Homework Turnin

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Section:	6G
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Turnin Successful!

The following file(s) were received:

Sorts.java (5066 bytes)

```
    /* M.L. Billington, 10/02/2006.
    Uses the helper classes Selection and Insertion.
    Students are to write the Selection and Insertion classes.
    */
import java.util.*;
import java.io.*;
public class Sorts
{
   public static void main(String[] args) throws Exception
   {
        //Part 1, for doubles
      int n = (int)(Math.random()*100);
      double[] array = new double[n];
      for(int k = 0; k < array.length; k++)
         array[k] = Math.random();
      print(array);
      System.out.println("*************  *************");
      //array = Selection.sort(array);
      array = Insertion.sort(array);
      print(array);

         //Part 2, for Strings
      int size = 100;
      Scanner sc = new Scanner(new File("declaration.txt"));
      Comparable[] arrayStr = new String[size];
      for(int k = 0; k < arrayStr.length; k++)
         arrayStr[k] = sc.next();
      print(arrayStr);
      System.out.println("*************  *************");
     // arrayStr = Selection.sort(arrayStr);
      arrayStr = Insertion.sort(arrayStr);
      print(arrayStr);
   }
   public static void print(double[] a)
   {
      // for(int k = 0; k < a.length; k++)    //old style
      //       System.out.println(a[k]);
      for(double d : a)                       // for-each loop
         System.out.println(d);
      System.out.println();
   }
   public static void print(Object[] papaya)
   {
      for(Object item : papaya)     //for-each
         System.out.println( item );
   }
}
   //*****************************************************************
  //Name:              Date:
  //The Selection class will have methods sort(), findMax() and swap().
  //Three versions of each method will have to be written, to work
```

```
  //for doubles, Strings, and Comparables.

class Selection
{
   public static double[] sort(double[] array)
   {
      for(int i=0;i<array.length;i++)
      {
         swap(array,array.length-1-i,findMax(array,i));
      }
      return array;
   }
   private static int findMax(double[] array, int n)
   {
      int max = 0;
      for(int i=1;i<array.length-n;i++)
         if(array[i]>array[max])
            max = i;
      return max;
   }
   private static void swap(double[] array, int a, int b)
   {
      double temp = array[a];
      array[a]=array[b];
      array[b] = temp;
   }
      /**********************************************
        for Strings
        **********************************************/
   public static String[] sort(String[] array)
   {
      for(int i=0;i<array.length;i++)
      {
         swap(array,array.length-1-i,findMax(array,i));
      }
      return array;
   }
   public static int findMax(String[] array, int upper)
   {
      int max = 0;
      for(int i=1;i<array.length-upper;i++)
         if(array[i].compareTo(array[max])>0)
            max = i;
      return max;
   }
   public static void swap(String[] array, int a, int b)
   {
      String temp = array[a];
      array[a]=array[b];
      array[b] = temp;
   }
      /**********************************************
       for Comparables,
            Swap() is for Objects.
            make sure that print() is for Objects, too.
        **********************************************/
   @SuppressWarnings("unchecked")//this removes the warning for Comparable
   public static Comparable[] sort(Comparable[] array)
   {
      for(int i=0;i<array.length;i++)
      {
         swap(array,array.length-1-i,findMax(array,i));
      }
      return array;
   }
   @SuppressWarnings("unchecked")
   public static int findMax(Comparable[] array, int upper)
   {
      int max = 0;
      for(int i=1;i<array.length-upper;i++)
         if(array[i].compareTo(array[max])>0)
            max = i;
      return max;
   }
   public static void swap(Object[] array, int a, int b)
   {
      Object temp = array[a];
      array[a]=array[b];
      array[b] = temp;

   }
```

```
}

//*********************************************************
  //Name:              Date:
  //The Insertion class
  //write enough methods to handle doubles and Comparables.
class Insertion
{
   public static double[] sort(double[] array)
   {
      for(int i=1;i<array.length;i++)
         shift(array, i, array[i]);

      return array;
   }
   private static int shift(double[] array, int index, double value)
   {
      int loc = index - 1;
      while( loc>=0 && value<array[loc])
      {
         array[loc+1]=array[loc];
         loc--;
      }
      array[loc+1] = value;
      return -1;
   }
   @SuppressWarnings("unchecked")
    public static Comparable[] sort(Comparable[] array)
   {
      for(int i=1;i<array.length;i++)
         shift(array, i, array[i]);

      return array;
   }
   @SuppressWarnings("unchecked")
    private static int shift(Comparable[] array, int index, Comparable value)
   {
      int loc = index - 1;
      while( loc>=0 && value.compareTo(array[loc])<0)
      {
         array[loc+1]=array[loc];
         loc--;
      }
      array[loc+1] = value;
      return -1;
   }

}
```