

Analysis of Algorithms
CS 375, Spring 2019
Presentation 2
Presentations in class Wednesday, May 8

Presentation 2: Final Presentation

In this assignment, you'll work in teams to create and deliver a technical presentation about an algorithm we have not yet addressed in class. The goals of this project are:

- to give you practice understanding a topic well enough to give a technical presentation about it;
- to give you practice giving a technical presentation; and
- to give you more practice working with other students as a team.

Assignment: Presenters' Choice!

You can present any algorithm you'd like (subject to approval), as long as it is not too simple, not too complicated, and not one that we have covered in class. (A variation on an algorithm discussed in class is fine.) It must be one that no other group is presenting. So, if you have a topic in mind, please let me know as soon as possible so that I can make sure not to assign it to another team or discuss it in class before your presentation! (It might be best for each team to email me with a list of their top three choices in order, to maximize the chances that they'll get one of those choices, but even if your team has only one topic in mind, it's a good idea to let me know as soon as possible.)

You will work in teams of size 3 or 4 that you pick yourselves. (Exceptions to group size may be made in *exceptional* cases.) If you are having difficulty finding a team of size 3 or 4, I'll be happy to help—please talk with me about it as soon as possible!

There are many algorithms we have not yet discussed that might be of interest. Some possible topic areas:

- algorithms in our textbook that we haven't covered in class, especially graph algorithms
- graph algorithms (or other algorithms) not in our textbook
- informed / heuristic search algorithms (e.g., A*)
- adversarial search algorithms (e.g., minimax)
- error-correcting code algorithms
- computational geometry algorithms (e.g., convex hull)
- data compression algorithms
- public key cryptography algorithms

Your Presentation

For your presentation, plan on using up to a maximum of 15 minutes, which means your talk should take about 12–13 minutes and should leave 2–3 minutes for setup at the beginning and questions at the end. As with technical presentations in general, it's good to *over-prepare*: Be sure you know your material in more depth than needed for the presentation, so you can answer questions from the audience (including me!).

Some things you should include in your presentation (not necessarily in this order!):

- A high-level summary showing how the algorithm works.
- A short example that you step through, to give your audience a sense of how the algorithm works.
- An explanation of the algorithm's correctness. It may not be easy to give much depth or detail, depending on how complex the algorithm is, but some discussion of an algorithm's correctness is essential whenever you're presenting an algorithm. Please feel free to ask me any questions about how your team might present an explanation of correctness for your algorithm!
- A complexity analysis of your algorithm, ideally including what the worst-case and best-case (and, if possible and relevant, average case, randomized case, and amortized case) time complexities are, and how much space (memory) is needed. Once again, it might not be easy to give much depth or detail, but some discussion of complexity is essential. Please feel free to ask me any questions about a complexity argument for your team's algorithm!

As with the previous CS375 presentation, you are also responsible for writing up a handout and giving copies of the handout to the audience. An (elegant) implementation of the algorithm would be a good thing to include on the handout, along with any other notes that would help your audience fully appreciate the algorithm you're presenting. (Your handout must be polished, easy to read, and free of grammatical errors.)

Because your presentation will be on the last day of classes for CS375, please do not give HW exercises to your classmates!

Other Instructions and Details

- You will **not** be required to do a dress rehearsal. If you wish to do so, be sure to make an appointment with me well before the presentation. Plan on a 40–45 minute dress rehearsal. You must come to the rehearsal with your handout and slides and having practiced your talk—the rehearsal is a *dress* rehearsal, not a *draft* rehearsal.
- You may use any of the whiteboard, the projector, the computer in the classroom, or your own computer if you wish. In any case, be sure and test any equipment ahead of time to be sure it is working properly and that you know how to operate it. Be sure and have a backup plan if the equipment fails immediately before or during your presentation. An equipment failure is not an acceptable excuse for not making a good presentation.

Some suggestions for getting the audience engaged in the presentation

Please see the assignment sheet for our Presentation 1 for suggestions that Dale Skrien gave to his students.

What to Hand In

Before the presentation, each team should submit two files:

- the handout (in PDF), as a file named `team_<LETTER>_presentation2_handout.pdf` (where `<LETTER>` is replaced by the letter corresponding to the group in the team assignments);
- the presentation materials—presumably as PowerPoint slides—as a file named `team_<LETTER>_presentation2_presentation.ppt` (or whatever extension is appropriate, if not PowerPoint).

(Note: If your team also has additional presentation material, ask me about the best way to submit it.)

Submission instructions: For this project, each group should have one “designated submitter” to handle submission of their materials. We are officially giving up on the Dropbox folder for the semester, so the designated submitter should email me (eaaron@colby.edu) the individual files.

In addition, each student is required to individually email me within a day after the project was turned in, telling me:

- how well your group worked together;
- how much (percentage) each member of your group contributed to the project; and
- how many hours you (individually) spent on this project.