

Shop Assist AI Assignment

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 ShopAssist 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 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" IPS 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 running at 2.6 GHz, providing 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" IPS 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.

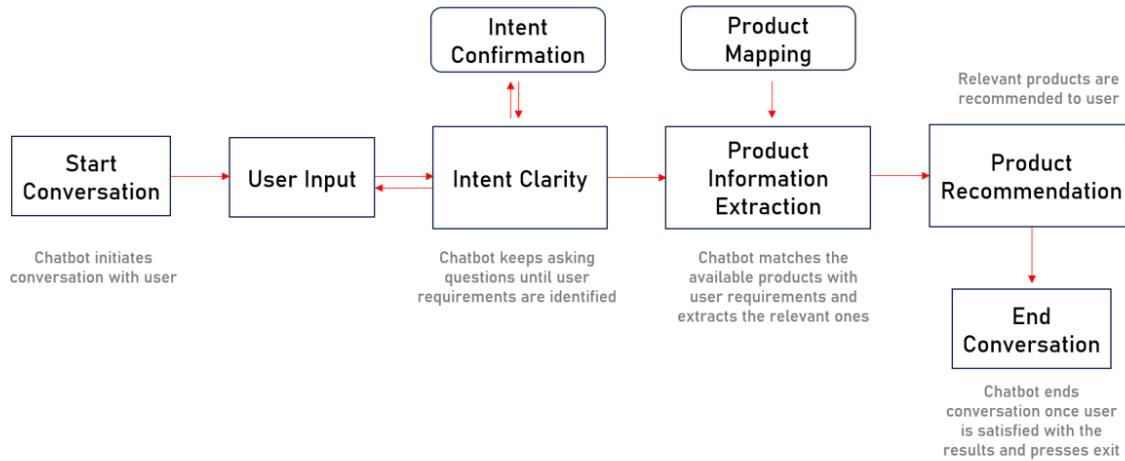
The dataset [laptop_data.csv](#) includes rows that detail the specifications of each laptop, with a concise description provided at the end of each entry. The chatbot will employ large language models to interpret the `Description` column and generate recommendations.

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.

8. Getting Started

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

1. Clone the repository

```
$ git clone https://github.com/neelamiimr/Upgrad-Shop-Assist-AI
```

Enable the virtual environment

```
$ source venv/bin/activate
```

Install dependencies

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

Initialize the chatbot

```
$ flask run
# or
$ python3 app.py
```

9. Few chatbot screenshots

Shopping Assistant

Hi there! Hope you're doing well. Please share your requirements regarding the laptop you are looking for.

I need a laptop for gaming

Great! As a gamer, you likely require a laptop with high GPU intensity for smooth gaming performance. Do you also prioritize high processing speed for quick rendering of graphics and high multitasking capability for running multiple programs simultaneously? Let me know if my understanding aligns with your requirements so far.

Yes I need high processing speed with multitasking capability

Type your message here...



End Conversation

Shopping Assistant

Got it! Since you prioritize high processing speed and multitasking capability, I will update the values for those keys in the final string accordingly. To better understand your needs, do you also prefer a high display quality for immersive gaming visuals and portability for ease of carrying your laptop to different gaming events? Let me know if my understanding is correct so far.

Yes

Great! Based on your preference for high processing speed and multitasking capability, along with high display quality and portability, I will update the values for those keys in the final string. Now, to determine the budget, could you please let me know the maximum amount you are willing to spend on the gaming laptop? This will help me find options that fit within your price range while meeting your specified requirements.

Type your message here...



End Conversation

Shopping Assistant

within your price range while meeting your specified requirements.

Budget approx 300000

Thank you for providing all the information. Kindly wait, while I fetch the products:

1. Dell Precision 5550 : Xeon processor, 32GB RAM, NVIDIA Quadro graphics, 15.6" OLED display, Thunderbolt 3, Ubuntu OS, 6 hours battery life, 3 years warranty, 250,000 Rs 2. Dell XPS 15 : i9 processor, 32GB RAM, NVIDIA GTX graphics, 15.6" OLED display, Adobe RGB color gamut, Windows 11 OS, 8 hours battery life, 3 years warranty, 180,000 Rs 3. Lenovo ThinkPad : Ryzen 7 processor, 16GB RAM, NVIDIA GTX graphics, 14" IPS display, Backlit Keyboard, Linux OS, 6 hours battery life, 3 years warranty, 60,000 Rs These are the three laptops available in the catalogue, listed in descending order

Type your message here...



End Conversation