

CS 100 Exercise 11: Sorting
Summer 2001
Due in lecture, Wednesday July 25

Name: _____ **CUID:** _____

The following code implements insertion sort for integer arrays. Read through the code, then indicate what the output will look like (see the back of this page).

```
/* Original code written by Dr. David Schwartz - dis@cs.cornell.edu
 * Modified by Ben Mathew (btm3@cornell.edu) and Kiri Wagstaff (wkiri@cs) */
public class InsertionSort
{
    public static void insertionSort (int[] a)
    {
        // Scan through all elements
        for (int i=1; i<a.length; i++)
        {
            // Index i gives current element.
            // Everything before i is already sorted.
            // Find max a[i] in unsorted region 0..i
            int key=a[i]; // current value to be inserted
            int maxpos=i; // position of max so far

            // move the array components to make a place
            // for the key to be inserted
            while (maxpos > 0 && a[maxpos-1] > key)
            {
                a[maxpos]=a[maxpos-1];
                maxpos--;
            }
            // insert the value into the array
            a[maxpos]=key;

            // print out sorted part
            System.out.println("Pass " + i + ": ");
            for (int j = 0; j <= i; j++)
            {
                System.out.print(a[j] + " ");
            }
            System.out.println();
        }
    }

    public static void main (String[] args)
    {
        int[] unsorted = {42, 3, -7, 13, -246, 75, 19, 1, 800, 0};
        System.out.print("Unsorted array: ");
        for (int i = 0; i < unsorted.length; i++)
        {
            System.out.print(unsorted[i] + " ");
        }
        System.out.println();
        insertionSort(unsorted); // unsorted is now sorted!
    }
}
```

OUTPUT:

Unsorted array: _____

Pass 1: _____

Pass 2: _____

Pass 3: _____

Pass 4: _____

Pass 5: _____

Pass 6: _____

Pass 7: _____

Pass 8: _____

Pass 9: _____