MSCS Mess

Department of Mathematics, Statistics and Computer Science
St. Olaf College
Northfield, MN 55057

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This Week's Colloquium

Title:	Statistics, Nutrition, and HIV/AIDS
Speaker:	George McCabe, Purdue University
Time:	Tuesday, October 4, 1:30 pm (treats at 1:15)
Place:	SC 182

Dr. McCabe will provide an overview of his recent trip to Kenya to help plan a study to test the effectiveness of several nutrition interventions for HIV/AIDS patients. He will use issues related to study design and power calculations to illustrate the role that a statistician can play in such studies.

George McCabe is a professor of statistics at Purdue University. He is widely recognized in the field of statistics for his technical contributions (in areas from statistical genetics to computational methods to experimental design), his consulting expertise (he was Director of Purdue's Statistical Consulting Laboratory for over 30 years), and his teaching abilities (he is the author of several best-selling textbooks).

Problem of the Week (POW)

Let Q be a non-degenerate convex quadrilateral inscribed in a circle. Show that the four lines, each passing through the midpoint at a side of Q and perpendicular to the opposite side, meet in a point.

*** 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.

Contests, Contests, Contests!

Carlson Contest

The Carlson Contest is our local problem-solving contest. Last year 104 students participated! Get your friends together so we can set a new record this year. The details:

When: You can pick up the problems any time between 2:30 p.m. and 4:30 p.m. on Wednesday, October 5, and any time between 6:00 p.m. and 8:00 p.m. on Thursday, October 6. You have two hours in which to work on the problems, beginning at the time your team picks them up.

Where: Pick up the problems and sign in at the fireplace near SC 109, just down the stairs from SC 188.

Who: Teams of 3 students. Any student interested in participating is welcome. The most senior person on the team determines the competition category (upper class, first year, or calculus 1).

What you get: Snacks while working on the contest, fun solving problems and cash prizes for the winners…what more could you want?

Everybody does it—you should too!

NCS Contest

The North Central Section of the Mathematics Association of America sponsors a team problem-solving contest in early November each year. Last year we had the largest number of teams of any school and all our teams scored in the top half of the field. This year the contest is on November 12, starting at 9:00 a.m. Please let Amelia Taylor know if you are interested in participating.

Putnam Exam

The Putnam Exam is a nationwide individual contest that is administered locally at St. Olaf College. The contest itself is on December 6, but registration is due soon. Please let Amelia Taylor know by October 12 if you are interested in participating in the Putnam Exam.

Please contact Amelia Taylor (ataylor@stolaf.edu) with questions about any of the contests or if you are interested in registering for the NCS or Putnam contests. For the Carlson Contest, you can just show up.

New Faculty Spotlight:

Tina Garrett

Math students, faculty, and staff beware: Tina Garrett can probably beat you at racquetball. This new member of the MSCS department once promised her students at Carleton College that anyone who could beat her in racquetball would earn an A for the semester. The record? Tina – more than a dozen; Everyone Else – 0.

Long before arriving at Carleton, however, Tina was a kid growing up in St. Paul Minnesota, where she attended St. Paul Academy and was raised by a family of lawyers. She attended MIT for undergraduate school and graduated in 1994 with a B.S. in mathematics.

Following graduation, Tina moved back to Minnesota and worked as the director of a non-profit youth center for gay and lesbian teenagers in Minneapolis. After a few years she began to miss math, however, and enrolled in graduate school at the University of Minnesota. She wrote her thesis on "Lattice Paths and Generalized Rogers-Ramanujan Type Identities" and graduated in 2001.

Tina's next stop was just across the river at Carleton (racquetball, remember?), where she taught for four years and ran a women's research group for undergraduates. Tina's own research has been in combinatorics, partition theory and q-series.

When not teaching or working on research, Tina spends her time cycling, visiting her nieces and nephews, going to see her mother in Florida, and hanging out with her partner, Cari, and their two cats.

And she plays a lot of racquetball, too.

Teach for America Information Session

By the time they reach eighth grade, students in low-income areas are on average three grade levels behind their higher-income peers in math. You can use your math and science skills to change this. Learn how by attending the Teach for America Information Session on Friday, October 7 at 4:00 p.m. in Buntrock 144.

Teach for America is building the movement to eliminate educational inequality by recruiting recent college graduates to commit two years to teaching in urban and rural public schools. Students from all backgrounds and academic majors are accepted, but there is a particularly strong need for math and science teachers.

Teach for America volunteers receive full first-year teacher salary and benefits, financial aid, a $9,450 AmeriCorps education award (if eligible), student loan forbearance, and interest payments for two years. $5000 signing bonuses are available to applicants with degrees in math, science, and engineering.

Find out how you can make an impact on the lives of children in low-income communities. To learn more, visit www.teachforamerica.org or contact admissions@teachforamerica.org.

Math Clinics Understaffed

If you have a little "free time" in your week, please consider using some of it to help other students think through the ideas and problems in Math 120. Slots to be filled are 7:30 to 9:00 p.m. Sunday, Tuesday, Wednesday, and Thursday evenings. If you could do at least two of these sessions, please fill out the Math Clinic Application Form at http://fusion.stolaf.edu/asc/forms/clinics/tutorApplicationSem1.cfm or call Peder Bolstad at x3288 for more information.

Stat Grad School Info Night

Graduate students in statistics and biostatistics will lead a panel discussion on Monday, October 10 from 5:30-7:00 p.m. Come hear these students talk about their experiences and answer questions such as: What is graduate school like? How do I pick a program? Will I be prepared? What can I do with an M.S. or a Ph. D. in statistics? And can I really get paid for going to school?!?

MSCS and the CEL

For seniors pondering life after St. Olaf, juniors looking for potential internships, and sophomores and first-years wondering about career possibilities, the Center for Experiential Learning is a wonderful resource. Several organizations are coming to St. Olaf to hold information sessions and conduct interviews in the next month, and many of these groups are interested in students who are proficient in mathematics, statistics, or computer science.

Representatives will be coming from General Mills, Target, Best Buy, Definitely Health, Peace Corps, and many other organizations. Federated Insurance and Securian (formerly Minnesota Life) are coming to speak with prospective actuarial interns and analysts, among other positions. St. Olaf students are also encouraged to travel across the river and visit with other organizations that are coming to Carleton.

For more information about career opportunities, and to see everything the CEL has to offer, go to http://olaf.erecruiting.com or http://www.stolaf.edu/services/career. Campus visits begin September 29, so check into things soon if you are interested—these are great opportunities not to be missed!

Last Week's Problem

Since there is a foreign language component at St. Olaf College, the Psychology and MSCS departments got together to study the retention of new words in students. They found that most students start at St. Olaf knowing, on average, 15 words. Then each week students learn about 30 new words, but also forget 5% of the words they have already learned. How many words have been learned after n weeks? What is the maximum number of words they can ever hope to learn in this scenario?

Congratulations to Thomas McConville '09 for submitting a correct complete solution and to Carrie Manke ’06 for a correct solution for x_n.

Let x_i be the number of words learned after week i. Then x_0 = 15 and x_1 = x_0 + 30 - .05x_0 = 30+.95x_0. Then x_2 = 30 + .95x_1 = 30 + .95(30 + .95x_0) = .95^2x_0 + 30(1+ .95). Similarly x_3 = 30 + .95x_2 = .95^3 x_0 + 30(1+.95 + .95^2). With a pattern suggesting itself, we proceed with an induction proof. Suppose x_n = .95^nx_0 + 30 (1+ .95 + .95^2 + ... + .95^(n-1)) = .95^n x_0 + 30(1-.95^n)/(1 .95), then x_(n+1) = x_n + 30 - .5(x_n) = 30+.95 (.95^nx_0 + 30 (1+ .95 + .95^2 + ... + .95^(n-1))) = .95^(n+1)x_0 + 30 (1+ .95 + .95^2 + ... + .95^n) = 95^(n+1)x_0 + 30 (1 .95^(n+1))/(1-.95). For the second part we just need to find the limit as n -> infinity of x_n. Since lim x-> infinity (.95)^n = 0, so lim x -> infinity x_n = 30(1/.05) = 600 words.

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