

IST 256  
Lab Week 13, Monday, April 19, 2010

**1. Understanding Bubble Sort**

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

```
Dim numbers ( 0 to 4 ) as Integer
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:

```
for (int i = 0; i < 4; i++)      // if array has n elements, number of passes is n-1
{
    for (int j = 0; j < (3-i); 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 <sup>st</sup> pass ( i=0)	After 2 <sup>nd</sup> pass ( i=1)	After 3 <sup>rd</sup> pass ( i=2)	After 4 <sup>th</sup> pass ( i=3)
numbers(0)					
numbers(1)					
numbers(2)					
numbers(3)					
numbers(4)					

### 3. 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 TestStudents2.

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:\_\_|  
Students: (Multi-line label)

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 one in your design page.

d. Test your program. Do the results look correct?