

# ST 740: Bayesian Inference & Analysis

## Project Description

Fall, 2007

Project Abstract Due: November 12, 2007

Final Report Due: December 7, 2007

40% of your course grade will depend upon successful, on time completion of the project. The projects are to be done in teams of 1-3 (2 person teams are probably optimal). They are to result in thorough but concise, professional quality technical reports of not more than 10 double spaced pages (not including the raw data, computer outputs and R or WinBUGS codes) followed by a 10-15 minute seminar style presentation.

Projects are to be turned in by the deadline stated above. If you hand it in before that date, the instructor will give feedback and allow you to make improvements. One paragraph proposals (project abstract) are due by the deadline stated above. These proposals should list your team members and spell out briefly source of data, main goal of the study, and your basic statistical methodology.

Pick a subject that interests you (preferably on a topic of your future/current dissertation) and plan, execute and analyze the results of an experiment intended to increase your understanding of the subject. Check out the web for sample project abstracts. A good source of data is in <http://www.stat.cmu.edu/DASL/>.

After experimenting make a thorough but concise report of your entire investigation. Include at least:

1. An Executive Summary (goals and major findings)
2. A Table of Contents
3. A Description of Data
4. Appropriate Bayesian Statistical Analyses of the Data (use graphics as well as numerical summaries)
5. A Statement of the Subject Matter Implications of Your Study, and
6. A Discussion of Further Questions Raised by Your Study (that might be investigated in a subsequent experiment).

Simply attaching a ream of computer printout is not what is meant by including an appropriate statistical analysis. The main body of the report should include only the end products of any statistical calculations (but example calculations should be included in an appendix so your reader can see how your end products were produced). If you are going to include complete computer printouts, they should be painstakingly annotated and included only as appendices (small parts of printouts may be integrated in the text where appropriate). Any appendices should be referred to explicitly in the text (don't leave the reader guessing why appendix material is included). Write the report as if a busy manager were going to read it. Statistical jargon for the sake of statistical jargon will not be well received.

This project need not be expensive nor require a huge time investment in data collection. But it does need to show careful planning, good logic and the Bayesian analysis concepts discussed in the course. Some part of your instructor's reaction to your project will also inevitably reflect the originality of your topic, so choose it with some care.

You will probably have less trouble with the project if the response or responses that you consider are quantitative as opposed to being categorical, and are derived from some physical measurement as opposed to say a 1 to 10 "rating" by an "expert."

Team average scores for these projects will be assigned according to the following schedule:

Executive Summary and Table of Contents	5%
Description of Data	10%
Presentation (and Annotation if Needed) of Raw Data	10%
Bayesian Statistical Analysis	20%
Subject Matter Implications and Question for Further Study	10%
Professional Appearance of Report	10%
General Readability of Report	10%
Seminar Presentation	25%

Sign the **Honor Pledge**: *I/We have neither given nor received unauthorized aid on this assignment* on your cover page, before you submit the project.