

Homework Assignment #6: An ML Programming Exercise

Note

This assignment constitutes 4% of your grade and is due 2:10PM Wednesday, November 14, 2012. Please write/type your answers/code on A4 (or similar size) paper. Drop your homework by the due time in Yih-Kuen Tsay's mail box on the first floor of Management College Building 2. Late submission will be penalized by 20% for each working day overdue. You may discuss the problems with others, but copying answers/code is strictly forbidden.

Your work will be graded according to its correctness and presentation. Specifically, you should provide evidences showing that your program is correct. You should also organize and document your program in such a way that other programmers, for example your classmates, can understand it. **Some of you may be requested to demonstrate your program.**

Problem

Write an ML program to translate an expression in the infix notation into one in the prefix notation. For example, “ $x + 2 * (y + 4)$ ” should be translated as “ $+ x (* 2 (+ y 4))$ ”. Note that the parentheses in the prefix notation are added to improve readability. You may choose not to add those parentheses.

It is satisfactory if you can only deal with the four basic arithmetic operations (+, −, *, /) and single-character names and numbers. You will earn extra credits if you also handle other operations (at different precedence levels) and/or multi-character names and numbers.

Below are some functions that you may find useful:

```
# "ab" ^ "cde";;
- : string = "abcde"
# String.concat "... " ["a";"bc"; "de"];;
- : string = "a...bc...de"
# String.length "abcde";;
- : int = 5
# String.get "abcde" 2;;
- : char = 'c'
# String.get "abcde" 0;;
- : char = 'a'
```