Final Project Proposal

As a first step in your final project, we would like you to form a group and write up a short (one or two page) project proposal. This handout gives a brief overview of our expectations for the final project and describes what we'd like you to include in your project proposal.

Due Wednesday, May 14 at 2:15PM
This writeup is worth 2% of your overall course grade

The Final Project

Our expectations for the final project are the following. You will choose a paper describing a data structure of your choice (as long as it's not a data structure we've covered this course).You will then write a paper summarizing the paper you read. We'll expect that you'll describe the data structure, explain the key results, and flesh out the proofs given in the paper. You will then do something "interesting" with the data structure. This could be as simple as coding it up and getting some performance numbers or reading another paper on the data structure and presenting an additional result or refinement to that structure. You can also run wild with this if you'd like – perhaps you'll improve a bound in the paper, apply one of the techniques from the paper to another domain, or come up with a practical performance improvement – though this certainly isn't required. We expect that the project will be 75% focused on understanding and presenting the original paper and 25% on additional topics. You'll then include this "interesting" addition in your writeup along with appropriate details (e.g. performance numbers, necessary lemmas, comparisons with other data structures, etc.)

Having written up the paper, your group will then give a 15 – 20 minute presentation to the course staff describing the data structure that you explored and explaining your "interesting" step. You should treat this as a mini-lecture in which you'll teach us about the data structure. These presentations will be open to everyone (including other students, faculty members, and the general community), and you're welcome to attend other presentations if you'd like!

Overall, your grade on the final project will be based on the following:

- **The quality of your presentation, both written and oral.** Although data structures are highly technical, you should be able to communicate your data structure effectively. You can assume that your audience understands the material from CS166. This applies both to your paper and to your presentation.

- **How "interesting" your addition is.** You don't need to go above and beyond with this step to earn a high grade on the final project, but what you choose should be somewhat interesting. Ideally, your "interesting" step should provide a richer understanding of the data structure or the context in which it resides.

The writeup for your final project will be due in the last week of class (final date TBA), and final project presentations will be in that week as well. We'll send out a signup form for presentation dates and times early next week.

The First Step: Your Proposal

Before you begin your project, we'd like you to submit a (very short) project proposal.

First, determine who you'll be working with. You are required to work in a group of two or three unless you receive prior approval from the course staff (that is, we specifically authorize you to work individually *before* you submit the project proposal). Next, choose the data structure you'll be focusing on. We've given a list of suggestions in a previous handout, but you're welcome to choose any data-structure-related topic you'd like as long as we haven't covered it this quarter. Having chosen your data structure, choose the paper that you'd like to focus on. This will probably be the original paper introducing the data structure, though it might also be a later paper that presents an alternative version of the data structure or which explores different aspects of the data structure. We strongly recommend also finding two or three other sources on the data structure – these could be lecture notes from other courses, book chapters, blogs, etc. – so that you have other resources to draw from if you need to.

Your group should submit a very short (one or two pages max) description of what you intend to do. Include the names of the people in your team, the data structure you'll be exploring, the paper you'll be using as your primary source, (optionally) some other resources you've come across, and a brief synopsis of what you're planning on doing as your "interesting" step. While you're welcome to change your "interesting" step later on in the project if you find something else you'd like to pursue, you should treat your paper, group, and data structure choice as final; any deviations from what you initially proposed will need the approval of the course staff.

Although you don't have to submit much in your proposal, we strongly recommend treating the proposal seriously. Our goal is to ensure that you've thought about the project you're going to do, have done some basic reading and research to select a paper that looks interesting, and have given some thought to what you plan to do as your "interesting" step. If you put this proposal together at the last minute, you may end up unhappy with the work that you've chosen for yourself.

We expect that at least two groups will end up choosing the same topic. This is perfectly fine. If you are in a group working on a topic that another group is covering as well, we'll assume under the Stanford Honor Code that you're not collaborating with that group, and you should not attend that other group's project presentation (as it might influence your own!)