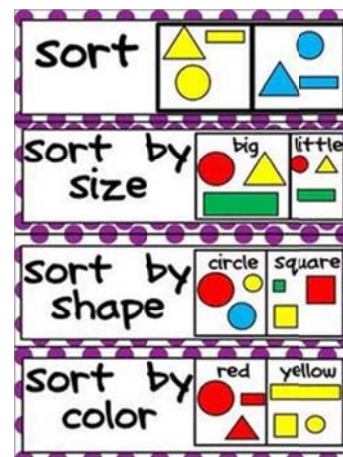


CS4349 Advanced Algorithm Design and Analysis

Assignment 4:

Due back on: Friday, February 20, 2015 at 11:00pm.



The following is from syllabus:

No e-mail submissions are accepted. No late submissions are accepted. So, please plan accordingly, do not leave your submissions to the last minute. If you encounter a problem during elearning submission, please contact 24/7 elearning Help IMMEDIATELY. This help is available 24/7 at:

eLearning Help URL: <http://www.utdallas.edu/elearning/eLearningHelpdesk.html>

eLearning Help Phone: 1 866 588 3192

Any submission that is missed will be graded with a zero. Please do not insist for exceptions.

Purpose: Demonstrate the ability to implement and analyze Heapsort and a divide and conquer based algorithm: Quicksort.

Question 1 (50 POINTS): Given an input array $A=\{6, 10, 1, 8, 7, 9, 3, 2, 4, 11\}$, answer the following questions:

1. A.) (20 POINTS) Manually trace the execution of the Heapsort algorithm on input array A. Please show your step by step work. Record the time it takes to sort the array A manually.

1.B.) (30 POINTS) Write a program in your favorite programming language to implement the Heapsort algorithm. Test run your program on the same input A. **You don't need to display a heap (as a binary tree) output. It is ok to display the output as array each time.** Record the time it takes to sort the array A via this program. Compare both runtimes and comment.

Question 2 (50 POINTS): Given an input array $A=\{6, 10, 1, 8, 7, 9, 3, 2, 4, 11\}$, answer the following questions:

2. A.) (20 POINTS) Manually trace the execution of the Quicksort algorithm on input array A. Please show your step by step work. Record the time it takes to sort the array A manually.

2.B.) (30 POINTS) Write a program in your favorite programming language to implement the Quicksort algorithm. Test run your program on the same input A. Record the time it takes to sort the array A via this program. Compare both runtimes and comment.

Naming Convention:

If you are submitting multiple files, please create a ZIP file of all your files and use the following naming convention for your ZIP file:

CS4349-Assignment<number>-<FirstName><LastName>.zip.

So, student John Smith will name his 1st assignment zip file as:

CS4349-Assignment1-JohnSmith.zip

If you are submitting a single file, please name your file as:

C4349-Assignment1-JohnSmith.doc or .pdf, etc.

Good luck.