Advanced Data Analysis Project Guidelines

2006-2007

The Advanced Data Analysis (ADA) project, including both oral and written components, is one of the qualifying examinations for the Ph.D. in Statistics. It is aimed at getting students an in-depth cross-disciplinary research experience, with emphasis on the role of statistics in solving a scientific, technological, or policy problem.

Students who present completed ADA projects are evaluated according to their efforts and success in

1. understanding the relevant subject matter (science, technology, or policy);
2. manipulating and pre-processing the data so that suitable statistical methods may be applied;
3. exploring the data and summarizing them in simple and easy-to-grasp form;
4. performing statistical analyses suitable to the problem(s) posed;
5. communicating the results to the subject-matter investigator, and to the departmental audience.

Although every project should include all of these elements, their relative importance will depend on the specific setting. For instance, some projects involve a great deal of data manipulation, the understanding of advanced scientific information, or challenges in structuring an unstructured problem; others may be reasonably well specified and involve, primarily, statistical modeling and implementation. New methodological development is not required; it is also not discouraged, provided it adds to the data analysis. However, students are always expected to create simple summaries, both for their use in communicating results and to check more complicated analyses. In no case should the project appear to be primarily aimed at new methodological development when the research question does not support the effort. ADA projects are partly evaluated in terms of the goal of producing work that is of publishable quality, and indeed many ADA projects do end up being published in fields outside of Statistics (with some additional polishing and re-writing). However, publication in and of itself is never a criterion for evaluating ADA projects.
Formalities and Procedures

The ADA project is undertaken in conjunction with the ADA I and ADA II courses. In ADA I the students find a research project, form an advisory committee (one person involved with the data and at least one statistician in our department), give a short written and oral report on the project by mid-semester, develop a preliminary project statement (about 10 pages in length), and make a preliminary oral presentation on the project to the class towards the end of the semester. In ADA II the students complete their projects and give an oral report (25 minutes) before the faculty and students. A final written report is then provided for the advisory committee.

A danger students face with their ADA projects is failure to secure data from the scientific investigator in a timely fashion. For this reason the ADA instructor imposes a deadline by which the data must be obtained. If the data are not yet available by this time the student is required to seek a new project.; this rule has circumvented many potential crises. The instructors in ADA courses will provide specific deadlines according to the following approximate guidelines:

- preliminary efforts to secure projects should begin six weeks prior to the start of ADA I;
- by mid-September the data should be available;
- by the beginning of November short reports on the projects should be made;
- during the final two weeks of ADA I, preliminary oral presentation on the projects should be made to the class;
- at the end of the first semester a preliminary written project statement should be completed;
- in ADA II at least two practice oral presentations should be made to the class;
- one month prior to the scheduled presentation date, research should be complete and intense preparations for the final oral presentation should commence in conjunction with the advisory committee;
- the final oral presentations are delivered near the end of the term, if possible;
- the final written report may be completed after the end of term, but must be approved by the advisory committee before the qualifying examinations is considered officially completed.

The faculty in attendance at the final oral presentation vote on whether or not the project is of sufficient quality to pass the qualifying examination. A “pass” can be made conditional on some further efforts in the project which are then included in the final written report. Upon receiving a written document, it is up to the advisory committee to give the final approval for the project.
The grades given in ADA I and II are based on in-class activities as well as the project. The final written report is required to qualify for the Ph.D., but it is not considered in determining the grade for ADA II.