

COMP 150 Introduction to Computing

Introductory Lecture

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Who studies computer science?

Who studies computer science? “Hollywood”

Google stereotypical computer scientist

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The Google search results page for "stereotypical computer scientist" displays a grid of images. The top row includes a large photo of a man in a plaid shirt at a computer, a collage titled "WHAT DOES A COMPUTER SCIENTIST LOOK LIKE?", and a collage titled "Stereotypes of CS Majors". Below these are several more images: three panels of infographics labeled "Stereotype #1", "Stereotype #2", and "Stereotype #3"; a photo of two women working on computers; a photo of four men working on computers; a photo of a person's arm pointing at a computer screen with the text "got root?" and "No, this is not my boyfriend's computer!"; a photo of a person in a red shirt using a laptop; and a photo of two men in casual attire looking at a computer screen. To the right of the images is a bar chart titled "Interest in computer science" comparing responses to stereotypical vs. non-stereotypical news articles for men and women.

WHAT DOES A COMPUTER SCIENTIST LOOK LIKE?

Stereotypes of CS Majors

Stereotype #1
A stereotypical computer scientist looks like this.
Stereotype #2
This is what a stereotypical computer scientist looks like.
Stereotype #3
Computer scientists are often seen as...
got root?
No, this is not my boyfriend's computer!

Interest in computer science

■ Stereotypical article ■ Non-stereotypical article

Fig. 1. Women's and men's interest in majoring in computer science after reading a newspaper article containing a stereotypical scientist (n = 62) or did not contain stereotypical traits (n = 72). Scale from 0 (strongly disagree) to 7 (strongly agree). Error bars represent standard errors.

Who studies computer science? Reality

computer science students



Data, Data Everywhere

The Economist

Obama the warrior
Misgoverning Argentina
The economic shift from West to East
Genetically modified crops blossom
The right to eat cats and dogs

The data deluge

AND HOW TO HANDLE IT: A 14-PAGE SPECIAL REPORT

Illustration: A man in a suit holding a large, multi-colored (green, yellow, red) umbrella over a small, colorful flower. The background is a dense grid of small, illegible text.

WHAT WOULD YOU DO WITH ALL THIS DATA?

Mathematics and statistics provide the tools to understand ever-increasing amounts of data. To learn more, visit the Mathematics Awareness Month website and enter for a chance to win an iTunes gift card at www.mathaware.org.

Mathematics, Statistics, and the Data Deluge
MATHEMATICS AWARENESS MONTH

Sponsored by the Joint Policy Board for Mathematics—American Mathematical Society, American Statistical Association, Mathematical Association of America, Society for Industrial and Applied Mathematics

Computer Science Skills Needed Across Disciplines



“Computing may be the fourth great domain of science along with the physical, life and social sciences”

-Peter Denning

<http://www.americanscientist.org/libraries/documents/20108101750328103-2010-09Denning-ComputingScience.pdf>

Computer Science Centers on Algorithms

Algorithm:

- Unambiguous, step by step instructions for how to accomplish a particular task in a finite amount of time.

The Great Principles of Computing

1. **Computation** (what can and cannot be computed)
2. **Communication** (reliable data transmission)
3. **Coordination** (cooperation among networked computers)
4. **Recollection** (storage and retrieval of information)
5. **Automation** (developing algorithms for tasks)
6. **Evaluation** (predicting performance of complex systems)
7. **Design** (building reliable software systems)

<http://www.americanscientist.org/libraries/documents/20108101750328103-2010-09Denning-ComputingScience.pdf>

What we'll focus on in COMP 150

Programming in Python

- Python is a simple, yet powerful, language to learn and understand (close to English)
- Even beginners can write programs to simplify their own personal tasks

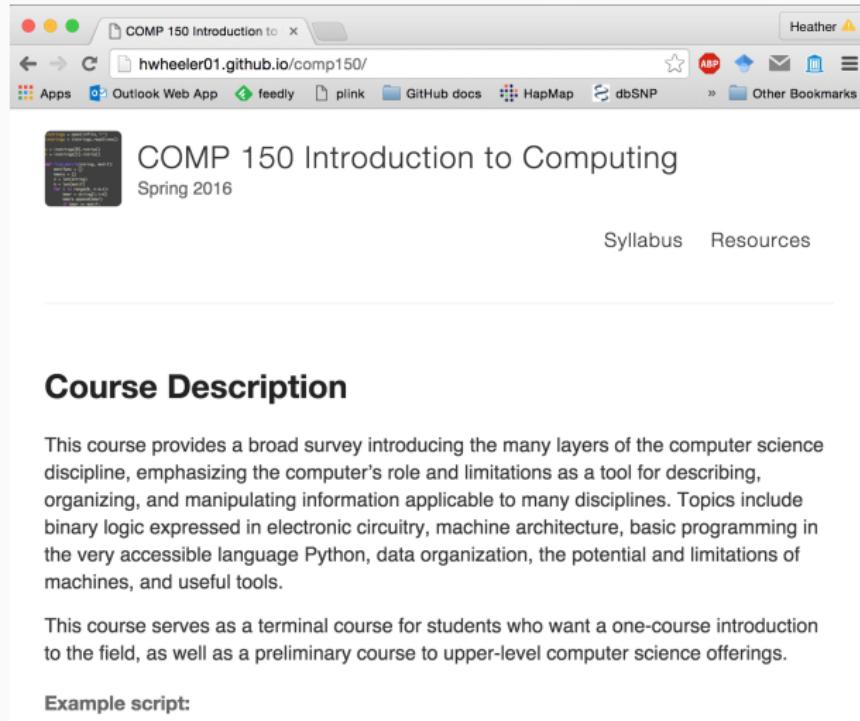
Applications

- Graphics
- Web servers

What's going on underneath Python

- Machine language and assembler code
- Computer hardware

The syllabus and assignments are posted on the class website



A screenshot of a web browser window titled "COMP 150 Introduction to Computing". The URL in the address bar is "hwheeler01.github.io/comp150/". The page content includes a small screenshot of a terminal window showing Python code and output, the title "COMP 150 Introduction to Computing", and the subtitle "Spring 2016". Below the title are two navigation links: "Syllabus" and "Resources".

Course Description

This course provides a broad survey introducing the many layers of the computer science discipline, emphasizing the computer's role and limitations as a tool for describing, organizing, and manipulating information applicable to many disciplines. Topics include binary logic expressed in electronic circuitry, machine architecture, basic programming in the very accessible language Python, data organization, the potential and limitations of machines, and useful tools.

This course serves as a terminal course for students who want a one-course introduction to the field, as well as a preliminary course to upper-level computer science offerings.

Example script:

<http://hwheeler01.github.io/comp150/>

Example Final Projects

- Take a look at some past project games to see what you can do with the programming skills you'll learn in this class
- Note: these 2 examples require Python version 3.4

<http://hwheeler01.github.io/comp150/ClassNotes.html#Past>

Get Python Running

- Links are on the syllabus page
- If using your own computer: Download Python (Tutorial 1.1.3)
- Download example files
- Run `madlib.py` (Tutorial 1.2.2)
- Open `madlib.py` in IDLE and run it within IDLE
- Get help if things aren't working