MSCS Mess

Statistics Graduate School Night

Speakers: Panel discussion with three current graduate students in statistics programs
Time: Thursday, November 4, 6:30 pm
(Pizza and Subs at 6:00)
Place: SC 182

In addition to the panel discussion, there is time for discussion and individual visits.
Contact Julie Legler, Paul Roback or Donna Brakke to schedule an individual visit.

This Week's Colloquium

Title: Carlson Contest Revealed
Speaker: Amelia Taylor
Time: Tuesday, November 2, 1:30 pm
(treats at 1:15)
Place: SC 182

Have you been wondering who won the Carlson Contest? Wondering if you'll be able to eat for the rest of the semester on your winnings? Have you been lying awake at night wondering how far Red Riding Hood has to travel, how those pesky professors found the mean of their salaries or what the path through the grid is? Then come to this week's Colloquium. We will announce the winners and celebrate their fame. We probably won't be able to do all of the problems, but I will take requests and highlight the key problem solving techniques needed.

Problem of the Week

The baseball playoff series between the Boston Red Sox and the New York Yankees lasted a full 7 games. How likely is it that a playoff series lasts 7 games, assuming the teams are evenly matched? Bonus: How likely is it that if two teams are evenly matched and the first team goes down 3 games to 0 (as they did), that the series will last a full 7 games?

[This problem is not particularly difficult and has probably appeared as a POW before, but is particularly relevant, this time of year. It can be done by bruteforce, by splitting it into several cases and performing a separate analysis for each case, but there exists a short and elegant solution.]

*** Please submit all solutions by Wednesday at noon to Amelia Taylor by e-mail

(ataylor@stolaf.edu) or by placing them in her box at OMH 201.

New CS Courses

CS 231, Mathematical Foundations of Computing (MFC, new course, Spring 2005)
This new course provides the mathematical background needed for further study in computer science. CS students must be able to reason formally using logic and to verify the correctness of their algorithms and programs, and they require introductory knowledge of functions and relations, proof techniques, graphs and trees, discrete probability, and computability (for assessing whether an algorithm or program is practical). MFC explores these conceptual topics using a "hands on" approach, building directly on CS1 skills. Prerequisites: CS 121 or 125, and mathematics background comparable to a calculus course, or permission of instructor (R. Brown).

CS 284, Client-Server Applications (CSA, new course, Spring 2005)
The web is an example of a *client-server application*: multiple computer programs (web servers, and your browser as the "client") cooperate via computer networking to provide physically remote computing services to your own personal computer. How do client-server applications work? CS 284 explores the computer science and technology behind such software systems, including graphics user interfaces (GUIs), network programming, Java programming language, XML language for expressing abstract structures, and databases (with SQL). These diverse topics are united in the course's team project, created using a new and respected approach to software development called "extreme programming." Prerequisite: CS 251 or 125; suitable for both early and advanced CS students, since each level of experience receives support to proceed at its own pace through the background material and on the project. See the CS web site

(www.cs.stolaf.edu) for more information. (Instructor: R. Brown).

CS 390, Senior Capstone Seminar (CAP, new course, Interim 2005)
Senior CS majors apply their knowledge and experience gained from CS courses and any other sources (such as internships and summer research) to an ongoing undergraduate research project in the Capstone Seminar, which is being offered for the first time this Interim. Each senior participates in four aspects of a project's work: reading relevant material from the CS research literature; contributing to the software effort; performing ethical analysis of that project; and writing up results for publication. The team projects are typically interdisciplinary applications for a real user community, and are determined in advance by the professor (R. Brown in Interim 2005) in consultation with students. Prerequisites: Senior standing in the CS major, including completion of most required core courses.

New Statistics Course

Stat 316 Advanced Statistical Modeling (new course, Spring 2005)
If you liked Stat 272, you'll love Stat 316! This course extends and generalizes methods introduced in Statistics 272, while keeping an applied, case study focus. Topics include generalized linear models focusing on longitudinal and correlated data methods, Poisson regression, categorical data analysis and latent variable modeling topics such as principle components and classification methods. These are powerful and sophisticated methods used frequently by practicitioners of statistics. Applications are drawn from across the disciplines. Prerequisite: Statistics 272. Instructor: J. Legler.

Math Practicum Interviews

Interviews for the Math Practicum (Math 390) for this coming interim will begin Monday, Nov 1, and continue through Tuesday, Nov 9. A sign-up list can be found outside Professor Roback's office (OMH206), and interviews will be conducted in Professor McKelvey's office (OMH102). Please come sign up if you are at all interested!

The purpose of these short (15 minute) interviews is (a) to share with you expectations about the month of January, (b) to gauge your mathematical (and non-mathematical) strengths and interests, (c) to help us make decisions if we start creeping above the course enrollment limit of 15 students (5 per group), (d) to allow you to ask any questions you have about the Practicum, and (e) to get you fired up for what promises to be an intense but immensely interesting and satisfying month.

We are in the process of finalizing the three projects for this interim; the tentative list of clients includes a financial services firm, a biostatistics group, and a high tech engineering firm. There is no specific mathematics background required for any project, just enthusiasm and an open, creative, analytical mind. Priority will be given to seniors, although there may be spaces available for interested juniors. If you have any questions, please contact Professors McKelvey or Roback. Alternatively, seniors Anna Ericksen, Sara Krohn, and Andrea Rau participated in last year's practicum, and they'd also be happy to answer any questions.

Last Week's Problem

Is there an arrangement of the ten numbers 1122334455 in a row so that each number, except the first and last, is the sum or difference of its two adjacent neighbors?

Congratulations to **William Voorhees '08** and **Lauren Benson '05** for submitting solutions this week. The sequences 2532134154 and 2352314514 work, as well as both sequences in reverse. One approach might be experimentation, but with the aid of parity (odd vs. even) we can make quick work of finding all the solutions. The parity of the first two numbers in the sequence determines the parity of the entire sequence and there are four possible parity arrangements of the first two numbers. Even numbers are 0 mod 2 and odd 1, so I will use 0 and 1 to denote even and odd numbers respectively. The four possible arrangements are 00, 01, 10 and 11. The parity sequence for each is then 0000000000, 0110110110, 1011011011, 1101101101. Looking at the sequence given, there are 4 even numbers and 6 odd numbers so the only possible parity sequence is 0110110110. Therefore we must start with an even, then an odd and this leaves only the two sequences 2532134154 and 2352314514 and these sequences in reverse.

***If you would like to receive a copy of the Math Mess in your P.O. Box weekly, please e-mail Donna Brakke at brakke@stolaf.edu.