

Northern Michigan University (Marquette Co, MI)

CS 556-01-24W: Functional Programming

Assignment 3

Due: Wednesday 10 April 2024 11:00 A.M. EST

Create a folder called “HW3” in the top level of your CS556-01-24W folder. Place all files pertaining to this assignment into the top level of your HW3 folder. Place a (possibly empty) file called “DONE” into this folder when you are ready to have your homework graded.

Write Haskell expressions that solve the following problems. These should not use recursion or loops. They should solve the problem using aggregate list functions.

1. Given an integer n , compute the sum of the squares from 1^2 to n^2 . Don't use a mathematical formula. Use list functions.
2. Given an integer n , compute the sum of the squares of the even integers from 1 to n , i.e. $2^2 + 4^2 + 6^2 + \dots$. Don't use a mathematical formula. Use list functions.
3. Given an integer n , compute the sum of the first n prime numbers.
4. Given a stream of ints, and an integer n , generate a list of length n , where each entry in the new list is the sum of the int at the corresponding position in the original list plus the two ints following it. For example,

[1,2,3,4,5,6,7,8,9,10,11,12,...] generates [6,9,12,15,18,21,24,27,30,33].
5. Given a list of ints, generate a list where each entry in the new list is the product of the int at the corresponding position in the original list and all ints following it.

[5,4,3,2,1] generates [120,24,6,2,1].