The algorithm is rapidly taking over vital functions of businesses, from the next Pandora song, to suggesting what to buy on Amazon to evaluating whether a movie was going to be a hit to making trades, etc. They’re running a Chi-NY dedicated fiber so an algorithm can close deals 3ms faster.

www.bbc.co.uk/news/technology-14306146

Non-majors: Out with CS3, In with CS10

- CS3S & CS3L
  - Programming, programming, programming
  - Prog ideas: Recursion, Functions-as-data
  - Scheme
    - Same as CS61A
    - Same take CS3L for wrong reason
    - Never remix code
    - Maybe graphical, interactive by week 15
  - 1 big final project

- CS10
  - Programming ½ story
    - Big ideas, HowStuffWorks, history, great applications, social implications too!
    - Prog 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!

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
  - Quiz, Midterm, Final
  - One paper (or blog)
  - Midterm project
  - Final project
  - Weekly readings & HW
  - Effort, Participation, Altruism

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

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.”

Henri Matisse: "Naked Blue IV"

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.

The London Underground 1928 Map & the 1933 map by Harry Beck.

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

"Function machine" from Simply Scheme (Harvey)

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!

Someone who died in 1930 could still drive a car today because they’ve kept the same Abstraction! (right pedal faster, left pedal slow)