Problem Set #8 - Due 04/09/03 Total 50

The purpose of this problem set is to:

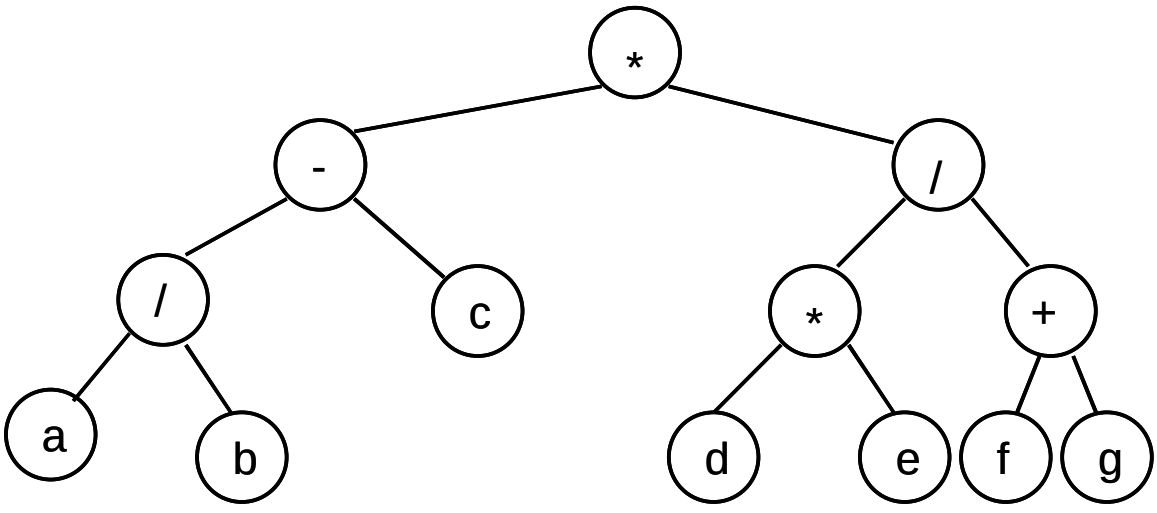
- Help you become familiar with linked lists, graph algorithms, hashing and your project.

Please turn in each problem on a separate page. Each page should have your Name, email id, and the problem number clearly printed/written on it. Keep track of how long time it takes to complete each problem. The time taken for each problem should be printed on the first page. If you use more than one page for one problem, please STAPLE the pages together. You will lose points if you do not document the time taken for each problem, which at the same time means that you will get points for documenting "time taken" A template (in PDF form) is available on the web.

Problem 1 - 9 points

Given the tree below, traverse the tree

a. Inorder
b. Preorder
c. Postorder



It is sufficient to show the final expression you obtain after traversing the tree.

Problem 2 - 8 points

a. What is a collision in a hash table?

b. What is the big-O of inserting an element into a hash table using chaining. Assume that the chaining is carried out using singly linked lists that are sorted. Justify your answer.

Problem 3 - 26 points

a. What are doubly linked lists? Explain with a diagram.

b. What are the fields in the node that you would use to implement a doubly linked list? Justify your answer in two lines.

c. Define your own package, with functions/procedures to

- Create a doubly linked list.
- Display the doubly linked list
    i. In order
    ii. In reverse order
- Insert an element into the list
    i. At the head of the list
    ii. At the tail of the list
- Given an element, determine if it is present in the list

Turn in a **hard copy** of the solution of **part c** in **case study format** and turn in **your code** for **part c electronically**. Feel free to reuse any of the code you have written / received so far. If you are reusing material, make a note of it in the header of your program ☺.

Problem 4 - 7 points

a. In 5 lines summarize why you chose your project and what you hope to learn from it.

b. How much time did you spend on your project this week?