

Homework 6

(Maximum 50 points)

Due beginning of class Monday October 19, 2015

Show the steps of deriving your answers.

1. **(25 points) [Binary heap: buildHeap, deleteMin]** Show the binary heap structure (as a tree) after building a heap from C O M P U T E R S C I E N C E using the linear algorithm and after deleteMin from the resulting binary heap. In percolateDown, if two children have the same key then swap with the left child.
2. **(25 point) [d-heap: comparison with binary heap in runtime]** Compare the cost of deleteMin operation and Insert operation between a 16-heap and a binary heap. Use the number of comparisons between two elements as the runtime metric. Specifically, state how many times each of the two 16-heap operations takes compared with the corresponding binary heap operation and explain why. Note that 16 is a power of 2 number and, therefore, multiplication and division by 16 can be done using bit shift operations which are fast.

Last modified: October 8, 2015