



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

COMP 110

Introduction to Programming

Fall 2015

Time: TR 9:30 – 10:45

Room: AR 121 (Hanes Art Center)

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Previous Class

- What did we discuss?



Today

- Assignment 4: Extension!
 - ALL of it (parts A and B) will be due on Wed, 12/2
- Today
 - Sorting
 - Course Evaluation



Sorting

- Put elements of an array in some order
 - alphabetize names
 - order grades lowest to highest
- Two simple sorting algorithms
 - selection sort
 - insertion sort



Selection Sort at work

98 68 83 74 93

68 98 83 74 93

68 74 83 98 93

68 74 83 98 93

68 74 83 93 98

SORTED!

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Insertion Sort

- Take an unsorted list and build a final sorted list by adding in one item at a time (we humans sort like this too)
- Insert each new item into an already sorted list
- Each unsorted element is inserted at the appropriate spot in the sorted subset until the list is sorted

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Insertion Sort: General Algorithm

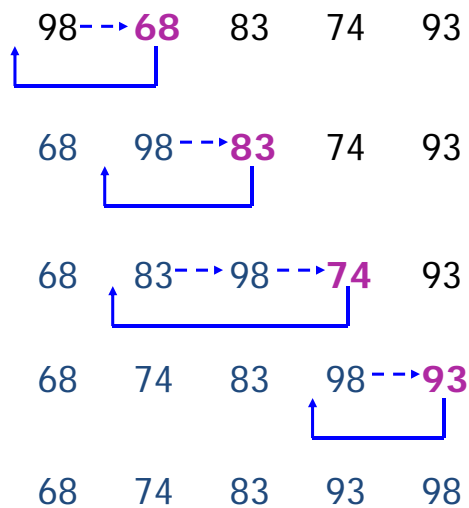
- Sort the first two values (swap, if necessary)
- Repeat:
 - insert list's next value into the appropriate position relative to the first ones (which are already sorted)
- Each time insertion made, number of values in the sorted subset increases by one
- Other values in array shift to make room for inserted elements

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Insertion Sort at work

**SORTED!**

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Insertion Sort

- Outer loop controls the index in the array of the next value to be inserted
- Inner loop compares the current insert value with values stored at lower indexes
- Each iteration of the outer loop adds one more value to the sorted subset of the list, until the entire list is sorted

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Sorting Things other than numbers

- characters
 - same as integers (compare with < and >)
- Strings
 - use the built-in compareTo method
- Other Objects
 - we write a compareTo method
 - use the compareTo method

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Swap

```
private static void swap(int i, int j, int[] a) {  
    int temp = a[i];  
    a[i] = a[j];  
    a[j] = temp;  
}
```

- This method will swap the value of a[i] and a[j]
- Let's do this in Eclipse now!



Demo (and attendance!)

<http://www.sorting-algorithms.com/>



Detour - Security and Privacy

Different slideset (not for exams;
this is just FYI)



Course Evaluations

- Only 50 of you have done the evaluations so far
- So, let's all take 10 mins to complete the course evaluations now



Next class

- Review for FINAL EXAM

HAPPY THANKSGIVING!

