Programming Homework 7

CSCI 169: Programming Languages

Spring 2020, Linnell

Due Friday May 22 in class.\*

Submission instructions below

1. (5 points)Write a function in Scala that takes in two lists of Ints, and returns a new list of Ints with the elements of the input lists alternating. So if the input lists were 1, 2, 3, 4 and 7, 8, 9, 10, 11, 12 the output list would be 1, 7, 2, 8, 3, 9, 4, 10, 11, 12.  Note that if one list is longer than the other, the extra elements are added at the end.   You may use a helper function with extra parameters if you like, but this is not necessary.
2. (5 points) Write a function in Scala whose parameters are: two lists of Ints, xs and ys, and a function f that takes in two Ints and returns an Int; the function should return a new list whose elements are obtained by applying f to the corresponding elements of xs and ys. Test your function using anonymous functions corresponding to f(x, y) = x+y and f(x, y) = x\*x+y.  For example, if xs was the list 3, 8, 1, 5 and ys was 12, 6, 23, 1, 8, 4 and the f used was f(x, y) = x+y, our result list would be 15, 14, 24, 6.  Note that if one list is longer than the other, the extra elements are not included in the result list.  You may NOT use a helper function with extra parameters.
3. (10 points) Write a function in Scala that takes in a list xs of Ints, and a function f from Ints to Booleans, and whose result is a list with only those elements x of xs for which f(x) is true. Test your function using anonymous functions corresponding to f(x) = x%2==0 and f(x) = x>10.  You may NOT use a helper function with extra parameters.
4. (5 points) Write a curried version of your function from problem 3, which takes in the function from Ints to Booleans and returns another function that takes in a list of Ints and returns a list of Ints. You should return an anonymous function, not a named one.  You may NOT use a helper function with extra parameters.

\*With Project P3 due Monday, I've made this homework due on Friday, but HW 8 will be due Wednesday 5/27

Submission instructions: Upload one file for each problem, named Problem1.txt, Problem2.txt, Problem3.txt.  To do this, make a copy of the file, and rename it.