PRDv1

Team Name: Gold Cats

Project Title: Gaucho Buddy

Company: Appfolio

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Background

In today's rapidly evolving educational landscape, the demand for comprehensive and readily accessible information to aid students in their course selection journey has reached a paramount level of importance. As educational institutions like the University of California, Santa Barbara (UCSB) strive to adapt to the ever-changing needs of their student body, the necessity for students to efficiently navigate course information, academic policies, and faculty details has never been more critical. Recognizing this growing demand for an all-encompassing academic support system, a visionary project has emerged. This project proposes the development of a web application integrated with a Large Language Model (LLM)-powered chatbot to revolutionize the course selection process. The primary goal is to empower students with the necessary tools and information, enabling them to make well-informed academic decisions. This pioneering web

application, coupled with the capabilities of an LLM chatbot, has the potential to provide students with round-the-clock academic advising assistance, delivering accurate and personalized guidance tailored to their individual needs.

This innovative solution represents a paradigm shift in the way students access academic support. The web application, alongside the LLM-powered chatbot, promises to be a game-changer in the realm of academic advising. The chatbot's capacity to offer 24/7 assistance ensures that students can receive guidance precisely when they need it, reducing the burden on human advisors and enhancing the overall student experience. By seamlessly integrating detailed course information, historical grade distributions, professor ratings, and peer-to-peer connectivity, this integrated platform aims to optimize students' academic journeys. With this comprehensive information at their fingertips, students will be better equipped to make informed decisions about their courses, gain insights into faculty members' teaching styles, and have a more well-rounded understanding of their overall academic experiences. This holistic approach to academic support not only facilitates smarter course selections but also fosters a stronger sense of community and engagement among students at UCSB.

Project Goals

The overarching goal of this project is to lay the foundation for a cutting-edge web application, potentially serving as a significant enhancement to the existing Gold website infrastructure at UCSB. Through the incorporation of a diverse range of advanced features, meticulously tailored to address the multifaceted requirements of the student community, the project aspires to redefine the academic support system at UCSB. With a strategic focus on seamless integration, the project aims to introduce an innovative advisor LLM chatbot, an extensive database of comprehensive grade distributions, a dynamic professor rating system, and an interactive group chat functionality.

The envisioned amalgamation of these sophisticated features aspires to foster the development of a robust and holistic ecosystem, one that is designed to serve as a comprehensive resource hub for students. By incorporating an advisor LLM chatbot, the project not only aims to streamline the process of accessing academic advice but also intends to provide students with immediate and accurate responses to a diverse array of academic queries, thereby alleviating the mounting academic pressures faced by the student body. Simultaneously, the integration of comprehensive grade distribution records and a professor rating system is envisioned to equip students with invaluable insights into course difficulty levels, teaching styles, and historical trends, facilitating informed decision-making when selecting courses and faculty members. Furthermore, the implementation of a group chat functionality aims to nurture a more interconnected academic community, fostering collaboration, knowledge-sharing, and a sense of collective academic

engagement amongst the students at UCSB. By fostering transparency, collaboration, and informed decision-making, this initiative seeks to elevate the overall learning experience and pave the way for a more enriched and dynamic academic environment at UCSB.

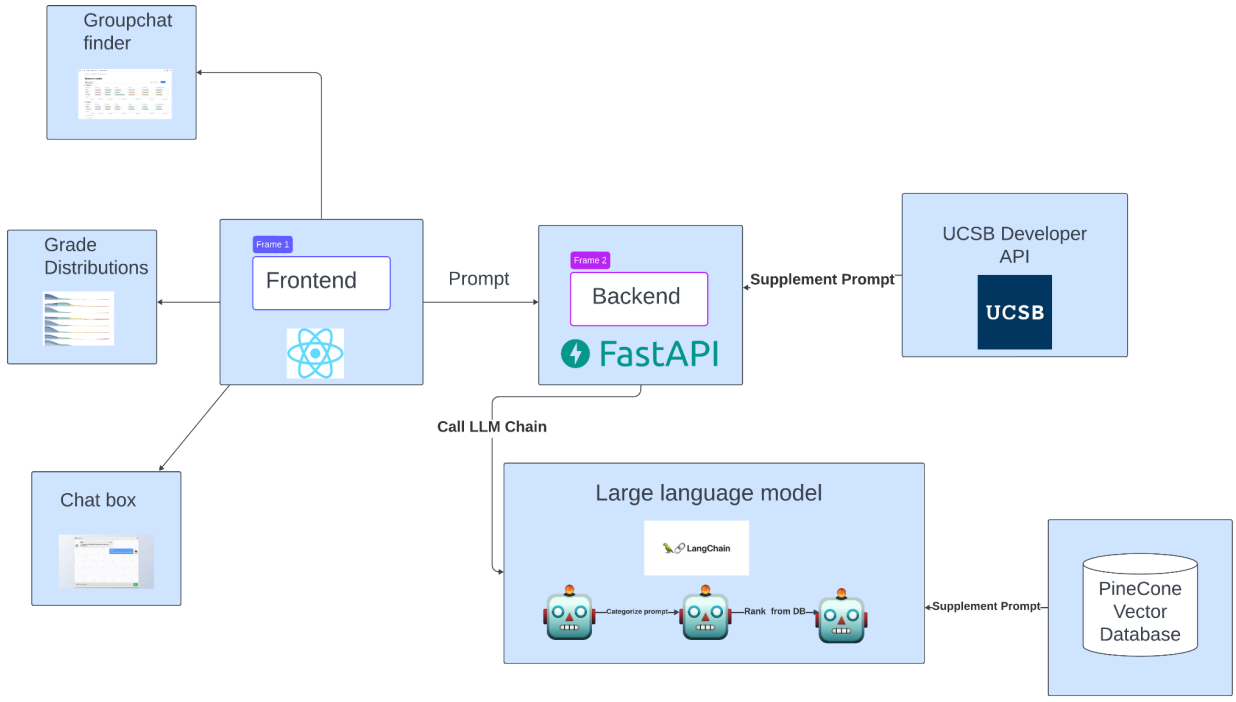
Project Specifications

The innovative integration of an advisor LLM chatbot, leveraging language models and UCSB's academic data, signifies a paradigm shift in the accessibility of academic support services. Furthermore, the implementation of a professor rating system utilizing advanced language models promises to provide students with concise and informative insights into course difficulty levels and teaching quality. Lastly, the integration of a group chat feature fosters collaboration and knowledge-sharing among students enrolled in the same courses, thereby facilitating a more engaged and interconnected academic community. Through these technological advancements and innovative solutions, the project aims to revolutionize the way students navigate with their academic life at UCSB, promoting transparency, informed decision-making, and holistic academic growth.

Our second phase project will be the existing Gold website at UCSB lacks certain critical features necessary for students to make well-informed decisions when selecting courses. The absence of comprehensive historical grade distributions, an intelligent advisor assistance system, and a peer-to-peer communication platform has posed significant challenges for students in understanding course expectations, effectively planning their academic journey, and accessing timely academic guidance. To address these challenges, our project proposes the incorporation of a cutting-edge extension directly into the Gold website, ensuring seamless integration of features for a user-friendly experience.

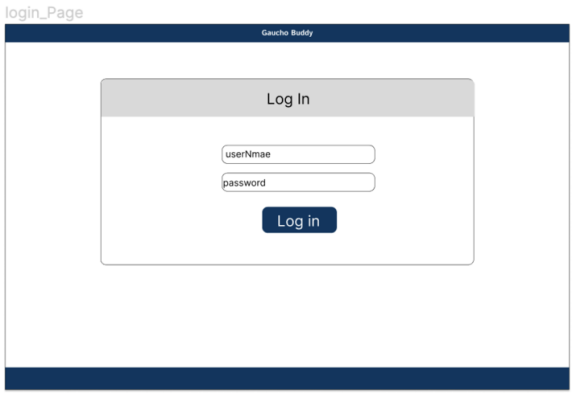
System Architecture Overview:

High Level Diagram:



UI Design:

https://www.figma.com/file/34Iw2PUgw15bL7OkbV7btm/Untitled?type=design&node-id=0-1&mode=design&t=1Mw5AqM6HmFf9zIq-0



Requirements:

System Models:
“ How well does professor moomoo teach”
“Who is teaching CS 189A this quarter?”
“What course should I take to learn about sea animals?”
“What is the hardest CS class?”
“Is CS184 offered in spring ?”
“What are some upper division courses for my major that I can take this quarter?”
“Can I take more than 21 units a quarter and how to do it?”
“What are good courses (easy A) courses to fulfill Area E?”
“Can i take less than 12 units a quarter and how to do it?”
“What is some good 1 unit I can take?”
“What are the graduation requirements for CS”?

User Interaction
Our users can interact with our service via the web application and the GOLD extension
Web Application (Phase 1): The web application serves as the primary interface for users to access the service. It consists of the following key features:

- Chatbot Supported by OpenAI LLM: This chatbot acts as a virtual assistant, providing users with interactive and personalized support. Leveraging OpenAI's Language Model, the chatbot can offer real-time assistance, answer queries, provide guidance, and even facilitate learning processes by responding to user questions.
- Course Information Page: Within the web application, there is a dedicated page that displays comprehensive information about various courses. This information typically includes details such as the instructor's name, course schedule, and historical grade data. Users can refer to this page to gain insights into the courses they are interested in and make informed decisions about their academic pursuits. This page will also show the grade distributions of previous iterations of the courses. The page will also have a google form where students can submit reviews about the course and the reviews will be visible to other logged in students. There will also be a link or a QR code to the group chat for this specific course.

GOLD Extension (Phase 2): The GOLD extension is designed as an additional tool to enhance the user experience, particularly when users are browsing through different courses on the official website. The key features of this extension include:

- Integration with GOLD Website: The extension is seamlessly integrated with the GOLD website, allowing users to access relevant information effortlessly. By leveraging this extension, users can easily view course-related details, instructor information, and historical grade data without navigating away from the GOLD website. This integration streamlines the process of accessing critical information and enables users to make informed decisions about course selection and academic planning.
- Enhanced Accessibility: By incorporating the GOLD extension, users can conveniently access crucial information while browsing through multiple courses on the official website. This feature eliminates the need for users to switch between different platforms or applications, thereby enhancing the overall efficiency and user-friendliness of the service.

User Stories:

1.As a user, I want to use the advisor chatbot to ask for course recommendations based on my year and major or some specific GE requirements.
Issue link:
https://github.com/UCSB-Capstone-Team5/GauchoBuddy/issues/16#issue-1969385097
Scenarios: Users can ask questions like “What course should I take to learn about Sea animals?”, “What are good courses (easy A) courses to fulfill Area E?” The chtbot should answer questions accurately.

2. As a user, I want to evaluate and provide feedback to the course I have taken on the web app.
Issue link:
https://github.com/UCSB-Capstone-Team5/GauchoBuddy/issues/17#issue-1969385455
Scenarios: User can click on a course and input some reviews about the course and about the instructor. The reviews are visible to other users.

3. As a user, I want to have the course and its historical grade information or review about professor clearly listed on the GOLD website or our WebApp
Issue link:
https://github.com/UCSB-Capstone-Team5/GauchoBuddy/issues/18#issue-1969386968
Scenarios: When a user enters the course page, there is clear and visual information about the past grades statistics.

4. As a user I want to use the web app to connect with my peers who take the same course with me.
Issue link:
https://github.com/UCSB-Capstone-Team5/GauchoBuddy/issues/19#issue-1969387211

Scenarios: Users can use our app to search for a course and then choose to join a group chat for the given course.

5. As a user I want to get advice from the chatbot on how well a professor is teaching the course.
Issue link:
https://github.com/UCSB-Capstone-Team5/GauchoBuddy/issues/20#issue-1969387492
Scenarios: users can ask questions like " How well does professor moomoo teach" and get information about it based on other users' reviews or possibly ratemyprofessor.

6. As a user i want to login to the chatbot easily using my UCSB account or email
Issue link:
https://github.com/UCSB-Capstone-Team5/GauchoBuddy/issues/22#issue-1969388272
Scenario: Users have the option to log in with their UCSB account and thus they can have access to the group chat and course review functions.

7. As a user, I want to know about all the Computer Science course that is not conflicted with my schedule
Issue link:
https://github.com/UCSB-Capstone-Team5/GauchoBuddy/issues/23#issue-1969388479
Scenario: Users can input his own requirements including his own schedules and his desired courses. The chatbot should respond with a set of courses that the user can choose to take.

8.As a user, I want to know how I can graduate in three years.
Issue link:
https://github.com/UCSB-Capstone-Team5/GauchoBuddy/issues/24#issue-1969388684
Scenario: Users can input their completed classes so far and then ask how they could graduate in three years. The chatbot should provide a detailed quarter-by-quarter plan on what classes to take in order to graduate.

9. As an admin, I want to be able to add, remove, modify, and edit the class group chats.
https://github.com/UCSB-Capstone-Team5/GauchoBuddy/issues/25#issue-1969389023
Scenarios: Admin can create and modify group chat and put the chat link into the database.

10. As a user, I want to be able to scroll through the chat bot and view past answers per session.
Issue link:
https://github.com/UCSB-Capstone-Team5/GauchoBuddy/issues/26#issue-1969389227
Scenarios: Users can view all recent chat log with the chatbot within the same session. Upon refresh, the session should still remain. Only after the tab is closed would the messages be lost.

Stretch Goals (if time allows):

11. As a user, I want to know the chance of getting in course through the waitlist.
Issue link:
https://github.com/UCSB-Capstone-Team5/GauchoBuddy/issues/25#issue-1969389023
Scenarios:

12. As a user, I want to be able to scroll through the chat bot and view past answers from the beginning.
Issue link:
https://github.com/UCSB-Capstone-Team5/GauchoBuddy/issues/26#issue-1969389227
Scenarios: Users can view all recent chat log with the chat bot.

Appendices (Technologies used)

- Frontend: React.js, Javascript, HTML/CSS
- Backend: FastAPI, Python
- LLM:Langchain, OpenAI
- Deployment: Docker, AWS
- Database: PineCone