CSE373 Worksheet on Priority Queue and Binary Heap

04/22/14

1. Fill with the worst-case asymptotic running time of each operation (Data structure is array kept organized as a min-heap) (Final 13au)

insert

lookup

delete

findMin

deleteMin

findMax

2. a) FindMin in a Priority Queue implemented with a binary search tree(midterm1 12au)

b) What is the worst-case asymptotic running time of sorting a sequence of integers using a Priority Queue implemented with a binary min-heap? (midterm1 14wi)

3. Draw the binary min heap that results from inserting the integers: 7, 5, 6, 3, 8, 1 in that order into an initially empty binary min heap. You do not need to show the array representation of the heap. You are only required to show the final tree, although drawing intermediate trees may result in partial credit. If you draw intermediate trees, please circle your final result for any credit. (midterm1 12au)

4. Suppose there is a binary min-heap with exactly 4 nodes, containing items with priorities 3, 9, 11, and 15.

(a) Show every possible binary min-heap that could match this description. For each, draw the appropriate tree and the array representation. (You can show just the priorities, not the corresponding items.)

(b) For one of your answers to part (a), show what happens with 4 deleteMin operations. Clearly indicate which heap you are starting with and show the heap after each deleteMin. You can just draw the tree (not the array) after each step. (midterm1 13au)