

Shop Assist AI

1. Background

In today's digital age, online shopping has become the preferred option for many consumers. However, the vast array of choices and the lack of personalised assistance can make the shopping experience overwhelming and challenging. To address this issue, we present Shop Assist AI. This chatbot combines the power of LLMs and rule-based functions to provide accurate and reliable recommendations during the online laptop shopping experience.

2. Problem Statement

Given a dataset containing laptop information (product names, specifications, descriptions, etc.), aim is to build a chatbot that parses the dataset and provides accurate laptop recommendations based on user requirements. This chatbot is named ShopAssist AI, and will

- Interact with users,
- Understand their laptop requirements and
- Recommend the most suitable laptops from a dataset based on their needs and preferences.

3. Dataset

1. Dataset are defined as below

Brand	Model Name	Core	CPU Manufacturer	Clock Speed	RAM Size	Storage Type	Display Type	Display Size	Graphics Processor	Screen Resolution	OS	Laptop Weight	Special Features	Warranty	Average Battery Life	Price	Description
Dell	Inspiron	i5	Intel	2.4 GHz	8GB	SSD	LCD	15.6"	Intel UHD	1920x1080	Windows 10	2.5 kg	Backlit Keyboard	1 year	6 hours	35,000	The Dell Inspiron is a versatile laptop that combines powerful performance and affordability. It features an Intel Core i5 processor clocked at 2.4 GHz, ensuring smooth multitasking and efficient computing. With 8GB of RAM and an SSD, it offers quick data access and ample storage capacity. The laptop sports a vibrant 15.6" LCD display with a resolution of 1920x1080, delivering crisp visuals and immersive viewing experiences. Powered by an Intel Core i5 processor running at 2.4 GHz, it delivers exceptional processing power for smooth gaming and demanding tasks. With 8GB of RAM and a combination of HDD and SSD storage, it offers ample memory and fast data access. The laptop features a 15.6" display with a resolution of 1920x1080.
MSI	GL65	i7	Intel	2.6 GHz	16GB	HDD+SSD	IPS	15.6"	NVIDIA GTX	1920x1080	Windows 10	2.3 kg	RGB Keyboard	2 years	4 hours	55,000	The MSI GL65 is a high-performance laptop designed for gaming enthusiasts. It features an Intel Core i7 processor clocked at 2.6 GHz, ensuring smooth multitasking and efficient computing. With 16GB of RAM and a combination of HDD and SSD storage, it offers ample memory and fast data access. The laptop sports a vibrant 15.6" IPS display with a resolution of 1920x1080, delivering crisp visuals and immersive viewing experiences. Powered by an Intel Core i7 processor running at 2.6 GHz, it delivers exceptional processing power for smooth gaming and demanding tasks. With 16GB of RAM and a combination of HDD and SSD storage, it offers ample memory and fast data access. The laptop features a 15.6" display with a resolution of 1920x1080.

2. The data file can be found [here](#)

4. Approach

1. **Conversation and Information Gathering:** The chatbot will utilise language models to understand and generate natural responses. Through a conversational flow, it will ask relevant questions to gather information about the user's requirements.
2. **Information Extraction:** Once the essential information is collected, rule-based functions come into play, extracting the top three laptops that best match the user's needs.
3. **Personalized Recommendation:** Leveraging this extracted information, the chatbot engages in further dialogue with the user, efficiently addressing their queries and aiding them in finding the perfect laptop solution.

5. System Functionalities

- **User Interface:** The ShopAssistAI platform features an intuitive web interface that allows users to engage seamlessly with the conversational AI assistant.
- **Conversational AI:** At the heart of this system is the conversational AI, which leverages OpenAI's chat model to guide users by asking appropriate questions and discerning their specific needs.
- **User Input Moderation:** To ensure a secure conversational environment, each inputs are regulated through OpenAI's moderation API.
- **User Profile Extraction:** The AI assistant collects vital information during the conversation to construct a user profile that accurately represents their laptop preferences, including budget, display quality, processing power, portability etc. utilizing OpenAI's function calling mechanism to convert user requirement strings into JSON format.

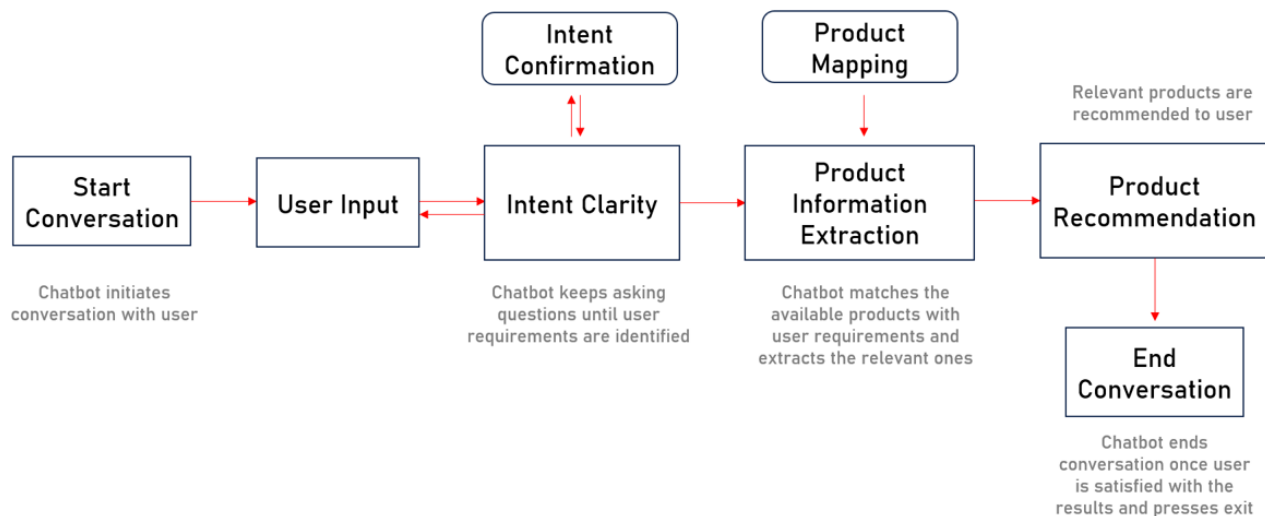
The dataset [laptop_data.csv](#) includes rows that detail the specifications of each laptop, with a concise description provided at the end of each entry. The chatbot will employ large language models to interpret the `Description` column and generate recommendations.

6. System Architecture

ShopAssistAI operates on a client-server architecture. Users engage with a web interface that is hosted on a server utilizing the Flask application. This application communicates with OpenAI's API to facilitate conversation generation and moderation, while also accessing and comparing laptop data from an external database.



CHATBOT SYSTEM DESIGN



7. Implementation Details

The Flask application utilizes various functionalities:

- **Routing:** Routing directs user requests to the relevant functions according to the specified URLs.
- **Conversation Management:** Oversees the initiation of conversations, the generation of responses utilizing OpenAI's chat model, and the maintenance of conversation history.
- **User Input Processing:** User Input Processing involves capturing user input, conducting moderation checks, and extracting user profiles from the conversation history, which includes converting the user input string into JSON format through OpenAI Function calling.
- **Recommendation Logic:** It assesses user profiles against laptop data, verifies the validity of recommendations, and produces the corresponding recommendation text

Major Functions

- `initialize_conversation()`: Initializes the variable conversation with the system message.
- `get_chat_completions()`: Takes the ongoing conversation as the input and returns the response by the assistant.
- `moderation_check()`: Checks if the user's or the assistant's message is inappropriate. If any of these is inappropriate, it ends the conversation.
- `intent_confirmation_layer()`: Evaluates if the chatbot has captured the user's profile clearly.
- `dictionary_present()`: Checks if the final understanding of the user's profile is returned by the chatbot as a Python dictionary.
- `compare_laptops_with_user()`: Compares the user's profile with the different laptops and comes back with the top 3 recommendations.
- `initialize_conv_reco()`: Initializes the recommendations conversation.

Prerequisites

- Python 3.7+
- Please ensure that you add your OpenAI API key to the empty text file named "OpenAI_API_Key" in order to access the OpenAI API.

Beyond the core system design, this implementation includes:

- Error Handling: Comprehensive error handling for different types of errors
- Rate Limiting: Protection against excessive requests
- Moderation: Content moderation for inappropriate inputs
- Debug Features: Debugging endpoints and tools
- Enhanced Query Understanding: Advanced pattern matching for specific laptop features

8. Getting Started

To begin utilizing ShopAssist AI, please proceed with the following instructions.

1. Clone the repository

```
$ git clone https://github.com/Ankitchandre/shopassist.git
```

2. create a open api key and add to OpenAI_API_Key.txt

3. Install dependencies

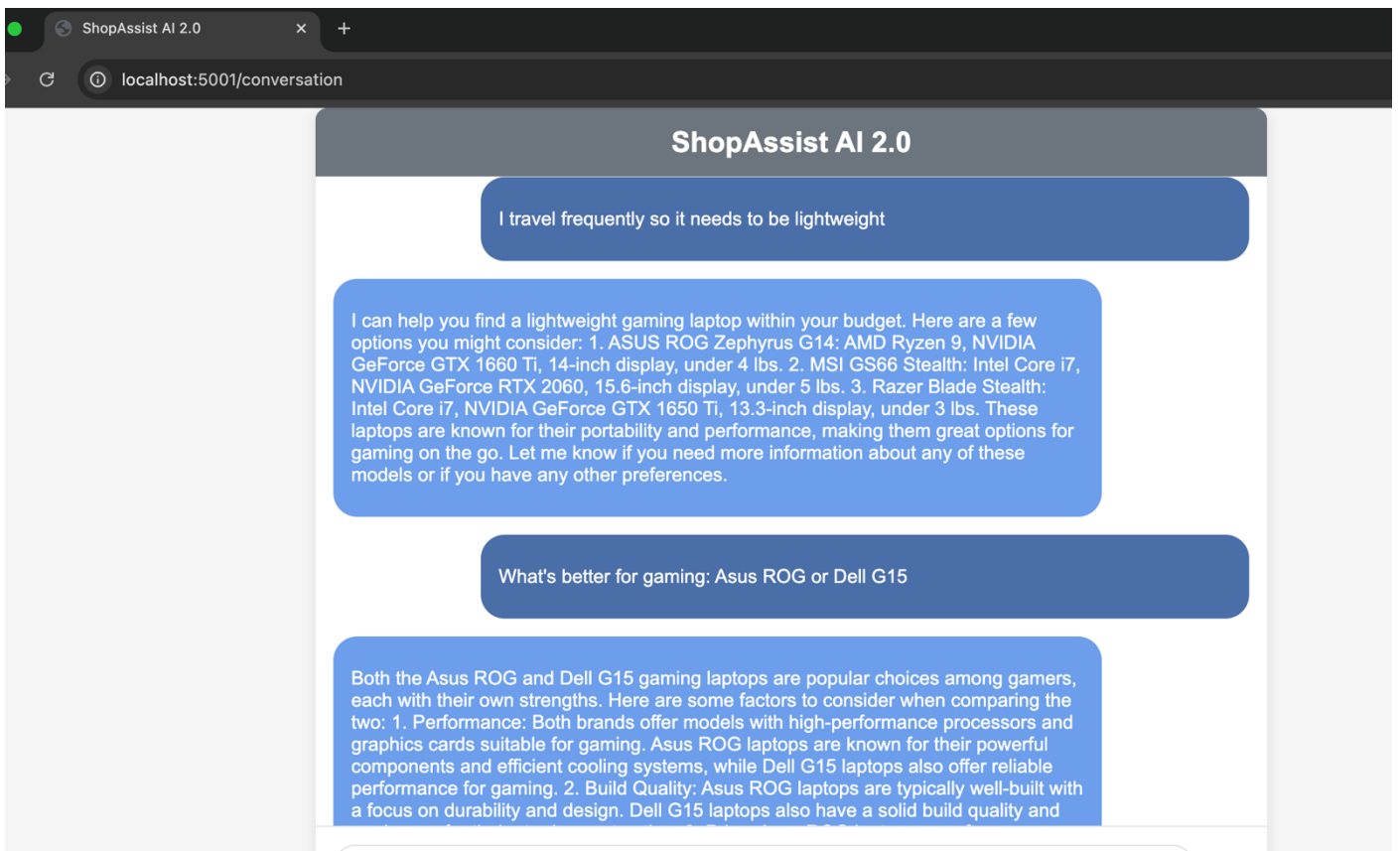
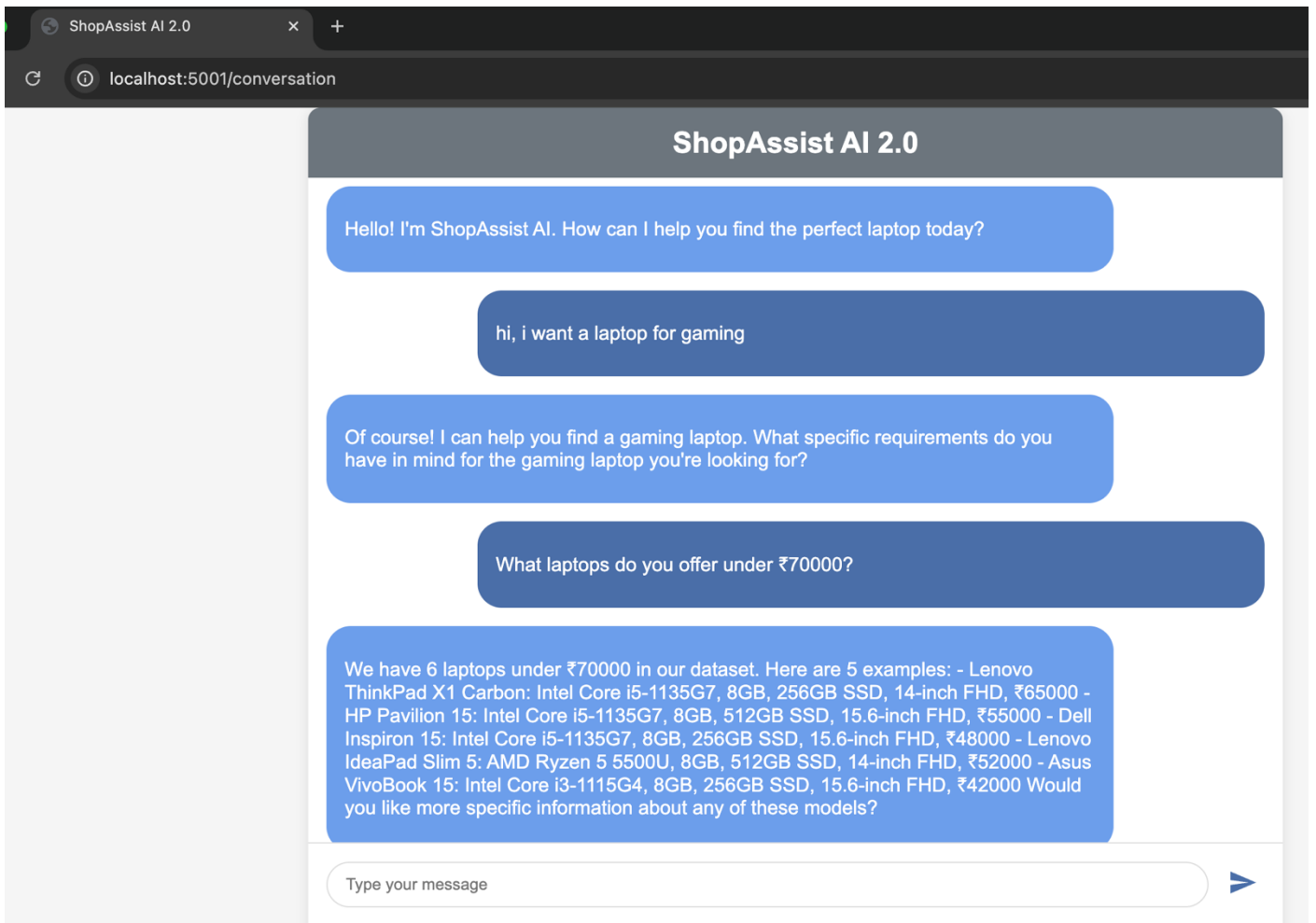
```
4. $ pip install -r requirements.txt
```

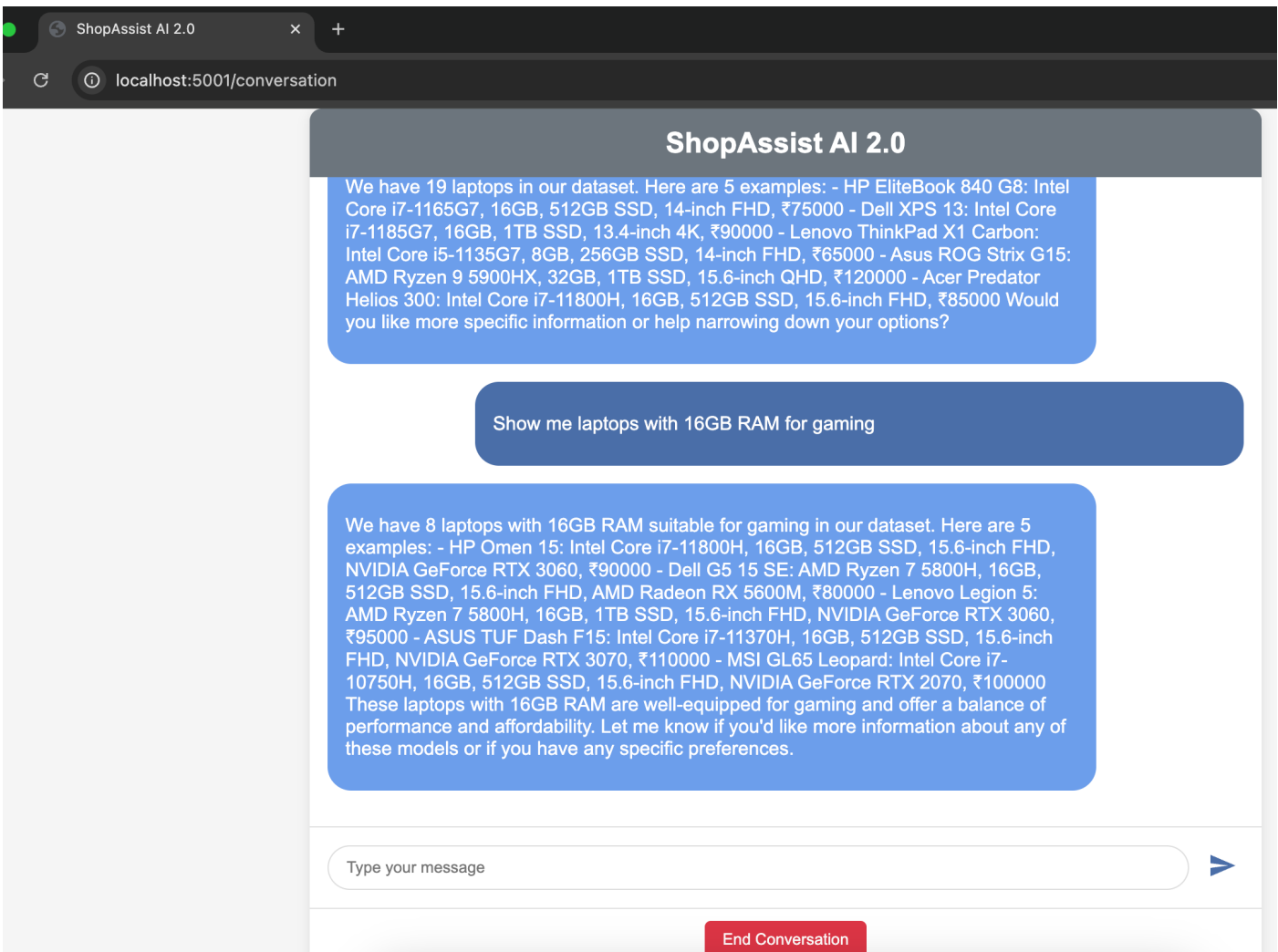
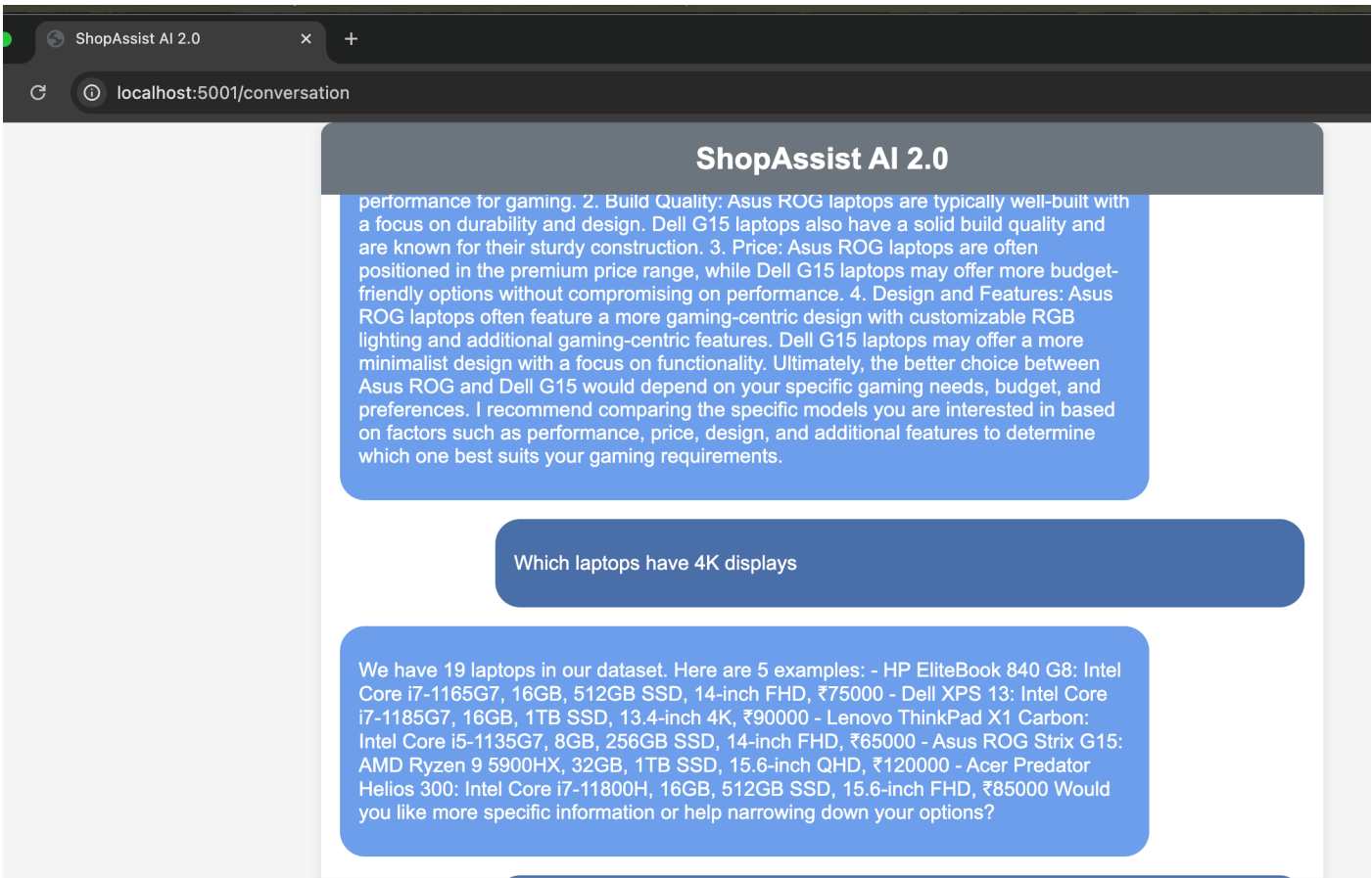
5. Initialize the chatbot

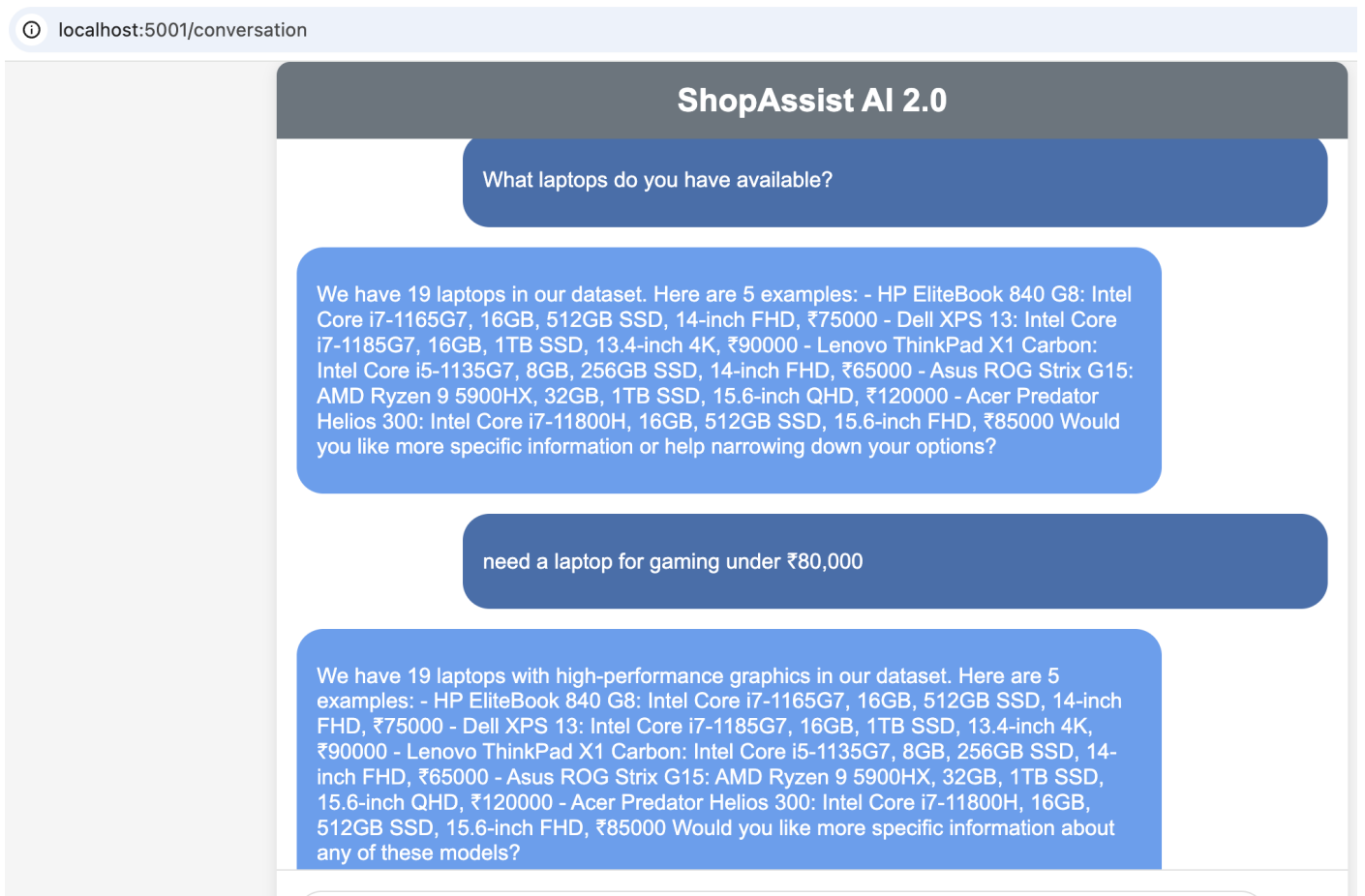
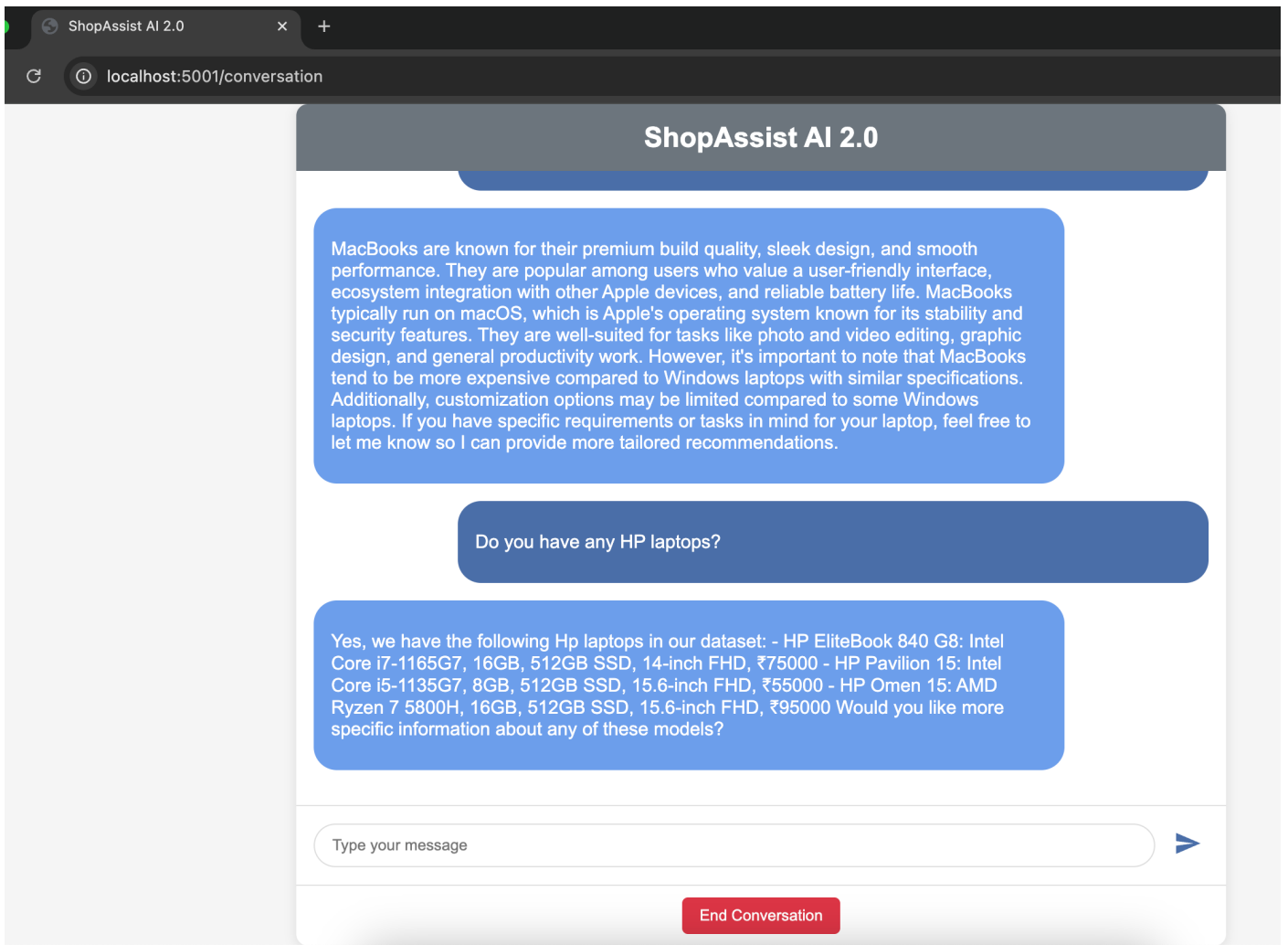
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6. $ python3 app.py
```

7. Open your web browser and navigate to: <http://localhost:5001>

9. chatbot screenshots







ShopAssist AI 2.0

We have 19 laptops with high-performance graphics in our dataset. Here are 5 examples: - HP EliteBook 840 G8: Intel Core i7-1165G7, 16GB, 512GB SSD, 14-inch FHD, ₹75000 - Dell XPS 13: Intel Core i7-1185G7, 16GB, 1TB SSD, 13.4-inch 4K, ₹90000 - Lenovo ThinkPad X1 Carbon: Intel Core i5-1135G7, 8GB, 256GB SSD, 14-inch FHD, ₹65000 - Asus ROG Strix G15: AMD Ryzen 9 5900HX, 32GB, 1TB SSD, 15.6-inch QHD, ₹120000 - Acer Predator Helios 300: Intel Core i7-11800H, 16GB, 512GB SSD, 15.6-inch FHD, ₹85000 Would you like more specific information about any of these models?

Show me laptops with 16GB RAM

Yes, we have 10 laptops with 16GB RAM in our dataset. Here are 5 examples: - HP EliteBook 840 G8: Intel Core i7-1165G7, 16GB, 512GB SSD, 14-inch FHD, ₹75000 - Dell XPS 13: Intel Core i7-1185G7, 16GB, 1TB SSD, 13.4-inch 4K, ₹90000 - Acer Predator Helios 300: Intel Core i7-11800H, 16GB, 512GB SSD, 15.6-inch FHD, ₹85000 - Microsoft Surface Laptop 4: AMD Ryzen 7 4980U, 16GB, 512GB SSD, 13.5-inch PixelSense, ₹110000 - Razer Blade 15: Intel Core i7-11800H, 16GB, 512GB SSD, 15.6-inch QHD, ₹140000 Would you like more specific information about any of these models?

Type your message



How does the Dell XPS compare to the Lenovo ThinkPad

The Dell XPS 13 has a sleek design with a 13.4-inch 4K display, powered by an Intel Core i7-1185G7 processor and 16GB of RAM, along with a 1TB SSD for storage. On the other hand, the Lenovo ThinkPad series is known for its durability and reliability, popular among business professionals. The ThinkPad laptops often feature robust build quality, excellent keyboards, and security features. In terms of specific features and performance, both the Dell XPS 13 and Lenovo ThinkPad have their strengths. The Dell XPS 13 is more focused on providing a high-resolution display and stylish design, while the Lenovo ThinkPad prioritizes durability and business-focused features. Ultimately, the choice between the Dell XPS 13 and Lenovo ThinkPad would depend on your specific needs and preferences, such as design, display quality, performance, and intended use case.

Try asking questions like :

- "What laptops do you have available?"
- "I need a laptop for gaming under ₹80,000"
- "Show me laptops with 16GB RAM"