Compsci 101
Introduction to Computer Science
Part 1 of 3

www.cs.duke.edu/courses/spring21/compsci101

Susan Rodger
Nicki Washington
January 21, 2021
CompSci 101 Professor

Prof. Nicki Washington

Prof. Susan Rodger
Yesenia Velasco

• Teaching Associate

• Right-hand woman - Handles logistics, substitute lectures, and much more!

• Handles accommodations
  • Email her your accommodation letter
  • yvelasco@cs.duke.edu
A is for …

• **Algorithm**
  • Step-by-step instructions realized in a program

• **Abstraction**
  • Hiding things is powerful
  • “What” vs “How”

• **APT**
  • Algorithmic Problem-solving Testing

• **API**
  • Application Programming Interface - using Libraries
Announcements

• Check out the calendar on the course website
  • PRE-WORK – what you must do before the lecture
  • LECT/LAB – will put notes/videos here from the live lecture or for the lab
  • DUE – what is due each week.

• What has been updated?

• Assignment 1 is already out!
• You will see a link to this video!
CompSci 101
Data into Information and Knowledge

Computer Science
Prerequisites for Compsci 101
Who has taken CompSci 101?
Compsci 101
Introduction to Computer Science
Part 2 of 3

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How it Started

How it’s Going
Vacuum Tubes

- Control electric current using the vacuum
- Can be used to start/stop, or change the flow based on the current

  - Off/On → 0/1
  - 00000011
The Original Computers
Apple I and II
Where the Magic Happens: Computer Science
Artificial Intelligence
Medicine, Genomics
Animation
What is Computer Science?

• Definition 1:
  • “The study of computers and computational systems.”

• Definition 2:
  • “The study of computers and computing, including their theoretical and algorithmic foundations, hardware and software, and their uses for processing information.”

• Definition 3:
  • “The study of how computers can be used to solve a wide range of problems.”
How We Communicate with Computers

- http://www.rosettastone.com/personal/demo
- http://duolingo.com
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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/](http://www.python.org/)
- Python is a *multi-paradigm* language
  - Procedural
  - Functional
  - Object-Oriented
- Simple, libraries, widely used
- Guido von Rossom
Course Overview: The Right Course?

- 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: PyCharm, Libraries, …
  • Using mathematical and scientific techniques
  • Art and science of programming
Course overview, logistics
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• Programming assignments: APTs and Assignments
  • Acknowledge assistance, to learn to program …
  • Be aware of late policy
• Exams: 3 exams and a final exam
  • All old exams are available, but no final exams
• Classwork/attendance
  • Attend the live lecture - participate
  • If you can’t attend you must watch it and participate within 24 hours
Python code hello.py

def print_hello(name):
    print(f'Hello, {name}')

if __name__ == '__main__':
    print_hello('CompSci 101 students')
Duke Connection: Fred Brooks '53

- Turing award winner
  - Developing IBM 360 computers
  - Software engineering
- What Would FB Say?
  "The most important single decision I ever made was to change the IBM 360 series from a 6-bit byte to an 8-bit byte, thereby enabling the use of lowercase letters. That change propagated everywhere."

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Why is programming fun?
Fred Brooks

• First is the sheer joy of making things
• Second is the pleasure of making things that are useful
• Third is the fascination of fashioning complex puzzle-like objects of interlocking moving parts
• Fourth is the joy of always learning
• Finally, there is the delight of working in such a tractable medium. The programmer, like the poet, works only slightly removed from pure thought-stuff.