Exam II

CSC 121-2
Fall 2019

Name:

Instructions: Answer five questions for 10 points each or six questions for 9 points each. Clearly mark on this page how many questions you answered and circle which ones they are. If you do not mark this page, I will assume you want me to grade all the problems.

Number of questions answered: _____

1. The nth triangular number is defined to be the sum $1+2+3+\cdots+n$. Write a function `triangularNumber` of type `Int -> Int` that takes an integer `n` and computes the `N`th triangular number using recursion.

2. Repeat Problem 1 using `map`, `foldl`, or `foldr`.

3. Define a function `repeats3 :: Eq a => [a] -> Bool` so that `repeats3 xs` is true if and only if `xs` has three equal elements next to each other.

4. Write a one-line function `filter'` using only `map`, `foldl`, or `foldr` that acts just like the library `filter` function.

5. Using `map`, `foldl`, or `foldr`, write a one-line function `sumpairs :: [(Int,Int)] -> [Int]` that takes a list of pairs of integers and returns the list of the sum of each pair. For example, `sumpairs [(1,3),(4,2),(-3,-4)]` evaluates to [4,6,-7].

6. Write a one-line function `append :: [a] -> [a] -> [a]` using only `map`, `foldl`, or `foldr` that takes two lists and appends the second to the end of the first. For example, `append [1,2,3] [4,5,6]` evaluates to [1,2,3,4,5,6]. You may not use the built-in append operator.