Algorithms Section 2
Spring 2003
Homework 3b
Due Tuesday, February 11

1. **[15 Points] Order Statistics Revisited.** In class we showed that the recursive **Select** algorithm runs in time $O(n \lg n)$ if the array is partitioned into groups of 3 but runs in time $O(n)$ if the array is partitioned into groups of 5. Now we'll investigate what happens if the algorithm is implemented so that the array is partitioned into groups of 7. Give the recurrence relation that arises when groups of 7 are used, and explain why your recurrence relation is correct. Then use the analysis technique that we used in class to derive the Big-Oh running time of this variant of the algorithm. Explain your analysis very carefully!

2. **[15 Points] The Oil of Olay Problem.** Exercise 9.3-9 in Cormen *et al.* second edition (page 193).