6.047/6.878/HST.507
Computational Biology: Genomes, Networks, Evolution

Fall 2014 Course Information

Lectures: Tue/Thu, 1-2:30PM, 32-141
Recitation: Friday 3PM, 56-154
Units: 3-0-9
Prerequisites: 6.006, 6.041, 7.01

Course information

Professor: Manolis Kellis: 32-D524, manoli@mit.edu, 617-253-2419
Teaching Assistant: Abhishek Sarkar: 32-D526, aksarkar@mit.edu. Office hours Wednesday 3-5PM, Building 32, D5 lounge or by appointment
Course administrator: Derek Aylward: 32-D433B, derekaylward@csail.mit.edu, 617-715-4882 (x5-4882)
Course website: compbio.mit.edu/6.047

Grading

Your grade in this course will be based on the following:

• Problem sets (30%)
• In-class quiz (20%)
• Final project (40%)
• Scribing (10%)

Problem Sets

There will be five problem sets during the semester, each including 3–5 problems for all students and a lab problem which is optional for 6.047 students. The problem sets will include both theoretical and programming problems. For programming problems, we provide skeleton code in Python, but you are welcome to write solutions in any language.

In-class quiz

There will be one quiz which will cover all material covered up to that point. There will be no final exam. The quiz will include true/false questions, short answer questions, practical problems using algorithms covered in class, and one or two problems extending ideas seen in class.

Final Project

Students will work on a final project with deliverables due at several milestones during the term as marked on the course schedule. The first part of the term will be spent identifying a topic relevant to the course material, planning the project, writing an NIH-style proposal, and reviewing the proposals of your peers. The second part of the term will be focused on completing the project, writing the report, and presenting the results. Details of what is expected by each milestone will be posted on the course website.
You may either work alone or with one partner; however, teams and 6.878 students will be expected to undertake more ambitious projects. Part of the final project grade will depend on the challenge and originality of your project.

We anticipate projects of a few types:

- Identify a biological problem, gather relevant datasets, design and implement new algorithms, apply the methods, and interpret the results
- Rigorously compare several algorithms which solve the same biological problem in terms of their performance and the quality of their outputs on synthetic and real data sets

**Scribing**

Each student will contribute to the scribe notes, which are chapters of the course textbook. Several students may be assigned to work together on a single lecture/chapter depending on course enrollment. As a scribe, you are expected to do the following:

1. Before the lecture, familiarize yourself with the material
2. During the lecture, take note of: ideas covered in lecture which are missing or explained poorly in the text, questions asked in lecture which are not answered in the text, digressions from the lecture material which are worth elaborating on, figures/illustrations which are confusing or missing important elements, etc.
3. After the lecture, edit the text to address the points you identified

Details of editing the text including a tutorial on \LaTeX{} are posted to the course website.

**Recitations**

Recitation will be held on Fridays, during which we will both review the lecture material and discuss additional aspects of it. Since there is only one recitation section, we will not be able to accommodate all scheduling conflicts. Therefore, attendance is not mandatory and recitation notes will be made available on the course website. Material in the recitation notes may appear on the quiz.

**Textbooks**

The course textbook is comprised of the scribe notes and is available from the course website. You may also find the following optional texts helpful:

- Richard Duda, Peter Hart, David Stork, *Pattern Classification*.

**Collaboration Policy**

You are welcome to collaborate on problem sets and the final project. However:

- You must work independently on each problem before you discuss it with others.
- You must write the solutions on your own.
- You must acknowledge outside sources and collaborators.