Homework Assignment 3 – Solutions

October 20, 2013

1 List splits

```
ghci 1> let { split :: [a] → [[a], [a]];
    split [] = [[], []];
    split (x:xs) = [[], x:xs] : [(x:ys, zs) | (ys, zs) ← split xs] }
```

```
ghci 2> split [1..5]
    [[[], [1,2,3,4,5]], ([1], [2,3,4,5]), ([1,2], [3,4,5]), ([1,2,3], [4,5]), ([1,2,3,4], [5]), ([1,2,3,4,5], [])]
```

2 List permutations

```
ghci 3> let { perm :: [a] → [[[a]]];
    perm [] = [[[]]];
    perm (x:xs) = [ys ++ [x] ++ zs | perm_xs ← perm xs, (ys, zs) ← split perm_xs ] }
```
3 Permutations of texts

Display 10 permutations of the words in the second sentence of the following text (from the Penn Treebank, WSJ section):

ghci 6> let text = "Pierre Vinken, 61 years old, will join the board " ++
"as a nonexecutive director Nov. 29. \nMr. Vinken " ++
"is chairman of Elsevier N.V., the Dutch publishing group."

ghci 7> let ws_sent2 = words (lines text) !! 1