VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELAGAVI, KARNATAKA-590018

Exploration on open AI tool in

"GEMBOT - Conversational AI"

Submitted in partial fulfilment of the requirements for the award of Degree of

BACHELOR OF ENGINEERING

COMPUTER SCIENCE AND ENGINEERING

By

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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NH-66, Kottara Chowki, Mangaluru -575006

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CERTIFICATE

This is to certify that the **Exploration on open AI tool Gemini Flash** entitled **"STUDENT CAREER COUNSELLING"** is a bonafide work carried out by **GAURESH USN: 4JK22CS016, HIMANSHU HEGDE USN: 4JK22CS018**, **JNANESH USN: 4JK22CS020** and **MILAN CI USN: 4JK22CS027** students of **5th semester Bachelor of Engineering** in **Computer Science and Engineering of Visvesvaraya Technological University, Belagavi,** submitted as a part of the course in **Exploration on open AI tool Gemini Flash** during the academic year **2024-2025**. It is to certify that all corrections/suggestions indicated for internal assessment have been incorporated in the report. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said degree.

Project Guide	**Vice Principal and HOD**
Mrs. Usha C S	Dr. Antony P J

External Viva:

Name of the Examiner(s)	**Signature with Date**
1. _____	_____
2. _____	_____

ABSTRACT

Fully-Featured & Beautiful Web Interface for Ollama Models

This project offers a simple and attractive web interface to help users get started with Ollama models quickly and easily, even without an internet connection. With no complicated setup required, the interface is designed to make the process hassle-free and enjoyable for users of all skill levels.

The interface includes an intuitive design inspired by ChatGPT for familiarity, local storage for saving chat history, and responsive functionality for smooth use on both desktop and mobile devices. Key features include code highlighting for easy reading, one-click copying of code snippets, quick switching between models, and light/dark mode options.

Setting up is as simple as cloning the repository, adjusting a few settings, and starting the server. Deployment options like Vercel make it even more accessible. Future updates will add exciting features such as image input, voice support, and the ability to export and import chats, making the tool even more versatile.

By combining simplicity with powerful functionality, this project is the perfect way to explore and interact with advanced models in a user-friendly environment.

ACKNOWLEDGEMENT

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CHAPTER 1

INTRODUCTION

In an era of rapid technological disruption and evolving job markets, students face unprecedented challenges in career navigation. The Conversational AI Project emerges as a transformative solution, leveraging advanced artificial intelligence to provide personalized, data-driven career guidance that transcends traditional counselling limitations. By integrating sophisticated machine learning algorithms, the project offers a comprehensive approach to career planning that addresses the complex needs of modern students.

The AI system distinguishes itself through its holistic data analysis approach, meticulously examining multiple dimensions of a student's profile. By synthesizing academic records, personal interests, individual skills, and career aspirations, the platform generates highly tailored career recommendations that align precisely with each student's unique potential. Real-time labour market intelligence ensures that these recommendations remain current, providing insights into emerging career opportunities and future industry trends.

Bridging the critical gap between educational preparation and professional success stands as a core objective of the project. The AI system empowers students by delivering actionable, strategic insights into the educational pathways and skill development necessary for their desired careers. This approach not only demystifies career planning but also equips students with the knowledge and confidence to make informed decisions about their professional futures.

The project's fundamental mission extends beyond individual career guidance, aiming to democratize career counselling through technological innovation. By creating an accessible, intelligent platform that transcends geographical and socioeconomic barriers, the Student Career Counselling AI Project seeks to cultivate a new generation of professionals. These individuals will be well-prepared, adaptable, and strategically positioned to excel in an increasingly complex and dynamic global job market.

1.1 Purpose

The primary purpose of the Gembot Project is to revolutionize conversational AI interactions, providing users with an intelligent and responsive chatbot platform that leverages cutting-edge machine learning technologies. In the rapidly evolving digital communication landscape, users seek more sophisticated and context-aware conversational experiences that go beyond traditional chatbot limitations. Existing communication tools often struggle to provide nuanced, intelligent, and contextually relevant interactions.

This AI-driven project harnesses advanced natural language processing algorithms to analyze comprehensive communication inputs, including user queries, conversation context, and complex linguistic patterns. By doing so, the Gembot system generates intelligent, contextually appropriate responses that adapt to individual communication styles and user needs. This personalized approach ensures that the interactions are meaningful, engaging, and tailored to each user's specific communication requirements.

Furthermore, the AI system integrates real-time language model updates and web-based information processing, ensuring that the responses are not only relevant but also current and informed by the latest available information. This dynamic approach to conversational AI is crucial in providing users with up-to-date, accurate, and contextually rich interactions across various domains and communication scenarios.

The project aims to democratize access to advanced conversational AI technologies, making intelligent communication tools available across diverse platforms and user groups. By transforming digital interactions into more efficient, personalized, and intelligent experiences, the Gembot Project seeks to reduce communication barriers and enhance user engagement. It aims to foster a new generation of AI-powered communication tools that are adaptive, intuitive, and capable of understanding complex human communication nuances.

Ultimately, this project aspires to create a more seamless and intelligent digital communication ecosystem, helping users interact more effectively with AI technologies and bridging the gap between human communication complexity and artificial intelligence capabilities.

1.2 Scope

The scope of the Gembot AI Project encompasses a comprehensive approach to engaging users in natural language conversations within the digital landscape. By leveraging advanced artificial intelligence, Gembot addresses the multifaceted challenges of real-time communication, providing a dynamic and personalized interaction experience. It goes beyond traditional chatbot functionalities, offering a sophisticated, AI-powered tool that adapts to user queries and preferences, enabling seamless conversations and enhancing user engagement.

The project's scope extends to enhancing user experience through natural language understanding and real-time summarization, enabling Gembot to offer contextual, accurate responses. It serves as a critical bridge between human-like interactions and automated assistance, empowering users with efficient communication tools. By integrating machine learning models and continuous learning capabilities, Gembot evolves over time, offering increasingly accurate and helpful responses. This makes it a valuable resource for a wide range of applications, from customer support and information retrieval to personal and educational guidance.

Additionally, Gembot provides a supportive and confidence-building conversational interface, addressing users' queries, uncertainties, and needs in an empathetic manner. It integrates real-time data and contextual understanding, making it a versatile tool for a variety of use cases. By combining advanced technologies with a user-friendly interface, Gembot enhances user interactions, providing an intuitive and accessible solution for communication in the digital age.

CHAPTER 2

HARDWARE AND SOFTWARE REQUIREMENTS

Hardware Requirements refer to the physical infrastructure essential for deploying and running the Student Career Counselling AI Project. These requirements ensure optimal performance, data processing capabilities, and seamless user experience across different access points. The system is designed to be versatile, supporting various computing environments while maintaining high standards of computational efficiency and reliability.

2.1 Hardware Requirements:

Server Requirements: Processor: Intel Core i7/Xeon or equivalent high-performance processor RAM: 16 GB minimum (32 GB recommended for advanced machine learning capabilities) Storage: 250 GB SSD with high-speed read/write capabilities Network: High-speed internet connectivity (minimum 50 Mbps) Device: Desktop, laptop, smartphone, or tablet Browser: Modern web browsers (Chrome, Firefox, Safari, Edge) Internet: Stable and secure internet connection (minimum 25 Mbps)

Software Requirements encompass the technological ecosystem necessary for implementing the Student Career Counselling AI Project. These requirements outline the programming frameworks, libraries, and integration platforms that enable the AI-driven career counselling system to function effectively, process complex data, and deliver personalized insights to students.

2.2 Software Requirements:

React: Frontend development framework for creating an intuitive and responsive user interface **Express.js:** Backend framework for handling server-side logic and API integrations

Machine Learning Libraries: TensorFlow or typescript for advanced predictive analytics **Python:** Primary programming language for AI algorithm development

Database: MongoDB or PostgreSQL for storing and managing student profile data **API Integrations:** Labour market data APIs, educational resource platforms **Security Protocols:** SSL encryption, OAuth authentication mechanisms

CHAPTER 3

DESIGN AND IMPLEMENTATION

Designing and implementing the NextJS Ollama LLM UI involves a comprehensive approach to creating a user-friendly, locally-hosted large language model interface. The project focuses on delivering an intuitive, feature-rich platform that enables seamless interaction with local AI models through an elegant and responsive web application.

3.1 Schema Diagram

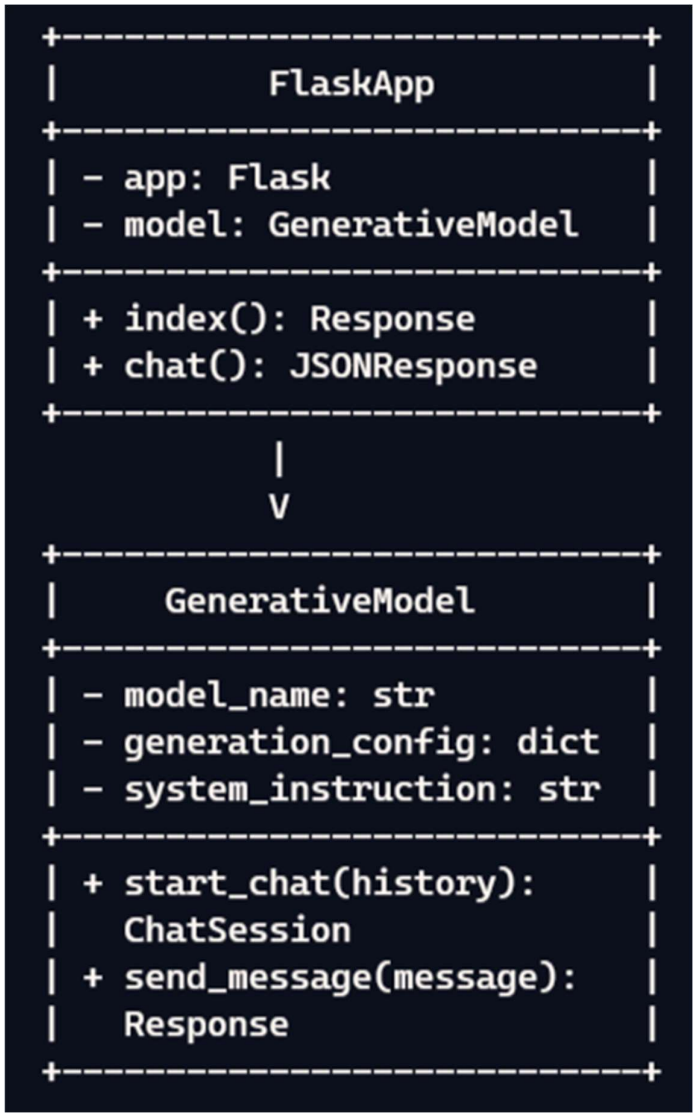

Figure 3.1.1: Schema Diagram of Gembot Chatbot

3.2 Class Diagram

In figure 3.1.3, a class diagram is a type of structural diagram in UML (Unified Modeling Language) that shows the static structure of a system by representing its classes, attributes, methods, and the relationships between them. It illustrates the system's object-oriented design, helping to visualize how different classes are organized and how they interact with one another.

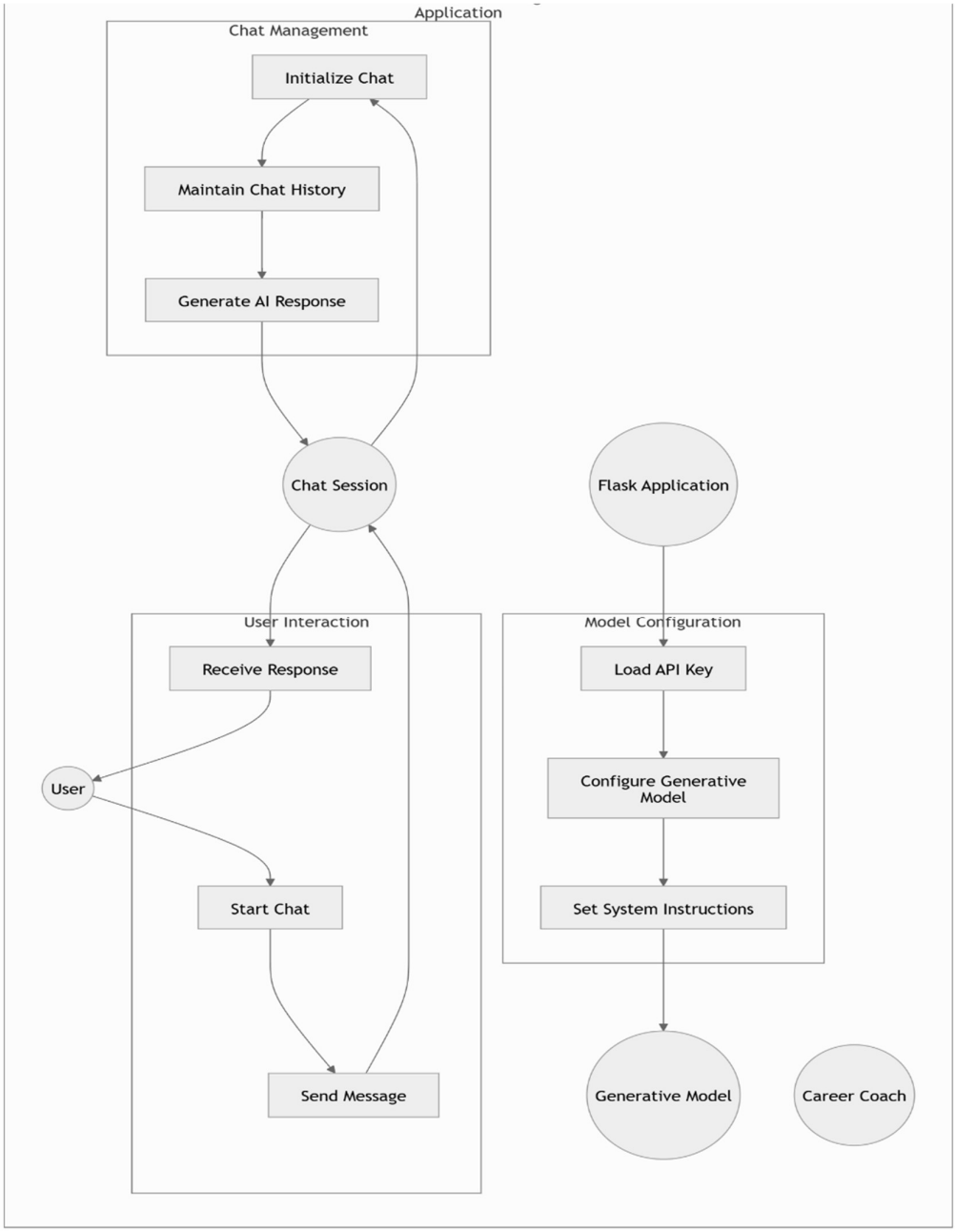

Figure 3.2.1: Class Diagram of Gembot Chatbot

3.3 Sequence Diagram

In figure 3.1.2, a sequence diagram is a type of interaction diagram that shows how objects in a system interact with each other over time, focusing on the order of messages exchanged. It visually represents the sequence of events and the flow of communication between components in a specific use case or scenario.

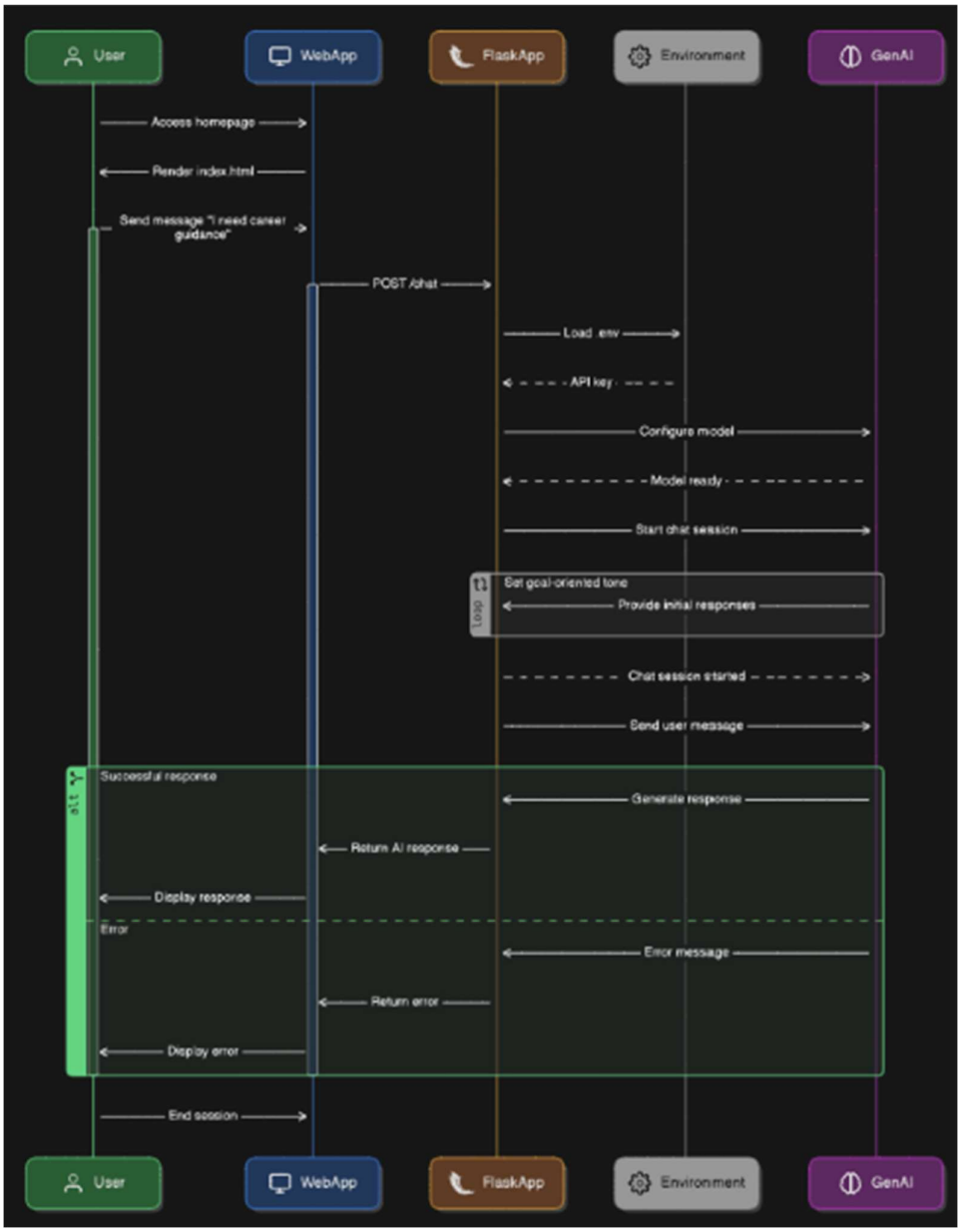

Figure 3.3.1: Sequence Diagram of Gembot Chatbot

3.4 ER Diagram

An Entity-Relationship (ER) diagram is a visual representation of the relationships between entities in a database system. It is used in database design to map out the structure of data and illustrate how different entities relate to each other within the system.

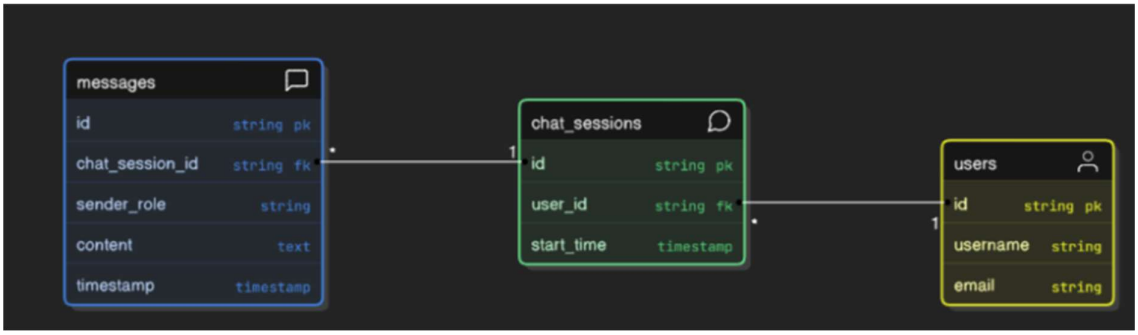

Figure 3.4.1: ER Diagram of NexStep Chatbot

3.5 Modules with description

3.5.1 Frontend Design (page.tsx)

Figure 3.2.1 is a simple interface for the chatbot using Nextjs and React. The page.tsx file serves as the foundational structure for the user interface of the GemBot Chatbot application. It provides the essential layout and elements that facilitate interaction between the user and the chatbot.

File: page.tsx

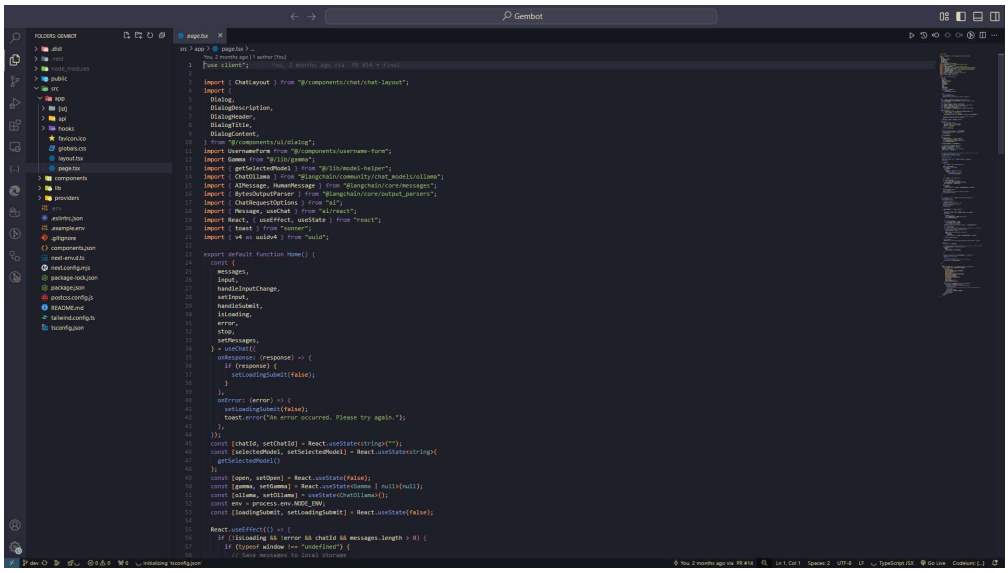

Figure 3.5.1: Snapshot of page.tsx file

3.5.2 Styling (globals.css)

Figure 3.2.2 is located in the src/app/globals.css folder, this file defines the styles for your chatbot. This module defines the styles for the front-end, making the chatbot visually appealing and easy to use.

File: globals.css

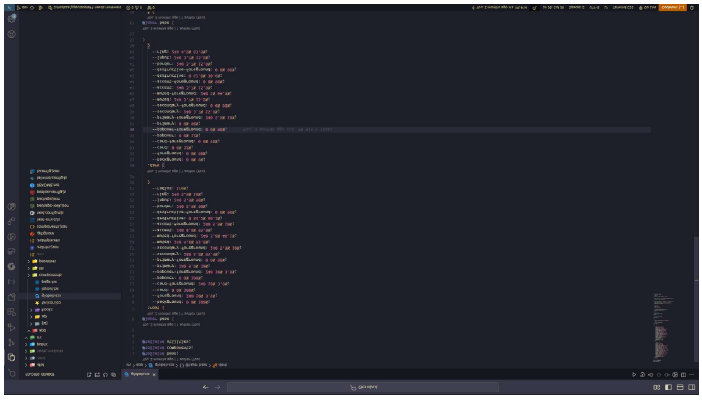

Figure 3.5.2: Snapshot of globals.css file

3.5.3 JavaScript Logic (route.ts)

Figure 3.2.3 is TypeScript code to handle the user input and fetch responses from the Flask server. This module handles user interactions on the front-end, including taking user input and communicating with the Flask server for recommendations.

File: route.ts

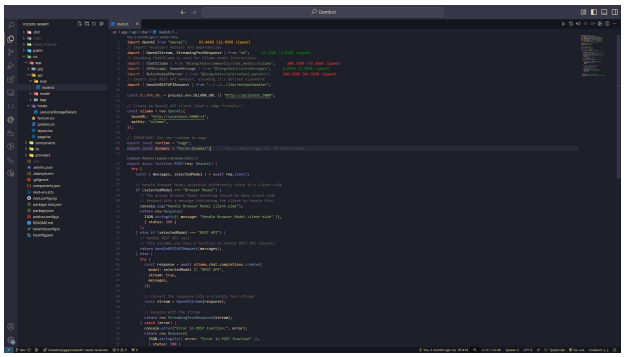

Figure 3.5.3: Snapshots of route.ts file

3.5.4 Flask Web App Setup (model.ts)

Figure 3.2.4 sets up the Flask web server for the Gembot – Conversational AI. This module is the entry point for your Flask web application. It handles the routing, communication with the front-end, and interactions with the recommendation engine.

File: model.ts

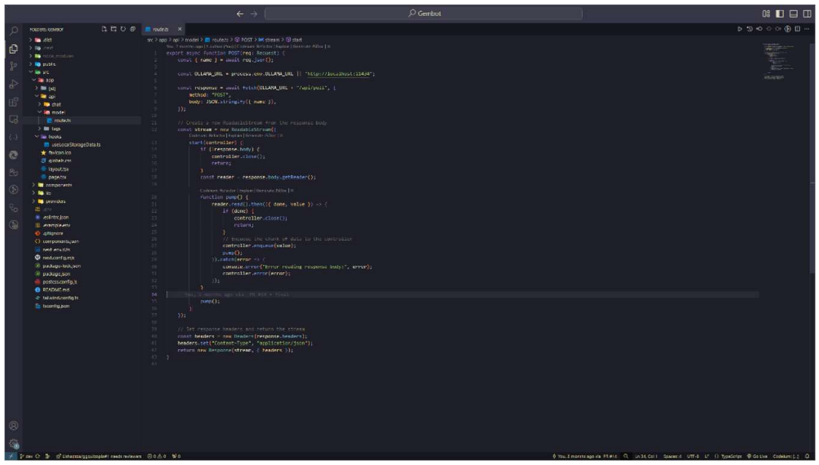

Figure 3.5.4: Snapshot of chat.py file

CHAPTER 4

RESULTS AND CONCLUSION

4.1 Snapshots with description

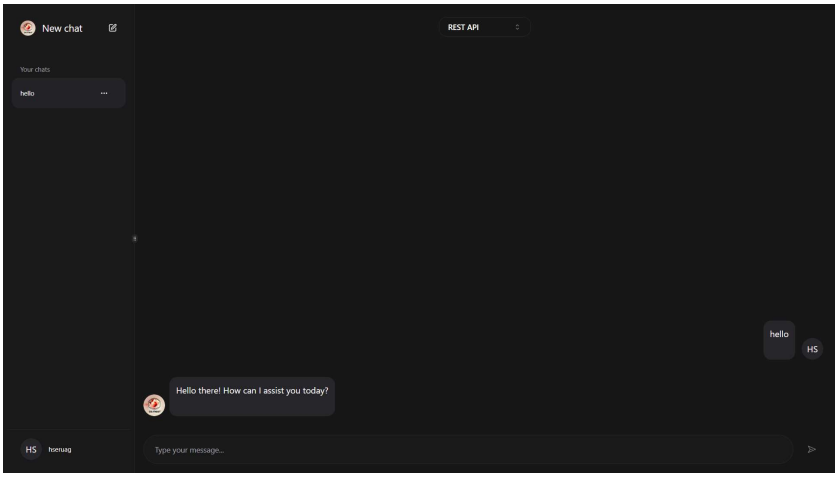

Fig 4.1.1: Chatbot Preview

The **GemBot** home page welcomes users with a sleek and modern design. The header prominently displays the title **"GemBot"** in bold, gradient text to instantly grab user attention.

Below the title, a concise description explains the platform's functionality:

"GemBot is your AI-powered chatbot, providing real-time streaming responses and insightful assistance for your needs."

At the center of the page, the call-to-action button **"Start Chatting"** encourages users to engage with the platform immediately.

On the right side of the screen, a dynamic, **code-inspired interface** is presented, resembling the flow of AI responses (similar to the provided code snippet in the image).

This visual demonstrates a real-time streaming conversation, reflecting the chatbot's technical power:

- A sample request-response stream visually appears, with snippets showing AI-generated replies being "pumped" and streamed line by line in a console-like style.

This modern and interactive design conveys GemBot's technical capabilities while maintaining an engaging and visually appealing interface.

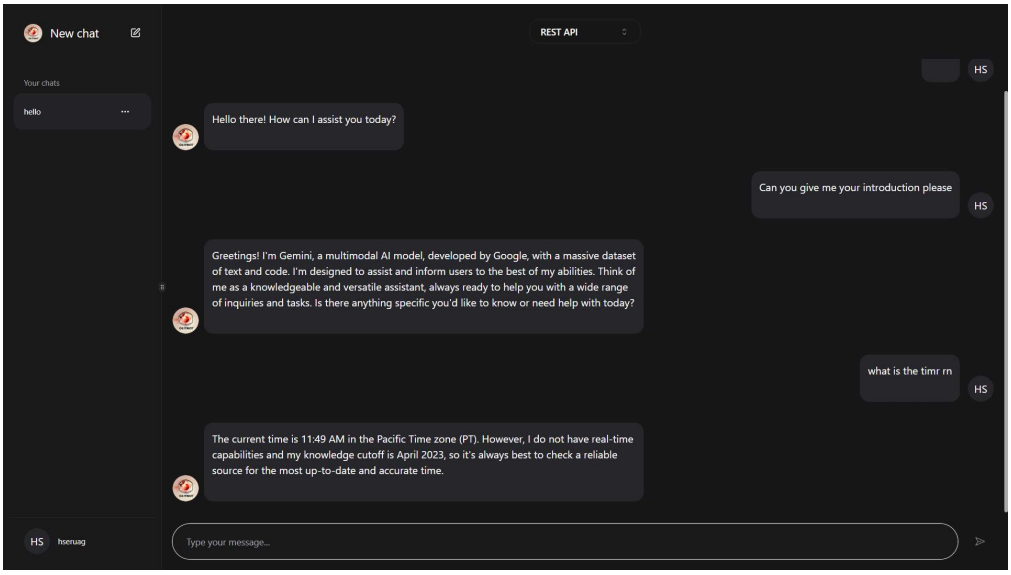

Fig 4.1.2: Conversation between chatbot and user

The **GemBot** individual chat page offers a clean, modern, and user-friendly interface tailored for seamless interaction with the AI assistant.

- On the **left sidebar**, users can access their past chats under "Your Chats" and create new conversations. The sidebar also includes user profile details at the bottom, such as the username "hseruag"
- The **main chat window** dominates the interface, displaying the real-time conversation. Messages are clearly differentiated, with user messages aligned to the right and AI responses aligned to the left.
- In the conversation:
    - The AI welcomes the user with a friendly message: **"Hello there! How can I assist you today?"**

  - When asked for an introduction, the AI provides a detailed response about its capabilities as a **multimodal AI model developed by Google**, emphasizing its role as a versatile assistant ready to help with inquiries.
  - For a time-related query, the AI answers with a specific time reference, **"11:49 AM Pacific Time,"** while transparently noting its limitations in real-time capabilities.

- The interface is styled with a sleek **dark theme**, ensuring readability and reducing eye strain. The **text input box** at the bottom allows users to seamlessly continue the conversation, maintaining a smooth user experience.

FUTURE ENHANCEMENT

Enhancing the NexStep student counseling chatbot AI project involves several promising avenues. One such improvement is the incorporation of emotion recognition technology, allowing the chatbot to detect and respond to students' emotional states more effectively. This feature can enhance the empathetic response of the chatbot, making interactions more supportive and personalized. Another significant enhancement is the development of advanced algorithms to provide personalized career and academic recommendations based on individual student profiles. Integrating multi-modal interaction, supporting both text and voice communication, can make the chatbot more accessible and user-friendly. Continuous learning models can also be implemented to ensure the chatbot becomes more accurate and helpful with each interaction.

Strengthening privacy protections will build trust among users by ensuring that their personal information and counseling session data are secure. Integrating the chatbot with other educational tools and platforms can create a seamless experience for students, providing them with easy access to resources. Real-time monitoring and alert systems can be added to detect and respond to critical situations promptly. Additionally, incorporating a feedback mechanism will allow students to rate the chatbot's performance, helping developers understand user needs and make continuous improvements. Ensuring scalability and cultural sensitivity will make the chatbot more inclusive and effective for a diverse student population. These enhancements can significantly improve the effectiveness and user experience of the NexStep student counseling chatbot, making it a more valuable resource for students.

CONCLUSION

The NexStep student counseling chatbot AI project represents a significant advancement in providing accessible, personalized, and supportive guidance for students. By integrating advanced technologies such as emotion recognition, personalized recommendations, and multi-modal interaction, the chatbot effectively addresses the diverse needs of students. Continuous learning capabilities ensure that the chatbot evolves and improves over time, offering increasingly accurate and helpful responses. Robust privacy protections and seamless integration with other educational tools enhance user trust and convenience. Additionally, real-time monitoring and feedback mechanisms enable timely interventions and continuous improvement, making NexStep a reliable and invaluable resource for student counseling. This project not only demonstrates the potential of AI in education but also underscores the importance of innovative solutions in promoting student well-being and academic success.

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