CSci 1933 Lab 12

December 08, 2015

1. Introduction

In class last Wednesday, we learned about algebraic expression trees. Today, you're going to implement them (but only for addition).

As we're approaching the end of the course and you're beginning to master the basics of Java, this lab will be somewhat different than the others: I'm going to pose a problem, and working either or alone or with a partner, you're going to try to solve the problem without any skeleton code. Without further adieu, here's the problem:

2. Your task

Note	For this lab, you cannot use any classes in the Java class library that implement Collection.

To complete this lab, you will do the following:

❖ Write a Java program (using an object-oriented approach) that can parse any algebraic expression that only consists of addition (e.g. "5+4+3+2+1") into a tree.

❖ Print the tree, showing depth using indented tabs (level 0 should have no tabs, level 1 should have one, etc.)

❖ Using the tree, execute the expression (i.e. add up the numbers)

❖ Challenge problem: expand to subtraction as well.

❖ Few Hints:

  ➢ The substring(int beginIndex, int endIndex) method in String.java will probably be useful

  ➢ Same deal with indexOf(char c) in String.Java

➢ You'll have to implement your own class(es) to operationalize a binary tree.

Unlike previous labs, your TAs will not reveal a solution near the end of the lab. We'll go over how to tackle this problem in class on Wednesday if enough folks had trouble finishing during lab.