Project Title: <u>College Ranker</u>

Project Summary: College Ranker aims to improve the college decision-making process of parents and highschoolers by integrating traditional ranking systems with user-generated insights. By aggregating rankings from major sources like US News, THE, and QS, we create a more balanced and transparent average ranking system tailored for domestic students. Users can filter rankings based on various criteria and set personal school preferences. Upon enrolling in a school, they can share their experiences through reviews, which are displayed anonymously on a News Feed page for prospective students. To enhance usability, we incorporate a generative AI workflow that leverages RAG (Retrieval-Augmented Generation) to synthesize objective school data and user opinions into concise summaries on school detail pages. This unique combination of structured rankings and community-driven insights provides a comprehensive and intuitive platform for college selection.

Project Description: This site efficiently combines all the information well known college rankings from every year. We gather the information such as rankings from US News, THE, and QS, average them into a new average ranking, as well as information of school location, average size, and average tuition rate. These will all be shown in the ranking page which has filter functionalities. We then want our site users to be able to set preferences on schools, and in the end they should be able to write reviews for the school they eventually decided to go to. This information will be updated to the News Feed page anonymously, where other users who are interested in a particular school can see why previous users choose this school. This should be a great combination of a traditional objective ranking system and an innovative blog-based subjective review system for colleges.

Creative Component:
1. The first creative component of our site is the average ranking system. It is usually difficult for students to go across different sites and find that the rankings differ site by site. Not to mention that sites like the QS are international rankings, while the US News is domestic rankings. By filtering out a clean domestic ranking across all traditional ranking sites, averaging them, we can have an average ranking which is clearer for students to make decisions.
2. The second creative component is the news feed page. Usually parents and students will list their opinions on blog sites like Reddit, but those sites do not have a database for all school information and rankings. By integrating a blog functionality in our site, people can share their choices and opinions with more ease, at the same time people checking such information shared by others can be more clean and organized, with detailed school information showing on the page as well. We have to find a way to prevent spam posts, thus such review of school posts can only be submitted and shown on the news feed page when the user decided to enroll a particular school on their user preference page.
3. We are integrating a generative AI workflow in order to generate a school opinion summary on the school details page. Such summary will include both objective data from the school ranking and info data table as well as from the opinions from the

users from the news feed data table. This workflow will train the LLM using RAG by feeding it the data tables. This avoids the user having to read and scroll through all the previous reviews when they just want a quick opinion.

Usefulness:
- **We are high-quality**: College Ranker is a highly valuable tool for both students (or perhaps students' parents) who are facing the challenging decision of selecting a college. We provide a useful and comprehensive review and recommendation system that assists users in their decision-making. Based on real dataset, our software is capable of providing up-to-date and personalized planning for users. We aim to help users obtain necessary data and transparency so that they can make a well-informed decision in this life-changing moment. This application has a tremendous practical significance as so many students are struggling with decision-making and we can provide a more unbiased and balanced resource pool for such decision-making processes.

- **We are different:** Unlike the existing platforms such as U.S. News, QS World University Rankings, Times Higher Education (THE) Rankings and Academic Ranking of World University, our College Ranker seeks to promote comprehensiveness and overall evaluation of a university, and based on the updated evaluation, we can help users make a well-informed decision. Unlike other platforms who present isolated data from different sources, our application integrates multiple rankings into one unified platform. Many colleges will reverse-engineer the ranking algorithm of a certain platform and tailor their data for the sole sake of higher ranking. To avoid the bias, we integrate all dataset into a bigger, unbiased database.

- **We are user-friendly**: We aim to provide an interactive and user-centered platform that provides a variety of features that support students in their college selection process. Users can get the updated information about an aggregated college rankings based on balanced and real-life datasets. Users can filter colleges based on their specified criteria, and will get personalized college suggestions. Students will be able to compare rankings from different sources side by side.The interactive news page will also provide a news feed system where users can always keep themselves up to date. Users have much freedom in tailoring their preferences by creating, updating and saving their account settings.

Realness:
The data set includes QS ranking, THE ranking, USNews ranking, and ARWU ranking for world's top universities. The links are:

QS:
https://www.topuniversities.com/world-university-rankings/2024?region=North%20America&countries=us&sort_by=rank&order_by=asc

THE:
https://www.timeshighereducation.com/world-university-rankings/2024/world-ranking

ARWU:
https://www.shanghairanking.com/rankings/arwu/2024

These are three most popular university ranking websites worldwide datasets. The cardinality of the datasets is 1498 for QS ranking, 2671 for THE ranking, and 1000 for ARWU. The degree of each dataset is 3 for QS, which accounts for Rank, University, and Total score; THE offers a more comprehensive set of seven metrics, including Rank, Name, Country/Region, Number of FTE Students, Number of Students per Staff, International Students, Female:Male Ratio, and % Interdisciplinary Science Research. ARWU contributes six metrics, such as World Rank, Institution, Country/Region, National/Regional Rank, Total Score, and Alumni. Collectively, these data sources capture essential and multifaceted information about each institution, enabling their systematic evaluation and organization into a ranked list.

Functionality:
- **Create:** Users can create a new account by providing personal details and preferences, which will be securely stored in the database.
- **Read:** Users can browse rankings, view combined scores, and access user-submitted reviews and feedback. Users can set filters which would be translated into queries to parse from the database.
- **Update:** Users can update their account information such as username, password, email. Users can update their college preferences and contribute to the news feed
- **Delete:** Users can delete their account and any personal information and associated data
- **Search:** Users can search for colleges based on specific college names, this will be translated into a query for strings and names from the database.

Work Distribution:

Frontend Development:

- **Jacky Zhang**: Leads the frontend design and development, responsible for structuring and styling HTML pages while ensuring a responsive and user-friendly interface.
- **Hunter Jiang & Charles Chen**: Focus on integrating the user interface with the backend, ensuring seamless and stable communication between both systems.

Backend Development:

- **Jacky Zhang**: Develops the Spring Boot backend, setting up the server, managing APIs, and handling user authentication.

- **Hunter Jiang**: Develops the Spring Boot backend. Ensures secure and efficient data exchange between the frontend and backend. He is responsible for database design and development, including schema creation, data queries, and performance optimization. Collaborates with Charles Chen to integrate backend services with the database.
- **Charles Chen**: Supports backend development with a focus on database operations, including data storage, retrieval, and maintaining data integrity. Works closely with Hunter Jiang to ensure smooth database functionality and backend implementation.

Integration and Testing:

- **Hunter Jiang & Jacky Zhang**: Oversee the integration of frontend and backend components to ensure smooth functionality.
- **Charles Chen**: Conducts extensive testing to identify and resolve potential issues, while also handling debugging and performance optimization.

Mock UI:
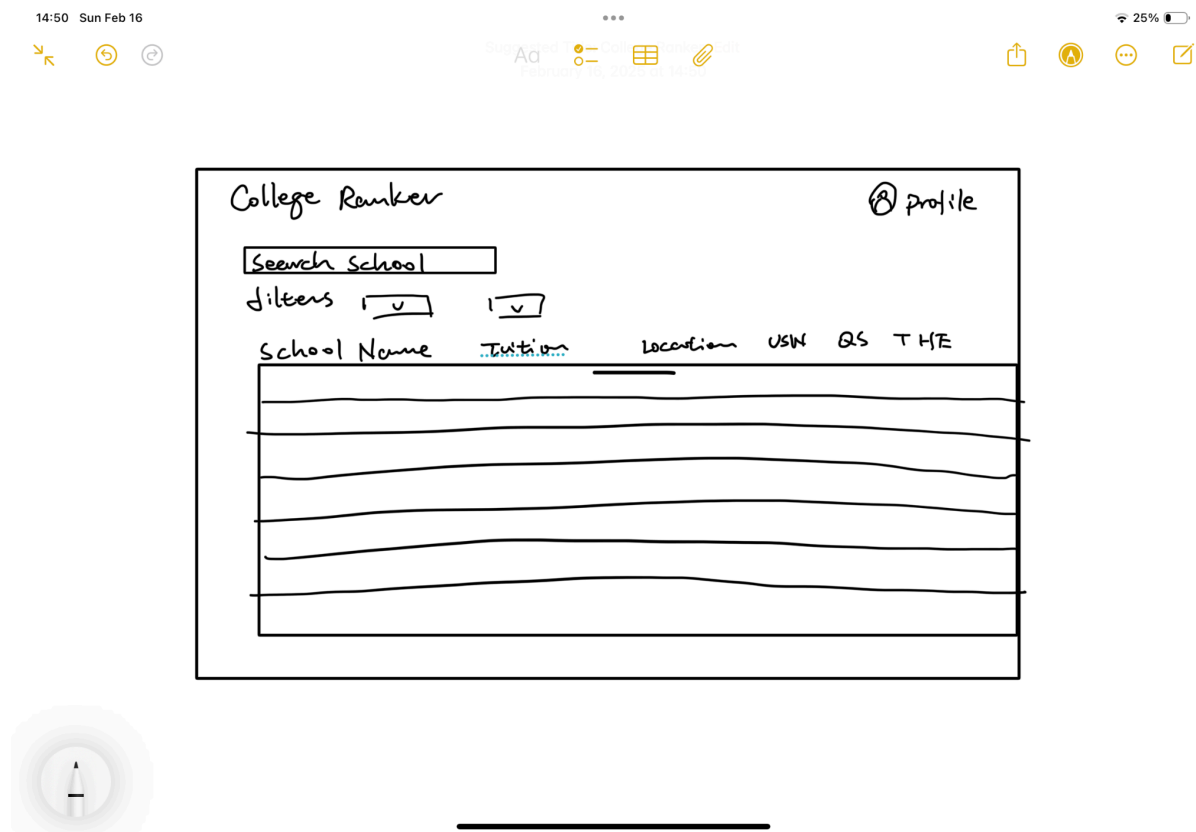
College Ranker

@ Profile

User A

Email xxx
Change Password

School Preference
- o UIUC
- o MIT
- o Harvard

College Ranker

@ Profile

Search School

Filters [v]   [v]

News Feed

@ UIUC   ★★★★☆

I'm lovin it !   Tution 5
                        Location 3.

@ MIT   ★

Hated it !