STUDENT PROJECTS: INTRODUCTION

Updated: December 27, 2006

(The attached PDF file has better formatting.)

Jacob: What is the student project?

Rachel: The joint SOA-CAS VEE Administration Committee believes that book learning is only part of a good statistics education. Students in a statistics course must learn to apply the statistical concepts and techniques to real data using statistical software.

Jacob: Is this a project that we design or a project that NEAS designs and we complete?

Rachel: The ideal project is designed by the student. The project can be on any topic.

Jacob: Can we use a project we did at work or in college?

Rachel: You can use a statistical project completed for work as the student project for the course. It should be modified to emphasize the application of the statistical concepts. Your work projects focus on actuarial topics, such as setting rates or estimating reserves. The student project focuses on statistical topics.

Jacob: Designing a new project is difficult. If we don't normally use statistical techniques, how do we get ideas and data for projects? What constitutes a good project?

Rachel: We provide project templates. The project templates are adapted from published actuarial applications of statistical concepts to insurance or finance.

We give you data sets and explain the procedures to apply. You can use Excel for all the project templates. We provide illustrative spread-sheets with code for statistical techniques that are not available as built-in functions or add-ins.

We focus on the concepts taught in the on-line courses; you don't have to learn other statistical concepts. You can use any statistical software you have; you are not restricted to Excel.

Jacob: What aspects of the student project differ from the homework and final exam?

Rachel: The homework assignments and final exams do not examine real data. Actuarial and statistical work differ in several ways:

- Actuaries use formulas and come to definite answers. A pricing actuary uses a set of procedures and derives a premium rate.
- Statisticians focus on charts, graphs, and plots. The results are stochastic, so the plots are often ambiguous and no single answer is necessarily correct.

These generalizations are often true, though they are not always true.

Jacob: What project templates do we have?

Rachel: We give several project templates on the discussion forum:

Regression analysis applied to loss reserving: dummy variables and squares of variables.
Sports won-loss records: *F* tests
ARIMA modeling (interest rates, inflation, and other time series)

Each project template provides data and ideas for dozens of student projects.

Jacob: Do we have other project templates?

Rachel: We are adding more project templates each semester. The project templates are hard to form: we must ensure that candidates can complete the project, but candidates must do significant work on their own. A poorly constructed project template annoys candidates. Our faculty has spent about three months on each project template, to ensure that it meets the requirements for VEE credit and can be completed by all candidates who have taken the on-line courses.

- For regression analysis, we have two project templates: dummy variables for regression analysis of loss reserves and *F* tests for sports won-loss records. The papers from which the projects are drawn are on the actuarial syllabus for CAS Exams 6 and 9 and the statistical skills are much desired by insurers.
- For time series, we use a project template on interest rates. Interest rates are much discussed in the textbook, and they are used by most candidates. The SOA and CAS syllabus for their investment exams have much material on interest rate analysis.

Jacob: Do we have our choice of student project? Can we pick any project template?

Rachel: You have your choice of any project template or any other student project.

Jacob: Can we discuss the project templates on the discussion forum?

Rachel: We encourage discussion. For some items, discussion is the quickest way to learn. You must use the Excel built-in functions to complete the regression analysis and form the residual plots. Some candidates have no problem with Excel; others are less familiar with it. We give guidance in the project templates, but we can't anticipate some problems.

Jacob: How is the student project submitted to NEAS?

Rachel: The student project should be emailed to NEAS as an electronic file. A text portion explains what you have done. The text can be in Microsoft Word, Corel WordPerfect, a text file, or a PDF file. The project template shows what questions you must answer. You have much lee-way; you can substitute a related topic if you want.

An Excel or similar attachment contains the statistical output and the graphs or plots: residual plots for regression analysis and sample autocorrelation functions for time series. In most cases, the built-in functions in Excel or other software forms the plots.

Jacob: Why do you want electronic files?

Rachel: We must send the files to our faculty members to review each project. Paper copies are harder to keep track of.

Jacob: What if we get stumped and can't figure out how to read a graph?

Rachel: Post your question on this discussion forum. Many statistical procedures are confusing at first, and probably other candidates are equally stumped. We will review the questions and post answers.

Jacob: What if the student project is not satisfactory?

Rachel: We will send you an email explaining what else needs to be done.

Jacob: How long will these student projects take?

Rachel: That depends on the candidate. If you understand the material, the student project is not hard. The project template explains what you do and what decisions you make. If you do not understand the statistics material and can not apply the methods to data, it takes time to work through each step of the project template.