



# Library ChatBot

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# TECH STACK

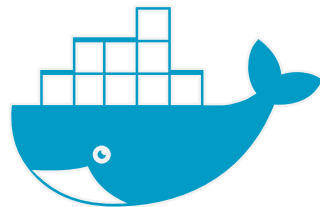


Streamlit



OpenAI

neo4j



docker



LangChain

- 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...



# Step 1.1

## Data Set

△ Title	△ Author	△ Genre	△ Summary	△ Reviews	# Ratings
<b>252</b> unique values	Thakazhi Sivasank... 3% Vaikom Muhamma... 3% Other (238) 94%	Fiction 30% Fantasy 6% Other (162) 64%	<b>250</b> 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

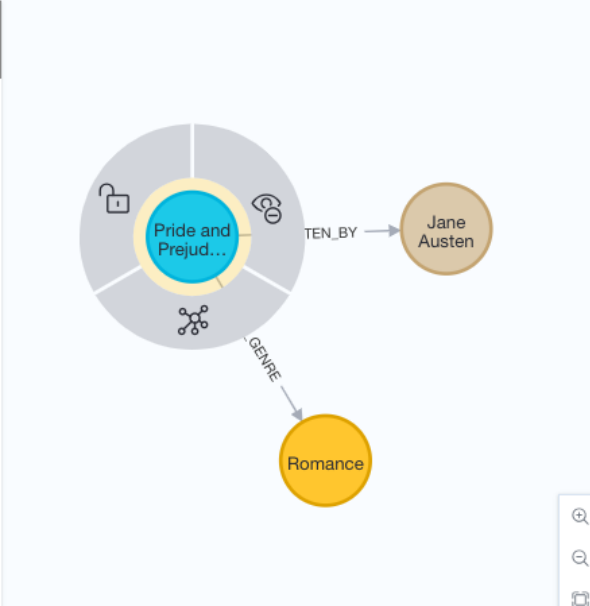
<https://www.kaggle.com/datasets/shijo96john/books-dataset>

# Step 1.2

## Database

### Neo4j

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

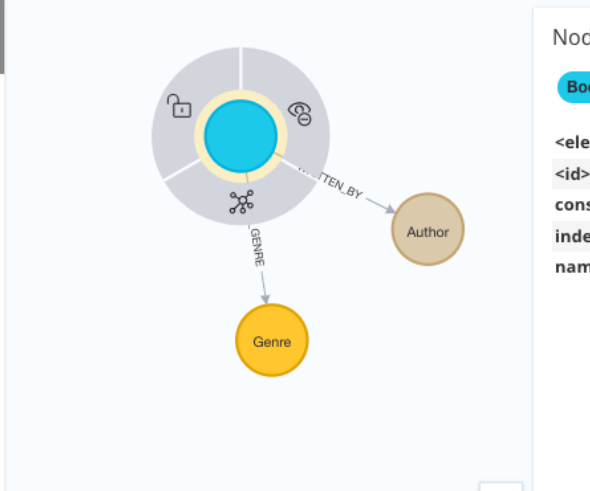


The graph visualization shows a central node labeled "Pride and Prejudice" (a book) connected to two other nodes: "Jane Austen" (an author) via the relationship "TEN\_BY" and "Romance" (a genre) via the relationship "GENRE". The interface includes a sidebar with icons for Graph, Table, Text, and Code, and a search bar at the bottom.

Node properties

Property	Value
<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 aristocrat...
title	Pride and Prejudice

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

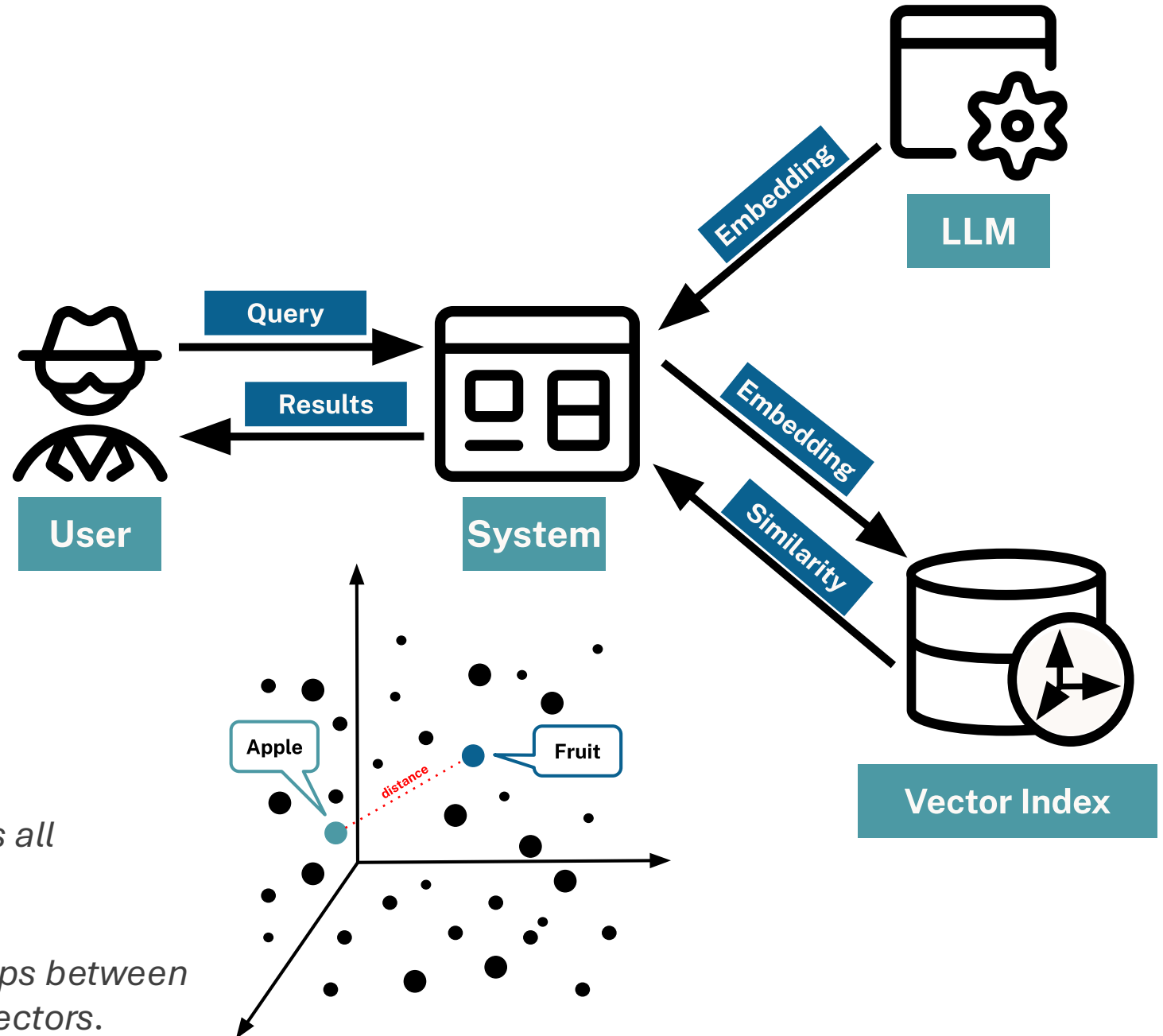


The schema visualization shows a central node labeled "Pride and Prejudice" (a book) connected to two other nodes: "Author" (an author) via the relationship "TEN\_BY" and "Genre" (a genre) via the relationship "GENRE". The interface includes a sidebar with icons for Graph, Table, Text, and Code, and a search bar at the bottom.

Node properties

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

## Step 1.3 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.

---

Hurray, our database is ready,  
now we'll make the chat app!





# Step 2.1

## 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})
```

## Library ChatBot



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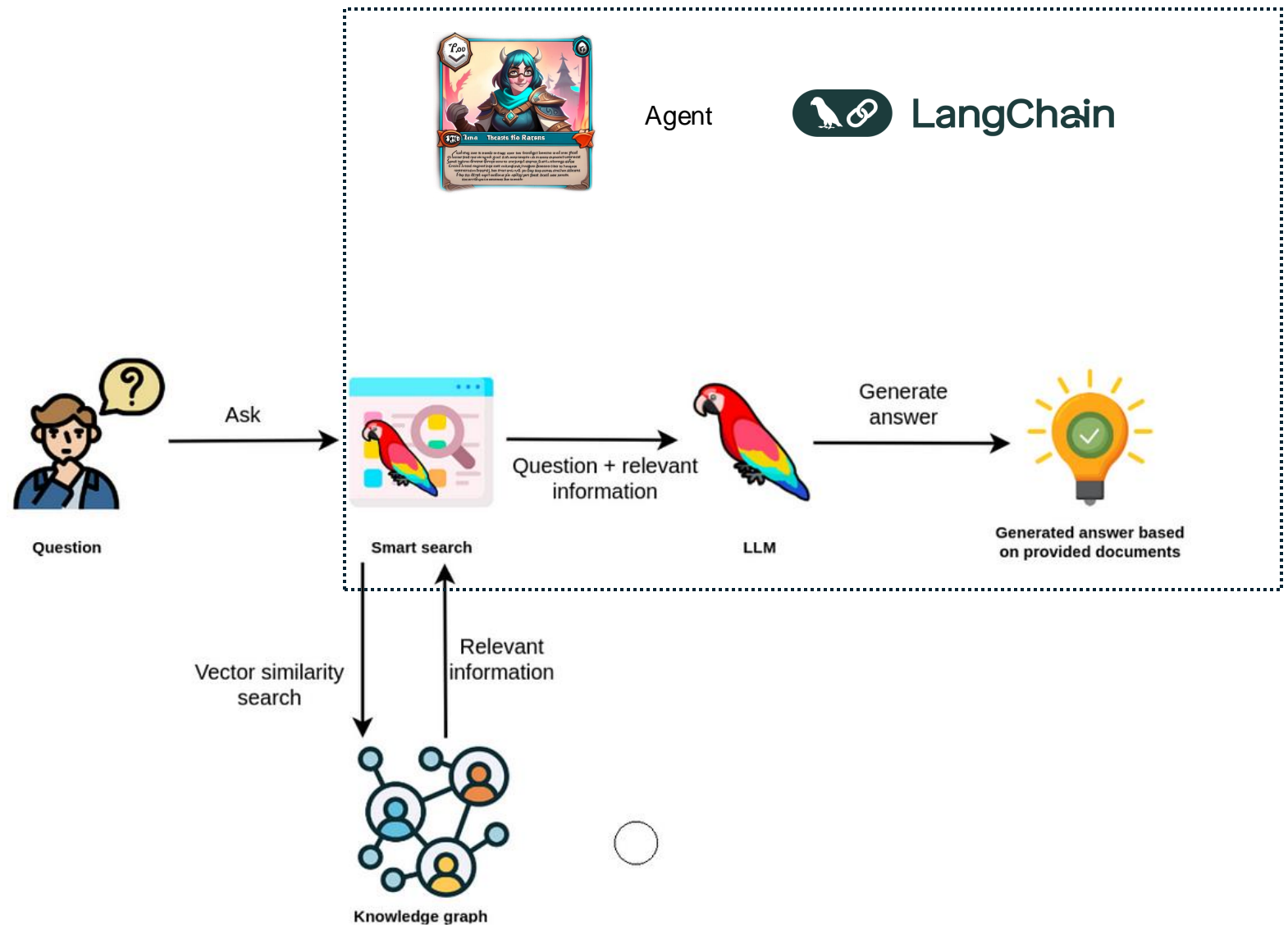




# Step 2.2

## RAG

*(Retrieval-Augmented Generation)*



## Chat agent:

a component configured to manage and run the process.

```
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",  
)
```

## Agent Executor:

a bridge between the user and the agent

Coordinates interactions between the agent and tools,  
ensures accountability.

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

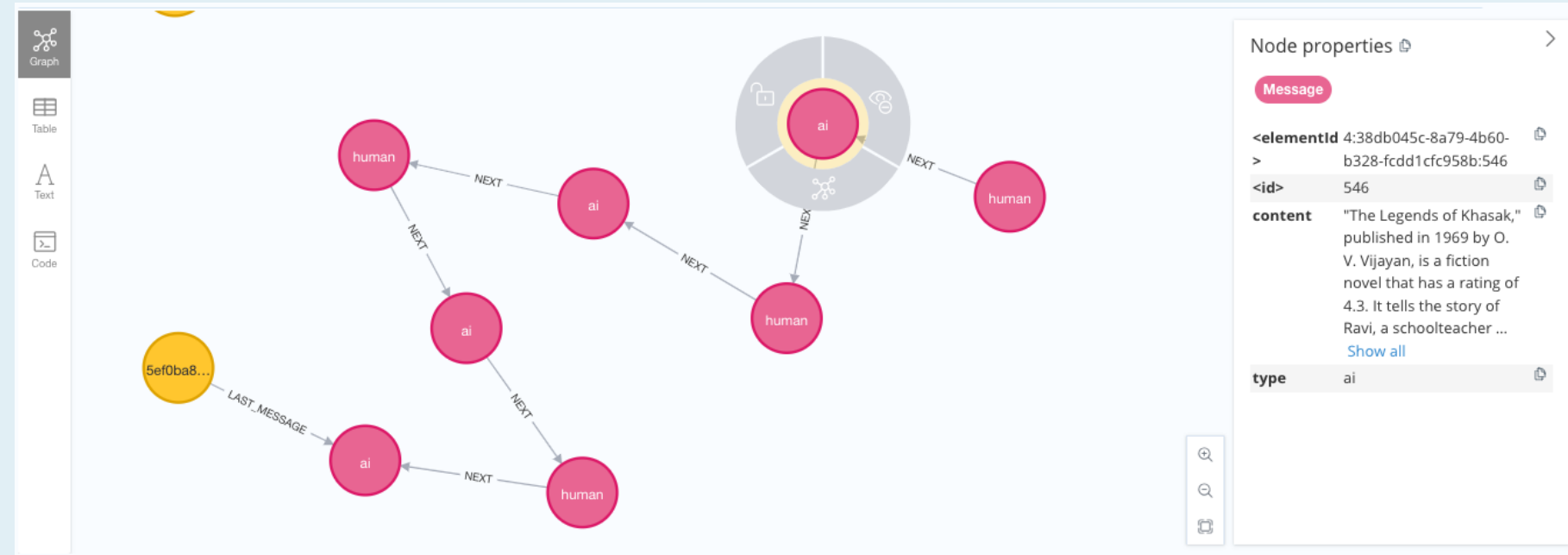
## Agent:

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



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

# Step 2.3 History



## Step 2.3

### Tools



```
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,  
    )  
]
```

## Step 2.3

### Tools

```
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!'}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.
```

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

