AI Student SupportChatbot for myUMBC Portal

It is a small chatbot developed with Flask, FAISS, and Sentence Transformers. It can retrieve information from a FAQ json file based on semantic similarity. It operates by embedding both user queries and stored FAQs and finding the nearest match with FAISS.

Below is the clear description of the process of setting up and running the project

1. To start with, we needed to download Python 3 on the computer and we used Visual studio code IDE to run our project.
2. Install Python on Visual studio code, and set it up.
3. After downloading and opening our project folder, we need to create a virtual environment within our project folder. This isolates project libraries with the other system. The environment can be created using the following command

   ```
   • python -m venv venv
   ```

4. Since Windows sometimes blocks script execution, we may need to temporarily allow it during this session. Run:

   ```
   • Set-ExecutionPolicy -Scope Process -ExecutionPolicy Bypass
   ```

5. Once venv is created we need to activate the virtual environment:

   ```
   • .\venv\Scripts\Activate.ps1
   ```

   Once activated, the terminal prompt will start showing (venv).

6. Next step is Installing Required Libraries : All the necessary Python libraries are listed in the requirements.txt file. we can install them with:

   ```
   • pip install -r requirements.txt
   ```

7. Building the Vector Store, now to run our model first run

   ```
   • python build_vector_store.py
   ```

This process will create files like faq_index.faiss and faq_store.pkl inside your vector_store folder.

8. Running the Chatbot

   ```
   • python app.py
   ```

9. When the server starts successfully, we will see a link such as:

   ```
   • http://127.0.0.1:5000
   ```

10. Using the link, open this in a browser to access the chatbot interface.

11. After launching the interface, we can type a question in the chat box. Our model will be answering with a suitable response.

12. Stopping the Server: If you need to stop the chatbot, go back to the terminal window running the server and press:

    • CTRL + C

Features

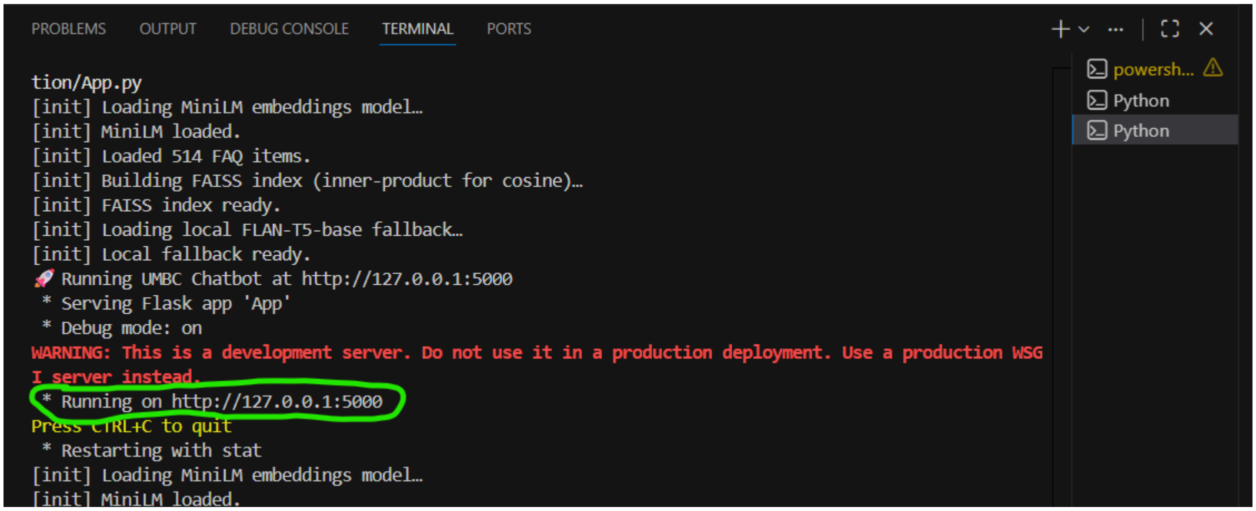
Our chatbot's UMBC-based UI comprise our main features. We have:

- Quick links
- Direct communication with the system
- Natural Language Processing
- URL retrieval
- Etc.

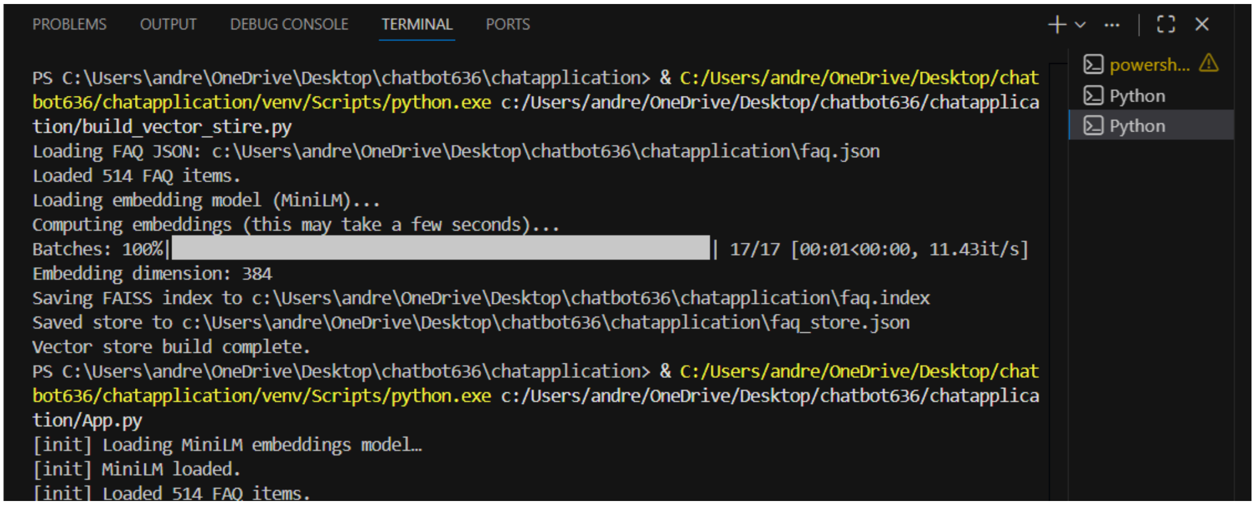
These make up the most important features of our system.

Expected Outputs

1. Output in terminal

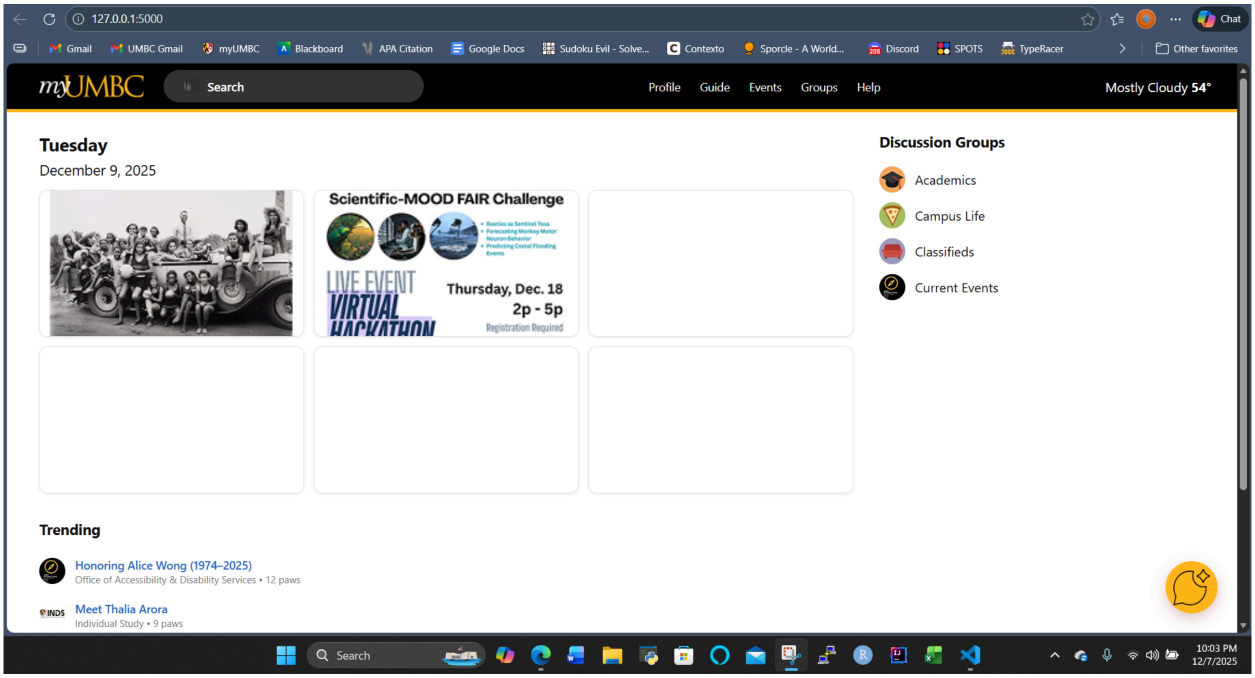


```
tion/App.py
[init] Loading MiniLM embeddings model…
[init] MiniLM loaded.
[init] Loaded 514 FAQ items.
[init] Building FAISS index (inner-product for cosine)…
[init] FAISS index ready.
[init] Loading local FLAN-T5-base fallback…
[init] Local fallback ready.
🚀 Running UMBC Chatbot at http://127.0.0.1:5000
 * Serving Flask app 'App'
 * Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSG
I server instead.
 * Running on http://127.0.0.1:5000
Press CTRL+C to quit
 * Restarting with stat
[init] Loading MiniLM embeddings model…
[init] MiniLM loaded.
```



```
PS C:\Users\andre\OneDrive\Desktop\chatbot636\chatapplication> & C:/Users/andre/OneDrive/Desktop/chat
bot636/chatapplication/venv/Scripts/python.exe c:/Users/andre/OneDrive/Desktop/chatbot636/chatapplica
tion/build_vector_stire.py
Loading FAQ JSON: c:\Users\andre\OneDrive\Desktop\chatbot636\chatapplication\faq.json
Loaded 514 FAQ items.
Loading embedding model (MiniLM)...
Computing embeddings (this may take a few seconds)...
Batches: 100%|██████████████████████████████████████████| 17/17 [00:01<00:00, 11.43it/s]
Embedding dimension: 384
Saving FAISS index to c:\Users\andre\OneDrive\Desktop\chatbot636\chatapplication\faq.index
Saved store to c:\Users\andre\OneDrive\Desktop\chatbot636\chatapplication\faq_store.json
Vector store build complete.
PS C:\Users\andre\OneDrive\Desktop\chatbot636\chatapplication> & C:/Users/andre/OneDrive/Desktop/chat
bot636/chatapplication/venv/Scripts/python.exe c:/Users/andre/OneDrive/Desktop/chatbot636/chatapplica
tion/App.py
[init] Loading MiniLM embeddings model…
[init] MiniLM loaded.
[init] Loaded 514 FAQ items.
```

2. The UI of our whole chatapplication



Tuesday

December 9, 2025

Discussion Groups

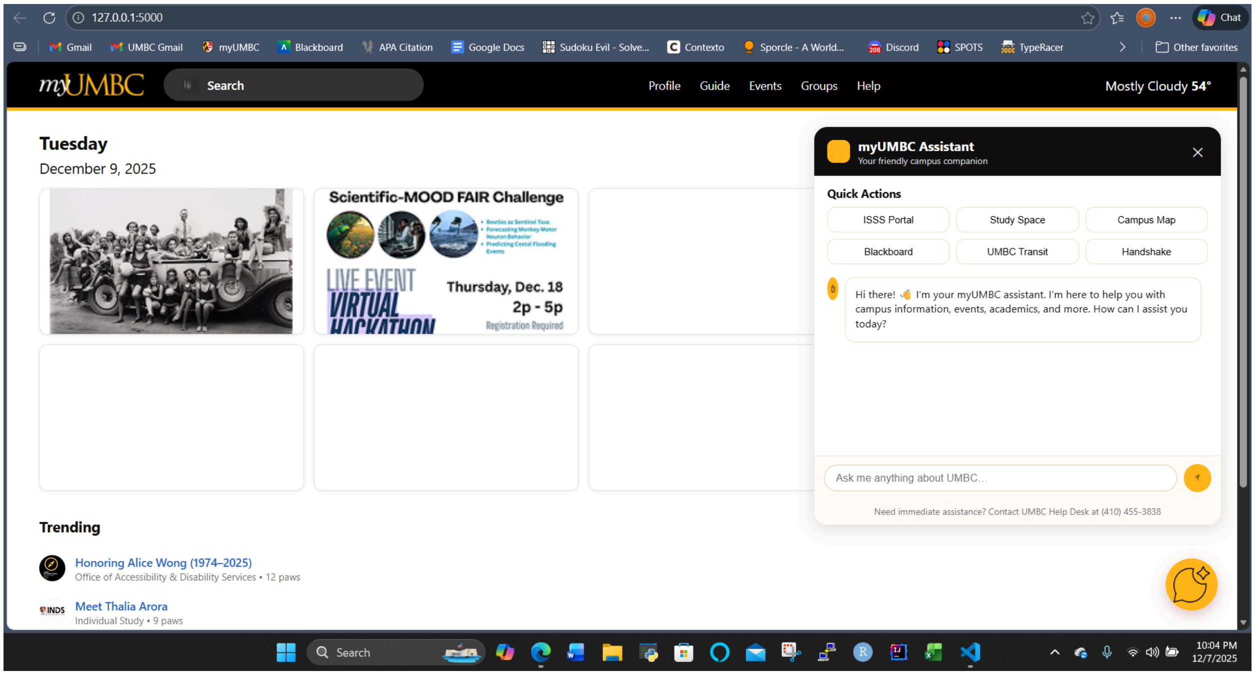
- Academics
- Campus Life
- Classifieds
- Current Events

Trending

Honoring Alice Wong (1974–2025)
Office of Accessibility & Disability Services • 12 paws

Meet Thalia Arora
Individual Study • 9 paws

3. Chatbot UI



Tuesday

December 9, 2025

myUMBC Assistant

Your friendly campus companion

Quick Actions

Hi there! 👋 I'm your myUMBC assistant. I'm here to help you with campus information, events, academics, and more. How can I assist you today?

Ask me anything about UMBC...

Need immediate assistance? Contact UMBC Help Desk at (410) 455-3838

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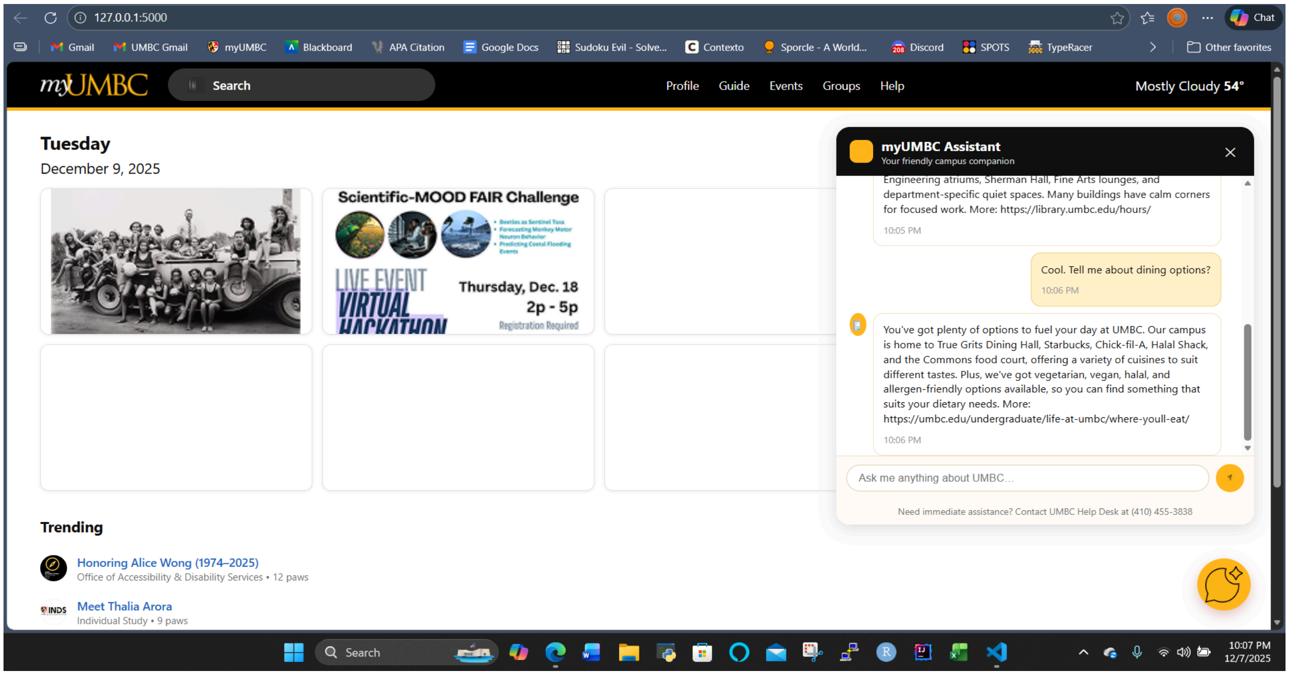
4. Example Chatbot response



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myUMBC Assistant
Your friendly campus companion

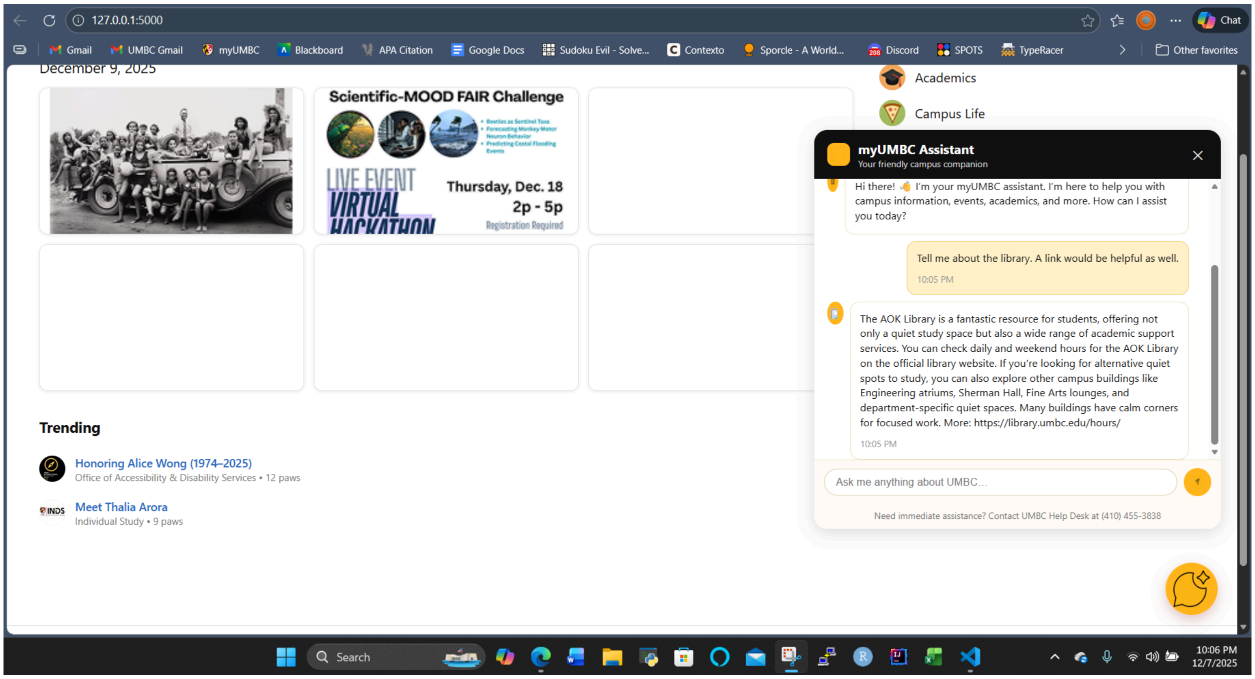
Engineering atriums, Sherman Hall, Fine Arts lounges, and department-specific quiet spaces. Many buildings have calm corners for focused work. More: https://library.umbc.edu/hours/
10:05 PM

Cool. Tell me about dining options?
10:06 PM

You've got plenty of options to fuel your day at UMBC. Our campus is home to True Grits Dining Hall, Starbucks, Chick-fil-A, Halal Shack, and the Commons food court, offering a variety of cuisines to suit different tastes. Plus, we've got vegetarian, vegan, halal, and allergen-friendly options available, so you can find something that suits your dietary needs. More: https://umbc.edu/undergraduate/life-at-umbc/where-youll-eat/
10:06 PM

Ask me anything about UMBC...

Need immediate assistance? Contact UMBC Help Desk at (410) 455-3838



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myUMBC Assistant
Your friendly campus companion

Hi there! 👋 I'm your myUMBC assistant. I'm here to help you with campus information, events, academics, and more. How can I assist you today?

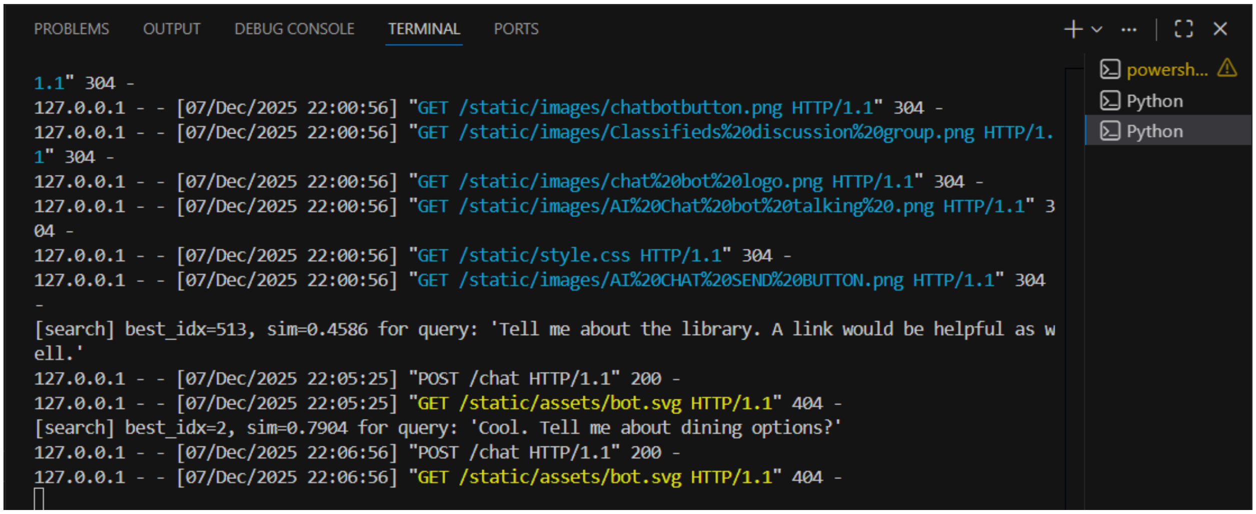
Tell me about the library. A link would be helpful as well.
10:05 PM

The AOK Library is a fantastic resource for students, offering not only a quiet study space but also a wide range of academic support services. You can check daily and weekend hours for the AOK Library on the official library website. If you're looking for alternative quiet spots to study, you can also explore other campus buildings like Engineering atriums, Sherman Hall, Fine Arts lounges, and department-specific quiet spaces. Many buildings have calm corners for focused work. More: https://library.umbc.edu/hours/
10:05 PM

Ask me anything about UMBC...

Need immediate assistance? Contact UMBC Help Desk at (410) 455-3838

5. Output in terminal of the chat



```
1.1" 304 -
127.0.0.1 - - [07/Dec/2025 22:00:56] "GET /static/images/chatbotbutton.png HTTP/1.1" 304 -
127.0.0.1 - - [07/Dec/2025 22:00:56] "GET /static/images/Classifieds%20discussion%20group.png HTTP/1.
1" 304 -
127.0.0.1 - - [07/Dec/2025 22:00:56] "GET /static/images/chat%20bot%20logo.png HTTP/1.1" 304 -
127.0.0.1 - - [07/Dec/2025 22:00:56] "GET /static/images/AI%20Chat%20bot%20talking%20.png HTTP/1.1" 3
04 -
127.0.0.1 - - [07/Dec/2025 22:00:56] "GET /static/style.css HTTP/1.1" 304 -
127.0.0.1 - - [07/Dec/2025 22:00:56] "GET /static/images/AI%20CHAT%20SEND%20BUTTON.png HTTP/1.1" 304
-
[search] best_idx=513, sim=0.4586 for query: 'Tell me about the library. A link would be helpful as w
ell.'
127.0.0.1 - - [07/Dec/2025 22:05:25] "POST /chat HTTP/1.1" 200 -
127.0.0.1 - - [07/Dec/2025 22:05:25] "GET /static/assets/bot.svg HTTP/1.1" 404 -
[search] best_idx=2, sim=0.7904 for query: 'Cool. Tell me about dining options?'
127.0.0.1 - - [07/Dec/2025 22:06:56] "POST /chat HTTP/1.1" 200 -
127.0.0.1 - - [07/Dec/2025 22:06:56] "GET /static/assets/bot.svg HTTP/1.1" 404 -
```