Welcome to CS Camp !



CS Camp 2018

Introduction to Computer Science

We don't have words strong enough to describe this class.

- US News and Course Report

Everyone will get out of this course – a lot!

- NYTimes Review of Courses

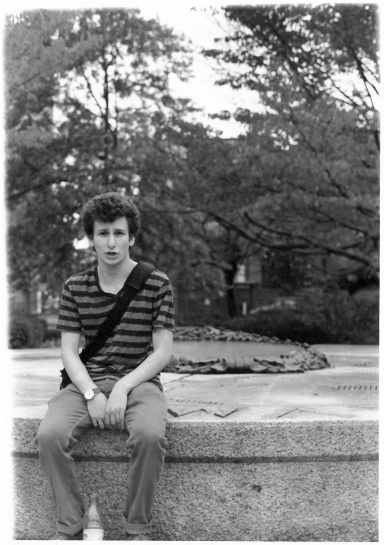
We give this course two thumbs…

- *Meta*metacritic

Introductions...

Prof. Jason Waterman
Sanders Physics 104.4

jawaterman@vassar.edu



Coach
Corin Rose
crose@vassar.edu





Coach
Ian Leinbac
ialeinbach@vassar.edu

Speaking of introductions



Today in CS Camp…

2) How Camp runs…

3) Python?!



Shouldn't there be an alien in this game?

1) What ***is*** CS?



CS is just programming, right?

I'm not so sure…



Whatever it is,
it's definitely *alien*!



CS Camp

- 6 weeks (Mon-Friday) 9:30 – 5:00
  - June 18th to July 27th
- Designed specifically for non-majors
  - Assumes no prior CS experience
- Covers the same material in a semester long course
- Hope to offer it as a semester course Spring'19

Daily Schedule

- I'll introduce the topics for the day in the morning at 10am
  - Be ready to go by 10am
- After class, work on exercises allow you to gain experience
  - Short exercises
  - Longer "lab" assignments
- Depending on the topic, we'll have an afternoon class at 2pm

Collaboration

- Try all the exercises yourself
- Collaboration is encouraged
  - Discuss with each other
  - Look at other's code
    - Explain your solution to your neighbor
- No tests, quizzes, or grades
  - You'll get out of the course what you put into it

Coaches

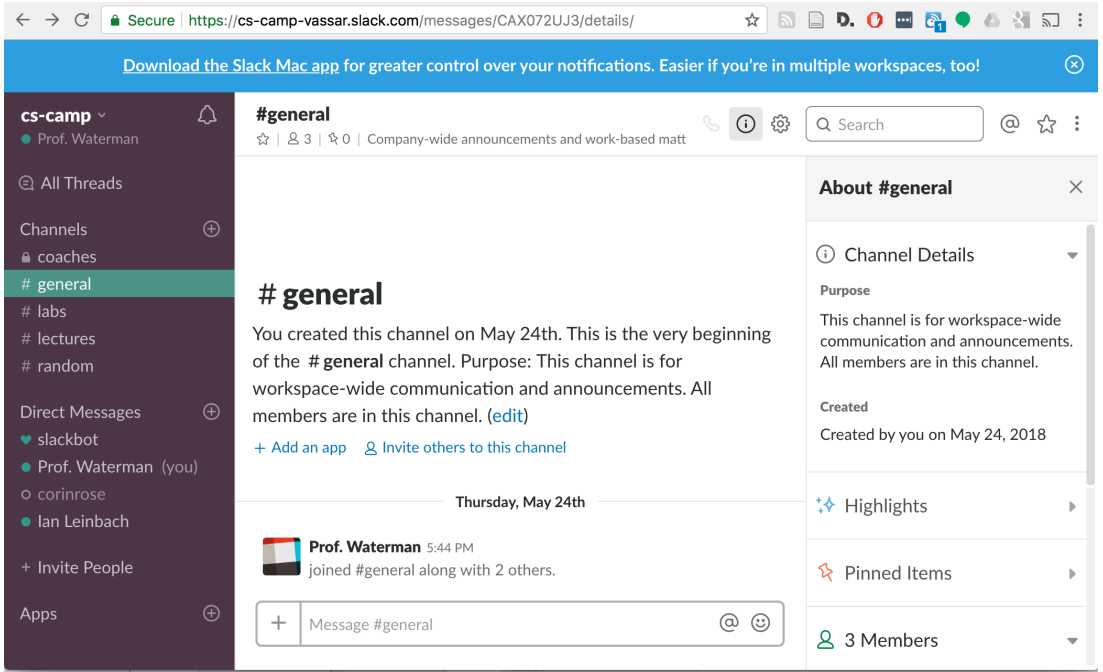
- Here from 9:30 to 6pm every day!
  - Lunch 12-1
- Most of the learning takes place through doing the exercises
  - Coaches can guide you if you get stuck
  - Evaluate your solutions
- They are the heart of this course!

Final Project

- Can be on anything you want!
  - We can give you suggestions
- Encourage working in groups of two (possibly three)
- Last day of class we will have a "Symposium" where you can show off your work

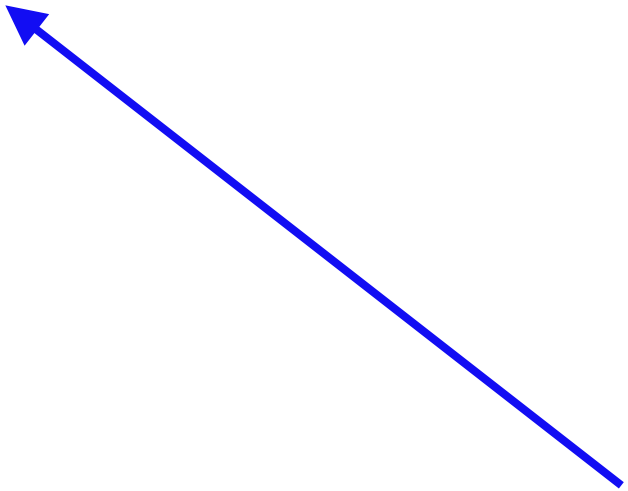
Getting Help

- Coaches
  - In the lab when you are
- Slack
  - https://cs-camp-vassar.slack.com



CS vs. programming ?

CS != programming



"not equal to"

CS != programming

So, what is CS?

Punctuation matters!
So what? *is* CS



CS != programming

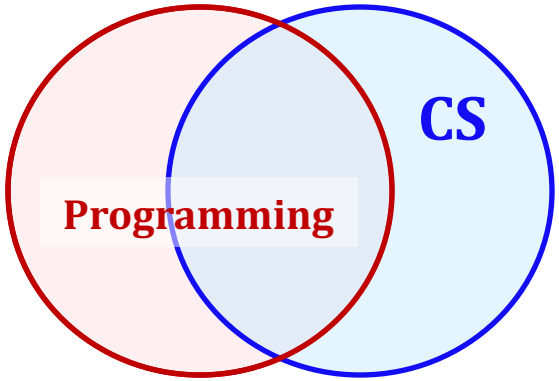
programming : **CS** ::

capital : business venture

equations : mathematics

language : ideas

web search : knowledge

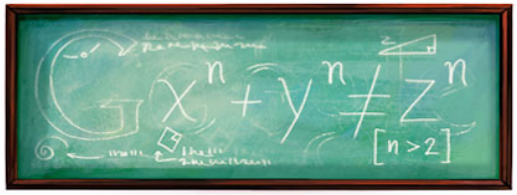


programs are a ***vehicle***, not the destination

What is CS?



What is CS?





creativity / design

commodity skills



What is CS a science *of* ?

the study of ***complexity***:

*How can **it** be done?*

*How well can **it** be done?*

*Can **it** be done at all?*

***it* ~ information**

or, more precisely, *a process transforming information from one form to another*



3 examples?
That's ***it*** for me!

We'll look at 3 examples

What is CS?

'HUMAN'

'CHIMPANZEE'

*How can **it** be done?*

*How well can **it** be done?*

*Can **it** be done at all?*

What is the ***Longest Common Subsequence*** between 2 strings?

biology's string-matching problem, "LCS"

'CGCTGAGCTAGGCC...'

'ATCCTAGGTAACTG...'

+10^9more

Can you solve the problem?

Can you create a *process* to solve such problems?

Eye oneder if this haz othur aplications?



Feels like home!



What is CS?

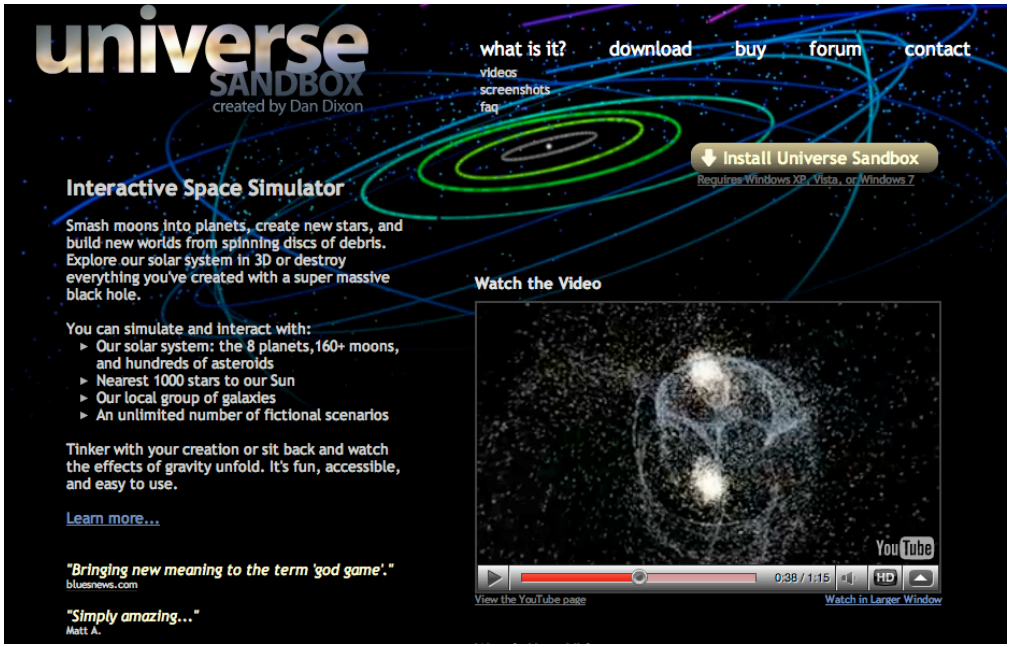
*How can **it** be done?*

*How well can **it** be done?*

*Can **it** be done at all?*

How *quickly* can you find a solution?

Is your solution the *"best"* possible?



How much work is needed to simulate N stars?

chemistry's + physics's "N-body" problem

https://www.youtube.com/watch?v=7HF5Oy8IMoM

what if N is a million-and-one...?

What is CS?

*How can **it** be done?*

*How well can **it** be done?*

*Can **it** be done at all?*

Is your problem *solvable*?

How can you tell !?

many problems are *uncomputable*...
... and you'll *prove* this!



Can we build a 3d model from one 2d image?

Andrew Ng's "Make3d"

https://www.youtube.com/watch?v=GWWIn29ZV4Q

All three eyes tell me that Make3d has just failed ~ epically!



What is CS?

CS is the study of ***complexity***

*How can **it** be done?*

*How well can **it** be done?*

*Can **it** be done at all?*

CS's ***six*** big questions are here.

But only <u>one</u> is ***programming***. Do you see which?

Can you solve this problem?

Can you create a process to solve such problems?

How quickly can you find solutions?

Do you have the "best" solution?

Is every problem solvable?

Is there a way to tell?

There isn't always!

What is CS?

CS is the study of ***complexity***

*How can **it** be done?*

*How well can **it** be done?*

*Can **it** be done at all?*

CS's ***six*** big questions are here.

But only <u>one</u> is ***programming***. Do you see which?

Can you solve this problem? CS

Can you create a process to solve such problems? *programming* + CS

How quickly can you find solutions? CS

Do you have the "best" solution? CS

Is every problem solvable? CS

Is there a way to tell? CS

There isn't always!

You're here ~ what's next?

2) How CS Camp runs…

3) Python?!

the first Python HW is ***choice!***



Shouldn't there be an alien in this game?



CS is just programming, right?

1) What ***is*** CS?

Whatever it is, it's definitely *alien*!



I'm not so sure…



Command line and Editors

- In class exercises
  - Logging in
    - Change your password (`passwd`)
  - Getting familiar with the command line
  - Using a text editor (Visual Studio Code)
    - Different from a word processer (MS Word)