

Computer Science 373 – Analysis of Algorithms
Prof. Steven Skiena
Spring 2008

Homework 1 – Asymptotics and Data Structures
Due Tuesday, February 19, 2008

Each of the problems should be solved on a separate sheet of paper to facilitate grading. Limit the solution of each problem to one sheet of paper. Please don't wait until the last minute to look at the problems.

All numbered problems come from the manuscript of the second edition of *The Algorithm Design Manual*, by Skiena. Interested students may attempt the extra credit programming challenges problems described at the end of the relevant chapters for a small amount of additional points – small enough that you should be motivated primarily by interest and not greed.

1. On my WWW page <http://www.cs.sunysb.edu/~skiena/373/programs>, there are a collection of seven short C language programs, all of whose time complexities are a function of n . After compilation, each executable accepts an integer value n as its command line argument.
 - Using the Unix *time* command, run each of the executables for various values of n , and graph the results.
 - Does the efficiency of each program behave roughly as expected by theory?
2. Problems 1-17 and 1-19.
3. Problems 2-7 and 2.8
4. Problem 2-19.
5. Problems 2-21 through 2.24.
6. Problem 3-2.
7. Problem 3-4.
8. Problem 3-10.
9. Problem 3-11.