15-122: Principles of Imperative Computation

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http://www.cs.cmu.edu/~rjsimmon/15122-m15
http://c0.typesafety.net/
Overview

• Goals of this course

• Interactions
  – Lectures, recitations, office hours

• Assessment
  – Quizzes, homework, exams

• A mysterious function!
Programming Skills

- Transforming algorithmic ideas to code
- Writing tests
- Imperative programming in C and C0
- Basic Unix survival
Algorithmic Ideas

• Asymptotic complexity
  – time/space/amortized
  – worst case/average case
  – important classes: $O(1), O(\log n), O(n \log n), O(n^k), O(2^n)$

• Big ideas like order and randomness

• Lots of fundamental data structures
  – (Psst... this is often what tech interviews test on!)
Computational Thinking

• “Thinking like a computer scientist” is important for lots of people, not just computer scientists!

• A computer science approach to thinking about the correctness of programs
The Big Picture

• Pre- or co-requisites
  – either 15-151 (Math Foundations for CS)
  – or 21-127 (Concepts of Mathematics)

• Counterpart
  – 15-150 (Principles of Functional Programming)

• Pre-requisite for
  – 15-213 (Introduction to Computer Systems)
  – 15-210 (Parallel and Sequential Data Structures and Algorithms)
  – 15-214 (Principles of Software System Construction)
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Lectures

• Monday-Friday, 10:30am
• Please be here, please be active
  – Ask and answer questions, pay attention
  – Lecture notes published after lecture
• Laptops for note-taking only
  – No surfing, email, games…
  – If you want to work on your homework, do so elsewhere
  – If you can see board from the back row, be there
  – Too distracting for other students
Labs and Recitations

• Most days, 3-4:20pm
  – First one is today: bring laptop!
• Reinforce lecture material
• Problem solving (and working in groups!)
• How-to programming and tool support
Online communication

• Autolab for homework and grades
• Piazza for announcements, questions, and communication with course staff. Get help, help each other!
• Cluster Linux machines and SSH to shared machines for assignments
Other Resources

• Course home page
  – http://www.cs.cmu.edu/~rjsimmon/15122-m15
  – Schedule, lecture notes, calendar, contact info...
  – Office hours start soon, check Piazza

• C0 home page
  – http://c0.typesafety.net/
  – Tutorial, reference, examples, binaries
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Assessment

• 50% - Exams (2 midterms and a final)
• 40% - Homework
  – Programming usually due T/F 11pm through Autolab
    • 2 late days total, max 1 day per assignment
    • Download assignments and code from Autolab
    • Style grading
  – Written usually due T/R in person, in recitation
    • No late days, turn in next day in lecture for a significant penalty
    • Don’t hand in work for other people
• 10% - Quizzes and Lab participation
  – Quizzes are mostly for you, very few points, open for 48h
  – Labs are graded on a check minus/check/check/check plus scale, and you’ll basically get full credit for a “check” every lab

http://www.cs.cmu.edu/~rjsimmon/15122-m15/schedule.html
Academic integrity

• Quizzes, exams, homework *must be your own*
• *You* must hand in your work
• OK: discussion of course material, practice problems, study sessions, going over handed-back homework in groups
• Not OK: copying or discussing answers, looking at or copying code (even parts)
• Not OK: talking through the assignment as you code with a classmate

• We use MOSS to catch code duplication
• If you make a mistake, come to us, don’t let us come to you
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A Mysterious Function Approaches!