15-122: Principles of Imperative Computation

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http://www.cs.cmu.edu/~rjsimmon/15122-s15
http://c0.typesafety.net/
Overview

• Goals of this course
• Interactions
  – Lectures, recitations, office hours
• Assessment
  – Quizzes, homework, exams
• A mysterious function!
Goals

Computational Thinking

Programming

Algorithms
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

• Tuesday and Thursday
• 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

• (Hello, TAs!)
• Labs Monday, recitations Friday
• Reinforce lecture material
• Problem solving (and working in groups!)
• How-to programming and tool support
• *Attend the lab/recitation you’re registered for*
Laptop Setup Office Hours

• Sunday, 4:30-6:30pm, GHC 4401 (Rashid)
• Get set up using the C0 tools with Andrew Linux
• Format: drop-in for half an hour
• Or do it yourself:
  http://c0.typesafety.net/tutorial/C0-at-CMU.html
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-s15
  – 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% - Weekly Homework
  – Programming usually due Thursday 10pm through Autolab
    • 4 late days total, max 1 day per assignment
    • Download assignments and code from Autolab
    • Style grading
  – Written usually due Monday by 5:30pm in person
    • No late days, turn in Tuesday in lecture for a significant penalty
    • Don’t hand in work for other people
• 10% - Quizzes and Lab participation
  – Labs Monday, Quizzes Fridays
  – Basically: make an good effort to get full credit

http://www.cs.cmu.edu/~rjsimmon/15122-s15/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!