Barthelemy Peter
bapeter
CS1350
Program 2
BST
Due Date: 12/01/17

Design Document

Design and implement a binary search tree that reads in its data from a text file. The data from the tree should be manipulated using three traversal methods, which are the inorder sequence, preorder sequence and postorder sequence.

Traversal Algorithms

Note: Assume left or right traversals eventually reach the end of the list.

Preorder- print parent, left node, then right node

Postorder- print left node, right node, then parent

Inorder- print left node, parent, then left node

UML

- void addLeafPrivate(int item, node* ptr);
- void InOrder(node* ptr);
- void preOrder(node* ptr);
- void postOrder(node* ptr);
+ BST();
+ ~BST();
+ void original(int x);
+ void input(int x);
+ void addLeaves(int item);
+ node* createLeaf(int item);
+ void printInOrder();
+ void printPreOrder();
+ void printPostOrder();

Reflection

What I Learned:

From completing this program, I learned about the basic concepts of program efficiency. I also learned a little more about classes and methods of combining private and public variable to keep the program running smoothly while accounting for user input.

Challenges:

My biggest challenge was having to predict the outcome of recursive functions, so that I could know for a fact that my program worked. Through research I was able to better understand recursion and determine what each recursive function should do before hand, and thus verify the validity of my program.

Solutions:

Since I was able to accurately read recursive statements, I was able to complete this program.

Output Listing

How many items do you want in the tree?

input: 25

This is the original list

5965 27237 29682 16528 35059 48586 21748 21384 49355 40679 3636 46126 44662 49195

41633 17735 12997 28386 40675 34650 13852 5108 8260 18058 14365

Inorder sequence

3636 5108 5965 8260 12997 13852 14365 16528 17735 18058 21384 21748 27237 28386

29682 34650 35059 40675 40679 41633 44662 46126 48586 49195 49355

Postorder sequence

5108 3636 8260 14365 13852 12997 18058 17735 21384 21748 16528 28386 34650 40675

41633 44662 46126 40679 49195 49355 48586 35059 29682 27237 5965

Preorder sequence

5965 3636 5108 27237 16528 12997 8260 13852 14365 21748 21384 17735 18058 29682

28386 35059 34650 48586 40679 40675 46126 44662 41633 49355 49195