

IST 256
Lab Week 12, Thursday, April 14, 2011

1. Understanding Bubble Sort

Suppose that we have an array with 5 elements that is declared and initialized as follows:

```
int [] numbers = new int[5];
numbers[0] = 24;
numbers[1] = 81;
numbers[2] = 23;
numbers[3] = 18;
numbers[4] = 32;
```

Suppose that this program also has the following bubble sort:

```
int n = 5; // n is the length of the array
for (int i = 0; i < (n - 1); i++) // if array has n elements, number of passes is n-1
{
    for (int j = 0; j < (n - (i+1)); j++) // number of comparisons in interval of pass i
    {
        if (numbers[ j ] > numbers [ j + 1])
        {
            temp = numbers [ j ];
            numbers [ j ] = numbers [ j + 1];
            numbers [ j + 1] = temp;
        }
    }
} // end of sorting
```

Show the order of these array elements after the first, second, third and fourth passes of the **bubble sort algorithm**.

	Initial value	After 1 st pass (i=0)	After 2 nd pass (i=1)	After 3 rd pass (i=2)	After 4 th pass (i=3)
numbers(0)					
numbers(1)					
numbers(2)					
numbers(3)					
numbers(4)					

Observe that on each pass, the next highest number is moved to the end of the interval.

2. Extending the Student Record program to sort students by age

- a. In this lab, we will continue our running example of the Students. Run NetBeans and open your student project, it was usually called Students.
- b. To the form, add a button for sorting. We can use the Student display label already on the form to show the result.

Add a button

|__Sort Students by age:__|

Add the Event -> actions -> actionPerformed event to this button.

- c. Look at your Student class. Does this class have an accessor method called getAge? If not, then add this method.
- d. Use the code given as a class example program as a guide to adding a sort to the new button. Modify the code to sort students by the value of their age, instead of height. Be sure and check that the display label has the name of the label in your design page.
- d. Test your program. Do the results look correct?

e. Submit your program to the iLMS:

First open a text processing program – this should be a simple program like Notepad.

Copy your program text from the array declaration down through all the button methods.

Paste this code into a text file in Notepad. Save the file on your H: drive under your IST 256 projects.

Upload the file into the iLMS under the assignments for Lab Program, Week 12, by Thursday, April 21 (note extended deadline).