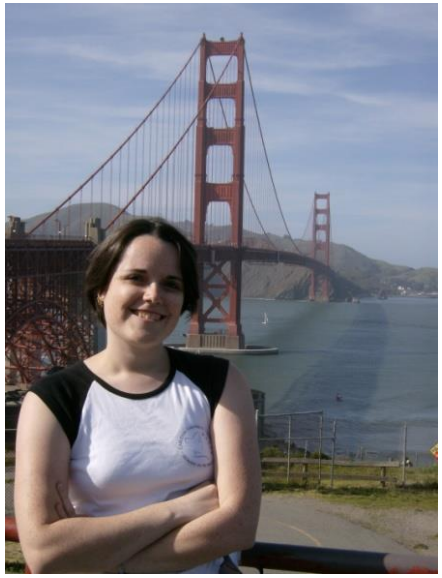
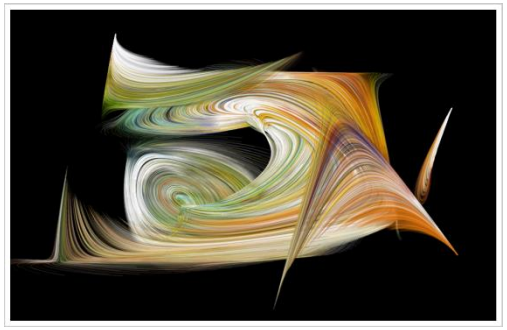
Introduction to Computer Science I

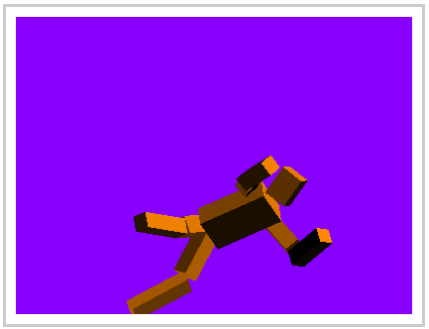
(COMP 1405)

About Me



What this course is all about…





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What is computer science?

@fortnow
Lance Fortnow

Asked: What is Computer Science?
Answered: Everything that happens after you ask a question to Google until you get a result.

What is computer science?

The big fancy definition:

Computer science (or computing science) is the study of the theoretical foundations of information and computation and their implementation and application in computer systems.

http://en.wikpedia.org/wiki/Computer_science

What is computer science?

It's all about finding ways to solve problems on a computer.

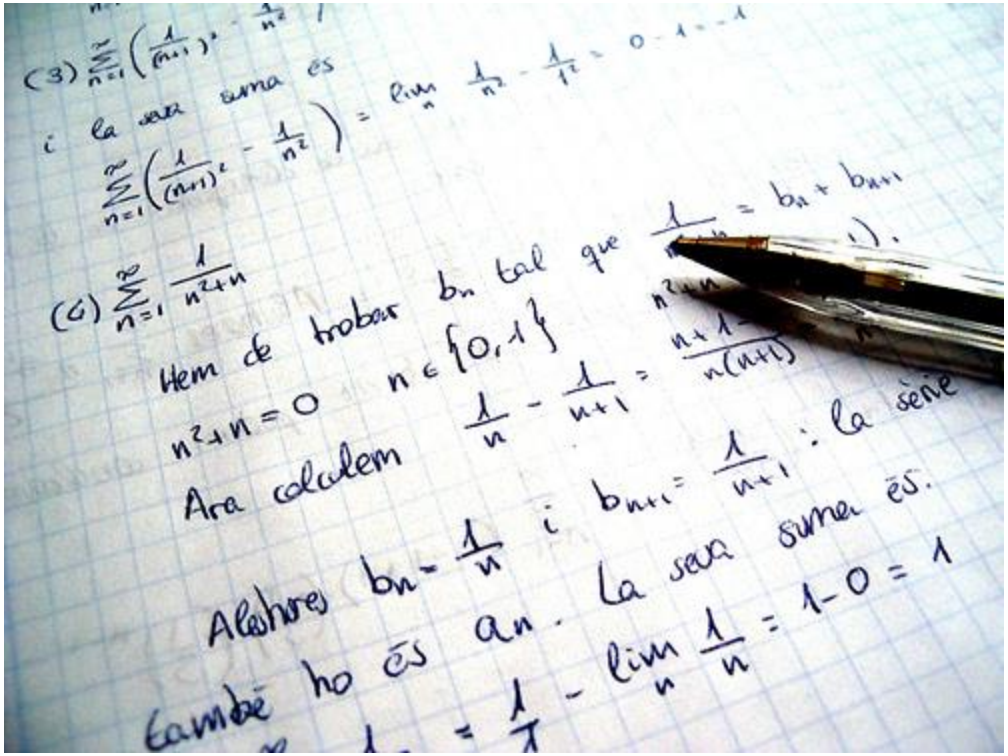
What can be computed automatically?

How hard is it to compute?

What interesting applications are there? (Like video games, Facebook, and more)

What's the best way to set up a computer so it can do all this stuff fast?

Computer science goes well with…



http://www.flickr.com/photos/akirsa/429721989/sizes/m/in/photostream/

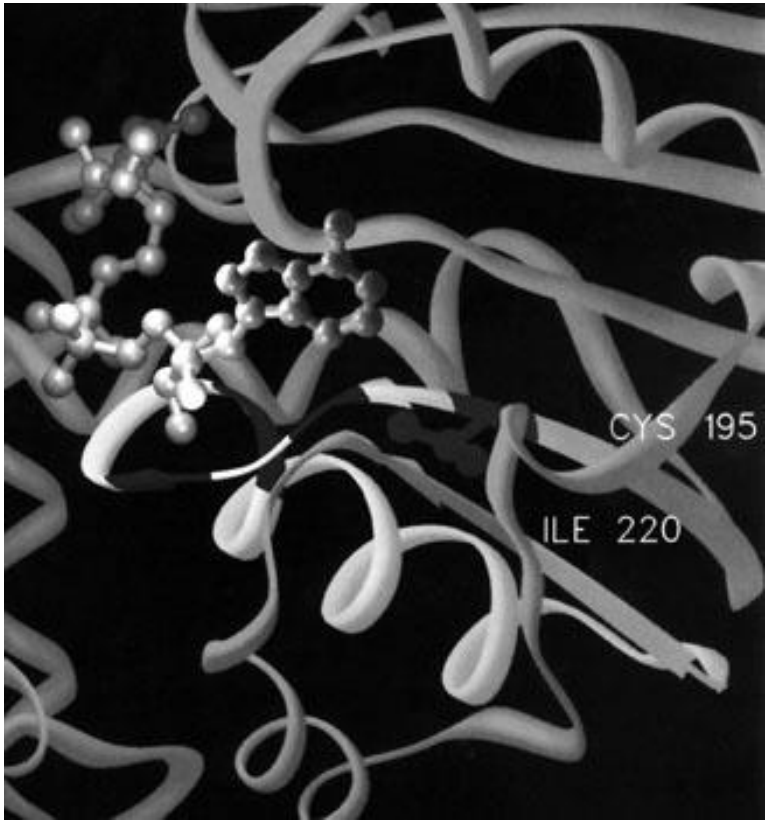
Computer science goes well with…

http://www.waynepubliclibrary.org/images/music%20notes.JPG

Computer science goes well with…

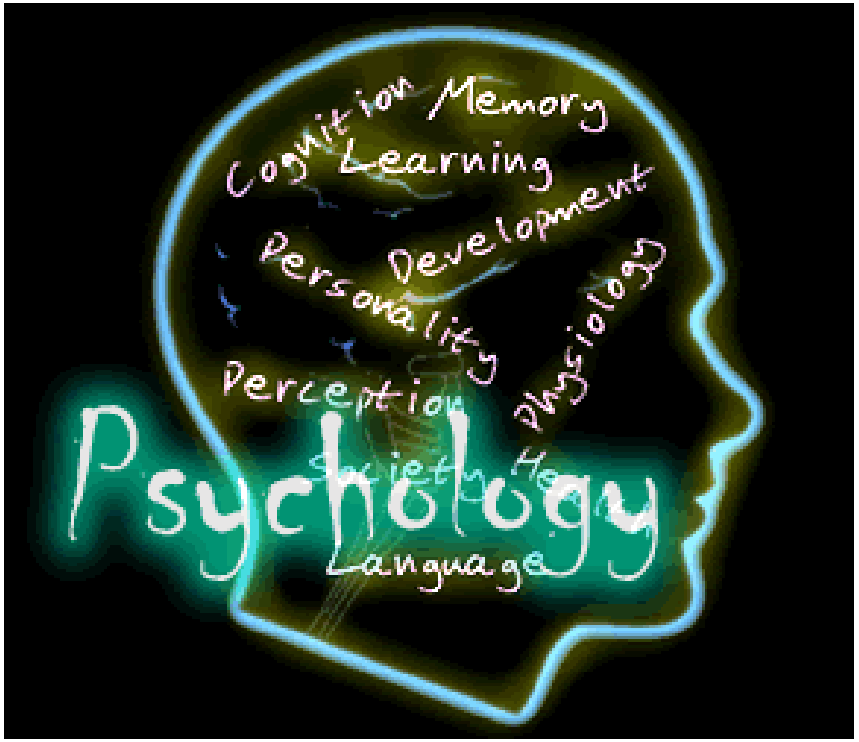
http://hornbillunleashed.files.wordpress.com/2009/10/law.jpg

Computer science goes well with…



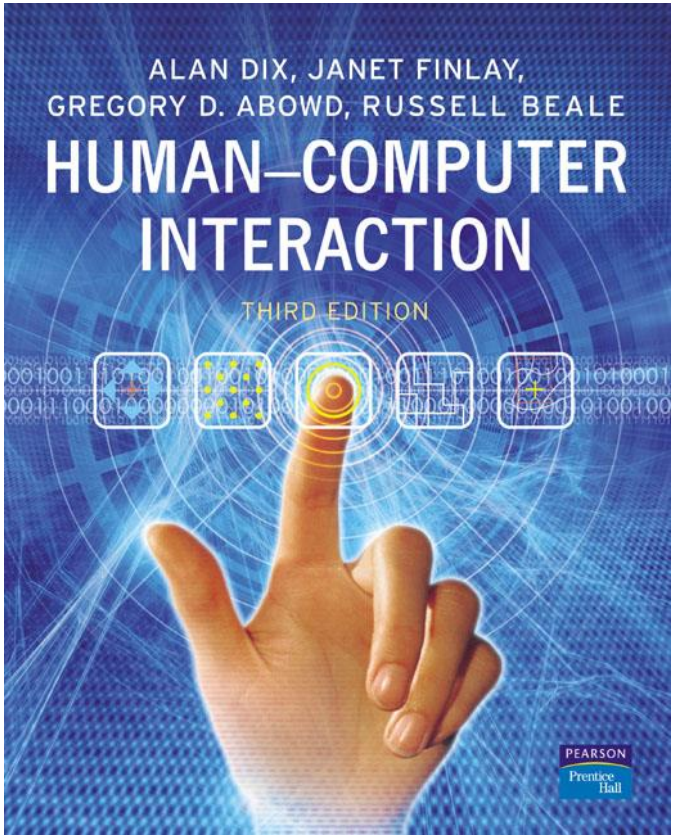
http://www.wadsworth.org/cores/images/stats.jpg

Computer science goes well with…



http://departments.weber.edu/psychology/Psychology.gif

Computer science goes well with…



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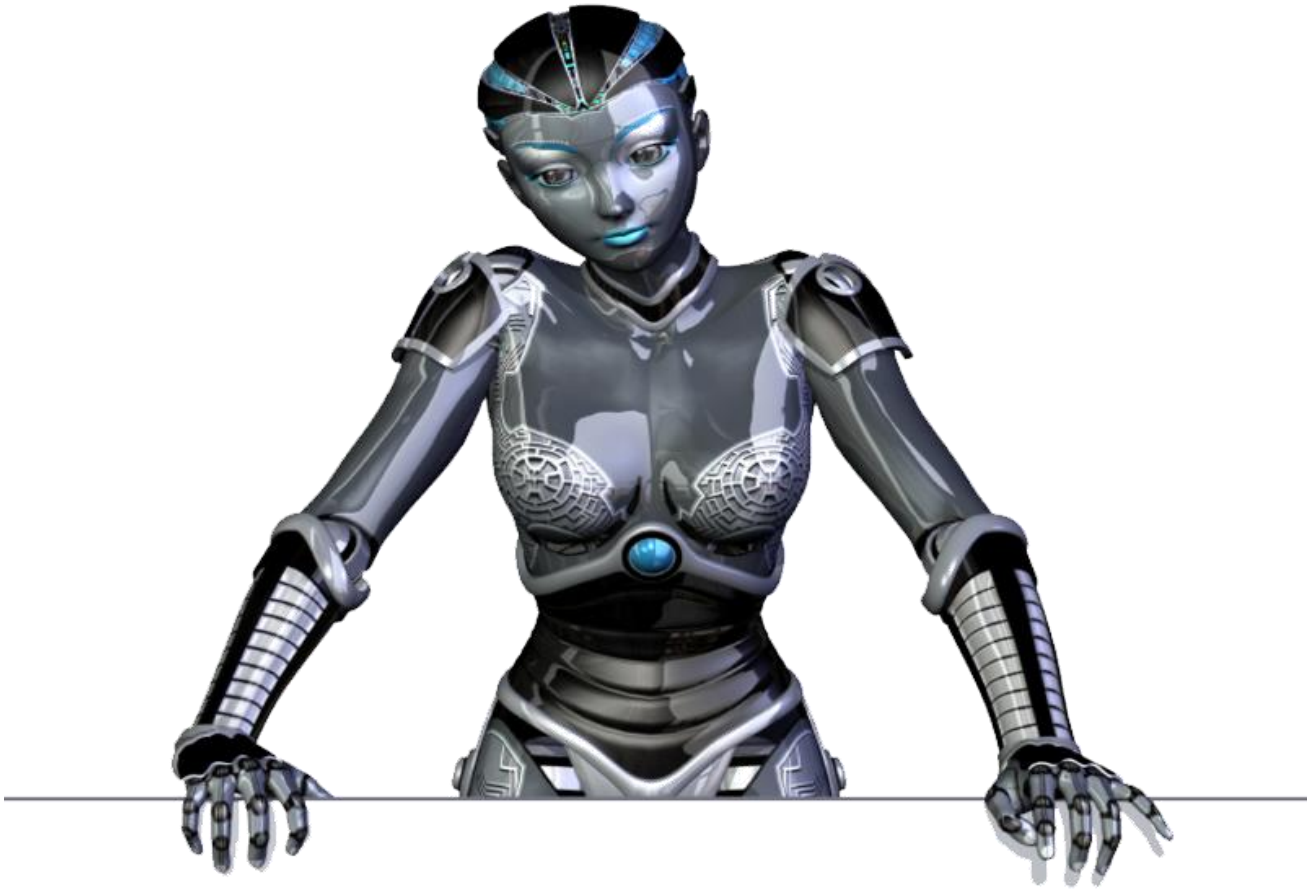
Computer science goes well with…



http://www.dailygalaxy.com/photos/uncategorized/2007/10/30/robot_5.jpg

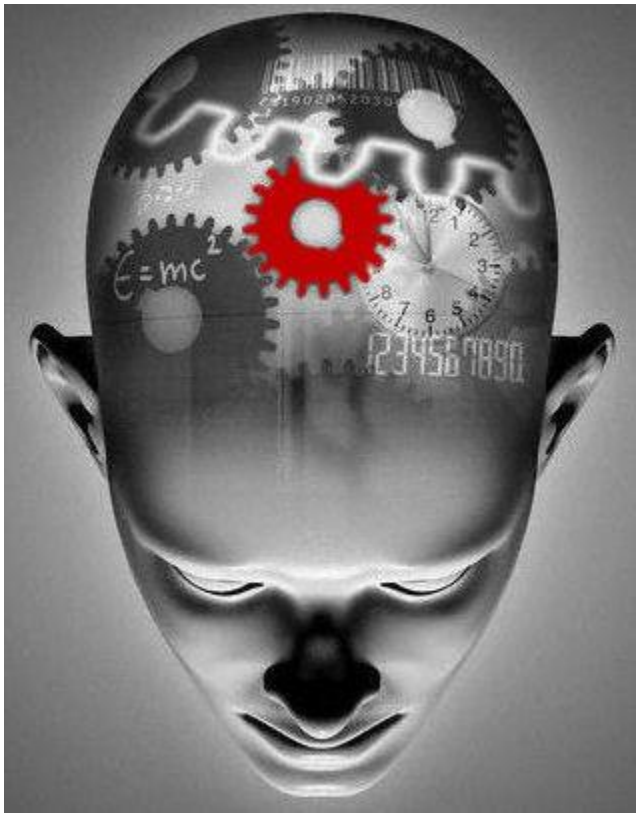
Computer science goes well with…

http://news.cnet.com/i/bto/20080609/iphone_550x550_540x539.jpg

Pathways in Computer Science

Video from University of Washington Computer Science and Engineering

http://www.youtube.com/watch?v=jq_EcstLlfE



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Computational Thinking

Computational Thinking

"Informally, computational thinking describes the mental activity in formulating a problem to admit a computational solution. The solution can be carried out by a human or machine, or more generally, by combinations of humans and machines."

http://www.cs.cmu.edu/~CompThink/papers/TheLinkWing.pdf

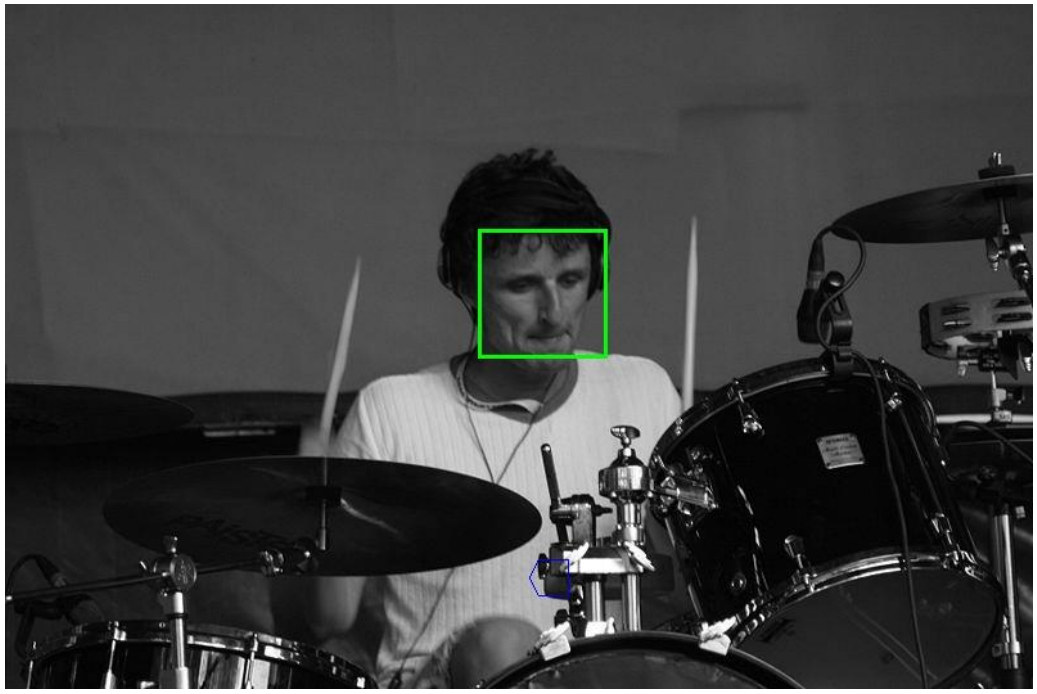
Decomposition

https://www.flickr.com/photos/ebarney/6219283590/

"...break down a task into minute details so that we can clearly explain a process to another person or to a computer, or even to just write notes for ourselves..."

http://www.google.com/edu/computational-thinking/what-is-ct.html

Pattern Recognition



http://en.wikipedia.org/wiki/Pattern_recognition

"...notice similarities or common differences that will help us make predictions or lead us to shortcuts..."

http://www.google.com/edu/computational-thinking/what-is-ct.html

Pattern Generalization, Abstraction

http://gigl.scs.carleton.ca/node/661

"...ability to filter out information that is not necessary to solve a certain type of problem and generalize the information that is necessary..."

http://www.google.com/edu/computational-thinking/what-is-ct.html

Algorithm Design

Follow **University Dr** to **Bronson Ave**

140 m / 28 s

Take **Colonel By Dr** to **Greenfield Ave/Ottawa 64**

4.0 km / 6 min

3. Take the 1st **left** onto **Bronson Ave**

280 m

4. Take the exit toward **Promenade Colonel By Drive**

88 m

5. Turn **left** onto **Bronson Pl**

130 m

6. Turn **right** onto **Colonel By Dr**
   Closed on Sundays

3.4 km

7. Turn **right** onto **Main St/Ottawa Regional Rd 72**

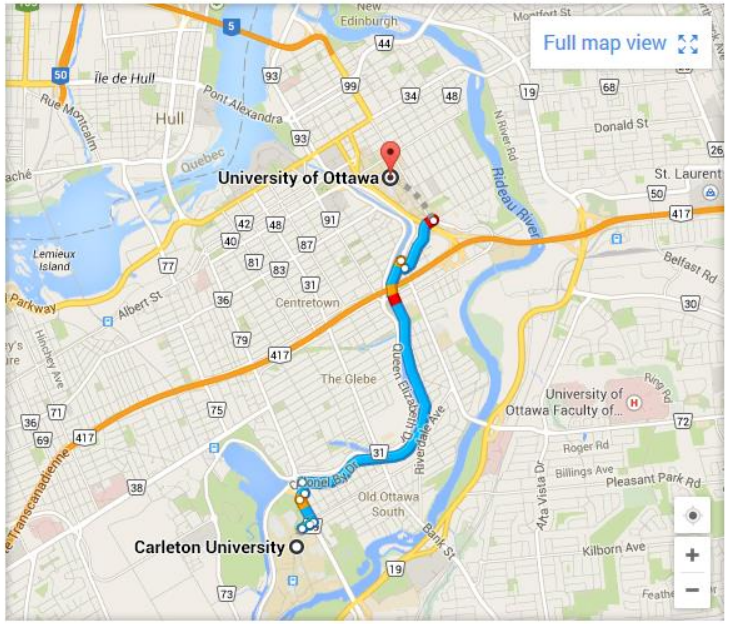
92 m

Turn **left** onto **Greenfield Ave/Ottawa 64**

650 m / 1 min

Turn **left** onto **King Edward Ave/Ottawa Regional Rd 99 N**

16 m / 10 s



http://maps.google.com

"...develop a step-by-step strategy for solving a problem...often written abstractly, utilizing variables..."

http://www.google.com/edu/computational-thinking/what-is-ct.html

Benefits of Being Able to Think Computationally

"Confidence in dealing with complexity"

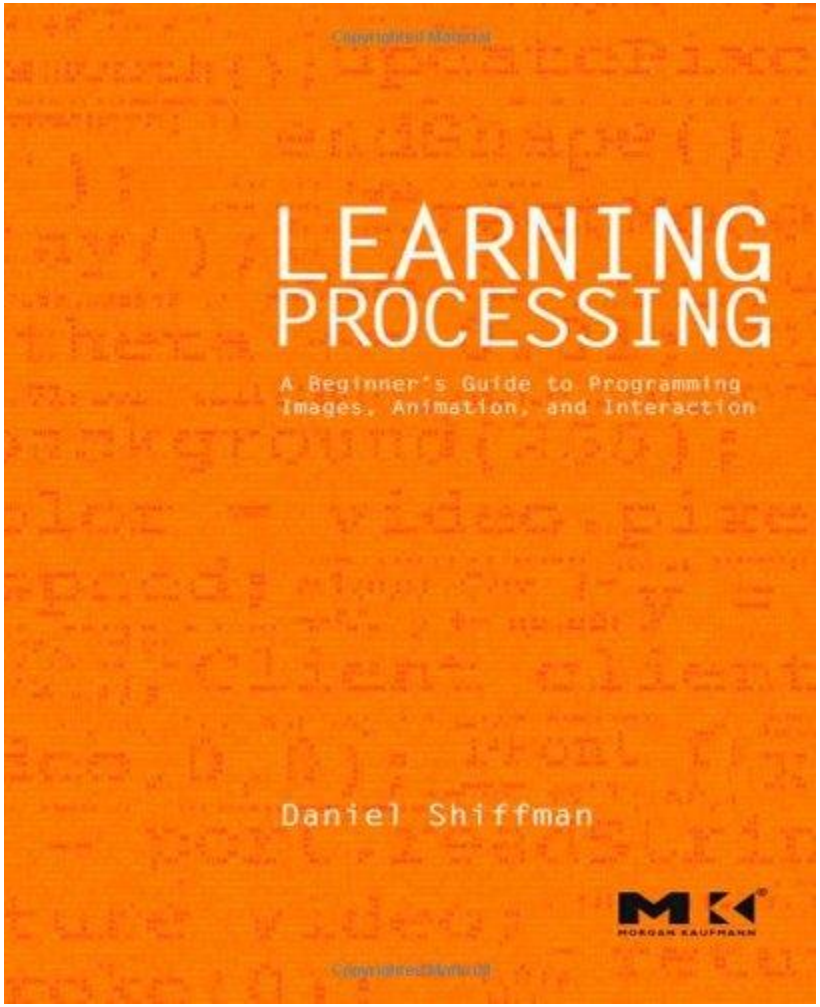
"Persistence in working with difficult problems"

"Tolerance for ambiguity"

"The ability to deal with open-ended problems"

"The ability to communicate and work with others to achieve a common goal or solution"

http://commons.wikimedia.org/wiki/File:Moleskine_ruled_notebook,_inside_view.jpg



http://www.learningprocessing.com/

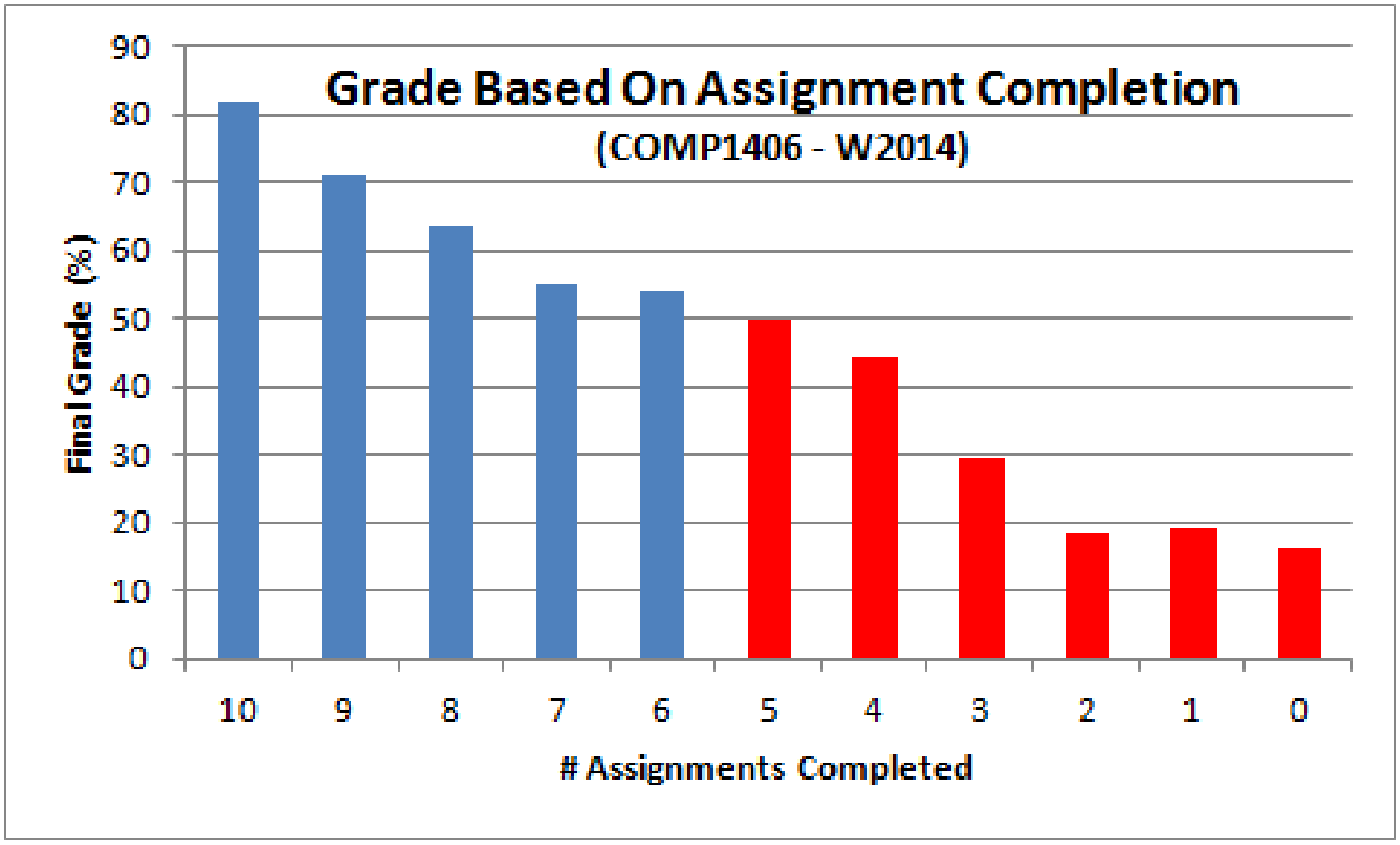
Poll Everywhere

Bring your devices!
(Laptops, tablets, cell phones)

…let's try it now!

Policies

1. Come to class and tutorial.
2. Participate.
3. Do required readings.
4. Submit on time.
5. Take advantage of office hours.
6. Remember that slides are only a teaching prop.


Grade Based On Assignment Completion
(COMP1406 - W2014)
Final Grade (%)
90
80
70
60
50
40
30
20
10
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10
9
8
7
6
5
4
3
2
1
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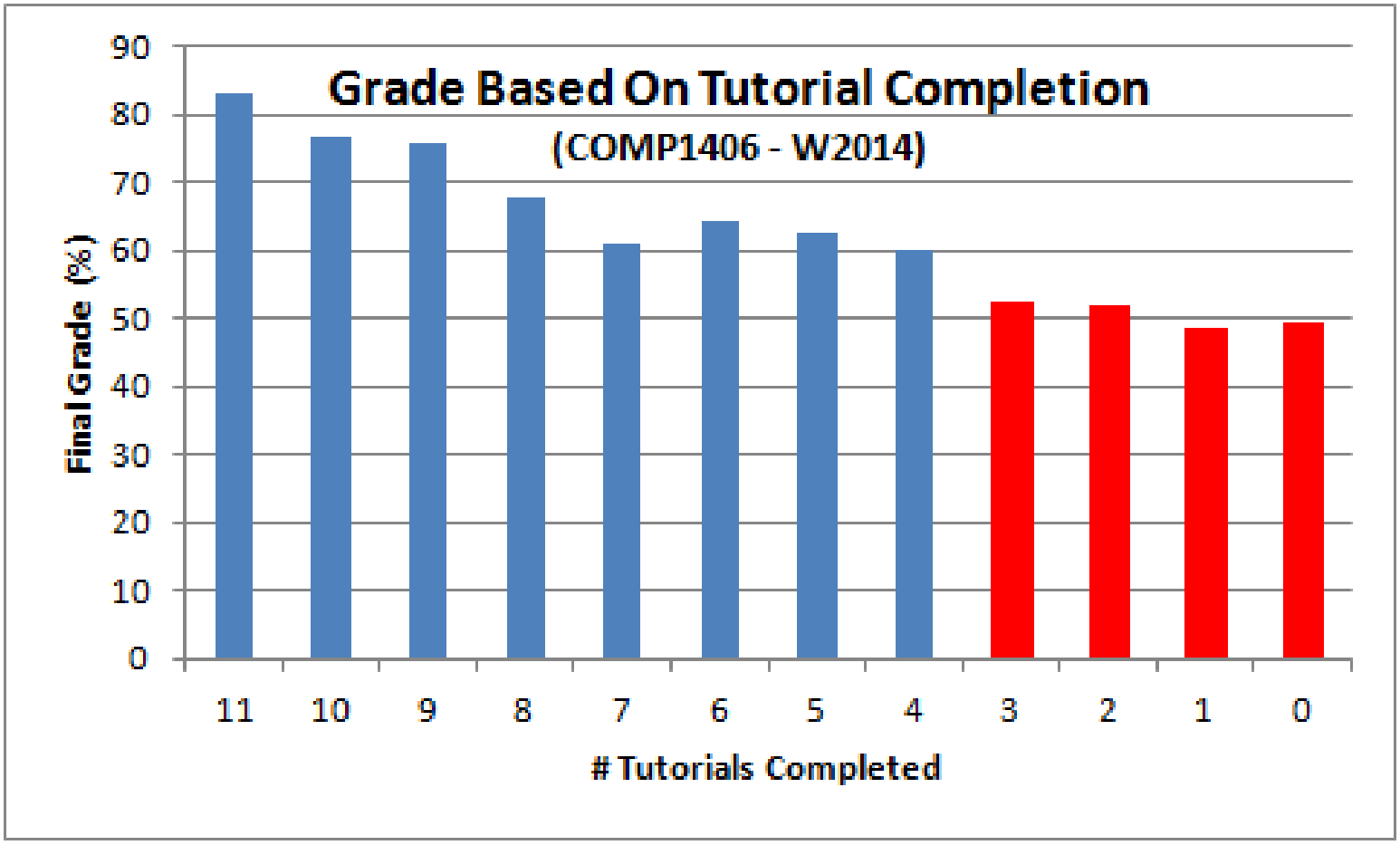
Assignments Completed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Tutorials Completed