15-122: Principles of Imperative Computation

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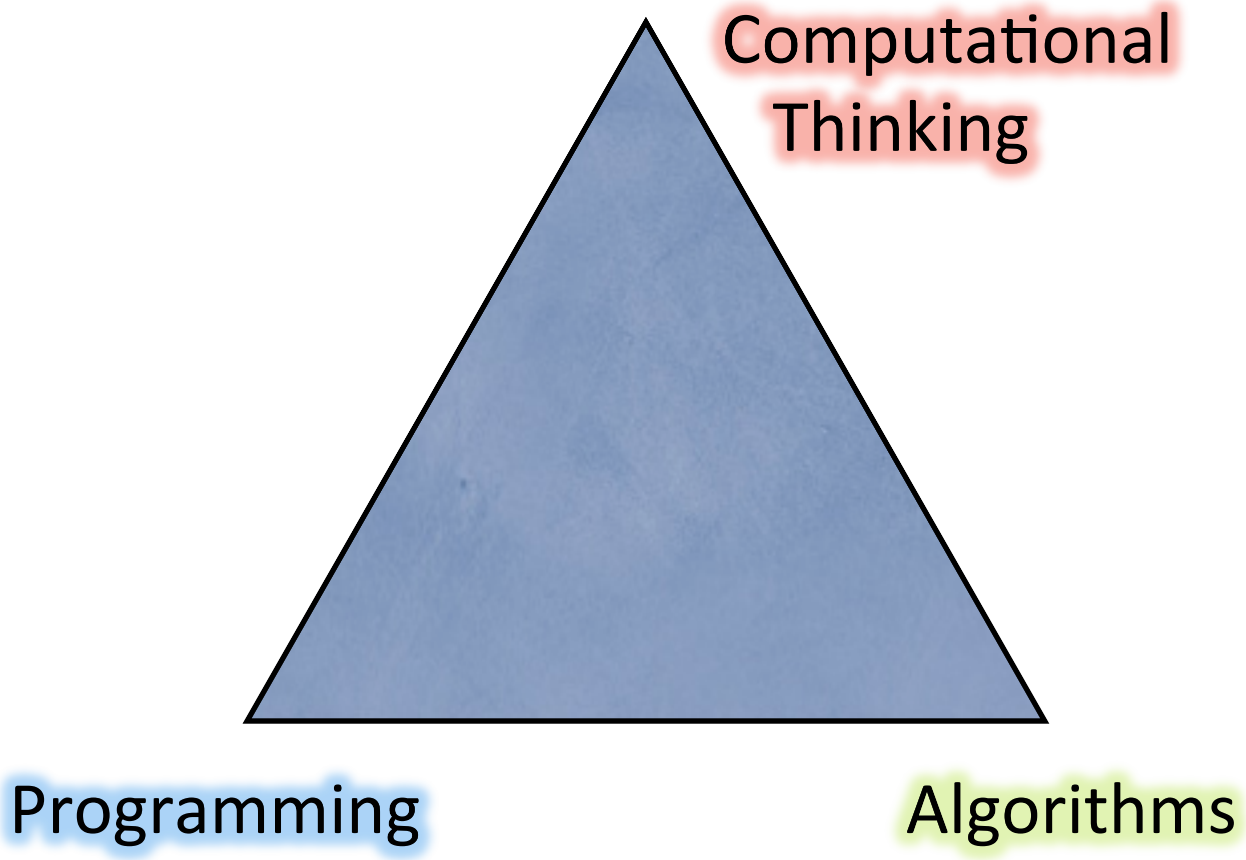
http://whiteboard.ddt.cs.cmu.edu/#/15122-f13

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

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

- Tuesday and Thursday, 9am and 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
  - Too distracting for other students

Recitations

- (Hello, TAs!)
- Wednesday and Friday, starting tomorrow
- Reinforce lecture material
- Problem solving
- How-to programming and tool support

Unix/Tools Tutorial

- Friday, 6pm-8:30pm, Wean 7500
- Get set up using the C0 tools with Andrew Linux
- Format: drop-in for half an hour
- Makeup sessions in the cluster TBA

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
  - https://whiteboard.ddt.cs.cmu.edu/#/15122-f13
  - Schedule, lecture notes, calendar, contact info…
  - Office hours (TBA, starting Friday)
  - Academic development walk-in tutoring
- C0 home page
  - http://c0.typesafety.net/
  - Tutorial, reference, examples, binaries (don't install binaries just yet)

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Assessment

- 25% - Midterms (two of them, 12.5% each)
- 25% - Final
- 40% - Weekly Homework
  - Programming due on Monday 10pm, through Autolab
    - 3 late days total, max 1 late day per assignment
    - 50% penalty per day beyond the given late days
  - Written due on Thursday 10pm
    - If you use TeX, submit online through the course page
    - It’s fine if you don’t, you can submit outside GHC 4117 (Tom’s office)
    - Late policy: submit by 4pm Friday for a 3-5 point penalty (~20%)
- 10% - Weekly Quizzes
  - 10am–10pm Friday
  - 3 lowest scores dropped

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!