# COSC 251 – Programming Languages
# Project 4
# Spring 2013

**Objective:** Create a simple infix to prefix calculator in LISP

**Your Task:** Your task is to create a simple equation evaluator in LISP. This leverages stuff we go over in our COSC 201 course (and, in fact, a slightly more complicated version of this assignment was the second project last semester). If you still have the Weiss book, the relevant section is 11.2. Note: the 201 algorithm is for infix to postfix, not prefix. You should handle the following operations:

| Operation | Meaning |
|-----------|---------|
| + | Addition |
| - | Subtraction |
| * | Multiplication |
| / | Integer Division |
| % | Modulus |

You will also have to deal with parentheses. You should assume that all operands are integers and that you will be doing integer based math for this project. You need not check to see if the input is in the correct format. Assume that it'll be a correct infix equation.

You may leverage any of the list processing functions that LISP provides. You will most likely want to leverage the eval function as well. If it's easier for you to do the stack based evaluation noted in some of the hint pages below, do that.

You may work in pairs on this project. You may not work with people you worked with for Projects 1-3. Teams must be sent to me via email by 5pm April 5[th.]

Notes: The prefix notation is also called Polish notation. It is slightly more complicated than postfix notation in regards to evaluation and you will likely need to do some inserting of parentheses to make sure everything evals correctly. For some hints see:

http://www.cs.man.ac.uk/~pjj/cs212/fix.html
http://en.wikipedia.org/wiki/Polish_notation
http://stackoverflow.com/questions/1946896/conversion-from-infix-to-prefix

**Deliverables:** Your lisp source as a single file named Proj4.lisp, with a method signature (calculate s) where s is a string. I will be calling this function to invoke your calculator. Example calls:

       (calculate "1+2-3*4/2+4")
       (calculate "4 * 6     + 3  - 0 * 43 / 4 +     23458509284")

**Expectations:** The code should be clean, concise, well commented, and correct. If you use an outside source, be sure to document that source. Significant use of outside sources will result in a deduction. Grading rubric will be provided a week ahead of the due date.

**Learning Targets:** Practice with LISP, a bit of "using stuff you should have learned in the past"

**DUE: April 21st, 11:59pm via Blackboard's stupid turnin stuff.**