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Carleton College
Northfield, MN 55057
The newsletter for the Carleton mathematics and statistics community
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Data Analytics Winners!

Congratulations to Junxiong Liu ('17, MS), Il Shan Ng ('17, MS/Econ), Yuhao Wan ('18 Math/Phil), Frank Yang ('17, Math/Econ), and Carly Yu ('17, ENTS) for winning first place at the MinneMUDAC data analytics competition last weekend. They spent the last month (and the early morning hours before the competition!) sifting through massive amounts of data provided by regional lake monitoring programs and tax databases to explore how land use and value is related to water quality. This past Saturday, they presented their results to an audience of well over 100 people and beat out 14 other undergraduate teams from across the five-state region. Besides winning prize money, they also received a free dinner at Grand Szechuan on their way back to Northfield!

Interested in the Mathematical Contest in Modeling?

No fashion sense necessary: this is mathematical modeling! The MCM is an international competition where teams tackle an open ended problem in applied math and submit their solutions for a chance to win prizes and recognition.The contest is held over four days, Jan 20-23 2017, and all work is done on campus. We would love for you to participate! Contact Rob (rthompson) for more info.

Major in Statistics!

Effective starting with the Class of 2019, students will be able to major in Statistics. The department is discontinuing the current "statistics track within the mathematics major." The primary changes are that the Math 236 (Structures) requirement is being replaced with CS 111 (Intro to CS), and all three electives can now be statistics courses. Visit https://apps.carleton.edu/curricular/math/major/#StatisticsMajor to see the complete description of the new major.

Study Abroad in Budapest

Thursday, January 10; 12 p.m. CMC 206

Do you like solving math problems? Are you curious about the Budapest programs in Mathematics and Mathematics Education? There will be an information meeting January 10 at noon; mark your calendars now! The directors of both the BSM and BSME programs will be present to answer your questions. Carleton students wishing to apply to either program need to apply to the Carleton Mathematics and Statistics Department first. Learn more at this meeting on January 10. If you have questions before then, email Deanna Haunsperger.

Job, Internship, and Graduate Opportunities

Operations Financial Analyst - Amazon

This past week Carleton Alumni, who now work in the finance divisions at Amazon, visited Carleton. They held informational sessions and one-on-one meetings about upcoming job opportunities at Amazon. One such opportunity was for an entry-level operations financial analyst position. More information about this position can be found via the Tunnel. The application deadline is November 28th.

Breakthrough Twin Cities

Breakthrough Twin Cities provides a paid, teaching internship opportunity for college students. Nationally rated a top-10 internship by the Princeton reveiw, the Teaching Fellowship is a great avenue for students to explore the field of education, build meaningful relationships with middle school students, and work to impact educational inequity in the Twin Cities. There are looking for outstanding students from the STEM fields who are interested in helping Middle School students get excited about science and math. If you would like more information, follow this link to sign up for their mailing list: http://eepurl.com/cdoCL9. Visit the Breakthrough website to learn more about the application process and deadlines.

Problems of the Week

To be acknowledged in the next *Gazette*, solutions to the problems below should reach me by noon on Wednesday, January 4, 2017. (We'll go back to Tuesday deadlines after that, but that Wednesday is the first day of winter term.)

1. Define a sequence (a_n) by

$$a_0 = 1,\ a_1 = 3, \quad \text{and for } n \geq 1, \quad a_{n+1} = \frac{n+3}{n+1}\,a_n - \frac{2}{n+1}\,a_{n-1}\ .$$

The first few terms are $1, 3, 5, \frac{19}{3}, 7, \ldots$. Find the limit of the sequence, or show that the limit doesn't exist.

2. Suppose you start at the origin in the coordinate plane, and you take a series of steps of length 1, where each step is in one of the coordinate directions (east, north, south, or west), with the restriction that you can never take three steps in a row in the same direction. As a function of n, what is the least number of steps you can take from $(0,0)$ to $(2017, n)$?

As of now, no student solutions have arrived for the problems posed October 28, unless I lost track of something (if so, please let me know!). *Mathematica* wizard John Snyder in Oconomowoc solved both problems, while "Auplume" solved the second problem. It will be a while before my own solutions get posted (I hope to have the ones for October 14 up soon, though), so additional solutions are still welcome. The problems above are supposed to tide you over winter break; good luck with the end of the term, and have an excellent break!

- Mark Krusemeyer

If you're having trouble seeing the Problem of the Week, try enabling images for the message.

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