

CompSci 101

Introduction to Computer Science

Part 1 of 3

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



Susan Rodger
Nicki Washington
January 21, 2021

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CompSci 101 Professor



Prof. Nicki Washington



Prof. Susan Rodger

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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



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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

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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 Calendar

Home About News Links Contact Us Privacy Policy

All materials we use in class are accessible via this page.
Information about grading and course logistics.

January 18-22 Week

	Monday 1/18	Tuesday 1/19	Wednesday 1/20	Thursday 1/21	Friday 1/22
PRE-WORK	MLK Day			Introduction Video 1 Video 2 The Meeting Quiz (MC)	First Lecture Lab 0
LECTURE LAB				<ul style="list-style-type: none"> • Link 0 • Link 1 • Link 2 	
ASSIGNMENTS APTS DUE				Assignment 0 out	

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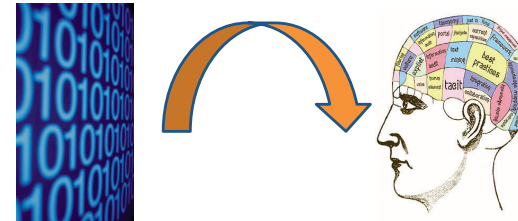
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Data into Information and Knowledge

Computer Science



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Prerequisites for CompSci 101

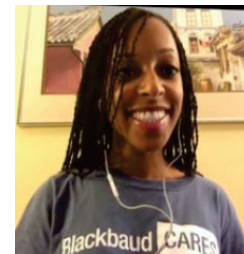


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Who has taken CompSci 101?



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Introduction to Computer Science

Part 2 of 3

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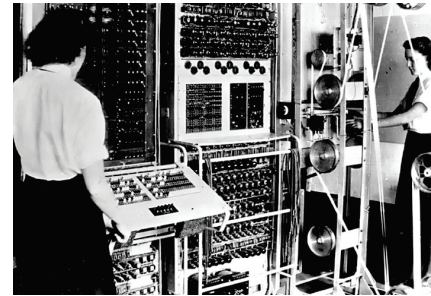
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How it Started

How it's Going



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Vacuum Tubes

1906

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



- Off/On \rightarrow 0/1
- 00000011

The Original Computers



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Apple I and II



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Where the Magic Happens: Computer Science



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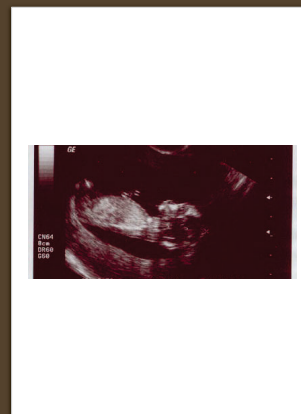


Artificial Intelligence

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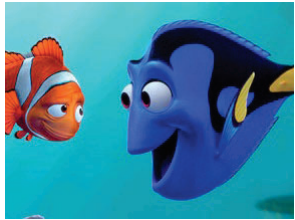


Medicine, Genomics

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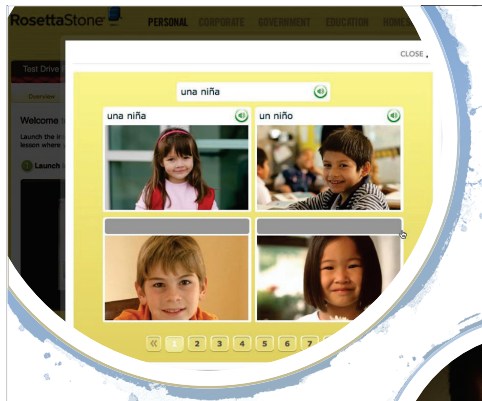
Animation

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."*

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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/>
- 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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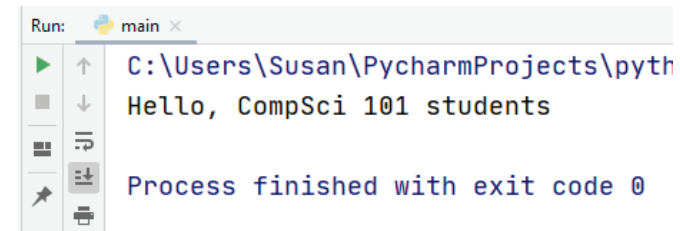
- **Programming assignments: APTs and Assignments**
 - Acknowledge assistance, to learn to program ...
 - Be aware of late policy
- **Exams: 3 exams and a final exam**
 - All old exams are available, but no final exams
- **Classwork/attendance**
 - Attend the live lecture - participate
 - If you can't attend you must watch it and participate within 24 hours

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Python code hello.py

```
7 def print_hello(name):
8     print(f'Hello, {name}')
9
10
11 if __name__ == '__main__':
12     print_hello('CompSci 101 students')
```



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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."



- "Fred Brooks" by Copyright owned by SD&M (www.sdm.de) - Request for picture sent by email to Fred Brooks by uploader (Mark Pellegrini; user:Raul654) Fred sent this photo back, along with contact information for Carola Lauber at SD&M, who gave copyright permission.. Licensed under CC BY-SA 3.0 via Wikimedia Commons
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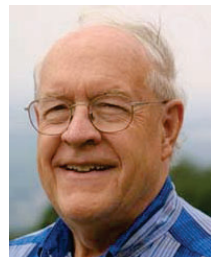
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Why is programming fun?

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.



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