CS 2

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

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/references, compiler/linker, ...

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

A Word of Caution

This is an *awfully biased* 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
    - see DNA computing as a recent example
  - we'll stick to the (old) world of silicon-based machines
    - we have to start somewhere
- lectures will be more algorithm-oriented
- recitations more about programming
  - regular Friday class

Contacts

We'll use Moodle
- https://courses.caltech.edu/
  - alternative: courses.cms.caltech.edu/cs2
- enrollment key: CS2EnrollMe

Alan H. Barr, Mathieu Desbrun
- barr@cms, mathieu@cms

Ellen Price, Ben Yuan & an army of TAs to help you
- use Moodle to ask questions
  - so that everybody can learn from your questions

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