

Comparing Algorithms for Sorting with t Stacks in Series

Rebecca Smith

Department of Mathematics, University of Florida, Gainesville, FL 32611-8105, USA
smithr@math.ufl.edu

Received February 6, 2004

AMS Subject Classification: 05A05, 68R05, 68W01

Abstract. We show that the left-greedy algorithm is a better algorithm than the right-greedy algorithm for sorting permutations using t stacks in series when $t > 1$. We also supply a method for constructing some permutations that can be sorted by t stacks in series and from this get a lower bound on the number of permutations of length n that are sortable by t stacks in series. Finally we show that the left-greedy algorithm is neither optimal nor defines a closed class of permutations for $t > 2$.

Keywords: permutations, stack sorting, sorting in series

References

1. M.D. Atkinson, M.M. Murphy, and N. Ruškuc, Sorting with two ordered stacks in series, *Theoret. Comput. Sci.* **289** (2002) 205–223.
2. M. Bóna, *Combinatorics of Permutations*, C.R.C. Press, 2004.
3. M. Bóna, A survey of stack sorting disciplines, *Elect. J. Combin.* **9** (2) (2002–2003) #A1.
4. D.E. Knuth, *Fundamental Algorithms, The Art of Computer Programming, Vol. 1, 2nd Ed.*, Addison-Wesley, Reading, MA 1973, World Scientific, 2002.
5. J. West, Sorting twice through a stack, *Theoret. Comput. Sci.* **117** (1993) 303–313.