

MA/CSSE 473 – Design and Analysis of Algorithms

Homework 9 (53 points total) Updated for summer 2012

When a problem is given by number, it is from the textbook. 1.1.2 means “problem 2 from section 1.1” .

Problems for enlightenment/practice/review (not to turn in, but you should think about them):

How many of them you need to do serious work on depends on you and your background. I do not want to make everyone do one of them for the sake of the (possibly) few who need it. You can hopefully figure out which ones you need to do.

- 5.5.4 (multiplication à la Russe)
- 5.5.7 (Josephus problem for $N=40$)
- 5.5.9 (Prove properties of Josephus solutions)

Problems to write up and turn in:

1. (6) 4.4.8 [5.5.2] (Ternary Search)
2. (12) 4.4.10 [5.5.3] (fake coin divide-into-three) Levitin made me do it!
3. (5) Which permutation immediately follows 37246510 in lexicographic order?
Show how you use the algorithm from Day 18 class to get your answer.
4. (5) If the permutations of the numbers 0-7 are numbered from 0 to $8!-1$,
what is the (lexicographic ordering) sequence number of the permutation 37246510?
5. (5) Which permutation of 01234567 is number 25000 in lexicographic order?
6. (20) 4.5.11 [5.6.10a] (moldy chocolate) This problem may be harder than it looks at first.
"Transform and conquer" is a good way to find a complete solution, so you may want to look ahead to Chapter 6. . However, if you can't solve the general case, get some partial credit solve some cases that you can solve, and write about what you tried for other cases. **In the past, several students said that this problem took them longer than any previous problem in the course.**

Don't forget to work on the Convex Hull implementation problem (Due Day 26)