Non-majors: Out with CS3, In with CS10

- **CS3S & CS3L**
  - Programming, programming, programming
  - Prag ideas: Recursion, functions-as-data
  - Scheme
    - Same as CS61A
    - Some take CS3L for wrong reason
    - Never remix code
    - Maybe graphical, interactive
    - 1 big Final project

- **CS10**
  - Programming ½ story
  - Big ideas, HowStuffWorks, history, great applications, social implications too!
  - Prag ideas: Recursion, functions-as-data
  - Scratch + BYOB
  - CS10.6(ABC) each in a different language
  - Graphical, interactive, musical by week 2
  - Share and upload code!
  - Two projects + essay

Design constraints of CS10

- **CS61A** expects program. experience, recursion
  - CS10 hits that in week 5, just about the same time as CS3
- **What should ugrads know about computing?**
  - Computational Thinking
  - History, CS+X, Industry guests
  - Apps that changed the world, hot research
  - “How stuff works” … demystifying computing
- **Passion, Beauty, Joy & Awe**
  - Take every step to make fun for non-traditional students
- **Make all resources free, available (Berkeley way)**
  - Videos, notes, exercises, book!

Peer Instruction

- Increase real-time learning in lecture, test understanding of concepts vs. details
- As complete a “segment” ask multiple choice question
  - 1-2 minutes to decide yourself
  - 2 minutes in pairs/triples to reach consensus. Teach others!
  - 2 minute discussion of answers, questions, clarifications

Format, Textbooks, Grading

- **Format**
  - Two 1-hr lectures / wk
  - Two 2-hr labs / wk
  - One 1-hr TA discussion/wk
- **Selected Reading**
  - Taken from recent books and papers
- **Grading**
  - Quest, Midterm, Final
  - One paper (or blog)
  - Midterm project
  - Final project
  - Weekly readings & HW
  - Effort, Participation, Altruism

Piazza for {ask,answer}ing questions
Abstraction

- Detail removal
  - "The act or process of leaving out of consideration one or more properties of a complex object so as to attend to others."
- Generalization
  - "The process of formulating general concepts by abstracting common properties of instances."

Detail Removal (in CS10)

- You'll want to write a project to simulate a real-world situation, or play a game, or …
- Abstraction is the idea that you focus on the essence, the cleanest way to map the messy real world to one you can build.

Generalization (in CS10)

- You are going to learn to write functions, like in math class:

  \[ y = \sin(x) \]

- You should think about what inputs make sense to use so you don't have to duplicate code.

Summary

- Abstraction is one of the big ideas of computing and computational thinking.
- Think about driving. How many of you know how a car works? How many can drive a car? Abstraction!