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# Guidelines for the final project report and presentations.

Due: See below for details

With just a few days left before the final project deadline, some of you have been asking about how long and how detailed the project reports should be, whether extensions are possible, and finally about presentations. This document provides some simple guidelines answering these questions.

## Final project report

**Style:** Your final project report should essentially read like a research paper. It should be clear and concise, and describe your contributions in the context of the broader literature.

**Length:** We expect most reports to be between 8 and 12 pages. We do impose a hard limit of 15 pages (single spaced, 10pt font, 1-inch margins all around), but you should try to keep your report within the 8-12 range. As with most conferences and journals, you have to make important decisions as to what to include, and that's part of the skillset needed for writing a solid paper. If you absolutely need to include additional graphs that are supporting your results, you can do so in an optional appendix.

**Contents:** You should structure your report around your key contributions, obviously, but make sure you include the following information:

- **Abstract:** A 300-500 word summary of the problem statement and its challenge, the state of the art in the field, your approach, your results (this is the most important part, of course), and the broader impact of your contributions.
- **Background:** A brief summary (1000 words max) of the problem, the current state of the field and existing literature, situating your work in the context of the more general area of research, and clearly stating how it differs from previous approaches, or from your previous work and other undertakings.
- **Results and discussion (the bulk of your report):** While some conferences/journals ask you to separate your results and their discussion, we prefer a single section describing for each aspect of your project, a summary of the challenge undertaken, a detailed description of the method used, and a clear description of the results obtained. With these descriptions, you can intersperse discussion on the rationale of the methods used, and also comment on the interpretation of the results you found. Be precise about your methods, and describe clearly any existing tools you used, and any new methods you developed (and their availability, if applicable). Be critical about your own results and findings, and think about alternative interpretations of your findings. Think about alternative approaches you would have considered if time permitted, or if you were to start anew.
- **Future goals (a few paragraphs):** Because this is a class project, we want you to think hard not only about what you have accomplished in the period of the term, but also where you want to take this project going forward. This is a great place to describe your plans for publication of this work, what else you would like to include before it is ready for prime-time, whether it's a masters thesis, a Nature paper, or your next book. We like to see projects flourish even after the class ends, and great new directions are testament of great projects.

- **Comparison with Milestones 1 and 2:** You also must comment on how the final report compares to what you proposed in milestones 1 and 2, in one or two paragraphs. Did you manage to accomplish all your goals, which ones failed and why, which were added and why, was your proposal overly ambitious or vague or short. Explain the differences, what shaped the project away from the original aims, and could you have foreseen that earlier.
- **Commentary on your experience (a couple of paragraphs):** We want you to also go back and think critically about your project, and what advice you would give to yourself if you were to start over. Were the datasets well-suited for the approach, did you manage your time well between doing and writing, or between different aims of your project, what aspect of your project proved the most challenging / the most rewarding, what part of the project did you enjoy the most / the least.
- **Division of labor (1 paragraph):** For people working in groups, describe the contributions of each of the authors. This is standard in most scientific journals nowadays, and you should be completely honest about it, and as precise as possible. You can also comment on the good and the bad aspects of the collaboration, and what advice you would give yourself were you to start over.

### Final report due date

The written reports are due on Friday Dec 5 at 5pm, but extensions are automatically granted (you still have to ask!) until Monday Dec 8 at 8pm.

### Final report submission

Submit a **single PDF document** by email to. Name your file: "**LastnameFirstname\_report.pdf**" (if working in teams, include all names, separated by underscores). Do not send to an individual TA, and do not submit a paper copy. If you cannot print to PDF, we will scan your document for you, but you have to bring us a color printout by 6pm on Monday at the latest.

### Oral presentation

In addition to the written report, an oral presentation of your project in front of the staff and the rest of the class will also be part of your evaluation.

You will be evaluated on your ability to clearly communicate your findings in front of a scientific audience in computational biology (even if they're not experts in the particular area of your project), on the clarity with which you communicate your contributions, your ability to manage your time well and finish on time, and of course the overall quality of the work and the presentation.

All presentations will be 8mins, leaving a 2min interval for questions and answers. We will be very strict and stop you short if you run over, so manage your time wisely and do not leave the best part for the last minute.

## Final project grading

Your projects will be graded on overall quality obviously, but to give you a sense of the criteria used, here's a fictitious breakdown of points (the categories are not fictitious, the points are):

- **Originality** (~5pts) How original / novel is the idea? If people say "oh, that's a good idea" when you describe your project, you're all set! If they say "oh, just like that paper from so-and-so in 2001", you must bring a new twist somehow!
- **Challenge** (~5pts) How challenging was the undertaking? If something was easy and you made it harder for yourself, you don't get any extra points. If it was hard, but you made it easy by taking intelligent shortcuts, you still get full credit. Lastly, if you undertook something challenging in an area that's novel to you, for the joy of learning something new, you get some extra points there.
- **Relevance** (~5pts) Is this relevant to the course? Are you using things you learned about in the lectures/recitations/problem sets? Is this something that we could have used as an example in one of the lectures? Or is this only a vaguely justifiable tangential connection of something you were working on already.
- **Achievement** (~10pts) This is the big one. What did you actually accomplish in your project, what is your actual contribution to the field. If you promised us something amazingly original, super challenging, and central to computational biology, but didn't deliver anything, you're not in great shape (see formula below). If you managed to achieve the goals you set forward in your project proposal and milestones, and these are original and ambitious and relevant, you're solid!
- **Presentation** (~10pts, oral and written) Lastly, research is not just about doing great work, it's about being able to communicate it. **Written.** If you spent 15 pages describing in general terms

why motif finding is important, but we can't figure out what you actually did for your project, we obviously won't be able to reward your contribution. If your paper is clear and crisp, you're all set! **Oral.** Similarly, if at the end of your talk the entire class is wondering what that graph meant, or what your project was about, you're not doing great. If you manage your time well, speak well, use clear slides and display items, and put some thought into your presentation, you'll get more points on this, and we'll be able to appreciate your entire work all the better!

Of course, despite the illusion of a point breakdown by the fictitious point assignments above, it's really not an additive score, so the final formula may look more like this:

- $\text{Total} = \text{Min}(O,C,R)*A+P$

Lastly, these categories are just a guideline we use to make our grade assignments as objective as possible. Of course, an exceptional performance on any one category will probably spill over and make the overall score higher (just like an abominal presentation may suck some points out from the other categories as we won't be able to understand your work).

Overall, our five staff members will discuss every final project, every presentation, and your overall contributions. We'll use a big fancy table and complicated formulae to come up with a final score, but will review that score thoroughly and make sure it reflects the overall quality of your project. We'll give you feedback on the project of course, whether you ask before or after the end of the class (but we won't disclose the individual scores for each rubric, so don't ask). Lastly, as you prepare to write up your work for publication, we can of course give you additional feedback in the future, and help you continue to be an active member of the computational biology community.