

# 15-122: Principles of Imperative Computation

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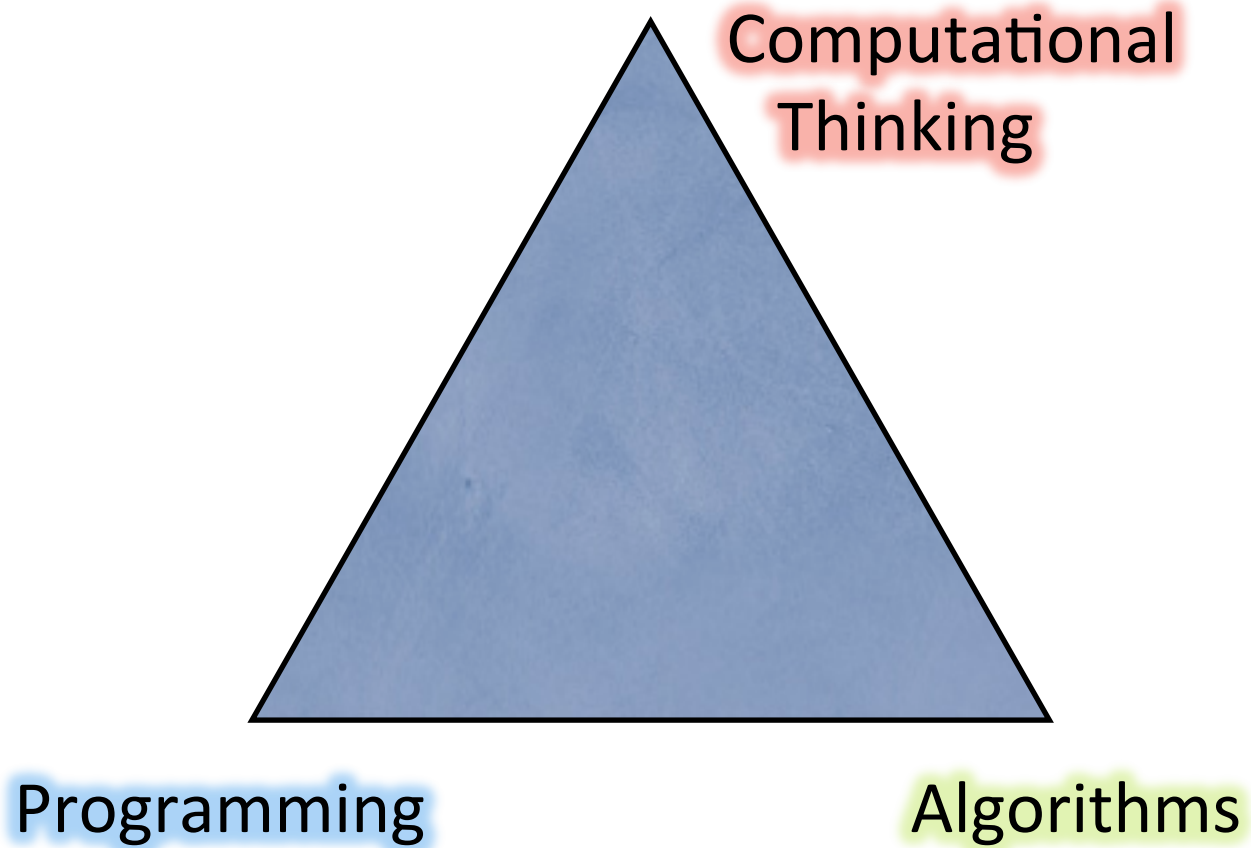
<http://www.cs.cmu.edu/~rjsimmon/15122-m15>

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

# Overview

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

# Goals



# 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 plus scale, and you'll basically get full credit for a "check" every lab

# 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!