CS 245 - Practice Assignment 5 Spring, 2020

Practice Assignment 5 - MegaSort

The goal of this assignment is to practice the choosing, the implementation and testing of different sorting algorithms we discussed.

Background

In this assignment, you will sort a large list of numbers. Each of the integers you are provided is exactly four digits long, including leading 0 digits. You are provided a sample (one million integers) in the file provided. No other code (eg. “starter code”) or support is provided.

Requirements (Process)

Requirement 1: Get the files you need. You will copy them to your own GitHub repository using the following procedure:

1. Log into GitHub. If you do not have a GitHub account, create one via github.com > Sign Up.
2. Point your browser to the URL https://classroom.github.com/a/r-u4oTum.
3. If necessary, authorize GitHub Classroom by selecting the “Authorize github” button.
4. If available, select your name from the list of names available. This will link your GitHub ID.
5. Accept the assignment by selecting the appropriate button.

If successful, your repository should contain one (1) data file, `1m-ints.txt`. This file contains (randomly-generated) 4-digit integers.

Requirement 2: Design a solution by choosing one or more algorithms we discussed in class. Your design may be a modification of an established sorting algorithm or may be exclusively your own.

Requirement 3: Implement a solution. Your “main” must be contained in a class called `MegaSort.java`. It must take one parameter, the name of the input file, and must output the sorted list to standard out (the terminal), one entry per line. In summary, it should be called and produce the first three output lines as follows:

```
$ java MegaSort 1m-ints.txt
0001
0001
0001
```

Submission

You are required to submit two items for this assignment:

1) One of the following explanations, depending on your design:
    a) The name of the well-known algorithm you used
    b) The names of the well-known algorithms you used and how you combined them
    c) A description of your unique algorithm
2) The code in `MegaSort.java` to sort a large number of integers

Use GitHub to check in the explanation (as a file in text or markdown format) and the code to complete the implementation. On Canvas, submit the URL for your GitHub repository.

Grading

Grades will be determined as follows:

- 20% = Choice and explanation of algorithm(s) used
- 70% = Correct implementation of the sorting algorithm and correct performance on the test file
- 10% = Style, including consistent indentation, variable naming, etc.