

ST 810A, SPRING 2005
PREPARATION FOR STATISTICAL RESEARCH
ASSIGNMENT 5, DUE WEDNESDAY, 5/4/05 OR TUESDAY,
5/10/05

Background: During the semester, you have developed a proposal for a simulation study (steps 1 and 2 below), and have carried out the study and have written up the results in the form of a journal article (step 3 below). All of these tasks have exploited and developed your written communication skills. For the final assignment, you will complete step 4 below:

1. Identify a problem where properties of a statistical method (e.g., an estimator or competing estimators, or a testing procedure or procedures) need empirical study. For example, only large-sample results may be available, and you may wish to see how well these approximate finite-sample behavior. Alternatively, you may wish to evaluate properties of a method or methods under conditions where usual assumptions under which they are derived do not hold. It is up to you to identify a problem and method(s) to study. *This need not be “original research” studying cutting-edge techniques! You may consider widely-used, familiar techniques or a problem in an area in which you are interested.*

2. Write a proposal for the simulation study you intend to carry out. This document should introduce the problem you will consider at a level that someone with general training in statistics could understand; provide background and rationale for why the problem and associated methods need study; and state clearly the objectives of the study, including what is likely to be learned and how the results will advance understanding. This should be a self-contained document, so you should introduce a consistent notation in which you describe the problem and the specific estimators or tests you will study.

For the proposal, you do not have to spell out a *specific* design for the simulations that you will carry out, but you should include some information on the general type of studies you envision you will carry out and why these general choices are relevant. As with any scientific communication, citation to relevant references should be given, and a “references” section should be included. Also, the document should follow an organized format (to be determined by you).

3. Design a specific set of simulation studies that address the objectives you have identified in your proposal, write relevant computer programs and carry out these studies, and write a full paper, in the form of a journal article, reporting on the studies and the results. The paper should integrate the background and objectives from your proposal into the presentation in whatever way you see fit. It should also describe in detail the design and why it was chosen. The results should be clearly presented and discussed, and the paper should offer interpretation of the results for general practice and a summary of what was learned. This document should follow the format and conventions of a regular journal article, including an abstract and references.

Thus, the paper should be a self-contained document in the spirit of a journal article that takes the reader through introduction of the problem, rationale for studying it, what was done and why, and what conclusions can be drawn.

4. Develop a 15-minute oral presentation of the material in your paper in item 3. Your presentation should be accessible to a broad audience with general training in statistics (but perhaps

not in the particular problem area) and should communicate the main ideas and messages. Oral presentations will take place during the final exam period (see below).

Thus: For this assignment, you should prepare an oral presentation summarizing your simulation studies. Some guidelines and comments:

- You will be assigned to present on either Wednesday, May 4, 1:00 - 4:30 pm, or Tuesday, May 10, 1:00 - 4:30 pm. The latter day/time is the scheduled final exam period for the class. Presentation assignments will be posted on the class web page. *Please arrive on time to your assigned session so that we may begin promptly. We will take a 10 minute break halfway through.*
- Use L^AT_EX (e.g., using the **seminar** or **prospcr** packages) to create your slides in the form of a pdf file. In preparing your presentation, keep in mind the recommendations discussed in class.
- E-mail your pdf file to me in advance (no later than noon on the day of your presentation) so that I can load it on to the laptop.
- No presentation will be allowed to exceed 15 minutes. I will warn you when you have 5 minutes to go by holding up a sign, and again at 1 minute. At 15 minutes, you will be asked to stop. *Thus, you will want to PRACTICE your presentation to ensure that you are not trying to say too much.*
- All students will fill out a written evaluation of each presentation. You will receive a summary of your evaluations that you may use to hone your skills in the future. The summary will be e-mailed to you during the summer.