

Assignment 7

due Friday, March 12, 2010

1. Exercise 7.1-1, p 173 [4 points]
2. Exercise 7.4-5, p 185. [6 points]
3. Given a sequence S of n comparable elements and a positive integer k , describe an $O(n)$ method for finding the k items whose **rank** is closest to that of the median. [6 points]
4. Given a sequence S of n comparable elements and a positive integer k , describe an $O(n)$ method for finding the k items whose **value** is closest to that of the median. [8 points]
5. Exercise 8.1-4, p 194. [8 points]
6. Exercise 8.3-4, p 200. (Note: if you use the second edition, you will need to replace n^2 with n^3). [6 points]

Total: 38 points

Notes:

- *Q3*: An item's rank is its relative position on the list. The smallest element has rank 1, the largest rank n , and the median rank $n/2$.
- *Q4*: Note that you may be returning different values than in the previous question. You may want to find the median first, then look at the difference between each element and the median. Find the k smallest of these latter values.
- *Q5*: It is **not sufficient** to simply combine the lower bounds for the individual subsequences.
- *Q6*: Represent a value k ($0 \leq k < n^3$) as a triple (i, j, k) , where $0 \leq i, j, k < n$. Then think about radix and counting sort combined.