Augarithms

AUGSBURG COLLEGE

Vol. 17, No.6 Visit us at augsburg.edu/math/ November 19, 2003

Colloquium Series Dates for Fall 2003

Colloquia are held on Wednesdays from 3:40 to 4:40 p.m. in Science 108. Except for the names of some of the speakers, here is the schedule of dates for the 2003-2004 academic year:

Nov. 19 Randy Erdahl, Decision Intelligence, Inc.
Dec. 3 Glen Meeden, University of Minnesota

This week's talk: Asset Allocation

Randy Erdahl

Randy Erdahl
Managing Partner
Decision Intelligence, Inc.

Many companies are faced with difficult decisions on where to best allocate limited marketing dollars. Trying to balance whether to spend the next dollar on prospective, active, or inactive customers across direct mail, email, or telemarketing channels when each has real business constraints on volume and frequency is next to impossible without an optimization tool. Fortunately, creative application of some basic math, stats, and OR techniques can formulate this business problem into a simple application. Hear how DII, an analytical consulting group, is designing its asset allocation solution.

Mathematician biography-Augustus Love

Augustus Love

Born April 17, 1863, in Weston-super-Mare, England, **Augustus Love** graduated from Cambridge and held the Sedleian chair of natural philosophy at Oxford from 1899. He worked on the mathematical theory of elasticity (on which he wrote the two volume work *A Treatise on the Mathematical Theory of Elasticity* (1892-93)) and on waves. His work on the structure of the Earth *Some Problems in Geodynamics* won the Adams Prize at Cambridge in 1911.

An expert on spherical harmonics, Love discovered the existence of waves of short wavelength in the Earth's crust. The ideas in this work are still much used in geophysical research and the short wavelength earthquake waves he discovered are called 'Love waves'.

He received many honours, the Royal Society awarded him its Royal Medal in 1909 and its Sylvester Medal in 1937, while the London Mathematical Society awarded him its De Morgan Medal in 1926.

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Mathematical Proofs...

Over the next few issues, one by one, we will print some entertaining mathematical "methods of proof," most of which have been in circulation for many years, and which were compiled in the May 1961 edition of *OPUS*, by Joel E. Cohen. The later "proofs" rely on the earlier ones, so save them.

Lemma 1. All horses are the same color.

Proof: (by induction) It is obvious that one horse is the same color. Let us assume the proposition $P(k)$ that k horses are the same color and use this to imply that $k + 1$ horses are the same color. Given the set of $k + 1$ horses, we remove one horse; then the remaining k horses are the same color, by hypothesis. We remove another horse and replace the first; the k horses by hypothesis, are again the same color. We repeat this until by exhaustion, the $k + 1$ sets of k horses have each been shown to be the same color. It follows then that since every horse is the same color as every other horse, $P(k)$ entails $P(k + 1)$. But since we have shown $P(1)$ to be true, P is true for all succeeding values of k, that is, all horses are the same color.

In the issues that follow, we will prove that 1) Every horse has an infinite number of legs, 2) Everything is the same color, 3) Everything is white, 4) Alexander the Great did not exist and had an infinite number of limbs.

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The Bi-weekly Newsletter of the Department of Mathematics at Augsburg College

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Puzzle & Problem...

Last issue's puzzle dealt with missing blocks. Correct answers of 23 blocks were sent in by **Kristin Olson**, **Eric Lundberg**, **Angela Bruns**, **Pa Kou Yang**, **Abbey Payeur**, **Eilidh R.**, **Mike Stoinski**, **Angela Bergeson**, **Nora Austins**, **Michael Starner**, **Adam Ketcher**, **Jill Graf**, **Matt Jackson**, **John Keefe**, **Abraham E. Dominguez**, **Shawnfaya Jones**, **Amber Bogart**, **Steve Stangler**, **Jen Hook**, **Andy Matzke**, **Taylor Pagel**, **Crystal Creighton**, **Sara Raymond, Melissa Lee**, **Rosie Thao**, **Alex Johnson**, **Eileen Dover**, **Lois Terms**, and **Tiny Hans Knekmek**. Here is this week's puzzle: In the grid below, place the numbers 1 through 42, one in each cell, so that they form a continuous chain. That is, starting with 1, you must be able to get to 2 by going left, right, up, or down, but never diagonally, and so on, up to 42. Three numbers have already been placed for you.

	11	12				
	31					

Last issue's problem asked for the average number of cards that need to be turned over until the first ace appears. The answer is 10.6, and we had but one correct solver, namely Dan O'Loughlin from the College of St. Catherine's Department of Mathematical Sciences. Here is a nice way to see the result without knowing lots of probability:

On average, the aces divide the deck into five stacks of size (52 - 4)/5 = 9.6, so the first ace appears on average at 10.6. Similarly, the other three aces appear at 21.2, 31.8, and 42.8. Here is this week's problem, which came from Brahmagupta (ca. 630), via Howard Eves:

Two ascetics lived at the top of a cliff of height 100, whose base was distant 200 from a neighboring village. One descended the cliff and walked to the village. The other, being a wizard, flew up a height x and then flew in a straight line to the village. The distance traversed by each was the same. Find x.

Send your solutions to the editor at kaminsky@augsburg.edu, or drop them in the *P & P* box just inside the math suite, Science Hall 137.

With exams approaching, consider the 'Stress Diet'

BREAKFAST:	1 poached egg
	1 slice dry whole wheat toast
	1/2 grapefruit
	8 oz. skim milk
LUNCH:	4 oz. lean broiled chicken
	1 cup steamed zucchini
	1 cup herb tea
	1 oreo cookie
MID	rest of package of oreo cookies
AFTERNOON	1 quart rocky road ice cream
SNACK:	1 jar fudge
	2 doughnuts
DINNER:	rest of bag of doughnuts
	1 large pizza with the works
	1 large pitcher of beer
	3 Milky Way bars
	1 cheesecake eaten directly from freezer

I can't recommend the candidate too highly

Robert J. Thornton wrote in the *Chronicle of Higher Education* that "letters of recommendation are becoming increasingly unreliable for evaluating candidates." To combat threats of lawsuits for negative letters, Thornton has created a lexicon of ambiguous recommendations. Here are some of his samples:

- To describe a candidate who is woeful inept: "I most enthusiastically recommend this candidate with no qualifications whatsoever."
- To describe a candidate who is not particularly industrious: "In my opinion, you will be very fortunate to get this person to work for you."
- To describe a candidate who is not worth further consideration: "I would urge you to waste no time in making this candidate an offer of employment."
- To describe a candidate with lackluster credentials: "All in all, I can not say enough good things about this candidate or recommend him too highly."
- To describe an ex-employee who had difficulty getting along with fellow workers: "I am pleased to say that this candidate is a former colleague of mine."

Well, it was a living

Ludoph van Ceulen (1540-1610) of Germany computed π to thirty-five decimal places by the classical method of inscribed and circumstribed regular polygons, using polygons having 2^{62} sides. He spent a large part of his life on this task and his achievement was considered so extraordinary that the number was engraved on his tombstone, and to this day is cometimes referred to in germany as "the Ludolphine number." Recent attempts to find the tombstone have been unsuccessful; it is probably no longer in existence.
Source: *The Other side of the Equation*, by Howard W. Eves.