Programming Assignment 1

Due: 4 Oct 2024

CSC311, Data Structures

Objectives

The main objectives of this assignment are as follows

1. Work with Array and Singly Linked List
2. Get familiar with Eclipse (import, export, Junit testing, debug)
3. Write test cases and use Junit to test

Problems

1. Sort an array
2. Find the kth largest element in an array, not sorted
3. Reverse a singly linked list
4. Remove duplicated in a sorted linked list

Getting Started

1. Download and import the following zip file: PA1.zip. For Eclipse:
   (a) Open Eclipse
   (b) Choose "File > Import"
   (c) Select the "General" category
   (d) Pick "Existing Projects into Workspace"
   (e) Click on "Next"
   (f) Select the button for "Select Archive File" and browse to/select the zip file.
   (g) Click on "Finish"
2. Read the comments in ArrayProblems.java and LinkedListProblems.java and understand the function for each method
3. Complete the 4 unfinished test cases in ArrayProblemsTest.java and LinkedListProblemsTest.java by following the finished test cases.
4. Complete the ArrayPoblems.java and LinkedListProblems.java

5. Run the test cases in ArrayProblemsTest.java and LinkedListProblemsTest.java and fix all the bugs.

Submission First, look at the following checklist:

- Have you tested every method?
- Is the indentation easily readable? You can have Eclipse correct indentation by highlighting all code and select "Source > Correct Indentation".
- Are comments well organized and concise?

Then, **export** your project to a zip (not .rar) file in Eclipse (projects must be exported, not saved):

1. Select File > Export
2. In the "Select an export wizard" pane, Select General > Archive File
3. Hit the "Next" button
4. Enter the archive file name PA1.zip or click the "Browse" to choose different directory and type the archive file name PA1.zip. Again, use the name PA1.zip
5. Click "Finish"

After the export is finished, expand the PA1.zip file and make sure it has the correct folder structure and ALL the java source code files are under the correct folders. Missing any source file or directory could cause compilation failure. When the project does not compile, you will get 0 point. If you had multiple copies in different locations, make sure you are expanding the right zip file by checking the timestamps. Then submit the zip file PA1.zip. You may submit many times, the latest submission will be graded only.

Each student has a total number of 2 slip days throughout the semester. Please refer to syllabus for more information about slip days (i.e., late submissions). Slip days are intended to account for routine illness, job interviews, system outages, etc. In case you need to use your slip days, make sure to leave a comment when submitting your assignment to let me know about it (do not send emails for this matter). For example, if you have never used any slip days and you need to use 1 slip day, let me know in the comment section that you are using 1 slip day for this assignment and you will have 1 remaining slip day for future possible late submission. All the assignments must be submitted via Canvas. Submissions by email will not be accepted.

Grading Criteria

- Sort an array (20p)
- Find the kth largest element in an array, not sorted (15p)
- Reverse a singly linked list (20p)
- Remove duplicated in a sorted linked list (20p)
- Complete the 4 unimplemented test cases (3 in ArrayProblemsTest.java and 1 in LinkedListProblemsTest.java) (20p)
- Source code is appropriately commented (5p)