HW7: Tree Traversals

CSS 501 – Data Structures & Object-Oriented Programming
By: Hansel Ong

Summary

The structure of a tree can itself be "information" with which to associate data that it stores. This is typically in the form of hierarchical data, but it can also be thought of as a "subtree" having more in common than another "subtree" in another part of the tree. Explore various ways of doing tree traversals on a set of data stored by your own implementation of a tree.

Skills Expected

- Linked Structures
- Tree ADT
- Tree Traversals

Assignment Description

Create a binary tree data structure used to keep track of data (e.g. an int).
Implement the following traversal functions:
- Pre-Order Traversal
- Post-Order Traversal
- In-Order Traversal

Grading Criteria

- Implementation
  - [3 Points] Binary Tree (Doesn't have to be sorted) data structure
  - [6 Points] Pre-Order Traversal
  - [6 Points] Post-Order Traversal
  - [6 Points] In-Order Traversal
- Demonstration (Driver)
  - Three different trees to traverse (containing at least 10 items each)
    - [2 Points] A "left-unbalanced" tree to traverse
    - [2 Points] A "right-unbalanced" tree to traverse
    - [2 Points] A "symmetrical" tree to traverse
  - On each of the three different trees to traverse, demonstrate:
    - [1 Point] Pre-Order Traversal
    - [1 Point] Post-Order Traversal
    - [1 Point] In-Order Traversal
- [3 Points Extra Credit] Breadth-first search (and demonstration)