

CS 101 Computer Science I (Spring 2001) Assignment 2

1. Write a Scheme procedure called "cycle" that rotates a three-element list. The procedure returns a list that is a rearrangement of the input list so that the second element of the list becomes the first, the third element becomes the second, and the first becomes the third. Examples:

```
(cycle '(sam i am)) ==> (i am sam)
(cycle '(cats hate dogs)) ==> (hate dogs cats)
```

2. Write a Scheme procedure called "regroup" that takes as input a list of two items, each of which is also a list of length two. The procedure should return a list with the same structure as the input list, but with the contents of the sublists rearranged as shown below. You may assume that the input list is always of the specified form.

```
(regroup '((1 2) (3 4))) ==> ((1 4) (2 3))
(regroup '((she ran)(quickly home))) ==> ((she home)(ran quickly))
```

3. Write a Scheme predicate called "inbetween?" that takes three numbers as arguments and returns #t if the first is greater than or equal to the second, and the first is less than or equal to the third. You must write two different versions of this procedure --- one version that uses cond or if (but does not use any of and, or & not), and one that uses neither cond nor if (but may use any of and, or & not). Examples:

```
(inbetween? 5 2 9) ==> #t
(inbetween? 1 2 9) ==> #f
(inbetween? 2 2 9) ==> #t
```

4. Write a Scheme procedure called "season" that takes two arguments, a symbol representing a month and an integer representing a day, and returns one of the four symbols summer, fall, winter or spring. Examples:

```
(season 'july 4) ==> summer
(season 'october 12) ==> fall
(season 'february 14) ==> winter
(season 'april 1) ==> spring
```

Due Dates

- Section 51 (Professor Welty): Monday February 5, 2001
- Section 52 (Professor Ellman): Tuesday February 6, 2001