Abstract:

- Dr Senior Design or: How I Learned to Stop Worrying and Love Registration.
- We found that the current method of searching and registering for a class had much room for improvement and built an intuitive yet powerful interface and an organized backend of course data to solve this problem.

Reasons for improving the registration process:

- Course selection time at Penn is always hectic and confusing for the simple reason that there is no way to do it smartly and fast.
- The problem is that students are not only concerned with fulfilling all types of curriculum requirements in their CPGs, but also to manage different timetables so as to make sure that classes do not overlap in their next schedule, and would like to ensure a schedule that doesn’t guarantee a semester spent in the lonely halls of Van Pelt.
- Penn has currently no tool that makes selection easy, furthermore all the information that consists of a student’s decision factor is not available in one place but form a disjoint, distributed set. This data has to be accessed through three separate websites, and the information is spread over tens, even hundreds of pages within these websites. In most cases, the only search that can be used to narrow down these course listings is to click on the link that contains courses from a particular department. This virtually forces students to waste hours juggling information.
- The process gets worse when after having built a dream schedule, students find out that a particular class is full, which ensures that the laborious process be repeated.

Registroogle was born:

- Out of those many nights of frustrations came one idea: to organize the data found in the Course Timetables, the Course Register, and the Penn Course Review and make all of it available through a single web page whose interface would be both intuitive and allow for the most powerful searches.
- The user of Registroogle can find courses, get recitation timings for courses if required, read the course description, find out what requirements it fulfills at the four undergraduate schools, see the class ratings, how hard it is likely to be, can automatically find out whether it is compatible with their current schedule and if the schedule can be modified to allow the addition of this class, all from a single web page, and with no more than a few clicks.

How it works:

- This project was made possible with the power of MySQL and the ease of use of PHP.

(a) First all the data needed to be parsed and scraped from the websites because the Penn Administration was reluctant to give access to any database or formatted feed. The parsing was done entirely with scripts loaded with some of the world’s most complex regular expressions that would traverse the web on the lookout for specific fields and values.
- After gathering all this data we filled the databases with it.
- The last part involved making the database available to many users in a dynamic, simple and powerful interface, using PHP.

The four major components of Registroogle:

- Constraint based searching: A web form allows a user to search through all the courses at Penn based on more than ten different criteria, including: department, days, times, requirements fulfilled, a range of course difficulties and course ratings. The list of courses returned will display the course details along with the recitations associated with the class. These can be added to the user’s course schedule.
- Detailed course description pages: Along with the course details displayed on the screen is the option to look at more detailed course information. This page displays the complete course title and number, all prerequisites for the class, a detailed description, the requirements fulfilled in the four schools and a list of all rating information for all available time periods. This information is immensely helpful in aiding a student who is trying to see if a class is right for them. Transitions between grid sample points can be accurately localized using bisection search.
- Scheduler: This page displays all the classes that a student has selected from the search page. Lectured and recitations are displayed separately, along with a graphical calendar for the week displaying all the times the student would have class with that schedule. This page also displays aggregate statistics for the schedule such as total hours of class per week, average difficulty, average course rating, day with the most hours of class, etc.
- Conflict resolver: Finally, a tool that is sure to be very helpful for students is the conflict resolver, which finds all the time conflicts between chosen courses, and attempts to build a new schedule with those same classes but at different time slots. Since some classes have multiple lecture times, this will help students find a schedule that will fit all their chosen classes, even if they are unaware of the multiple lecture times.

screenshots:

- You can search using any of the 10 criteria we allow:
- A sample search result (for classes rated between 3.5 and 4.0):
- The program builds and optimizes a schedule for you:
- And prints out relevant schedule statistics:

Conclusions:

- We faced a number of challenges while designing our application including: no direct access to Penn course database, lack of a consistent structure in HTML pages on course related websites and determining the optimal database table structure.
- Despite these challenges, we managed to parse and organize a large amount of data and build a simple, intuitive front-end to navigate, search, and schedule classes at Penn.
- We had a great time building Registroogle and believe that it can be immensely useful to future generations of Penn students, and would like to find a responsible student willing to handle and update this application as the need arises.