



Introduction to Programming Methods

What We Will Cover...

Programming methods

- algorithmic thinking
 - classes, objects; brute-force, recursion, ...
- importance of data structures
- performance analysis

Goal: challenging you

- to code better, faster, more efficiently
- to learn by doing and thinking



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Languages of Choice

Python is so last term...

- moving on to C++ [but I'll use all sorts of languages in class]
- object-oriented language
 - high-level language, far from machine language
 - (hierarchy of) classes, and objects as instances of a class
 - encapsulation of behavior and data
- learn by doing
 - you'll indubitably encounter classic bugs
 - off-by-one bug, infinite loop, pointers/refs, compiler/linker, ...
 - will try to stick to C++11, but may use C++14 (like *auto*)



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Topics Planned

A window into life after CS2

- classical algorithms
 - sorting, convex hull, shortest path...
- intro to computational complexity
 - methods that scale vs. those that don't
- games and fun apps along the way
 - othello tournament (but it's not you playing)
- pointers to other CS-related classes
 - from networking to applied math



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A Word of Caution

This is an *awfully limited* class

- CS is not all about programming
 - far from it (just like astronomy is not about telescopes)
- “computations” not just done on chips
 - information processing happens everywhere
 - we'll stick to the (old) world of silicon-based machines
- lectures will be more algorithm-oriented
- Friday recitations more about programming

Learn about 50-foot policy & honor code



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Contacts

We'll use Moodle

- <https://courses.caltech.edu/>
 - alternative: courses.cms.caltech.edu/cs2
- enrollment key: CS2EnrollME

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An army of TAs to help you

- use Moodle to ask questions, please
 - so that everybody can learn from your questions



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Before You Ask...

A bit of logistics

- Grading
 - all homework assignments (due Tuesdays 5pm)
 - one a week, submitted through moodle
 - final assignment will be turned into a contest
 - late policy: don't be late (but we give you two 48h extensions)
 - details will be posted on moodle
- Class participation very much appreciated
- Changes compared to last year
 - so please provide continuous feedback

