

CSE 3302/5307 Lab Assignment 4

Due May 8, 2015

Goals:

Understanding of Scheme and elementary functional programming concepts..

Requirements:

1. Write the following two Scheme functions:

- a. (`position term1`)
- b. (`orderReplace term1 orderPredicate`)

`position` is to replace each atom by its relative position going from left-to-right. The first atom will be replaced by 0.

`orderReplace` it to replace each atom using a sorted list of the atoms that appear in `term1`. `orderPredicate` should be used with the built-in function `sort`.

2. Submit your racket source file on Blackboard by 9:15 a.m. on May 8.

```
> (position 'a)
0
> (position '(a))
'(0)
> (position '(((a)) b) c)
'(((0)) 1) 2)
> (position '(1 (20 (3 (4 40) 3) 2) 1))
'(0 (1 (2 (3 4) 5) 6) 7)
> (position '(11 (2 (3 (4 () 4) 32) 2) 15 ()))
'(0 (1 (2 (3 () 4) 5) 6) 7 ())

> (orderReplace 'a symbol<?)
'a
> (orderReplace '(a) symbol<?)
'(a)
> (orderReplace '(((a)) b) c) symbol<?)
'(((a)) b) c)
> (orderReplace '(1 (20 (3 (4 40) 3) 2) 1) <)
'(1 (1 (2 (3 3) 4) 20) 40)
> (orderReplace '(11 (2 (3 (4 () 4) 32) 2) 15 ()) <)
'(2 (2 (3 (4 () 4) 11) 15) 32 ())
> (orderReplace '(((a)) b) c) (lambda (x y) (symbol<? y x)))
'(((c)) b) a)
> (orderReplace '(1 (20 (3 (4 40) 3) 2) 1) >)
'(40 (20 (4 (3 3) 2) 1) 1)
> (orderReplace '(11 (2 (3 (4 () 4) 32) 2) 15 ()) >)
'(32 (15 (11 (4 () 4) 3) 2) 2 ())
```

3. Characteristics of my solution:

- a. `atom?` is not used.
- b. `set!` is used once for `position`, twice for `orderReplace`.
- c. The only global names defined are `position` and `orderReplace`.
- d. 11 lines for `position`, 15 for `orderReplace`.