

Sorting Permutations with Finite-Depth Stacks

Timothy Goodrich, Drew Groth, Lauren Knop

Departmental Affiliation: Mathematics and Computer Science
College of Arts and Sciences

Sorting organizes information for optimal usage and is desirable in many different fields. Noted computer scientist Donald Knuth first considered using stacks of infinite depth as a powerful means to sort data. We extend this work to consider stack-sortable permutations using stacks of specified finite depths. We characterize patterns that sortable permutations must avoid and derive a handy enumeration formula. Further generalizations include the introduction of multiple stacks and the analysis of the resulting counting sequences.

Information about the Authors:

Timothy Goodrich is a sophomore computer science and mathematics double major from Franklin, TN. His interests include programming and discrete mathematics, areas which he tutors for the Academic Success Center and hopes to continue studying in graduate school. Drew Groth is a sophomore actuarial science and finance double major from Pewaukee, WI. His interests include applied mathematics and music, and he is currently a member of Interfraternity Council and Phi Kappa Psi. Career goals include being an actuary for a consulting firm and someday owning his own firm. Lauren Knop is a freshman mathematics major from Geneva, IL. She is currently a member of the Valparaiso University swim team and is exploring her career options.

Faculty Sponsor: Dr. Lara Pudwell

Student Contact: timothy.goodrich@valpo.edu