



ΓΟΟΔΣΕΛΛ ΓΑΖΕΤΤΕ

Carleton College

55057

The newsletter for the Carleton mathematics and statistics community

February 7, 2020 Northfield, MN

Vol. 38, No. 07



Inclusion/Exclusion: Building a More Welcoming Math/Stats Community

When: Friday, February 7, 3:30-4:30pm

Where: Weitz 236

Are you interested in math/stats? Are you curious about gender issues? Come join us in Weitz 236 from 3:30-4:30 pm on Friday, February 7 for stories and conversations about the intersection between math/stats and gender at Carleton. This event is open to both students and faculty.

Gather Your Team for the Konhauser Problemfest

On Saturday, February 29, the 28th annual Konhauser Memorial Problemfest will take place at Macalester. The contest, which is named after the late Macalester professor and legendary problem poser Joe Konhauser, is a premier local problem-solving event. Teams of up to three students get three hours (9 a.m. to noon) to work together on a set of ten challenging and intriguing math problems. The participants then have lunch together while the solutions are graded, and the results are announced right after lunch. The winning team gets to take the famous granite "pizza trophy" home to their college for the year. It's been in residence right here at Carleton this past year (check it out in the common space near Sue's office), and it would be great to have it stick around for another year. To sign up for the Konhauser, contact Rafe (rfjones@carleton.edu). Three people can sign up as a team, but individuals are also welcome to express interest -- it should be possible to find you some teammates. The deadline is Friday, February 21.

If you want to see what Konhauser problems are like, and get some practice solving them, drop by the problem-solving group, which meets on Wednesdays 4:30-5:30 pm in CMC 328.

Upcoming Events

Week 5

Friday, Feb 7, 3:30-4:30pm
Inclusion/Exclusion Event - Weitz 236

Job, Internship, & Other Opportunities

Consumer Financial Protection Bureau - Director's Financial Analyst

Carleton alum and former Admissions Director, Jaime Anthony '06 (Econ) is seeking to hire an Associate Data Analyst at the organization she is working for, Education Technology, Services, and Research (<https://eab.com/>). This is an entry level position for someone who likes numbers, data integrity, etc. Find more information and apply at <https://eab.com/careers/516919>.

Department of Homeland Security - Student Researcher

Are you a student looking for a professional opportunity to learn about homeland security related research to enhance your research interests and career goals? Do you want to learn from top scientists and subject matter experts in homeland security related areas? Do you want to network with your peers and members of the academic and scientific communities in business, industry, and government research facilities conducting research in DHS relevant areas? If you answered "Yes" to the above questions, the HS-POWER program is for you!

The U.S. Department of Homeland Security (DHS) Science and Technology Directorate Office of University Programs (<https://www.dhs.gov/science-and-technology/office-university-programs>) sponsors the Professional Opportunities for Student Workforce to Experience Research (HS-POWER) Program for undergraduate and graduate students. HS-POWER is open to students majoring in a broad spectrum of homeland security related science, technology, engineering and mathematics (STEM) disciplines as well as DHS mission-relevant research areas.

As a participant in the HS-POWER Program, you will participate in quality research experiences at federal research facilities and other HS-STEM focused entities nationwide. This experience will provide you a competitive edge as you apply your education, talent, and skills in a variety of settings within the DHS enterprise. You will also be able to establish connections with DHS professionals that promote long-term relationships between yourself, researchers, DHS personnel, and research facilities.

Visit <https://www.zintellect.com/Opportunity/Details/DHS-POWER-2020> to learn more and complete the application!

Consumer Financial Protection Bureau - Director's Financial Analyst

This unique, two-year rotational fellowship sits at the intersection of the federal government and the financial services industry. Director's Financial Analysts are given the opportunity to hone analytical and problem-solving skills while helping to make markets for consumer financial products work for Americans. Members of the Director's Financial Analyst Program will experience diverse roles, responsibilities, and areas of expertise. As a result, in a short period of time, analysts will play an integral role in everything the Bureau does, from rigorous data-driven policy creation and market monitoring to on-site supervision of market participants.

All analysts will complete developmental rotations in offices throughout the CFPB. These rotations are designed to provide exposure to the analysis, strategy, research, education, policy development, supervision, enforcement, and rulemaking activities throughout the Bureau. We are recruiting for positions

that begin after the 2019-2020 academic year.

We are currently accepting resumes through our posting on your school's job posting site. However, to officially apply, students will need to do so at <https://www.consumerfinance.gov/careers> during our live application window on USAJobs. The second window will be opening on January 31st and stay open until February 10th. Students who send an email demonstrating interest will be notified when the application becomes available. Interested students should send an email to CFPB_DFA_Program@cfpb.gov. If they have additional questions about the position or the application process, they can also reach out to whitney.harris@cfpb.gov.

Problems of the Fortnight

To be acknowledged in the next *Gazette*, solutions to the problems below should reach me by noon on Tuesday, February 18.

1. If you watched last Sunday's Super Bowl game, you may remember that at halftime, the 49ers (SF) and Chiefs (KC) were tied 10-10. To that point, the scoring had gone as follows: SF field goal (3 points), KC touchdown with extra point (7 points), KC field goal (3 points), SF touchdown with extra point (7 points). That is, if we further abbreviate SF by A and KC by B and we only record the points, the scoring sequence looked like A3, B7, B3, A7. Naturally, there are many other possible scoring sequences that would have led to the same 10-10 tie. As you may well know, the possible individual scores in a scoring sequence are 2, 3, 6, 7, and 8. (Those are the scores for a safety, a field goal, a touchdown with missed extra point(s), a touchdown with extra point, and a touchdown with conversion, respectively.) Given this, how many possible scoring sequences (like the actual sequence A3, B7, B3, A7, indicating which team scored how many points each time and in what order the scores occurred) are possible that lead to a 10-10 tie? (Note: If you are not able to solve this problem exactly, feel free to submit a guess. If *no* student solves the problem exactly, a prize may be awarded for the closest guess. Please don't use a computer program to count the number of possibilities by "brute force," and please don't submit more than one guess per person.)

2. For the purposes of this problem, define a *tile* to be a trapezoidal region in the plane that is congruent to the one with vertices $(0,0)$, $(1,0)$, $(2,1)$, and $(0,1)$. For what positive real numbers c can you cover a region that has the exact same shape as a tile, but with side lengths c times as long, by tiles, without overlap? In other words, given an unlimited supply of tiles, for what values of c can you use those tiles (which you can put down in any orientation) to form "supertiles" for which every distance is scaled up by a factor c ? (To solve the problem completely, you should show not only how to do this, but also how you know that you have all possible values of c .)

Welcome solutions to both problems posed January 24 came in from far and further away, from regular solvers "Auplume" and John Snyder. Here's hoping that midterm break and the "short week" after will bring some student solutions, as well!

- Mark Krusemeyer



Editors: Adam Loy, Antonia Ritter
Problems of the Fortnight: Mark Krusemeyer
Web & Subscriptions: Sue Jandro

