ECE-250 – Algorithms and Data Structures (Winter 2012)

Tutorial 7 (2012-03-15)

1 – Insert the following values into an initially empty min heap: 7, 19, 9, 3, 5, 15, 4. Since no extra work is involved in maintaining a complete binary tree, you should choose this approach.

2 – Dequeue two elements, using the following two techniques:
(a) When removing a node, you promote the lower one of its children.
(b) When removing the root, you take the element at the back (the only one that can be removed in a complete binary tree) and place it at the root, percolating down.

Explain why the second technique is preferred.

3 – Sort the following array, using heap sort (you may assume that there is an extra element that you can use before the first element in the array — essentially, you don't need to worry about the issue of first element being at subscript 1; just assume that convention):

6, 15, 2, 11, 20, 9, 14

4 – For the same array as in question 3, run the first iteration of quick sort, using the median-of-three approximation for the median.