CSE 3302/5307 Lab Assignment 2

Due April 8, 2015

Goals:

Understanding of Scheme and elementary functional programming concepts..

Requirements:

1. Write the following two Scheme functions:

   a. `(subterm` term1 lat`)`
   b. `(replace` term1 term2 lat`)`

   In both cases, the lat is used to go downward in a tree-like fashion through term1. At each level in term1, one numeric atom from the lat will be consumed. This atom will indicate the left-to-right ordinal position to continue from.

   `subterm` should return the value (atom or list) that is reached when the lat has been exhausted.

   `replace` should return the result of replacing the reached value, e.g. the rest of the surrounding tree is unchanged.

2. Submit your racket source file on Blackboard by 9:15 a.m. on April 8. Be sure to indicate the browser(s) you tested with.

```
> (subterm '(1 2 3 4 5) '(3))
3
> (subterm '(1 2 3 4 5) '(2))
2
> (subterm '(1 2 (3 4 5) 6 7) '(3 2))
4
> (subterm '(1 2 (3 4 5) (6 (7 (8) 9 10))) '(4 2 2 1))
8
> (subterm '1 '())
1
> (subterm '(1 2 (3 4 5) (6 (7 (8) 9 10))) '())
'(1 2 (3 4 5) (6 (7 (8) 9 10)))
> (replace '(1 2 3 4 5) '(6 7 8) '(3))
'(1 2 (6 7 8) 4 5)
> (replace '(1 2 3 4 5) '(6 7 8) '(2))
'(1 (6 7 8) 3 4 5)
> (replace '(1 2 (3 4 5) 6 7) '(8 9) '(3 2))
'(1 2 (3 (8 9) 5) 6 7)
> (replace '(1 2 (3 4 5) (6 (7 (8) 9 10))) '(11 12) '(4 2 2 1))
'(1 2 (3 4 5) (6 (7 ((11 12)) 9 10)))
> (replace '(1 2 (3 4 5) (6 (7 (8) 9 10))) 1000 '(4 2 2 1))
'(1 2 (3 4 5) (6 (7 (1000) 9 10)))
> (replace '(1 2 (3 4 5) (6 (7 (8) 9 10))) 'x '())
'x
> (replace '1 '(2 3 4) '())
'(2 3 4)
```

Getting Started:

1. Observe the following equivalences to Racket built-in functions:

```
> (subterm '(1 2 3 4) '(1))
1
> (first '(1 2 3 4))
1
> (subterm '(1 2 3 4) '(2))
2
> (second '(1 2 3 4))
2
```

2. Error checking is not expected.