Parallel Functional Programming

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primes = filterPrime [2..]

where filterPrime (p:xs) =
    p : filterPrime [x | x <- xs, x `mod` p /= 0]

Purely Functional · Declarative · Lazy · Statically Type-Inferred · Parallel

Sequential Haskell in the first half · Parallel in the second half
Prerequisites

Data structures (COMS W3134, W3137, or equivalent)

- You must be fluent in at least one programming language
- You must dream about lists and trees
- You do not need prior experience in a functional programming language; that’s what this course is for
Assignments and Grading

75 % Four individual homework assignments
25 % Final Project (alone or in pairs)

This is a coding† class
Do the homework assignments alone
The project may be done alone or in pairs

†More precisely, mostly debugging, with a little bit of bugging
Collaboration

You may seek outside help, including from other students, on homework, but

- **You must write all** of your own code. No copying or copying-with-modification of any code. No looking at other student’s code as reference as you write your own.

- **You must cite** all people and resources you consulted. For example, you might add a comment like


See also http://www.cs.columbia.edu/education/honesty/
Recommended Texts

Miran Lipovača.
Learn You a Haskell for Great Good!

http://learnyouahaskell.com/

Excellent introductory text. We will be following it for roughly the first half of the class.
Recommended Texts

Simon Marlow. 
Parallel and Concurrent Programing in Haskell. 
O’Reilly, 2013. 
https://simonmar.github.io/pages/pcph.html

Like its title says. Assumes a reasonable understanding of Haskell. We will be following it for the second half of the class.
Recommended Texts


http://book.realworldhaskell.org/

Also an introductory text on Haskell that starts at the beginning, it quickly focuses on practical, real-world aspects of writing Haskell programs, such as elaborate I/O, and interfacing with external libraries.
Recommended Texts

Paul Hudak.
The Haskell School of Expression.

http://www.cs.yale.edu/homes/hudak/SOE/

An idiosyncratic approach to learning Haskell based on multimedia (graphics, animation, and sound) ultimately leading to domain-specific languages.
Recommended Texts

Graham Hutton.
Programming in Haskell.
http://www.cs.nott.ac.uk/~pszgmh/pih.html

Another introductory Haskell text, this one written by a professor from the University of Nottingham
Recommended Texts

Will Kurt.
https://www.manning.com/books/get-programming-with-haskell

Another introductory Haskell text, written more like a textbook