Programming Language Concepts, CS2104
Tutorial 6 (7 October 2011)
(All students must prepare/attempt in advance.)

Exercise 1

Write an HOP program (that is, no recursion is allowed), that computes the minimum element of a list of integers. You may use either Haskell, or Ocaml, or Scheme as your programming language. Hint: all these languages have a `min` function that computes the minimum of two numbers.

Exercise 2

Convert the following loop into a recursive function (all variables are integers). You may use either Haskell, or Ocaml, or Scheme as your programming language. Hint: use the systematic translation scheme given in Lecture 7.

```
i = 0 ; b = 1 ;
while ( i < 100 ) {
  if ( a & 1 == 0 ) {
    a <<= 1 ;
    b = 3*a+1 ;
  } else {
    a = 2*b+1 ;
    b -- ;
  }
  i ++ ;
}
```

Exercise 3

Write a higher order function, in any of the three languages mentioned above, that reverses a list.

Exercise 4

Write a higher order function, in any of the three languages mentioned above, that partitions a list into elements that are larger than a pivot, and elements that are smaller than a pivot. The function should take two arguments: the pivot, and the list to be partitioned, and return a pair containing the partitions.