

15-122: Principles of Imperative Computation

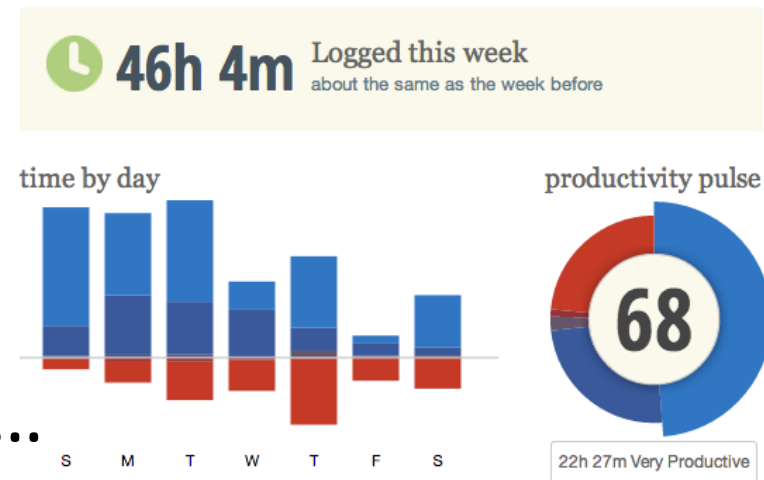
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<http://www.cs.cmu.edu/~rjsimmon/15122-m14/>

<http://c0.typesafety.net/>

Word of Warning

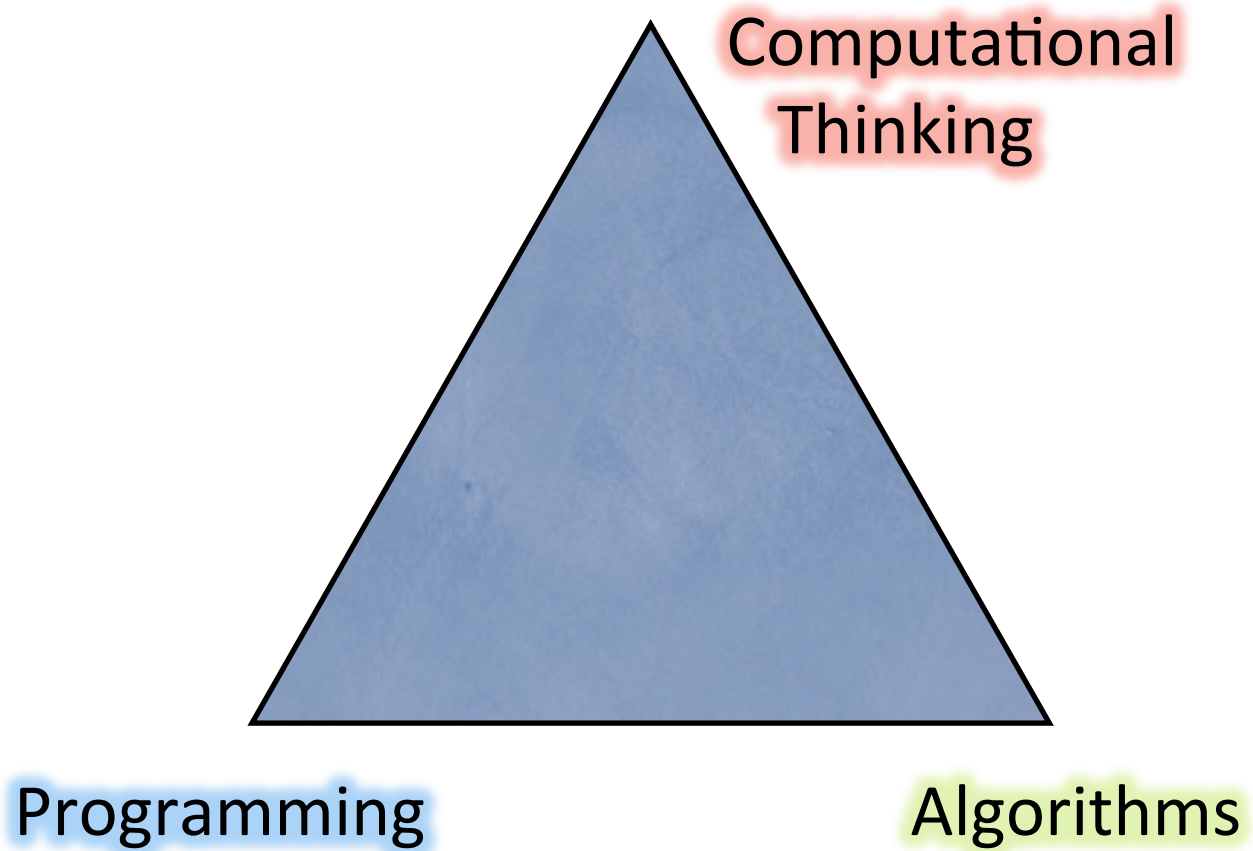
- This is a 10 hour course at 2.5 speed
- That's 25 hours a week of coursework!
 - 7 hours of lecture, 4 of recitation
 - 1 hour doing quizzes
- 13 hours of *on-task* solo work (3 hws/week!)
- I'm at most 50% on-task
- So, $12 + 13 * 2 = 38$ hours
- Also, 12/week during year is the average, not 10...



Overview

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

Goals



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

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!)

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

Recitations

- (Hello, TAs!)
- Tuesday-Thursday 3-4:20pm
- Reinforce lecture material
- Problem solving
- How-to programming and tool support

Unix/Tools Tutorial

- Today, 3pm, GHC 4303
- Get set up using the C0 tools with Andrew Linux
- Format: drop-in for half an hour

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-m14>
 - Schedule, lecture notes, calendar, contact info...
 - Me: Tues, Wed, Fri 1pm-3pm, GHC 9101
 - TA: Every single day 4:30pm-6pm, GHC 4215
- C0 home page
 - <http://c0.typesafety.net/>
 - Tutorial, reference, examples, binaries

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Assessment

- 45% - Exams (3 of them, cumulative, in class)
- 45% - Weekly Homework
 - Programming: Tuesday and Friday through Autolab
 - Due time decided by poll (closes this evening)
 - 2 late days total, max 1 day per assignment, none on C0VM
 - Download assignments and code from Autolab
 - Style grading
 - Written due on Thursday in recitation
 - No work accepted late without prior arrangement
- 10% - Quizzes
 - Wednesday and Saturday
 - 3 lowest scores dropped

<http://www.cs.cmu.edu/~rjsimmon/15122-m14/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!