CompSci 101
Introduction to Computer Science

`www.cs.duke.edu/courses/fall17/compsci101`
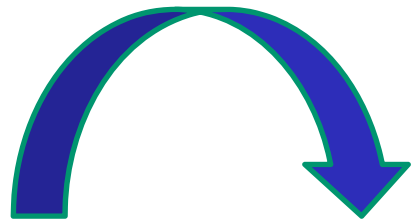
Aug 29, 2017

Prof. Rodger

CompSci 101
Data into Information and Knowledge

Computer Science

Prerequisites for Compsci 101

Announcements

- See assigned reading on course web page
  - Reading Quiz 1 (RQ1) online on Sakai (out today)
  - due by 1:25pm Thurs, Aug 31.
- Labs start this week! Aug 30-31! (Wed/Thur)
- Assignment 1 out today! Due Sept 5!
- Try out course software - VM
  - Try to run it before going to lab
  - If you get frustrated, get help or wait til go to lab!

- Today: Introduce Computer Science

What is Computer Science?

http://bit.ly/101f17-0829-1

Just ask Siri (or Bing?)

https://www.bing.com/search?q=what+is+computer+science&qs=HS&sc=8-0&cvid=C80E71D615F5404298E579A938ACCA3F&FORM=QBLH&sp=1
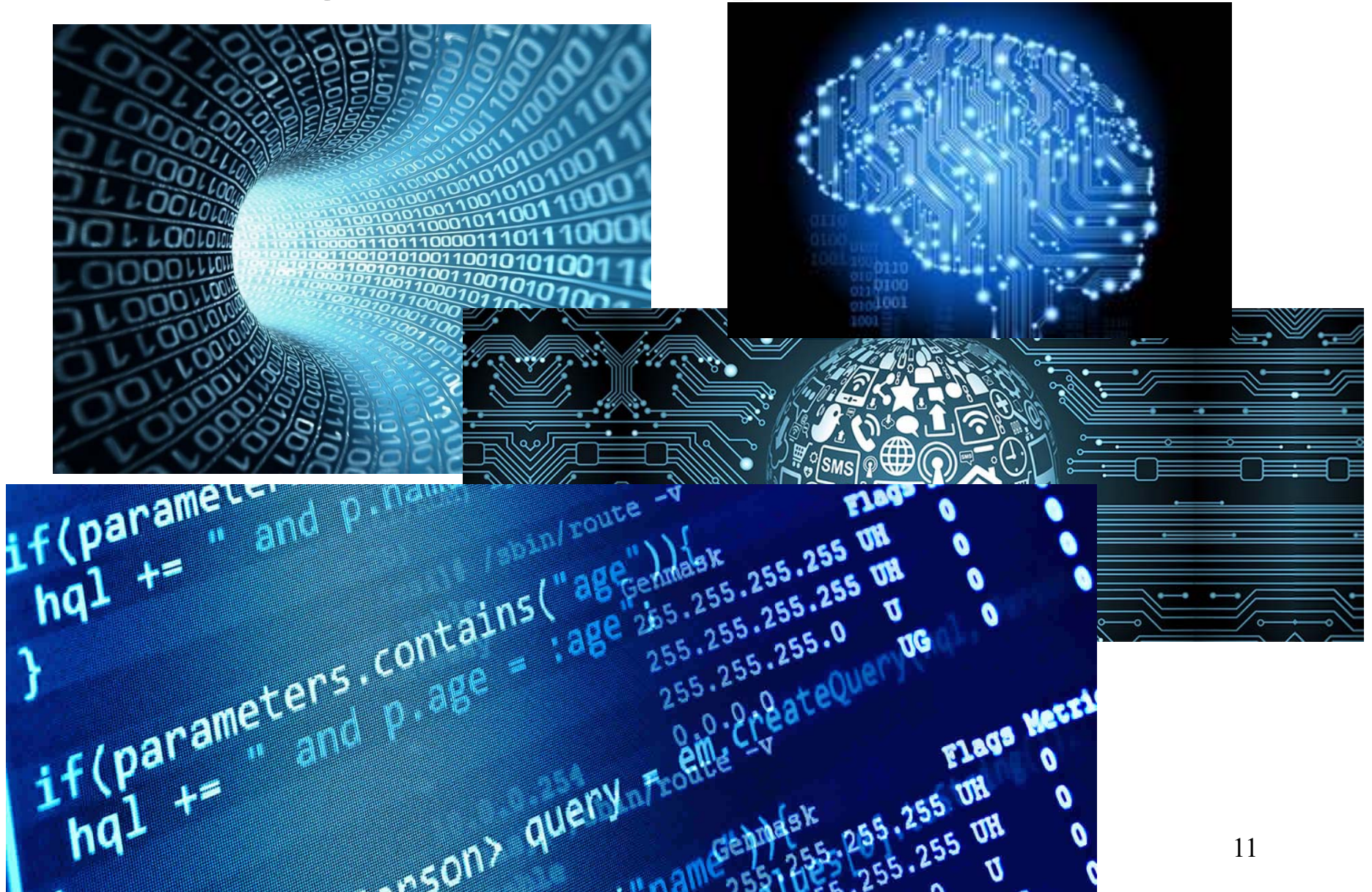
Ask Google -
Anatomy of a search query

https://www.google.com/search?q=what+is+computer+science&ie=utf-8&oe=utf-8

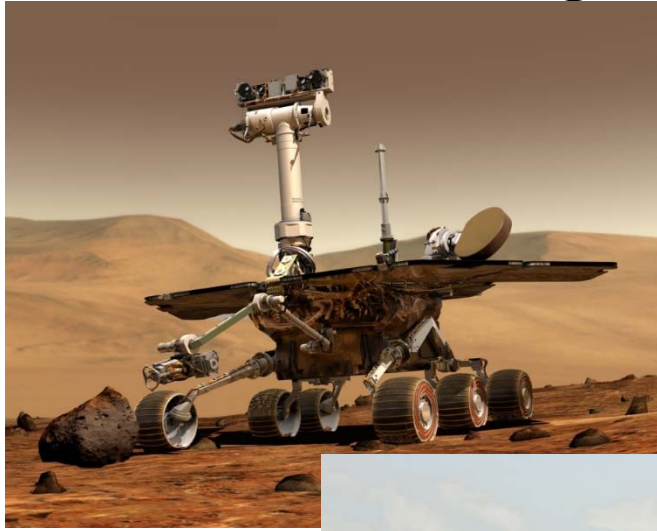What are the parameters to the query?

> What changes, what stays the same?

Images for Computer Science

What is Computer Science?

- Artificial Intelligence

Roomba

Spirit,
Mars Rover

Self-driving car

Personal Robot

compsci 101 fall 2017

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What is Computer Science?

- Medicine, Genomics

What is Computer Science?

- Animation

Who are all these people?
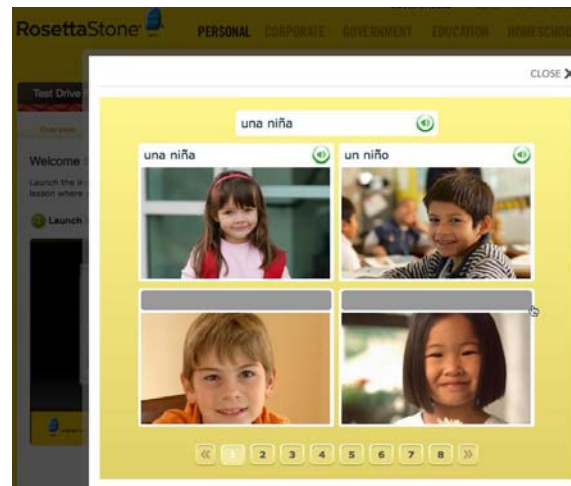## bit.ly/101f17-0829-2

1

2

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6

7

Questions about Computer Science

What is it that distinguishes it from the separate subjects with which it is related? What is *the linking thread* which gathers these disparate branches into a single discipline? My answer to these questions is simple --- it *is the art of programming a computer*. It is the art of designing efficient and elegant methods of getting a computer to solve problems, theoretical or practical, small or large, simple or complex.

C.A.R. (Tony)Hoare

How will you learn to 'speak'?

- http://www.rosettastone.com/personal/demo
- http://duolingo.com

How will you learn to program?

- You learn more than programming
- Coding, Algorithms
  - UX/UI: User Experience, User Interface
  - Data Analytics, Software Engineering

- A course, a way of thinking, a set of skills and practice that can lead to more or …

What language will we learn?

- http://www.python.org/
- Python is a *multi-paradigm* language
  - Procedural
  - Functional
  - Object-Oriented
- Simple, libraries, widely used
- Guido von Rossom is BDFL

Who are you?

- Let's look at survey to see who is taking Compsci 101 in Spring 2017
    - Do you recognize yourself?
    - Is there a stereotypical Compsci 101 student?
    - Is there a stereotypical computer scientist?

- Everyone can succeed! Ideally you won't have lots of experience programming

Course Overview: Is this the right one?

- Work by yourself and collaboratively on solving problems that programming
  - Analyze the problems, think about solving them
  - Create, Collaborate, Persist, Problem-Solve
- Why should you come to class?
  - Learn things, participate in a community
  - Provide help, get help, wonder, dance, think
- Why is this course so great?
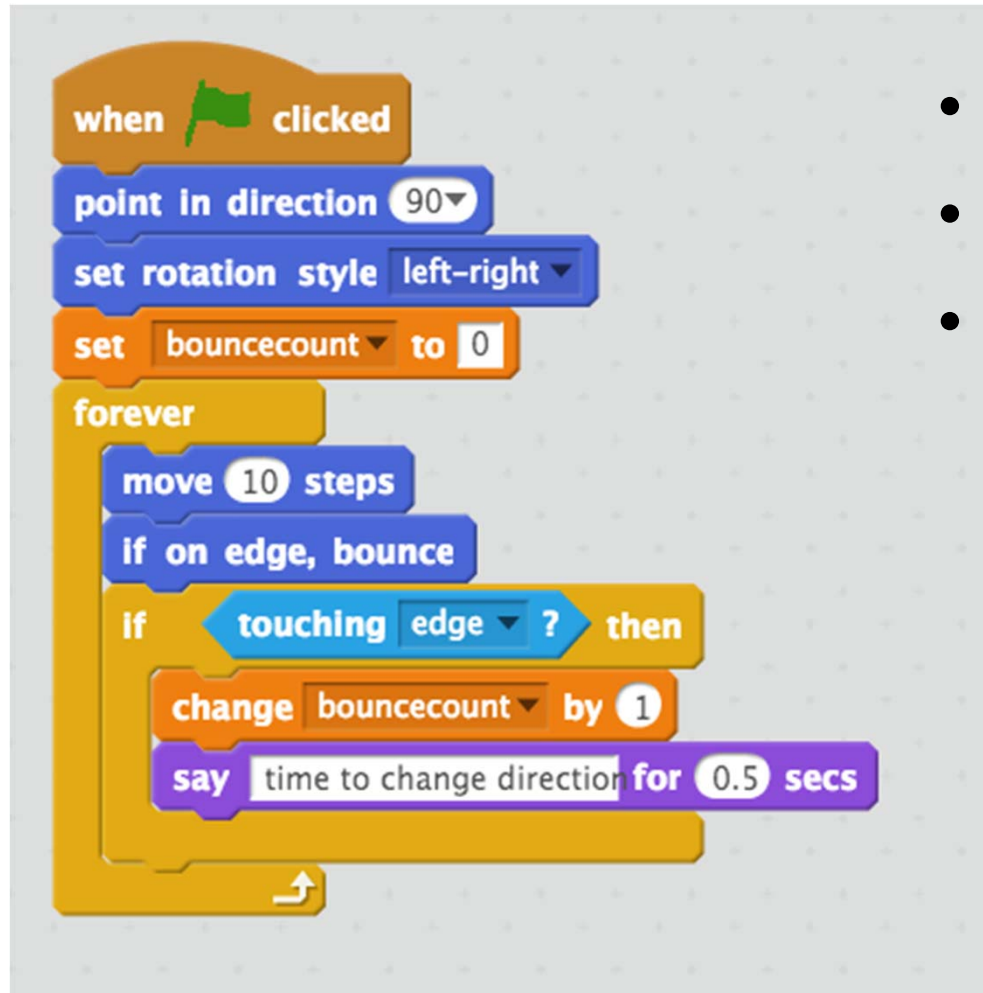 - Because you're in it

What's in Compsci 101?

- Learning about computing, computer science, and programming
  - Vocabulary of Python and programming
  - *Power of automation, repetition, scale*
  - Understanding and changing the world
- Programming using Python
  - Tools: Eclipse, EPD, Libraries, …
  - Using mathematical and scientific techniques
  - Art *and* science of programming

Course overview, logistics

www.cs.duke.edu/courses/fall17/compsci101

- Programming assignments: APTs and Assignments
  - Acknowledge assistance, to learn to program …
  - Be aware of late policy
- Exams: midterms and final: paper-based, different
  - All old midterms available
- Class work/attendance
  - Examples today, benefits hopefully clear

- "Hello World"
- Scratch Program
- Colors
  - Duke blue: motion
  - Mustard: control
  - Light blue: sensing
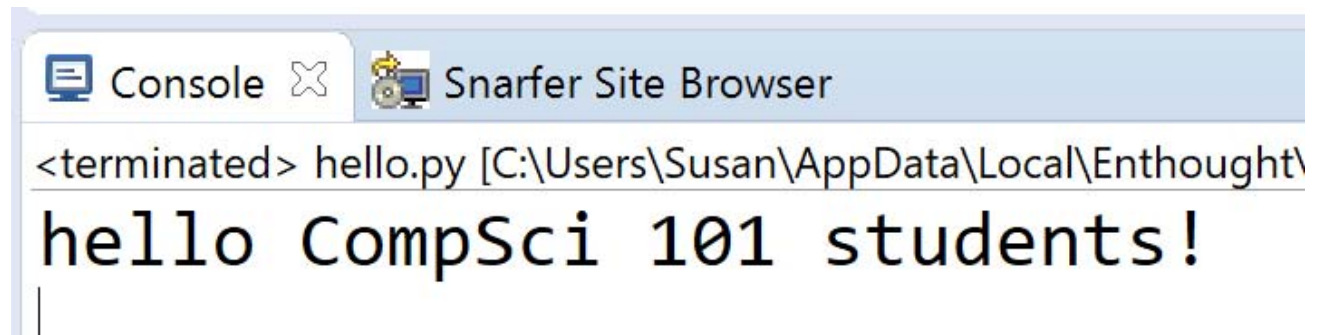 - Orange: data
  - Purple: looks

Analyze this Scratch Program?

http://bit.ly/101f17-0829-3

Python code
hello.py

```
1  '''
2  Created on Aug 28, 2017
3
4  @author: Susan
5  '''
6  print "hello CompSci 101 students!"
```

Console ✕   Snarfer Site Browser

`<terminated> hello.py [C:\Users\Susan\AppData\Local\Enthought\`

```
hello CompSci 101 students!
|
```

Python data reading code

```
f = open("kjv10.txt")
st = f.read()
total = len(st)
zc = st.count('z')
print "total # chars = ",total
print "number of z's",zc
for ch in 'aeiou':
     print ch, st.count(ch)
```