This quarter you will be doing a project in algorithms; 40% of your grade for this course will derive from this project. Ideally, this will be a project on a topic that is of great interest to you, and better yet, if it's relevant to your work/research in some way.

The project must involve algorithms design/analysis in a nontrivial way, and can involve modeling, implementation and experimentation. There must be at least one significant proof presented. (That proof does not need to be original, but it should be explained in your own way, and it should add value to published versions: more intuition, extra examples, details filled in, clarifying figures, clearer exposition, etc.)

The topic of the project should be directly related to this course, either to something we are actually covering, or something we would cover if we had more time, e.g., taken from the topics covered in the following courses:

- http://www.cs.cmu.edu/afs/cs/project/pscico-guyb/realworld/www/slidesS14.html

- http://www.cs.princeton.edu/courses/archive/fall14/cos521/

- http://www.eecs.berkeley.edu/%7Esatishr/cs270/sp13/,

- Topics in a basic undergraduate level algorithms course such as CSE 421. See e.g.

  http://courses.cs.washington.edu/courses/cse421/15wi/

If your topic is unrelated to any of these, please discuss it with me early to get approval. **Please start looking around now for ideas!**

All projects must be done in **groups of 2**. Working on your own is not allowed.

Deadlines and evaluation

- Each group should turn in a 1-page pre-proposal by February 4. This pre-proposal should include citations to at least 2 papers that you'll be drawing material from. (You are responsible for finding these on your own.) These papers must be published in venues (conferences or journals) that are reputable within the theoretical computer science community, e.g. references from the course websites listed above. Your pre-proposal should also include a description of the algorithmic problem you will be studying, the application domain (if specific) and your plan of attack: will you be presenting new models? designing and analyzing algorithms? evaluating algorithms that others have designed? comparing algorithms for the same problem from a theoretical point of view? performing an implementation study/comparison of algorithms?

- The final 8-10 page paper on your project will be due on Sunday, March 17. You will post it to the class discussion page. The paper will be evaluated on clarity, correctness, completeness,

and depth. Your paper should be easy to read and not assume any background beyond what we've done in class (or what was assumed for class). Assume that the reader will have no knowledge about the topic and you are trying to give them intuition and a great entry point to it.

- Each group will give a 5 minute "pitch" for their project during class on March 14. All students are required to attend these presentations. The presentation will be evaluated on clarity, and on how interesting it is.

- Each student will read two write-ups from other groups and provide a substantial comment on the discussion board for each of these by March 21. Comments can include a discussion of points that you found unclear and why, questions about the results, suggestions for further related research, citations to relevant papers, etc. Comments need not be more than about a page long (and less is okay – we're looking for quality, not quantity.)

You may find some of the ideas mentioned at the end of these two handouts (from similar courses) useful:

- http://www.cs.princeton.edu/courses/archive/fall13/cos521/projectnotes

- http://courses.cs.washington.edu/courses/csep521/09au/project.html