

CS3360: Design and Implementation of Programming Languages

Programming project #3

Due: November 8th, 2013 at 11:59pm via email to your TA

Email project to: afgarciacontreras@miners.utep.edu

Notes:

- 1) This project is to be done *individually*.
- 2) The program must fulfill the requirements, regardless of the interface. This means that the quality of the interface will not be graded, as long as it clearly shows that the requirements are fulfilled.
- 3) The grading of this project will be as follows: **40% for the program** you have to implement, **55% for the report** (see below for details), and **5% for your progress report** at mid-point, in person to your TA.

Goals of the project: Understand the functional programming paradigm through the use of Haskell. Develop a good working knowledge of the syntax of Haskell. Be able to put Haskell to practice and reflect on its use.

To be done:

1) Implement a Haskell solution for each of the following problems:

- (a) Add all the natural numbers below one thousand that are multiples of 3 or 5.
- (b) Compute the difference between the sum of the squares and the square of the sums: given x , compute the difference between $1 + 2^2 + \dots + x^2$ and $(1+2+\dots+x)^2$.
- (c) Given a weighted graph in the form of a matrix, and two indices (representing two nodes in the graph): determine the length of the shortest path between these nodes.

For each of the above tasks, you will design Haskell functions as needed. You will then describe your implementation choices and details, and their effectiveness in:

2) In a supporting document:

- Describe what your functions do and how to use them.
- List and describe the major differences between your Haskell programs and what would have been your Java-implemented programs for the same problems. Clearly describe the differences and justify them.
- What were the pros of solving these problems using Haskell VS. what it would have been to solve them using Java?
- What were the cons of solving these problems using Haskell VS. what it would have been to solve them using Java?

- Make an argument for a programming language you would recommend to use to solve each of these problems you just solved using Haskell.

Deliverables:

- Haskell program
- A readme file
- A report

Note: Make sure to follow best programming practices (including proper indentation, commenting, documenting, ...) as well as the report template (provided on piazza by your TA).

Upcoming deadlines:

- *Logic programming assignment (Prolog): December 6*