

Project 0: Tree Assignment

Due Date: Tuesday, October 4, 2005 (**Duration:** One week)

This assignment is not for credit; do not hand anything in.

Objectives

Gain familiarity with the Java Language. Get used to working with tree-shaped data structures, which we'll use to represent source programs in our compiler.

Requirements

Obtain the file `Tree.java`. It is available through the web page, or at:

```
~harry/public_html/compilers/p0
```

Make the following modifications to the code, and test your changes.

(1) Add a method

```
String postFix ()
```

to each of the classes. When invoked on a node in the tree, this method will return a String giving the post-fix representation of the subtree at that node. For example, the output might be:

```
Prefix = * - + d e + g h
Infix = ((- (d + e)) * (g + h))
Postfix = d e + - g h + *
```

(2) Add a method to walk the tree and return the number of nodes in the tree. Print this number out:

```
Number of nodes = 8
```

(3) Add a new kind of node with 3 children, called a ternary node. Such a node will have 2 labels. For example:

```
Node x = new TernaryNode ("?", ":", a, b, c);
```

A ternary node will look like this when printed:

```
Prefix = ?: a b c
Infix = (a ? b : c)
Postfix = a b c ?:
```

Additional Requirements:

- (1) Add / modify comments as appropriate.
- (2) Follow the existing stylistic conventions in the code. Make your code look the same.
- (3) Always add your name and the date to any code files you modify.