Shopping Assistant Assignment

1. Background:

In the contemporary digital era, online shopping has emerged as the preferred mode of purchase for a significant portion of consumers. Nevertheless, the extensive array of options and the tendency towards personalized assistance can render the shopping experience overwhelming and arduous. To mitigate this challenge, we introduce ShopAssist Al, a chatbot that integrates the capabilities of large language models and rule-based functions to deliver precise and trustworthy recommendations throughout the online laptop shopping process.

2. Problem Statement:

Given a dataset containing product names, specifications, descriptions, and other relevant information about laptops, the objective is to construct a chatbot named ShopAssist Al. This chatbot will engage in user interactions, comprehend user laptop requirements, and subsequently recommend the most suitable laptops from the dataset based on those requirements and preferences.

3. Dataset:

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 off 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 immers
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. Powered by an Intel Core i7 processor running at 2.6 GHz, it delivers exceptiona processing power for smooth gaming and demanding tasks. With 16GB of RAM a 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

4. Approach:

1. Conversation and Information Gathering:The chatbot will employ language models to comprehend and generate natural responses. Through a conversational dialogue, it will pose pertinent inquiries to acquire information pertaining to the user's requirements.

2. Information Extraction Action: Upon the collection of the crucial data, rule-based algorithms are employed to identify the top three laptops that most effectively align with the user's requirements.

3. Personalized Recommendation: Leveraging the extracted information, the chatbot initiates additional dialogue.

5. System Functionalities:

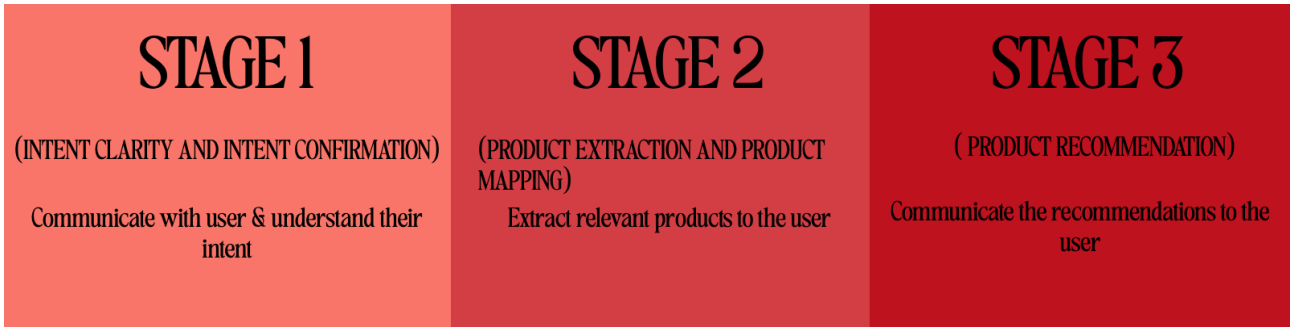
User Interface: The ShopAssistAI platform boasts an intuitive web interface that facilitates seamless interaction with the conversational AI assistant.

Conversational AI: The core of this system is the conversational AI, which utilizes OpenAI's chat model to guide users by posing pertinent questions and accurately identifying their specific requirements.
User Input Moderation: To maintain a secure conversational environment, each input is regulated through OpenAI's moderation API.
User Profile Extraction: The AI assistant collects pertinent information during the conversation to construct a user profile that accurately represents their laptop preferences, including budget, display quality, processing power, and portability. This is achieved using OpenAI's function calming mechanism to convert user requirements into JSON format.

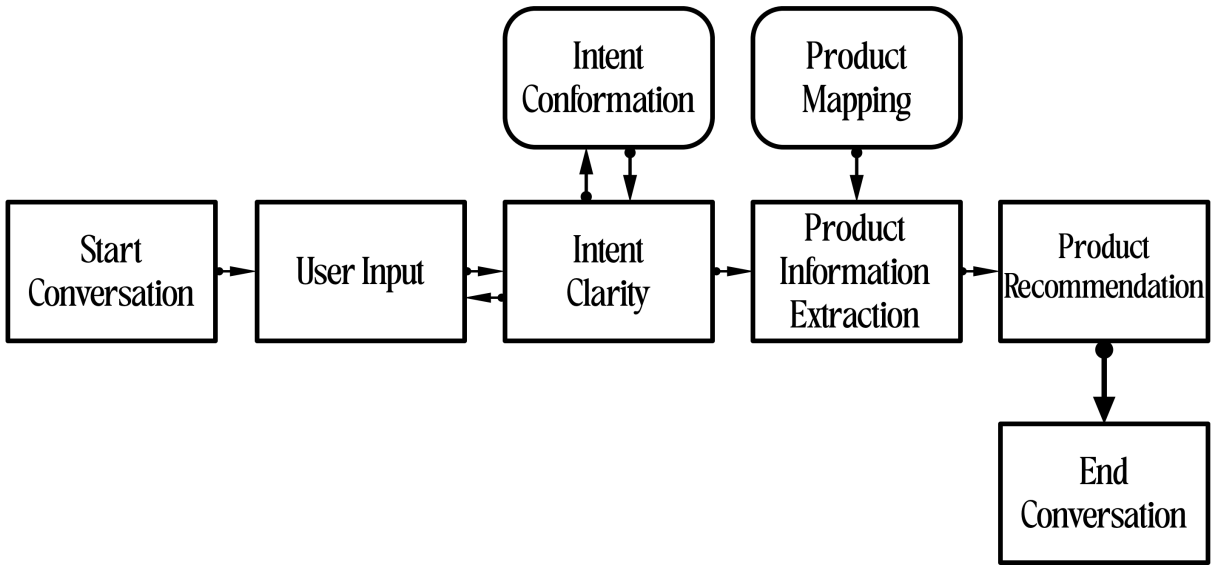
The dataset laptop_data.csv contains nckides rows that provide detailed specifications for each laptop, accompanied by a brief description at the end of each entry. The chatbot wM utilizes large language models to interpret the Description column and generate personalized recommendations.

6. System Architecture:

ShopAssistAI operates on a client-server architecture. Users interact with a web interface hosted on a server using the Flask application. This application communicates with OpenAJ'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 provides a comprehensive suite of functionalities, including:

Routing: This functionality directs user requests to the appropriate functions based on the specified URLs.

Conversation Management: This component oversees the initiation of conversations, the generation of responses utilizing OpenAI's chat model, and the maintenance of conversation history.

User Input Processing: This component captures user input, conducts moderation checks, and extracts user professions from the conversation history. It also converts the user input string into JSON format using OpenAI Function calling.

Recommendation Logic: This component assesses user profiles against laptop data, verifies the validity of recommendations, and generates the corresponding recommendation text.

Major Functions:

Initialize.conversation(): This function initializes the conversation with the system message.

get_chat_completions(): This function takes the ongoing conversation as input and returns the response from the assistant.

moderation_check(): This function checks if the user's or the assistant's message is inappropriate. If any of these messages is inappropriate, it terminates the conversation.

intent_confimation_layer(): This function verifies if the chatbot has accurately captured the user's profession.

dictionary_present(): This function checks if the final understanding of the user's profile, returned as a Python dictionary, is present in the conversation history.

compare_laptops_with_user(): Compares the user's profile with the available laptops and provides three 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_APl_Key" to access the OpenAI API.