Homework 4

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Spring 2016 Professor: P Thananjeyan

Written Assignments

1. Elementary sorts

   a) Sort the sequence I, L, O, V, E, A, L, G, O, R, I, T, H, M, S using the following sorting methods. Show trace after each iteration of the outer loop. Also, compare the best, worst, and average case for these algorithms.
      a. Insertion sort
      b. Selection sort
      c. Bubble sort

   Solution:
   a.
   b.
   c.

   b) Show in the style of the example , how shell sorts the E, A, S, Y, S, H, E, L, L, S, O, R, T, Q, U, E, S, T, I, O, N

   Solution:
   Solution?

   c) Given traces, showing how I, L, O, V, E, A, L, G, O, R, I, T, H, M, S are sorted for following mergesort algorithms:
      a. Top-down mergesort
      b. Bottom-up mergesort

   Solution:
   Solution?

2. Quicksort

   1) Show how method partitions I, L, O, V, E, A, L, G, O, R, I, T, H, M, S
   2) Show how quicksort sorts I, L, O, V, E, A, L, G, O, R, I, T, H, M, S(ignore the initial shuffle.) Compare the best, worst, and average case.

   Solution:
   Solution?

3. Priority Queues

   1) Suppose that the P R I O * R * * I * T * Y * * * Q U E * * * U * E * (where a letter means insert and an asterisk means remove the maximum) is an initially empty priority queue. **Give the sequence of heaps** and the sequence letters returned by *remove the maximum operations.*

Solution:
P
P-R