

MA/CSSE 473 – Design and Analysis of Algorithms

Homework 13 (45 points total)

These are to be turned in as hard copy. You can write solutions out by hand, or write them on your computer and print them. If there are multiple pages, please staple them together.

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.

- 8.1.1 (Compare and contrast dynamic programming with divide-and-conquer)
- 8.1.4 (Space efficiency of dynamic programming for Binomial coefficients)
- 8.2.2 (Time efficiency of Warshall's Algorithm)
- 8.3.1 (Practice optimal BST calculation)
- 8.3.2 (Time and space efficiency of optimal BST calculation)
- 8.3.9 (Include unsuccessful searches in optimal BST calculation)

Problems to write up and turn in:

1. (5) 8.1.5 (Order of growth of $C(n, k)$) For (iii), Stirling's approximation may help you to simplify.
2. (10) 8.1.10 (World Series odds)
3. (5) 8.2.3 (Warshall with no extra memory use)
4. (10) 8.2.4 (More efficient Warshall inner loop)
5. (10) 8.3.3 (Optimal BST from root table)
6. (5) 8.3.10a (Matrix chain multiplication) Also think about parts (b) and (c), which may appear on a later assignment or exam.