Introduction to CS320

Lecturer: Hongwei Xi

Tuesday, May 18, 2010
Welcome!

- *Concepts of Programming Language* is a course that introduces students to some fundamental concepts in programming language design and implementation.
- The primary goal of the course is to allow the students who complete the subject to have
  - a good feel for the elements of style and aesthetics of programming, and
  - a strong command of certain major techniques for controlling complexities in programming.
Software Crisis

- Faulty and fragile software is norm rather than exception
- Security breaches happen at an alarming rate
- Maintenance cost is skyrocketing
- Programming productivity stagnates
Course Overview

- Building abstractions with procedures (functions)
  - This practice is essential to effectively controlling complexity in constructing large systems
- Building abstractions with datatypes
  - This practice is essential to effectively handling large complex data structures
Course Overview

▶ Elements of Programming in ATS
  ▶ Lists and Trees
  ▶ Functions
  ▶ Recursion
  ▶ Datatypes and Pattern Matching
  ▶ Polymorphism (Generics)
  ▶ Higher-order Functions (Functions as first-class values)
  ▶ Input and Output
  ▶ ...

Lecturer: Hongwei Xi  Introduction to CS320
What is this course like?

- It requires that you do a significant amount of programming.
  - You will need to program in the functional programming language ATS, which demand a programming style that may seem unnatural or counterintuitive to you at the beginning.
  - You are expected to read documentation and learn certain essential debugging skills.
  - There will be 6 assignments, each of which involves some amount programming.
What is this course like?

- It proceeds in a fast pace (it is even more so given that this is a summer course).
  - You are expected to read text that we may not have time to cover in class.
  - You are expected to try programming examples that we may not have time to explain in class.
  - You may need to take notes on materials that are not present in the textbook.
What is this course like?

- You are to have rapid exposure to many fundamental concepts in programming.
- You are expected to gain a lot more understanding of programming, which can greatly help you pursue other topics in computer science.
- Above all, I do hope that you will find a great deal more fun in programming after taking this course.
What is this course not like?

- This is not a course about your top 10 favorite programming languages.
  - We are interested in fundamental programming concepts
  - We are not so concerned with “fads”.
- This is not a compiler course, though it can be of great help for you to take a compiler course later.
Warnings

- This is likely to be a challenging course for you as many new (and thus unfamiliar) concepts are to be introduced rapidly.
  - You may need to give some time for certain concepts to “sink in”.
  - You may find that some programming assignments are difficult and demanding.
  - Please do ask for help if you need it.
Please ask questions. A lot of them!
Academic Integrity

- All the work you turn in must be **solely your own** unless specified otherwise.
- You are allowed (actually encouraged) to discuss problems with your classmates. However, you must write your own code and solution.
The End

Questions?