

CS202 - Final Project Proposal

Every semester at Allegheny College, students are placed into registration groups organized by class and then a letter code which is then randomized. This combination determines when they are allowed to register for the upcoming semester's courses. Students are aggravated by this system for their registration class, as they often never get the chance to register first or near the top due to how the groups are randomized by the letter codes. We feel this issue is important because it affects every student at Allegheny College. As a result, we feel we should come up with an algorithm to solve this issue and we will pursue Track 2, which will allow us to create an algorithm and a program to solve this real-life problem.

Our potential solution would involve a significant implementation portion, including the design and implementation of a new letter code sorting algorithm using the Python Programming Language. The algorithm could be classified as a sorting algorithm of sorts. The letter code sorting algorithm would eliminate the complete randomization of each class's letter code. The algorithm would take in a data structure that contains the name, class, letter group, and GPA of each student from the previous semester. It would then analyze which letter group the student was in for the previous semester. After this, it would split the data structure of the eight letter groups into halves, with the letter codes that registered first, second, third, and fourth being one half, and the remaining four-letter codes becoming the second half. The algorithm would then swap these two halves and split each half in half again, creating sub-halves of two letter codes. Afterward, the algorithm would calculate the average GPA of each letter code. Then the letter code with the highest average GPA inside each sub-half would become the first letter code in each sub-half.

The program interacting with this algorithm would be fairly simple. It would call the algorithm, passing some sort of list to the algorithm containing student names, classes, letter groups, and GPAs. It would then take the results of the algorithm and output them to a text file. It would also create an elegant and simple user interface for the user to interact with and view what the algorithm is doing.

In order to learn more about this problem and some potential solutions to it, we completed some background research. We first looked at the Allegheny College Registration Website to learn more about how registration works. We found that registration is divided by class and then divided by letter groups which are randomly chosen, which is where our problem stems from. We then found a study that described how assigned registration times affected course availability for students. The study noted that because of fewer course offerings in today's schools, students forced to register later were less likely to get into classes. This is similar to Allegheny, but an updated algorithm could help make this process fairer and even in determining who gets to register first, determining who gets into classes.

We feel pursuing Track 2 to create an algorithm that would improve the registration schedule for students at Allegheny College would help to fix student anger surrounding registration. The algorithm would make sure students in the 2nd half of their class registration group in the previous semester would be guaranteed to be in the first half next semester and then better sort these subgroups in an attempt to fix issues with the registration schedule. This algorithm would have real-world implications.

References

<https://sites.allegheny.edu/registrar/registration/registration-schedule-fall-2019/>
<https://sites.allegheny.edu/registrar/registration/when-do-i-register/>
https://cepa.stanford.edu/sites/default/files/Gurantz_Who%20Loses%20Out.pdf