Course Compass

Summary

The Course Compass project will intelligently find courses that students may find interesting based on Professor Ratings, average GPAs, and relevance to interests. The user will indicate interest in different courses, and our backend Machine Learning model will recommend courses based on similarity. The user will be able to set course preferences, such as minimum GPA, professor rating, terms offered, and more. Over time, the app will learn the preferences of the user and be able to recommend courses the user is likely interested in taking.

Description

Currently, there are many sources of information to help students on course selection. The main issue is that these sources are so distant from each other, such that there is not an easy way to consider all of this information at once. This project will compile all of these sources of information together, storing them in databases, and make recommendations to help students pick courses that match their interests. Students will be able to use this tool when choosing and registering for classes to easily find interesting coursework.

Creative Component

The use of Machine Learning and Natural Language Processing will be used to group similar courses. Expressing course descriptions as word embeddings trained on a corpus of the University of Illinois Course Explorer will allow us to find courses, potentially in seemingly distant departments, with similar content. As an example, IE 534 is a Deep Learning course similar to CS 540. This will make the application's recommendation engine much more robust by generating an expansive list of courses matching the interests of students.

Usefulness

There will be a web application to let students import their past coursework and express interests. The backend database will store Professor Ratings, course information from past semesters, such as grade statistics, time taught, etc. This data will be used to make recommendations for future courses students should consider taking. Although there are similar web applications to this project, these web applications only focus on providing the data. Our application, however, uses Machine Learning to optimally recommend courses based on an encompassing range of data.

Datasets

There are a handful of datasets available, which will make this project possible, including:

Prof Wade Fagen-Ulmschneider's "Grade disparity between sections at UIUC" (.csv)

- Provides Average GPA and Grade Percentages (publicly available on GitHub)

Chinmaya Mahesh's "GPA++" datasets (.csv)

- Provides Average GPA and Grade Percentages (publicly available on GitHub)

RateMyProfessor.com

- Provides crowdsourced advice and 1-5 rating on professors with the class taught

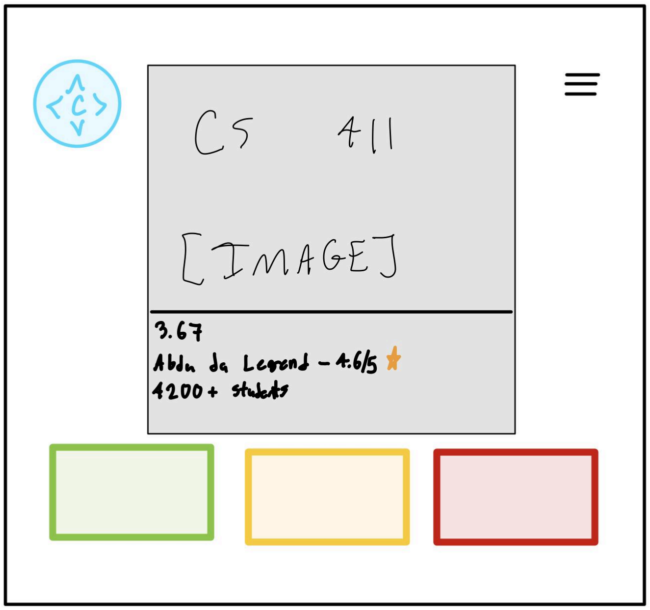
The University of Illinois Course Explorer (Public API to extract into JSON)

- Provides all information stored in Course Explorer (Title, CRN, Description, Professor,...)

Functionality

The primary way in which the user will interact with the app will be evaluating a series of courses that are suggested, and algorithmically curating the suggestions as the user makes more selections. For each course, the user can indicate no interest, some interest, or a lot of interest/intention to take the class. As more courses are interacted with, the user's decision will be stored in the database, and some courses may be suggested again at a later time to re-evaluate interest, in which case the decision will be updated accordingly. When determining the next course to be suggested, previous decisions will be referenced and read. A user will also have the option to remove a course from consideration in suggestions, in which case it will not be added to the database, and will be deleted if it had existed. Thus, effectively, it will not affect further decisions. There will also be a search functionality that will allow the user to specifically look for a course with a particular gpa, course rating, content, etc. The search will also be enhanced by machine learning, as discussed in the creative component.

UI Mockup + Work Distribution



Our techstack will likely consist of Google Cloud for MySQL, React for frontend, and Python Flask for backend. In addition, we will use DALL-E for images. While all members of the group will contribute to each portion of the project, we anticipate that roles will primarily be as such:

Frontend: Michelle; Backend: Nathan

Intelligent Systems: Max; Databases: Saashin