

Final Project Requirements

The Writeup

The core of your final project will consist of a writeup in which you will describe the data structure you chose to explore and present your “interesting” component.

In your writeup, you should provide some background for the data structure (what does it do? who invented it?), describe in detail how the data structure works (how is each operation implemented? how is it represented?), and argue its correctness and runtime (why does each operation work correctly? why does it run in the stated time bounds?) As appropriate, provide proofs of important theorems or nontrivial time bounds, and provide an intuition for why those results hold. Ideally, the description of your data structure should be sufficiently clear and detailed that anyone with a CS166-level background who has never heard of your data structure would be able to understand it.

Additionally, your writeup should describe the “interesting” portion of your project. We're excited to hear about what you chose, and this is your opportunity to describe it to us! In as much detail as necessary, describe your “interesting” step. For example, if you chose to implement the data structure and get performance numbers, you could outline how you got those numbers and might include charts and graphs if appropriate. As another example, if you decided to read several papers to set the data structure in a historical context, you could trace the evolution of the ideas behind the data structure and outline where various insights were introduced.

You will be evaluated both on correctness, demonstrated mastery of the topic, and presentation (clarity, style, etc.). Please treat your writeup like you would an article in a technical journal – write in complete sentences, introduce section headings as appropriate, etc. Avoid spelling or grammatical errors, as they will detract from the quality of your writeup. Although there are no minimum or maximum page requirements, we expect most writeups will be between 10 and 15 pages, double-spaced.

You're welcome to share drafts of your writeup with other CS166 students (*as long as they're not using the same data structure in their final project*) to get feedback, and in fact you're encouraged to do so. That way, you can get feedback on your clarity and presentation. Just make a note of it somewhere in your writeup.

The writeup is due 24 hours before your group gives its presentation. This will give us time to give a quick read of your writeup before you give your presentation. For example, if your group is presenting on Tuesday, June 3 at 3:30PM, your writeup is due on Monday, June 2 at 3:30PM.

The Presentation

The other part of your final project will consist of a 15-20 minute presentation that you'll give during the last week of class.

As with the writeup, you should use this time to introduce your data structure, describe it, and present the “interesting” component of your project. Unlike the writeup, during your presentation you do not need to give a complete description of your data structure. Instead, present the basics of the data structure – what does it do? how does it work? what are the time bounds? – in a way that makes it accessible and understandable. Your job should be to communicate the data structure and present your “interesting” component in a way that makes the structure seem as interesting and exciting as possible.

At the end of your presentation, we'll open for questions from the course staff and anyone else present. The course staff might ask some brief questions on your presentation or data structure at this time, so you may want to quickly review your writeup and your data structure beforehand.

These presentations are open to the public. You can probably expect that two or three members of the course staff will be there, along with other CS166 students and generally interested members of the CS community. Accordingly, you can assume that the audience has a technical background at the level of CS166, but you should not assume that they already know what your data structure is or how it works. In particular, even though the course staff will have likely already taken a quick look at your writeup, we won't necessarily have a full command of the data structure at the time you present.

Because presentations are spaced apart at 30-minute intervals and we want to have five minutes for questions at the end, we may have to cut off early any presentations that overrun the time limit. Additionally, please arrive at least five minutes early so that you have time to get set up.

Evaluation

Your grade on the final project will be determined on the clarity and quality of your writeup and presentation, the correctness and technical rigor of your exposition, the level of effort and creativity demonstrated by your “interesting” component, and the demonstrated mastery of the topic you chose to explore.