We would like to announce the availability of a new project for Business Math I (Math 173 at Pima CC). This project replaces Project 1, “Loan Work Outs”, from Mathematics for Business Decisions (MBD).

Our new project is based on an insurance situation: cancellation insurance for one-time events such as concerts. As with the MBD project, students must estimate probabilities (both absolute and conditional) from databases, then use those and Bayes’s Theorem to obtain a conditional probability that can’t be obtained directly from the data. The conditional probability is then used to calculate the premium for the insurance product. Students write a group report and deliver a presentation to the class based on their work.

The project is mathematically equivalent to the MBD project, but ours offers a number of advantages:

- We describe the project and present the necessary mathematics concisely and clearly in a PDF file. Students and instructors do not have to page through dozens of PowerPoint slides to discover what the project’s about and how to do it.

- The calculations have been simplified, without a loss of mathematical sophistication. The MBD project involves conditioning on three variables; we limit ourselves to two. We avoid an unnecessary use of the Law of Total Probability using an assumption of independence that was present in the original MBD project. We also avoid the use of subscripts indicating the databases from which variables were obtained; these give the student little useful information, and make the formulas look far noisier and more intimidating. All of this should give the students a far clearer look at the basic mathematics and principles required to model the situation.

- We provide the student with clear direction on the oral and written reports. MBD says, in essence: “Write a report and give a presentation.” We specify the audience to whom the presentation is to be delivered, and the readers of the report. We also provide a sample report on which students can base theirs. In our directions, the presentation is to be delivered to the potential customers of the insurance product, and selling the product is emphasized. This is good experience for Business Math students, many of whom are marketing majors and will need to deliver sales-oriented presentations in future courses. The report is written for colleagues in the insurance company: the emphasis there is on explaining the mathematics used, and describing the use of the Excel spreadsheet. The different targets for the presentation and the report will give students useful practice in tailoring their material to the appropriate audience.

- The clarity and brevity of our presentation of the project will allow instructors to understand the project in one session of reading. Right now, it’s hard to find instructors willing to teach Business Math; and new instructors typically spend six hours in workshops, plus weekly meetings, learning to teach the course, with heavy emphasis on the projects. Our project allows those instructors to put this time to more productive use.
• Students will also find our project much more comprehensible than MBD’s. By simplifying the calculations and by streamlining the explanations, we’ve created a project that students should be able to understand with much less explanation by the instructor. Indeed, the decreased computational complexity should make it possible for students to do this project as an independent study.

• MBD uses a single database, supposedly created by shuffling together three different sets of records from three different sources. It’s difficult to imagine how such a situation might’ve come about in the real world, without imagining secretaries falling downstairs while carrying stacks of index cards. We straightforwardly use two separate databases. This is more realistic, and it’s easier to extract information from it.

• We provide a model Excel file and discuss some principles of good spreadsheet design, with emphasis on ease of use by others.

• We introduce students to the procedure for creating and using named ranges in Excel. This reduces the likelihood of error in entering formulas, and allows existing Excel sheets to be modified more readily if the database needs to be augmented. MBD does not describe or use this procedure at all.

• We discuss the assumptions behind our calculations and encourage students to consider whether they’re realistic or not. This is something that anyone who’s going to be doing modelling must learn. MBD makes an assumption of independence, but doesn’t try to justify it.

We hope that you’ll take the time to look at our project, and will consider using it in your Business Math course. We would be grateful for any feedback you’d like to provide us.

Wayne Hacker
wayne.hacker@pima.edu

William Flack