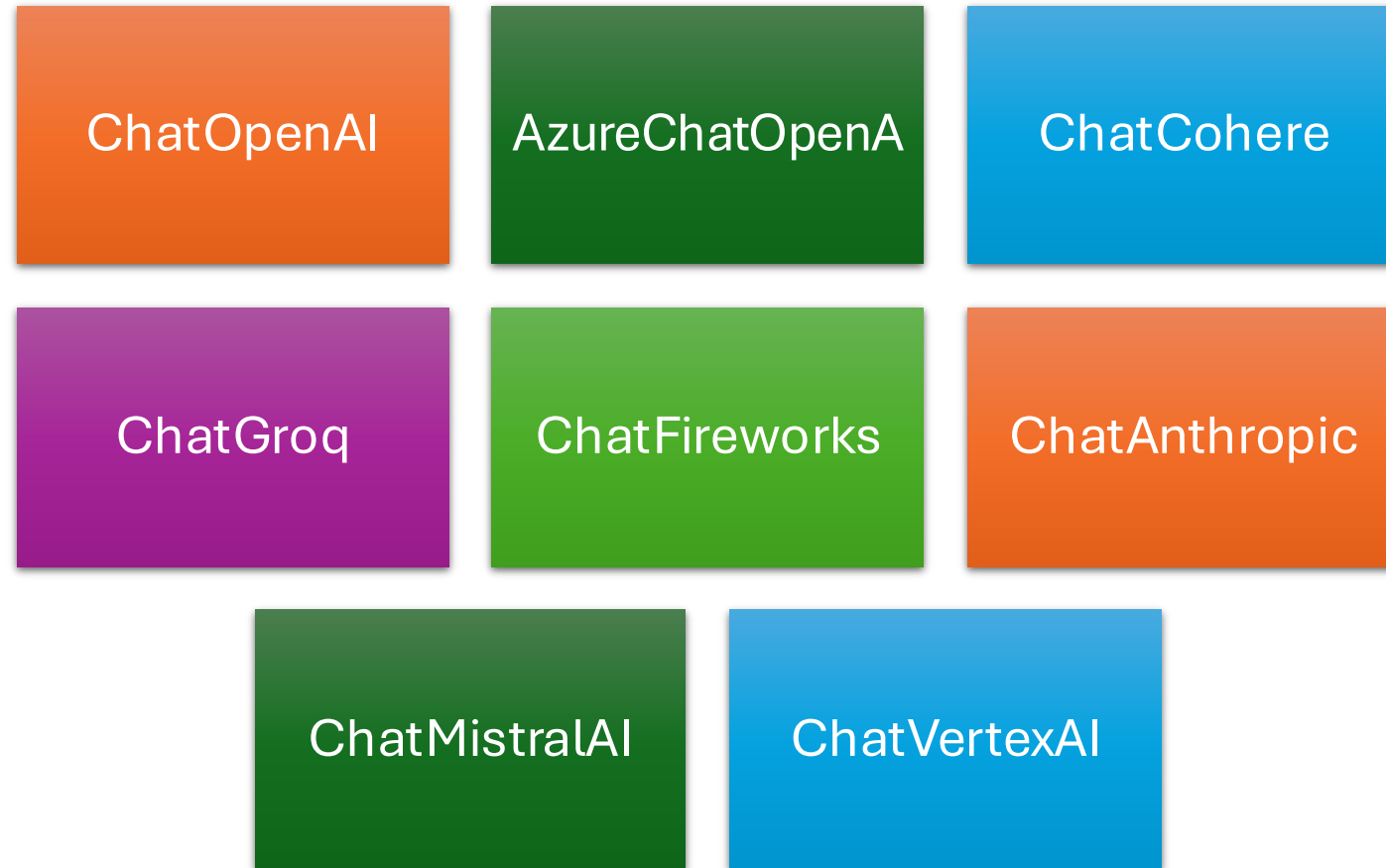


```
chat-1      | ...
chat-1      | Thought: Do I need to use a tool? Yes
chat-1      | Action: Books Plot Search
chat-1      | Action Input: "3 Body Problem"{'input': '3 Body Problem', 'context': [Document(metadata={'author': ['John Grisham'], 'book_title': 'The Brethren'}, page_content="'The Brethren' is a legal thriller that follows the story of three disgraced judges serving time in a federal prison. Using their legal expertise, the judges orchestrate a lucrative extortion scheme targeting wealthy men with dark secrets. However, their operation attracts the attention of powerful forces, leading to deadly consequences. As the stakes escalate, the judges must navigate a treacherous game of deception and betrayal to survive."), Document(metadata={'author': ['Fyodor Dostoevsky'], 'book_title': 'The Brothers Karamazov'}, page_content='The story of the Karamazov brothers and their father, exploring themes of faith, morality, and free will.'), Document(metadata={'author': ['Antoine de Saint-Exupéry'], 'book_title': 'The Little Prince'}, page_content='A philosophical tale narrated by a young prince who travels to different planets, encountering various characters.'), Document(metadata={'author': ['Vikram Seth'], 'book_title': 'A Suitable Boy'}, page_content='A panoramic tale set in post-independence India, following the lives of four families as they navigate love, marriage, and politics.')]}, 'answer': 'The "3 Body Problem" is a science fiction novel by Chinese author Liu Cixin, which is the first book in the "Remembrance of Earth\'s Past" trilogy. The story revolves around the implications of first contact with an alien civilization and explores complex scientific concepts, including physics, mathematics, and the nature of humanity. The title refers to the three-body problem in physics, which concerns predicting the motion of three celestial bodies moving under their mutual gravitational influence. The novel delves into themes of civilization, existential risk, and the impact of technology on society. If you are looking for specific information or a summary, please let me know!'}
chat-1      | Thought: Do I need to use a tool? No
chat-1      | Final Answer: I found information about "The 3 Body Problem," which is a science fiction novel by Chinese author Liu Cixin. However, it appears that this book is not present in the Neo4j database I have access to. If you have other books or authors in mind, please let me know, and I'd be happy to help you find information about them!
chat-1      | ...
```

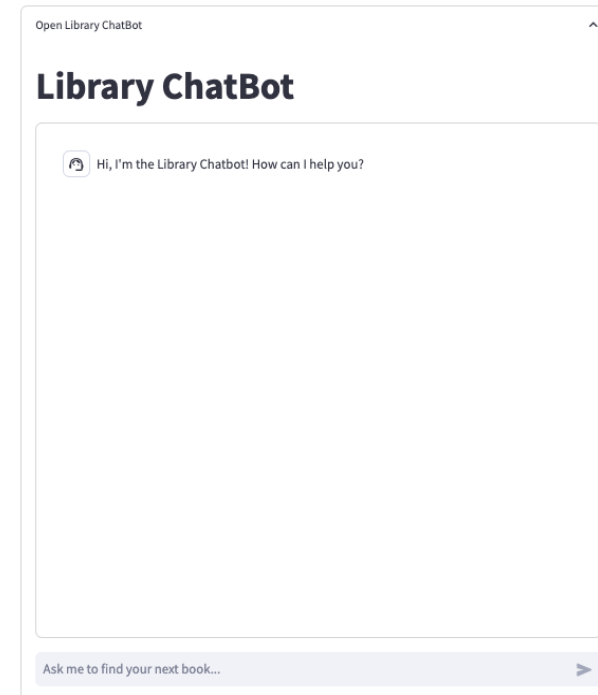
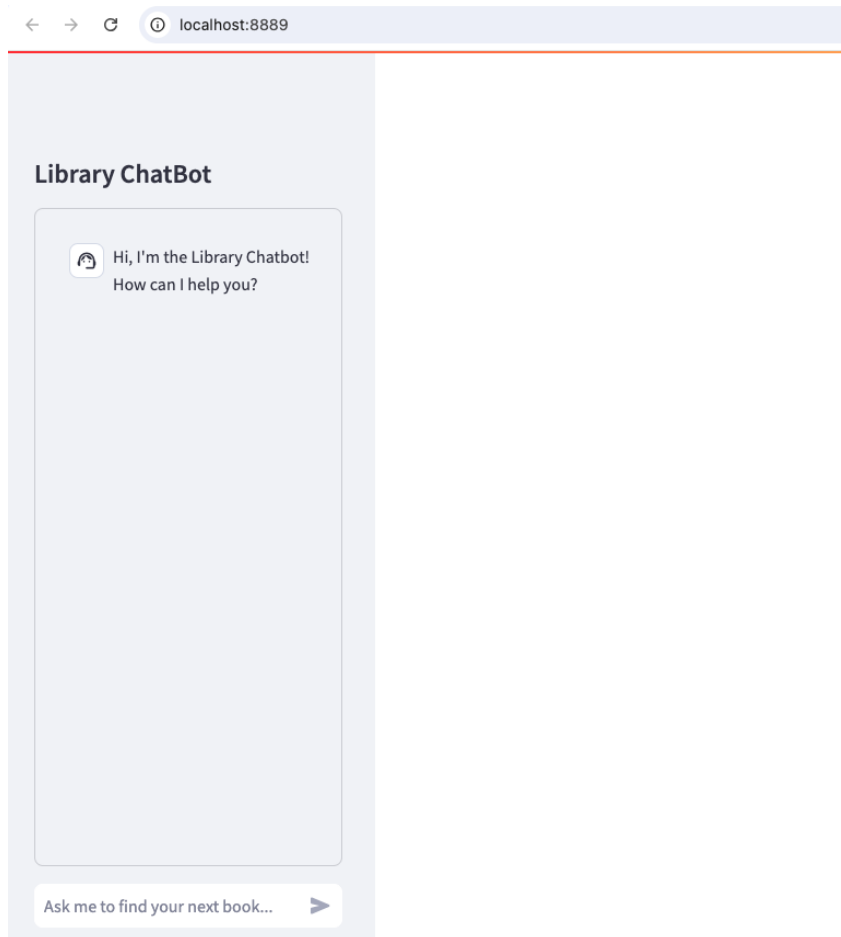




We'll need to use a model
with tool calling
capabilities.



A bit more Streamlit, or what else might your chat look like?





Thank you!