Final project overview

The final project is divided into several milestones due over the course of the semester. The first two milestones will get you thinking about problems you are interested in and classmates you may want to collaborate with. These early milestones are included in the problem sets; however, the subsequent milestones are separate assignments. This overview lists some resources for finding project topics and outlines the criteria that will be used to evaluate your project. Further details of the milestones are available on the course website.

Milestones

I Project profile (due 9/22)
II Literature search and pre-proposal (due 10/6)
IIIa Formal proposal (due 10/15)
IIIb Peer review (due 10/27)
IIIc Review response (due 11/3)
IV Midcourse progress report (due 11/17)
Va Final report (due 12/5)
Vb Project presentations (12/9)

Selecting a final project

The first part of any research project is coming up with a good, innovative, concrete, and feasible idea. There is no single recipe for getting a good idea for a project, and our best ideas frequently come in unexpected ways. While you are brainstorming, there are several resources available: During lectures, we will discuss several research directions that can be pursued as final projects. Going through your notes can give you more ideas. The second half of the semester will be guest lectures on current research. Guest lecture notes from last year can give you more details on most of these and can help you build your own research projects. The problem sets will provide possible starting points for projects that extend the algorithms and programs you have already written in new research directions. And of course, browsing recent publications in Nature, Science, PLoS Biology, Genome Research, Nucleic Acids Research, PNAS, PLoS Computational Biology, the Journal of Computational Biology, PubMed, and Google Scholar is a great way to get ideas of recent research ideas, datasets, and results that you can expand upon for your project.
Grading criteria

Originality  How original is the idea?  Note that we don’t expect every project to solve a previously unsolved problem.  But we do expect projects to introduce some new computational idea to whatever problem they tackle (as illustrated in the lectures).

Challenge  How challenging was the project?  Although we don’t expect every project to develop a brand-new algorithm, we do expect projects to do more than just apply off-the-shelf bioinformatics tools.

Relevance  Is the problem relevant to the course?  Are you using ideas discussed in the course?  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  What did you actually accomplish in your project?  What is your contribution to the field?  Note that what you accomplished will be weighed against what you proposed to do and how challenging it was going to be, so be sure to pick a small enough, concrete problem which is still interesting.

Presentation  Did you effectively convey your research problem and your key ideas?  In your written report, remember that you are writing for an audience of computational biologists.  Be sure to make explicit what your contributions were not just in terms of figures and tables, but more importantly in terms of the ideas (biological or computational) which generated them.  In your oral presentation, remember you are speaking to an audience of your peers and that you have stringent time limits.  You must get your key ideas across, so do not feel obligated to show all of your results.  Instead, prioritize the ones which demonstrate the intuition behind your approach.

These categories are a guideline we use to make our grade assignments as objective as possible; however, the actual formula used to derive a final score is not set in stone.  The course staff will consider every final project individually and make sure the score we compute reflects the overall quality of your project.  We will give feedback on the project by 11/21 in response to your midcourse progress report, plus you are welcome to ask for feedback any time during the semester.