

SHOP ASSIST AI 2.0

Project Background

In today's digital age, online shopping has become the go-to option for many consumers. However, the overwhelming number of choices and the lack of personalized assistance can make the shopping experience daunting. To address this, we have developed ShopAssist AI, a chatbot that combines the power of large language models and rule-based functions and function api calling, to ensure accurate and reliable information delivery.

Problem Statement

Given a dataset containing information about laptops (product names, specifications, descriptions, etc.), build a chatbot that parses the dataset and provides accurate laptop recommendations based on user requirements. With the given dataset as below laptop.csv

	Brand	Model Name	Core	CPU Manuf	Clock Speed	RAM Size	Storage Type	Display Type	Display Size	Graphics Procc	Screen Resolut	OS	Laptop Weight	Special Featur	Warranty	Average Battel	Price
1	Dell	Inspiron	i5	Intel	2.4 GHz	8GB	SSD	LCD	15.6"	Intel UHD	1920x1080	Windows 10	2.5 kg	Backlit Keyboa	1 year	6 hours	35,000
2	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
3	HP	EliteBook	i7	Intel	2.8 GHz	16GB	SSD	LED	14"	Intel UHD	1920x1080	Windows 11	1.5 kg	Fingerprint Sen	3 years	8 hours	90,000
4	Lenovo	IdeaPad	i3	Intel	2.1 GHz	8GB	HDD	TN	15.6"	Intel UHD	1366x768	Windows 10	2.2 kg	Dolby Audio	1 year	5 hours	25,000
5	ASUS	ZenBook Pro	i9	Intel	3.1 GHz	64GB	SSD	OLED	15.6"	NVIDIA RTX	3840x2160	Windows 10	1.8 kg	NanoEdge Disp	2 years	7 hours	2,00,000
6	Acer	Predator	i7	Intel	2.8 GHz	16GB	SSD	IPS	17.3"	NVIDIA GTX	1920x1080	Windows 10	3.2 kg	Dual Cooling F	1 year	5 hours	80,000
7	Microsoft	Surface Laptop	i5	Intel	1.6 GHz	8GB	SSD	PixelSense	13.5"	Intel Iris Plus	2256x1504	Windows 11	1.3 kg	Touchscreen D	1 year	10 hours	90,000
8	Lenovo	ThinkPad	Ryzen 7	AMD	3.0 GHz	16GB	SSD	IPS	14"	NVIDIA GTX	2560x1440	Linux	1.6 kg	Backlit Keyboa	3 years	6 hours	60,000
9	HP	Pavilion	i5	Intel	2.3 GHz	12GB	HDD	LCD	15.6"	Intel UHD	1366x768	Windows 10	2.1 kg	B&O Audio	1 year	4 hours	30,000
10	ASUS	ROG Strix G	i7	Intel	2.9 GHz	16GB	SSD	IPS	17.3"	NVIDIA RTX	1920x1080	Windows 10	2.9 kg	Aura Sync RGB	2 years	5 hours	85,000
11	Dell	XPS 15	i9	Intel	2.8 GHz	32GB	SSD	OLED	15.6"	NVIDIA GTX	3840x2160	Windows 11	1.8 kg	Adobe RGB col	3 years	8 hours	1,80,000
12	Lenovo	ThinkPad X1 Carbon	i7	Intel	2.6 GHz	16GB	SSD	IPS	14"	Intel UHD	2560x1440	Windows 10	1.13 kg	IR Camera for	3 years	12 hours	1,30,000
13	Acer	Swift 3	Ryzen 5	AMD	2.3 GHz	8GB	SSD	IPS	14"	AMD Radeon	1920x1080	Windows 11	1.2 kg	Fingerprint Rea	1 year	9 hours	50,000
14	Apple	MacBook Air	M1	Apple	3.2 GHz	16GB	SSD	Retina	13.3"	Apple M1	2560x1600	macOS	1.29 kg	Touch ID	3 years	14 hours	1,00,000
15	MSI	Prestige 14	i5	Intel	2.4 GHz	16GB	SSD	IPS	14"	NVIDIA GTX	1920x1080	Windows 10	1.29 kg	True Color Tec	2 years	8 hours	70,000
16	ASUS	ZenBook 13	i7	Intel	2.8 GHz	16GB	SSD	NanoEdge	13.3"	Intel Iris Xe	1920x1080	Windows 11	1.11 kg	Military-Grade	2 years	11 hours	95,000
17	Dell	Precision 5550	Xeon	Intel	2.6 GHz	32GB	SSD	OLED	15.6"	NVIDIA Quadrc	3840x2160	Ubuntu	1.83 kg	Thunderbolt 3	3 years	6 hours	2,50,000
18	HP	ENVY x360	i7	Intel	2.8 GHz	16GB	SSD	IPS	15.6"	Intel Iris Xe	1920x1080	Windows 10	2.05 kg	2-in-1 Converti	1 year	7 hours	80,000
19	Razer	Blade 15	i7	Intel	2.6 GHz	16GB	SSD	IPS	15.6"	NVIDIA RTX	1920x1080	Windows 11	2.09 kg	Chroma RGB K	1 year	6 hours	1,50,000
20	Apple	MacBook Pro	i9	Intel	2.9 GHz	32GB	SSD	Retina	16"	AMD Radeon	3072x1920	macOS	2.02 kg	True Tone Disp	3 years	10 hours	2,80,000

Approach:

- Conversation and Information Gathering:** The chatbot will utilize 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.
- Information Extraction:** Once the essential information is collected, rule-based functions come into play, extracting the top 3 laptops that best match the user's needs.
- 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.

System Design:

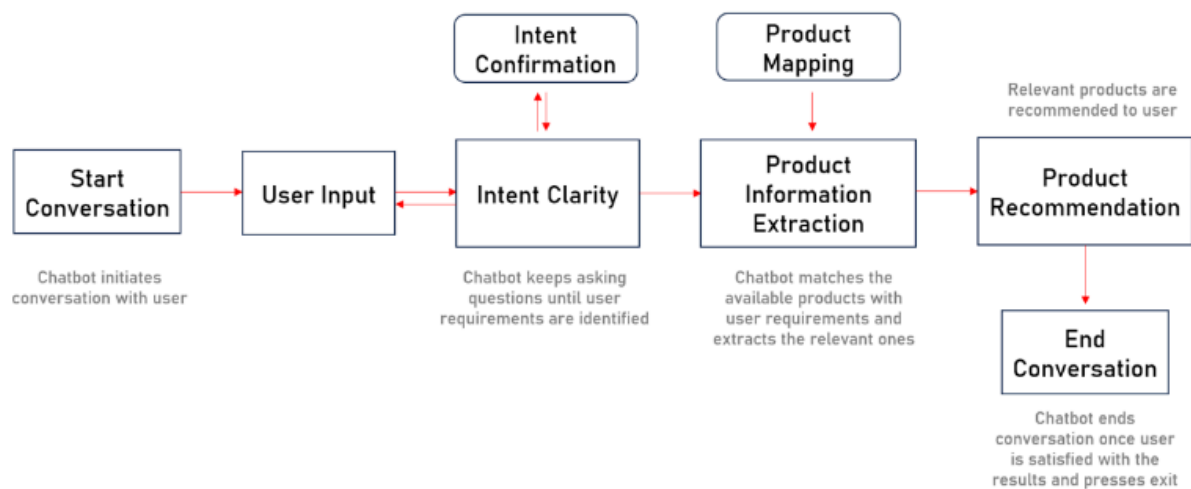
Dividing the main steps of the project into 3 main stages:

STAGE 1: Intent clarity and intent confirmation

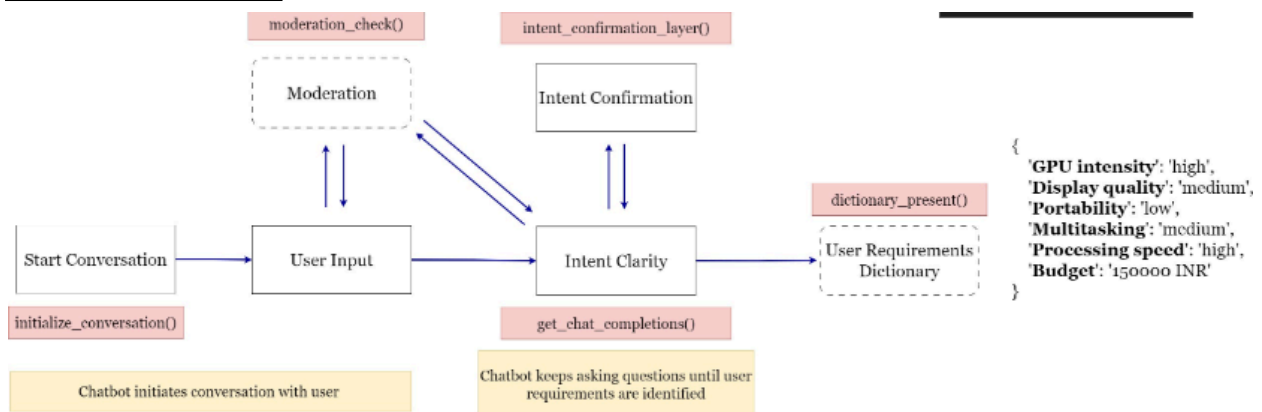
STAGE 2: Product extraction and product mapping

STAGE 3: Product recommendation

CHATBOT SYSTEM DESIGN



STAGE 1 flowchart:



Brief about each functions:

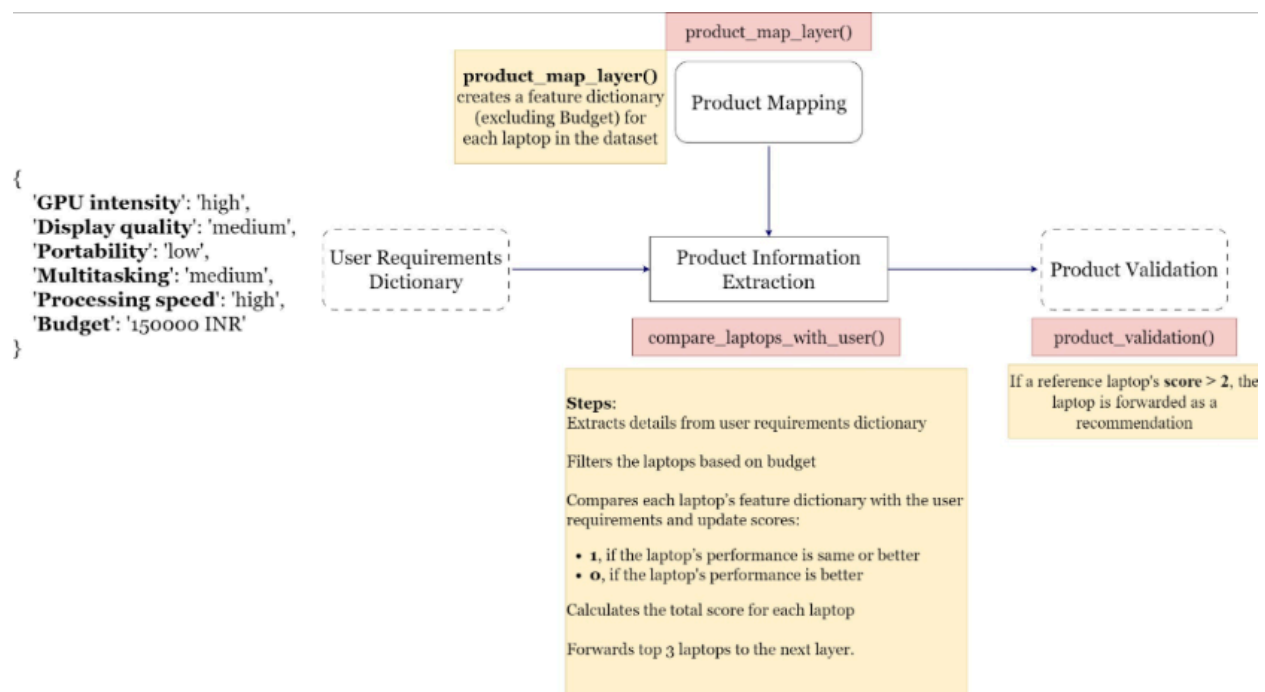
- `initialize_conversation()`: This initializes the variable conversation with the system message.
- `get_chat_completions()`: This takes the ongoing conversation as the input and returns the response by the assistant
- `moderation_check()`: This checks if the user's or the assistant's message is inappropriate. If any of these is inappropriate, it ends the conversation.

- `intent_confirmation_layer()`: This function takes the assistant's response and evaluates if the chatbot has captured the user's profile clearly. Specifically, this checks if the following properties for the user has been captured or not GPU intensity, Display quality, Portability, Multitasking, Processing speed, Budget
- `dictionary_present()`: This function checks if the final understanding of a user's profile is returned by the chatbot as a python dictionary or not. If there is a dictionary, it extracts the information as a Python dictionary.

Changes that i have added to enhance:

1. Added function calling api method for few of these functions. Why is it preferred more than rule based approach, is that it provides a consistent result as the output.
2. Added the following function to `intent_confirmation_layer()`, `dictionary_present()`
3. Scrapped the `iterate_llm_response()` method as it was redundant and since we added a function call method, the response ideally outputs a stable one.
4. Added a few examples to test the following methods `get_chat_completions()`, `moderation_check()`, `intent_confirmation_layer()` if it works accordingly.

STAGE 2 flowchart:

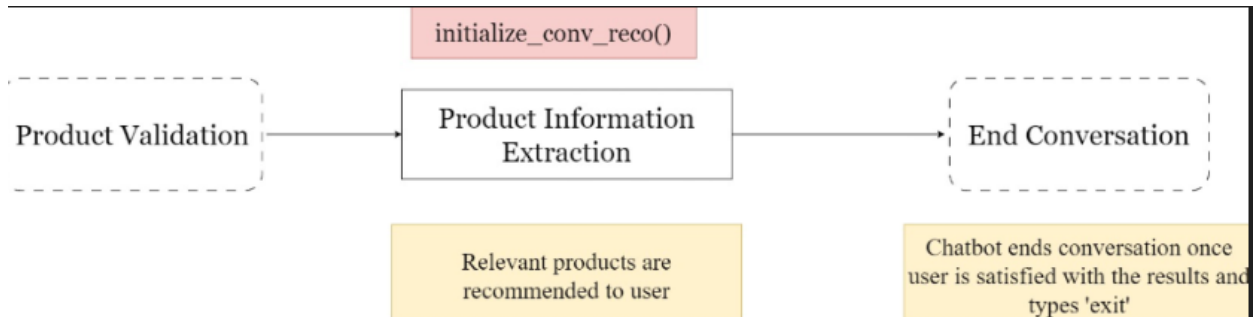


- `product_map_layer()`: This function is responsible for extracting key features and criteria from laptop descriptions.
- `compare_laptops_with_user()`: This function compares the user's profile with the different laptops and comes back with the top 3 recommendations.
- `product_validation()`: This function verifies that the laptop recommendations are good enough, has a score greater than 2, and matches the user's requirements.

Changes that i have added to enhance:

1. Added function calling API method to product_map_layer() function.

STAGE 3 Flowchart



- initialize_conv_reco(): Initializes the recommendations conversation

COMBINING ALL THREE STAGES- DIALOGUE MANAGEMENT SYSTEM

Bringing everything together, we create a diagloue_mgmt_system() function that contains the logic of how the different layers would interact with each other. This will be the function that we'll call to initiate the chatbot.

OUTPUT OF SHOPASSIST AI 2.0:

user_response: i want information about laptops

assistant_response: Hi there! I'd be happy to help you with information about laptops. Could you please tell me a bit more about what you are looking for in a laptop?

user_response: I am a coder, i require a laptop with higher RAM

assistant_response: Great to know that you are a coder! As a coder, having higher RAM is crucial for handling multiple applications and tasks simultaneously.

Do you also require a laptop with high processing speed for coding efficiently? And what is your budget range for the laptop?

user_response: yes, i require high processing speed. My budget is 70,000

assistant_response: Awesome! So, you are looking for a laptop with higher RAM, high processing speed, and your budget is 70,000.

Just to confirm, do you prefer a laptop with a high GPU for any specific coding tasks, or is it not a priority for you?

user_response: GPU can be medium

assistant_response: Thank you for the information! Based on our conversation, I have gathered the following details:

- GPU intensity: medium
- Display quality:
- Portability:
- Multitasking:
- Processing speed: high
- Budget: 70,000

To provide you with more accurate recommendations, could you please share if display quality, portability, and multitasking are important factors for you in a laptop?

user_response: display quality can be high, portability is less and multitasking also is high

assistant_response: Thank you for sharing that! Based on your requirements, here is the information I have gathered:

- GPU intensity: medium
- Display quality: high
- Portability: low
- Multitasking: high
- Processing speed: high
- Budget: 70,000

With this information, I can suggest some laptop options that fit your needs. Would you like me to recommend some laptops within your budget and specifications?

user_response: yes

assistant_response: Great! Based on your requirements of a laptop with medium GPU intensity, high display quality, low portability, high multitasking, high processing speed, and a budget of 70,000, I would recommend considering laptops from brands like Dell, HP, Lenovo, or Asus.

You can look for laptops that come with at least 8GB of RAM, a fast processor (like Intel Core i5 or i7), a dedicated GPU if possible, a Full HD display, and good multitasking capabilities.

Do some research on models like Dell Inspiron, HP Pavilion, Lenovo Ideapad, or Asus VivoBook within your budget range. These laptops usually offer a good balance between performance, display quality, and multitasking capabilities.

Feel free to explore these options and let me know if you need more specific recommendations or have any other questions.

user_response: can you give me top 3 of your suggestions

assistant_response: Based on your requirements of a laptop with medium GPU intensity, high display quality, low portability, high multitasking, high processing speed, and a budget of 70,000, here are the top 3 laptop suggestions:

1. Dell Inspiron 15: This laptop offers a good balance of performance and display quality with options for higher RAM configurations and a dedicated GPU within your budget range.
2. HP Pavilion x360: A convertible laptop that provides high multitasking capabilities, a Full HD display, and good processing speed for coding tasks.
3. Lenovo Ideapad L340: Known for its powerful performance and multitasking abilities, this laptop offers a solid build quality, high-quality display, and customizable configurations within your budget.

These suggestions should meet your requirements and provide a good coding experience. Feel free to explore these models in detail and choose the one that best fits your needs. Let me know if you need more information or have any other preferences!

user_response: can you also specify the budget of the laptops alongside the specified laptops please

assistant_response: Sure, here are the top 3 laptop suggestions along with their approximate budget ranges:

1. Dell Inspiron 15: Price range - 60,000 to 75,000
2. HP Pavilion x360: Price range - 65,000 to 80,000
3. Lenovo Ideapad L340: Price range - 55,000 to 70,000

These laptops offer a good balance of performance, display quality, and multitasking capabilities within your budget of 70,000. You can further explore these models online or at local stores to find the best deal that suits your coding needs. Let me know if you need more information or assistance in choosing the right laptop!

user_response: thank you

assistant_response: You're welcome! If you have any more questions in the future or need further assistance, feel free to ask. Good luck with finding the perfect laptop for your coding needs! Have a great day!

user_response: exit

assistant_response: Goodbye! If you ever need assistance again, feel free to reach out. Have a wonderful day ahead!

INFERENCE:

The budget specified by the user in the conversation was 70k, the model has suggested top 3 laptops in the same price range window.

TOOLS USED:

GPT version- 3.5-turbo

Tenacity

Libraries like JSON,pandas

APIS from openai- chat completions, moderation api, functions and arguments in chat completions

My learning in this project:

1. Gained a good understanding of how to write better prompts to get what we want as output from the AI.
2. Got a hands on experience working with chat completions api, moderation api.
3. Understood on how to design a strong system design for a use case.