

Due at the start of class Monday, July 7, 2003.

Problem 1. In class, we solved the selection problem by breaking the list into groups of 5 elements each.

- (a) We used the fact that you can find the median of 5 numbers with 10 comparisons (by sorting). It turns out that you can find the median with only 6 comparisons.
 - (i) Write down the recurrence for the running time using this new fact. (You can ignore floors and ceilings, as we did in class.)
 - (ii) Solve the recurrence.
- (b) (i) How many comparisons do you need to find the median of 3 elements? Justify your answer.
 - (ii) Write down the recurrence for a selection algorithm based on columns with three elements each. (You can ignore floors and ceilings, as we did in class.)
 - (iii) Solve the recurrence.
- (c) You need 10 comparisons to find the median of 7 elements?
 - (i) Write down the recurrence for a selection algorithm based on columns with 7 elements each. (You can ignore floors and ceilings, as we did in class.)
 - (ii) Solve the recurrence.
- (d) What did you learn?

Problem 2. Do Exercise 9.3-9 on page 193 of CLRS (Exercise 10.3-9 on pages 192-3 of CLR).

Problem 3. Challenge problem. Show how to find the median of 5 numbers with only 6 comparisons.