Problem set number 8
CS470 Spring 2005
due date April 14, 2005, 11:59pm

Exercise 8.1 [worth 150 points]
In this exercise you will compare the running time of different sorting algorithms on different inputs. You will consider the five algorithms that you have implemented: mergesort, randomized quicksort, insertionsort, bucketsort, and radixsort. The problem has two stages with different due dates:

Stage 1, deadline April 14: Generate files of the following characteristics:

file name	number of numbers	content
R1.txt	**10**	pseudorandom numbers from {1,…,100000}
R2.txt	**100**	pseudorandom numbers from {1,…,100000}
R3.txt	**1000**	pseudorandom numbers from {1,…,100000}
R4.txt	**10000**	pseudorandom numbers from {1,…,100000}
R5.txt	**100000**	pseudorandom numbers from {1,…,100000}

file name	number of numbers	content
S1.txt	100000	start with sorted sequence 1,2,…,100000, and swap **10** pseudorandomly selected pairs
S2.txt	100000	start with sorted sequence 1,2,…,100000, and swap **100** pseudorandomly selected pairs
S3.txt	100000	start with sorted sequence 1,2,…,100000, and swap **1000** pseudorandomly selected pairs
S4.txt	100000	start with sorted sequence 1,2,…,100000, and swap **10000** pseudorandomly selected pairs
S5.txt	100000	start with sorted sequence 1,2,…,100000, and swap **100000** pseudorandomly selected pairs

file name	number of numbers	content
L1.txt	100000	pseudorandom numbers from {1,…,**10**}
L2.txt	100000	pseudorandom numbers from {1,…,**100**}
L3.txt	100000	pseudorandom numbers from {1,…,**1000**}
L4.txt	100000	pseudorandom numbers from {1,…,**10000**}
L5.txt	100000	pseudorandom numbers from {1,…,**100000**}

file name	number of numbers	content
D1.txt	100000	number 100000 and 99999 pseudorandom numbers from {1,…,**10**}
D2.txt	100000	number 100000 and 99999 pseudorandom numbers from {1,…,**100**}
D3.txt	100000	number 100000 and 99999 pseudorandom numbers from {1,…,**1000**}
D4.txt	100000	number 100000 and 99999 pseudorandom numbers from {1,…,**10000**}
D5.txt	100000	number 100000 and 99999 pseudorandom numbers from {1,…,**100000**}

Stage 2, deadline April 24: You will be given access to files and you need to run each of the five algorithms of the files and record the running times. You will compare the running times and interpret the results. Details of this stage will be provided after April 14.