CS314 Fall 2018

Assignment 6

Problem I – Scheme

Write Scheme programs that generate the following lists as output using only `cons` as the list building operator:

1. `'((c (e f (b))) g b)`
2. `'((g) ((((h) i)) (a f)) d)`
3. `A list l that contains three items: the atom 'g', the division operator '/', and the atom '6' such that ((cadr l) 18 9) evaluates to 2.`

   Note that *cadr* is composed of *car* and *cdr* such that (cadr l) = (car (cdr l)).

Problem II – Scheme

Write the following functions on lists in Scheme. The semantics of the functions is described through examples.

1. Get nth digit of an integer

```
(define getnthdigit
    (lambda (m n)
        ...))
    ...
(getnthdigit 32145 1) --> 5
(getnthdigit 32145 2) --> 4
```

   Note: You can use Scheme build-in function "modulo" and "floor".

2.
```
(define rev
  (lambda (l)
    ...))
...
(rev '(e((b)(c d)(((f)))))) --> '(((((f)))(d c)(b))e)
```

Note: Do not use the Scheme build-in function "reverse".

3. Position of first occurrence of k in list

```
(define positionof
    (lambda (k lst)
        ...))
...
(positionof 'c '(c b d c e f)) --> 1
```

Note: You may want to define a helper function