Algorithms

CMPT 435

– Final Project - 100 points

Goals

- to have a semester-long programming project that you can work on a little bit each week and to develop a solution to the Stable Marriage / Stable Matching / Matching Markets problem

Requirements and Notes

- First, program a solution to the *Hospitals and Residents* variation of the Stable Marriage Problem based on the algorithms described in the slide deck. [70 points]
  - Test your solution with the data set in the slide deck to verify that it works.
  - Test your solution with your own data sets to be really sure.
  - Document your solution as well as your test results in LaTeX and commit that to your GitHub repository along with your code and data sets. [5 points]

- Second, consider a slightly different version of the problem where hospitals **do not** rank residents (but residents still rank the hospitals, and hospitals are limited by capacity as before). Program a solution to that. [20 points]
  - Define what "stability" means in this context.
  - Test your solution with the your own data sets to verify that your solution produces a stable match.
  - Document your solution as well as your test results in LaTeX and commit that to your GitHub repository along with your code and data sets. [5 points]

Resources

- Everything we're doing this semester is likely to be of use for you in this project.
- This site presents a nice overview of the problem along with some solutions: https://www.jillcates.com/stable-matching-problem/
- Here's a video explaining things, in the context of the 2012 Nobel Prize in Economics: https://youtu.be/TpTRz0AmomU/
- … and a blog post to go with it.
- See our slide deck with algorithm and examples.

Hints

Start early. Do a little bit every day.

Submitting Your Work

Commit your final work in your private GitHub repository on or before the due date (see our syllabus).