

COMP 150 Introduction to Computing

Introductory Lecture

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Who studies computer science?

Who studies computer science? Stereotype

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WHAT DOES A COMPUTER SCIENTIST LOOK LIKE?

Stereotypes of CS Majors

Stereotype #1: Computer scientists are geeks who like to play video games.

Stereotype #2: Computer scientists are nerds who like to eat pizza.

Stereotype #3: Computer scientists are people who like to work alone.

Fig. 1 Women's and men's responses to responses to computer science stereotypes. Note that including a stereotype in their response does not mean that they did not feel it was stereotypes in Study 2. Scale ranged from 1 (strongly disagree) to 7 (strongly agree). Error bars represent standard errors.

Response	Women (n=744)	Men (n=744)
Strongly Disagree	~1.0	~1.0
Disagree	~2.5	~2.5
Agree	~3.5	~3.5
Strongly Agree	~2.5	~2.5

Who studies computer science? Reality



Data, Data Everywhere

The Economist
OBAMA'S CHANCE TO LEAD
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

A man in a suit holds a large umbrella over a small flower, symbolizing protection or growth in the face of data.

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

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
- Data visualization

What's going on underneath Python

- Machine language and assembler code
- Computer hardware

The syllabus and assignments are posted on the class website

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



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Syllabus 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:

```
'''Given: Two positive integers a and b.  
Return: The integer corresponding to  
the square of the hypotenuse of the right  
triangle whose legs have lengths a and b.'''
```

```
def hypSq(x, y):  
    hs = int(x)**2 + int(y)**2  
    print("Hypotenuse squared = " + str(hs))
```

Pair Programming

A method of programming in which two people work together at one keyboard

- One person, the “driver”, types at the keyboard
- The other person, the “observer” or “navigator”, reviews each line of code as it is typed, checking for errors and thinking about the overall design
- Switch roles often – at least every half hour



Pair Programming

Some benefits you can expect:

- better code (simpler design, fewer bugs)
- shared knowledge throughout your team
- better time management, higher productivity
- higher morale (more fun!)



Pair Programming

First:

- Get to know each other with People BINGO
 - Fabulous prizes available

Then:

- Choose your own partner OR
- If you'd rather leave it up to chance, we will use a Python script to randomly assign you a partner

Get Python Running

- 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