CS401 Project

1. Project Description

Create to compare running complexity among data search algorithms. You need to compare:

1.1 Unsorted list in array and linked list
1.2 Sorted list (make the same data from the UL (by 1) but sorted data (refer a sorting algorithm in chapter 11, you can choose one)
1.3 Binary Search Tree
1.4 Total of 5 structures (use only one data set)

Requirements

1. Read a data file to store data into a data structure (both array and linked list each).
2. Data in a data file: product name, customer name, or any string (size up to 100)
3. Search target data and compare run time to conclude (found or not found)
4. Use sequential search for 1.1 and 1.2 (four structures) and compare running complexities
5. Use Binary search of sorted array and use BST
6. Additional data: generate 2,000 random numbers and search data
7. Your project also produces a Big-O notation per ADT and per algorithm based on the result

Thus, your project uses two sets of data:
(1) your string data file and
(2) random generated numbers (integer number)

How to compare run time or complexity? Choose one.

1. An easy way is to count comparison or
2. Use system running time measurement, or
3. Something else you create.

** Count only for searching data (i.e. each comparison in a loop) but do not count any other algorithm such as sorting data

GUI program is not required but if your project runs as full GUI (mouse can choose project menu) frame and if your GUI is easy to operate, your project may be qualified to earn extra credit (up to 5%). Command window GUI is not considered as a full GUI.

2. Additional Requirements

- Your project has a menu to select each algorithm to run and run all once
- Your project must employ OOP, putting your entire project in "main" is not permitted
- When your project runs, provide instructions how to run
- When a list is created, print out the list (UL)
- Use both implementations (array and LL: such as bounded and unbounded model)
- No standard interface is given. (Use your own idea)

Programming language: JAVA ONLY

What to submit?

Submit softcopy through the Course BB

1. Documents based on Software Development Life Cycle (all in one file either MS Word or PDF format except the source code file)

   a. Software specification - What functions or methods do you plan?
   b. Design diagram document (including UML diagram and/or flow charts or pseudo code)
   c. Operational document (user's manual: how to use your program, what is expected result or screen shots because everyone's project looks different)
   d. README file contains step-by-step instructions on how to compile and run your program
   e. Data file (if you use)
   f. Project management/schedule – daily, weekly progress plan
      Hours per each task to be done (briefly)
   g. Complexity analysis based on your results with the theory you learn
2. Source code files (with detail comments why you use the code there or why you include libraries) – do not include any package in the source code
3. Compiled files (to run command line or terminal base)

- Submit multiple files as one submission in the BB
- Do not submit the Google doc link for file (we had some issues in the past)

Final Project Due Date: ***Blackboard submission deadline***

- Late submission penalty: 10% in every 2 hours for 12 hours
- When TA needs more instruction than the operational document to review your project, you may get a minor deduction (up to 5%).
- Demonstration to TA: Contact TA to schedule a demonstration session
- No demo or re-evaluation after final exam. The final exam means END of the semester. No more extra efforts can be allowed by the department.