Institut for Matematik og Datalogi

Syddansk Universitet

November 30, 2010

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Programmering B
4th Weekly Note (E10, Week 48)

Reading for Week 48

Section on "Graphs" in Section 12.4 in "Java Software Solutions".

Tutorial on Priority Queues and Binary Heaps, available from:
`http://www.cse.hut.fi/en/research/SVG/TRAKLA2/tutorials/heap_tutorial/`

Lecture: Tuesday, November 30, 10-12 (U37)

We introduce the ADT priority queue. Then we see how priority queues can be implemented efficiently by using heaps.

Lecture: Thursday, December 2, 8-10 (U140)

We introduce graphs and learn how to traverse them.

Discussion: see schedule for time and room

Consider the three sorting algorithms selection sort, bubble sort, and insertion sort. Discuss the following questions in class:

- What is the worst case input for the algorithm with respect to the number of comparisons? How many comparisons are performed for this input?

- What is the best case input for the algorithm with respect to the number of comparisons? How many comparisons are performed for this input?

- What is the worst case input for the algorithm with respect to the number of swaps? How many swaps are performed for this input?

- What is the best case input for the algorithm with respect to the number of swaps? How many swaps are performed for this input?

Look at insertion sort and selection sort. Can you make a general statement about the number of comparisons performed by each of them? Does one of them always have a lower number of comparisons? Which algorithm would you chose? Does it depend on the situation?

Compare the number of comparisons needed in selection sort to those needed when sorting with the help of a heap-based priority queue. For which sizes of inputs does using a heap give a real advantage?