Assigned: Wednesday, May 1, 2024 (Week 11).
Due: Wednesday, May 15, 2024 (Week 13).
Graded Points: 10%

Sorting Techniques (10 Points)

Objectives

1 Familiarity with sorting techniques,
2 Practicing the implementation for several sorting techniques, and
3 Analyze and compare the performance of sorting methods.

The Problem

It's required to implement a program (in Java) that compares between the following sorting techniques:

1. Linear Sort,
2. Bubble Sort,
3. Quick Sort.

The Comparisons is to be made for the following types of array (Random, Sorted, and Inversely Sorted) and for size of arrays (10,000 elements).

The Program compares these techniques for the following comparison parameters:

- Relative run time
- Number of comparisons
- Number of interchanges of entries

Your program must either generate arrays of a certain type (sorted, inversely sorted or random) or accept as an input a group of file names containing lists of integers of different sizes. Each of these files is a text file containing a single integer on each line.

Expected Output of the Program

- A table representing the results of comparison for the three sorting techniques and for different array types,
- A graph representing these results, and
- Simulation of sorting iterations. The simulation represents the numbers to be sorted as lines (or bars) and the positions of these lines Change at each iteration (Bonus max 3 points).

You should submit a report in which you compare the various sorting techniques. Graphs for all techniques for all comparisons parameters should be represented well in the report. Also, you should write your comments on the results.