Sorting

11-4-2011

Opening Discussion

- Minute essay comments:
  - Sending me IcP code.

Bubble Sort

- Inner loop:
  - Compare adjacent elements and swap them if they are out of order.
- Outer loop:
  - Repeat n-1 times or until no swaps are done.
  - The latter option is called a flagged bubble sort.

Selection Sort

- This is often called a min-sort or a max-sort depending on how you write it. I'll describe a min-sort here.
- Inner loop:
  - Find the smallest element and SWAP it into position if not already there.
- Outer loop:
  - Repeat n-1 times so all elements are in the right place.
- Does only O(n) swaps, but still $O(n^2)$ comparisons.

Insertion Sort

- Inner loop:
  - Take the next element and shift it down to the right spot.
- Outer loop:
  - Run through all the elements starting with the second.
- This sort is actually a bit faster (factor of 2) on random data. It is really efficient on nearly sorted data.

Watching Them Work

- One advantage of doing graphics before sorting is that we can write code to visualize what is happening when we sort numbers with these sorts.

Minute Essay

- Show me what would happen after each iteration of the inner loop if we min-sort these values.
  - 4, 7, 1, 3, 8, 2
- Quiz #4 is next class.
- Registration info:
  - CS Major/Minor:
    - CSCI 1321, 1323, 1120, (consider 2094 if you weren't in it this semester)
    - Watch for e-mail about CSCI 3194
  - Others:
    - CSCI 1321, PHED 1137