Group Assignment #2 (Week of Jan 21, 2002)

1. Write a recursive program p1 which takes a list of number(s) and double the value of its element(s).
   Example: p1 [2,4,6] = [4, 8, 12]

   p1 [ ] = [ ]
   p1 (x:xs) = x *2 : p1 xs

2. Write a recursive program using p1 to double the value of all the elements in each list of numbers in a list.
   Example: p2 [[1], [2,3,4], [3,4]] = [[2], [4,6,8], [6,8]]

   p2 [ ] = [ ]
   p2 (a:as) = p1 a: p2 as

3. Write a recursive function that will make a list by doubling all the Value of all the elements inside the lists of numbers using p1.
   Example: p3 [[4], [2,7], [3,6,9]] = [8, 4, 14, 6, 12, 18]

   p3 [ ] = [ ]
   p3 (x:xs) = p1 x ++ p3 xs

4. What is the type of this program?
   g 0 y = 2
   g 1 y = 3
   g n [ ] = 1
   g n (x:xs) = (g (n-1) xs) + (g (n-2) xs)
   Example: g 3 [2,4,6] = 8
   g:: num -> [*] -> num

5. What is the type of this program?
   f [ ] y = 0
   f (x:xs) y = x!y, if x!y > 3
   = y, otherwise
   Example: f [[2,4,6],[6,8,9]] 0 = 0
   f [[2,4,6],[6,8,9]] 1 = 4
   f:: [[num]] -> num -> num

6. What is the type of this program, and what does it do?
   What is the result of p [[2,4,6], [8,10]]?
   p [ ] = [ ]
   p (x:xs) = [k x] : p xs

   k y = sumlist y / # y
   sumlist [ ] = 0
   sumlist (x:xs) = x + sumlist xs

   p:: [[num]] -> [[num]]
   p [[2,4,6], [8,10]] = [[4], [9]]
   It takes a list of list of numbers and returns the average value of each list.