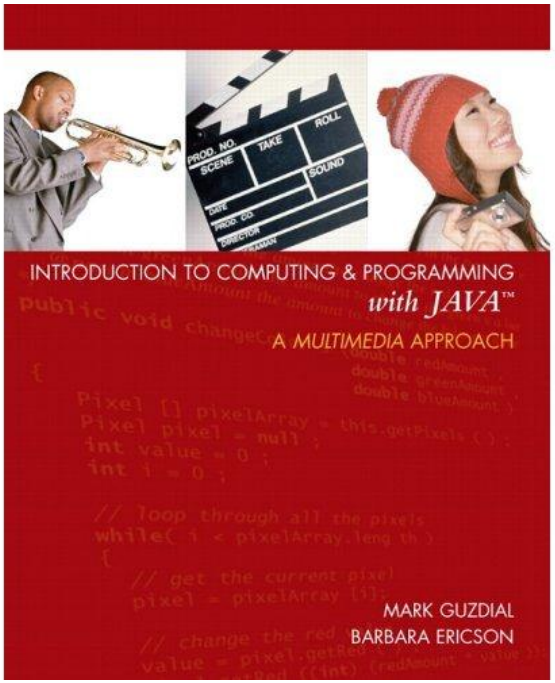
CSE8A: Introduction to Programming in Java Winter 2013



Susan Marx

cse8awinter13.weebly.com

What is Computer Science?

1. In a sentence or so, what is computer science? Or, what are some major aspects of CS?

2. Try to describe one thing that you think that a researcher in computer science might study.

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CS  !=  programming
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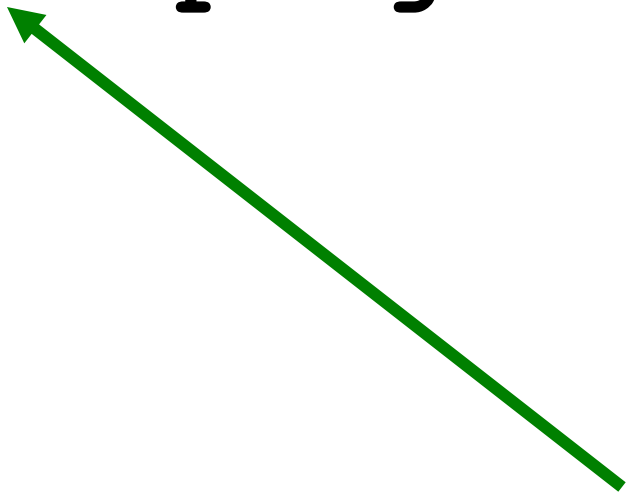
programming : CS ::



"not equal to"

CS != programming

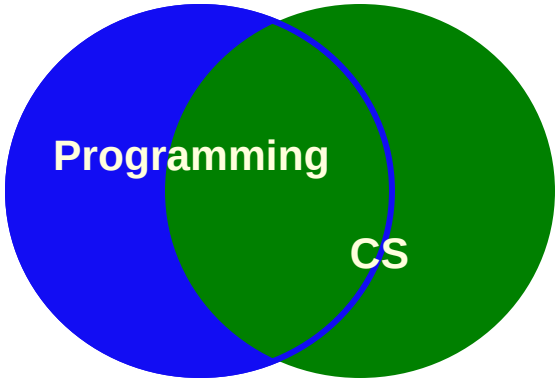
programming : CS ::

surfing : San Diego

machining : engineering

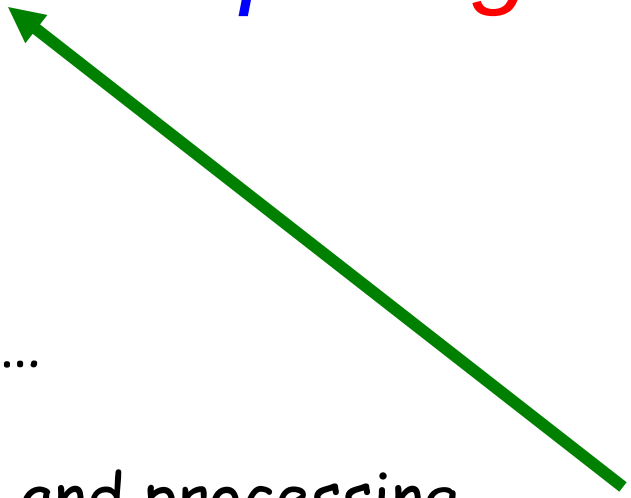
grammar : literature

equations : mathematics



a vehicle, not a destination

CS == *computing* science



"equal to"

Computer Science is…

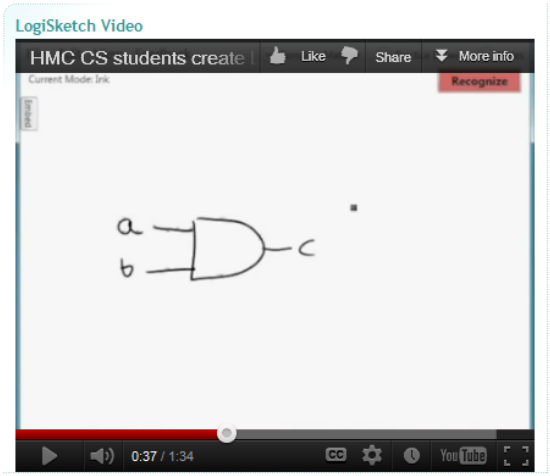
The science of using and processing
large amounts of information
to automate useful tasks
and learn about the world around us
(using a computer)

Why do we like computer science?

- Because computers can do *cool things!*

http://www.hpi.uni-potsdam.de/?id=6247

http://www.youtube.com/watch?v=6NcIJXTlugc



https://sites.google.com/a/eng.ucsd.edu/alvarado/projects

Can a computer do… *anything*?

- Well, there are some limits to what a computer can do:
  - There are some things no machine can do at all, in principle
  - There are some things that are impossible for machines, in practice
  - (more about these limits in CSE 101 Design and Analysis of Algorithms and CSE 105 Theory of Computability)
- However, in CSE 8A our limits are set by
  - our imagination
  - our skill at programming

What are we going to learn in this class?

How to solve problems	using a computer
Algorithm Development	Programming using Java language

Example: The Cake Box

- **Problem**: I want some chocolate cake
- **Break down** the problem based on what we know:
  - **Input**: I have a box of cake mix
  - **Output**: Warm cake to eat
- **Algorithm**: A plan for getting from the Input to the Output
  - conveniently provided on back of box!
- **Implementation**: YOU!

CSE8A WITH DIGITAL MEDIA!

Not so interesting

- Write a program to produce all the odd numbers from X thru Y
- Input: X=3, Y=19
- Output: 3,5,7,9,11,13,15,17,19

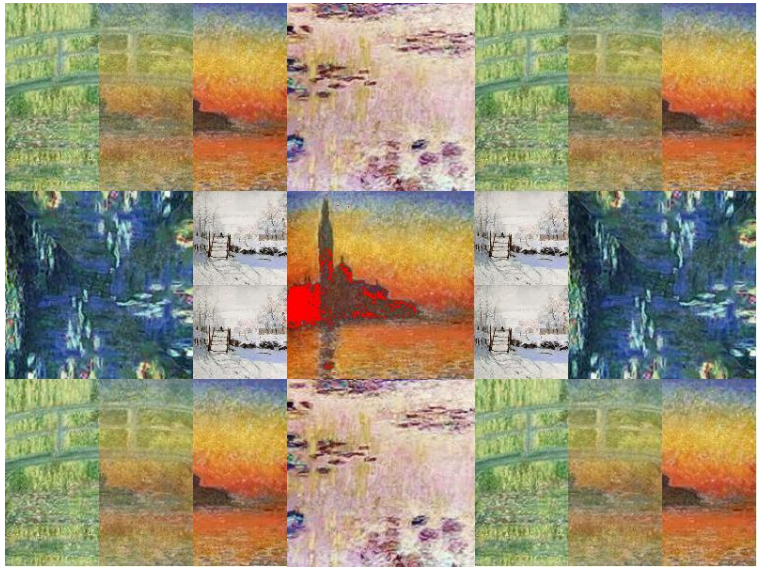
More interesting

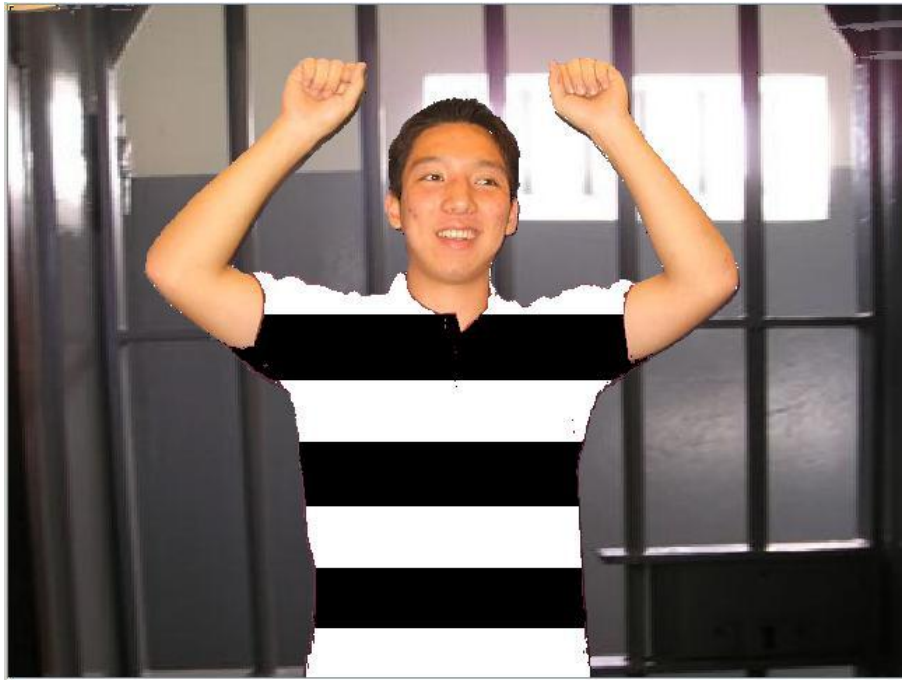
- Write a program to make this picture appear to be taken at sunset
- Input:

- Output:


CSE ROCKS!


Tour de France
2007
Champion
LCL
LYONNAIS
couery





About me

- Susan Marx (smarx@ucsd.edu)
  - UCSD CSE faculty since 1994!
  - Love teaching in CSE
  - C (5a), Java (8a/8b/11), Info. Technology (3)
  - Previously Silicon Valley Systems Engineer, Management, Instruction, Marketing, …
  - Faculty co-Chair Chancellor's Advisory Committee on the Status of Women (2010-2012)

My job

- Prepare computing professionals
  - Help you learn concepts, facts, skills
  - Help you develop good intellectual and professional habits
- Prepare you to apply computing in your career
  - Art, Film, Biology, Math, Physics, Medicine, etc.
- Explore and illuminate the hardest concepts
- Answer your questions

PLEASE COME visit ME during office hours for help or …

Your job

- Start down the road to becoming a professional
  - Be honest with yourself
  - Hold yourself to a professional standard
- Learn HOW to approach Computer Science classes
  - And HOW to learn computing forever…

Learning Goals:
By the end of CSE8A you will be able to…

1. **Design computational solutions to problems.** This requires applying the following skills to problem statements or code: explain, compare and contrast, argue, diagram a memory model, and design a class.

2. **Code a Java implementation to problems.** This requires applying skills including code writing, code modification (including of others‘ code), and explaining what code does.

3. **Analyze and debug Java programs.** This requires applying skills including reading and understanding code, tracing variable values, and debugging.

4. **Communicate professionally about Java programs.** This requires applying skills such as explaining code you wrote, arguing about coding and design decisions, and drawing memory models to explain behavior.

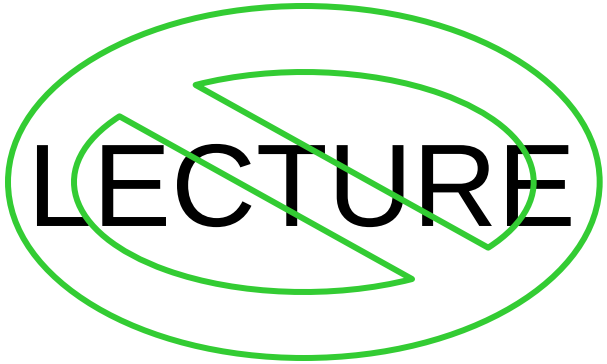
5. **Solve basic problems by applying goals 1-4 as steps in a process to create a Java program.**

6. **Apply goals 1-5 in various media-related contexts** to make interesting applications involving digital images (filters, collages, special effects) and digital audio files (mixing music).

What to expect

- Devoting 8-10 hours a week to this class
- Learning a profession
  - Requires practice and application
- Me to be your guide and mentor in understanding concepts
  - Not a regurgitator of what's in the book
- You to be actively involved in building and assessing your understanding in class
  - Not sitting and passively copying things down
- Questions
  - Who has been in a class of 150+ people before?

About This Class



You must attend class
You must prepare for class
You must participate in class

iClickers: You must bring them

- Buy an iClicker at the Bookstore
- Register it following instructions in the Syllabus

About This Class: Class sessions

- What must you do to prepare for each class?
- What happens if you have to miss one class?
- What happens if you miss more than 6 classes?
- When are the reading quizzes given?
- True or False: the reading quiz questions are provided before class

About this class: PSAs

- When are the problem solving assignments (PSAs) due?
- What should you do when you finish the PSA?
- What are the rules for working with a partner on a PSA?
- I need an extension on a PSA. What should I do?
- It's Friday morning and I don't know where to start on my PSA. What should I do?

About this class: Labs and Exams

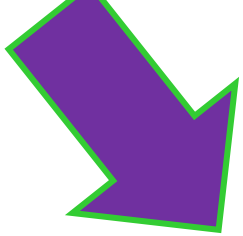
- Do I have to be registered for both CSE 8A and CSE 8AL?
- What happens if I am more than 5 minutes late to lab?
- Can exams be made-up or rescheduled?

About this class: Academic Integrity

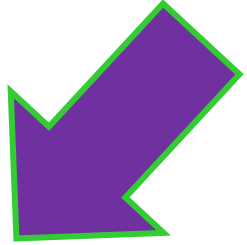
- You are working on one of the PSAs with your partner. You are stuck on a tricky problem, so you ask your friend who has taken CSE 8A before for help. Your friend shows you his solution, which you look at, but then put away before going back to your solution. Is this cheating?
- You and your partner are working together on a PSA, but she has to go to work. You stay and finish up the assignment without her and then submit it. Is this cheating?

About This Class: Getting Help

- What are all the resources for getting help in this class?



To Do For Next Class:



- Go to the course web site: http://cse8awinter13.weebly.com
- If you haven't already: buy a book and a clicker, and register your clicker at iClicker.com (see instructions on the syllabus)
- PSA 0: Post a "get to know you" message on Piazza
- Do the reading for Wednesday's class (under Course Material)
- Make sure you know the answers to the reading quiz questions
- BRING YOUR CLICKER TO CLASS