September 26, 2003

STATISTICS 535A (1.5 Credits)

Coursework

Earlier I had indicated that credit for 535A would be project-based. For several reasons I think it is actually better to split the project into smaller pieces. In particular, credit for the course will be based on **three separate 'investigations'**. By investigation I mean a short and focussed investigation into a single topic. Take something we talked about in the lectures and investigate it further. Do some further reading on the topic, and do some *empirical* work. By empirical, I mean actually doing some computing. Give a short write-up on what you've learned and what you've done.

Rough Flavour. Here are some rough templates for an investigation. But the format of your investigations need not match one of these precisely.

- Take two algorithms for the same task. Describe them and compare them, both intuitivley/mathematically and empirically.
- Take an algorithm and describe and try different variants of it (i.e., variants we didn't have time to talk about in the lecture). Discuss what seems to work well in your particular context.
- Demonstrate how a particular algorithm can be used to tackle a specific statistical problem.

How much work/effort/time? Each investigation corresponds to 0.5 credits. That a single investigation should correspond to a relatively modest amount of work and be described with quite a brief write-up. I hesitate to suggest a length for the write-up, since the notion of 'page' is so variable, particuarly when some pages might consist of tables or figures describing results of empirical work. Here is one calibration. Say you took a standard 3-credit. 13-week, lecture course with regular problem sets assigned. And say that in fact six problem sets were assigned, one every second week, as might be typical. The effort for one investigation should then be comparable to the effort on one such assignment (or perhaps slightly more since there is no final exam in 535A).

Tips: A couple of suggestions...

- When describing empirical work, a rule-of-thumb is that you should give enough detail that an interested reader could reproduce what you have done (without your code, on a different computer).
- I'm happy to *discuss* choices of topics with you. But I'm *not* willing to simply 'give' topics to you. Part of the work here is for you to identify a topic/question of interest to you.

Breadth. To ensure students don't ignore large portions of the course entirely:

- at least one of the three investigations should deal with some aspect of numerical linear algebra or function maximization, broadly interpreted.
- at least one of the three investigations should invovle Monte Carlo methods.

Deadlines. One one level I don't mind if you submit all three investigations at the end of the term. But in practice students who leave everything until the last minute get themselves in *big trouble*. I would *suggest* the following schedule. Complete the first investigation by the end of October. Complete the second by the end of November. Complete the third at least a few days before the end of the exam period in December.

Special Deal! I realize that what is being asked is quite 'open-ended.' Particularly with the first investigation students may have some doubts about what is expected of them. So for the first investigation only, students may, if they wish, make revisions to their write-up *after* it has been graded. I will then re-grade it. The actual grade for this investigation will be the average of the initial and subsequent grades.

Grading Policy. There has been some recent discussion in the department about grading policy for graduate courses. Several grading schemes have been circulated. My views might be summarized as follows.

Any grade below 68% has academic consequences for the student. By UBC rules, the passing grade is 60% for the Master's students, 68% for PhD students.

A grade of 68% to 75% gives the student credit but indicates the student is having some problems, i.e., the work is below the deapartment's expectations. The department requires an over-all academic average of 75%.

A grade of 76% to 79% indicates work that is 'borderline' satisfactory

An "A-" grade (80% to 84%) indicates satisfactory work but does not encourage the student to consider this area for research at this stage.

An "A" grade (85% to 89%) identifies good work. The student is encouraged to take follow-up courses or perhaps do research in the area.

An "A+" grade (90% to 100%) identifies outstanding work. The student is encouraged to pursue research in this area.