Homework 3
CSc 72700: Analysis of Algoritms
CUNY Graduate Center, Fall 2001

Due Wednesday, 3 October

See the guidelines on the webpage for details about submitting homework. (If turning your homework in electronically, you can mail it directly to the grader at: `ivm3@columbia.edu`.)

Practice Problems

The problems in this section **are not to be submitted**. They are to help you understand the material, and some will appear on exams.

- Exercise 8.1-1 on p 155 (in the second edition: 7.1-1 on p 148).
- Exercise 8.1-2 on p 155 (in the second edition: 7.1-2 on p 148).
- Exercise 8.3-1 on p 162 (in the second edition: 7.3-1 on p 154).
- Exercise 12.2-2 on p 226 (in the second edition: 11.2-2 on p 229).
- Problem 12-1 (Longest probe for bounding hasing) on p 241 (in the second edition: 11-1 on p 250).

Graded Problems

These problems will be graded and should be submitted, following the guidelines on the webpage.

1. Exercise on running time for quicksort when all elements have the same value, 8.2-1 on p 160 (in the second edition: 7.2-2 on p 153).
2. Exercise on worst case searching when $|u| > nm$, 12.2-6 on p 226 (in the second edition: 11.2-5 on p 229).
3. Implement **both** the regular and randomized version of quicksort. Run the sorts on a list of 1000 randomly generated numbers, and on the list: `1000, 999, 998,..., 3,2,1`. What difference in performance did you notice? Give an possible explanation for any difference you noticed. [To measure the time performance, you could time it using profiling tools on your system, or another way would be to add in a counter or print statements and count the number of calls.]

   You should submit your programs, the timing results for both data sets on both programs, and a discussion of their relative performance.