

Project 1. Due date: Wednesday, October 10, by 15:45 p.m. EST

Two-Phase Multiway Merge-Sort

The task is to sort a large input file of tuples (records). The input file is given as a text-file in which each line of the file is a positive integer (with possibly duplicated values), where each integer is a tuple. The task is to compare the tuples in the list and to output to a file the same list where its tuples are sorted in ascending order. The first line of the input file will indicate the number of tuples in it and the amount of allowed maximum main memory. The second line of the input file is blank and from the third line the tuples start. Example

1000000 5mb

111111 234566 22

The sorting algorithm is the Two-Phase Multiway Merge-Sort with possibly several rounds of merging in Phase 2. and based on the given input information your algorithm should determine the best buffer size before it starts the actual sorting.

The project will be graded based on correctness, wall-clock execution time on the machines in the labs and optimization on the size of buffer and number of rounds.

There are a few considerations:

- Programming language is restricted to Java.
- Use `XmxkM` to restrict the main memory usage to k MB. for example `Xmx5m` will restrict the main memory to 5MB. You need to set it up on Eclipse.
- Your program should work with any input size.
- Execution time is important. All of the projects will be run on the same machine and your grade will depend on the correctness as well as the execution time.
- You need to provide a single page report describing your algorithms.
- Projects are to be submitted electronically by one of the group members in a single archive file (*.tar.gz), using the link:

<https://fis.encs.concordia.ca/eas/>

Submit your project as "Project 1."

Notice: While discussion of the project problems among students is encouraged, each group must implement the project independently. Groups should be aware of the University's Code of Conduct concerning cheating, plagiarism, and the possible consequences of violating this code. Furthermore, on the submitted project you must write the following statement: "We certify that this submission is our original work and meets the Faculty's Expectations of Originality", together with your signatures.