

# Compsci 101

## Introduction

This is a temporary schedule for what we will do, subject to change!  
Information about grading and course logistics.

January 3-7 Week					
	Monday	Tuesday	Wednesday	Thursday	Friday
PRE-WORK	1/3	1/4	1/5	1/6 Introduction QZ01	1/7
LECTURE LAB				Lecture 1 First Lecture	Lab 0
ASSIGNMENTS APTS DUE				Assign 0 out	

Susan Rodger  
January 6, 2022

1/6/22

Compsci 101, Spring 2022

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# Sea turtles hatching

- <https://www.youtube.com/watch?v=sZYd0-eggbc>



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Prof Rodger

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MS. 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 0 is already out!
- Lab 0 on Friday
- Prelab for Lab1 (install Python)
- You will see a link to this video!

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## Go over CompSci 101 webpages

### CompSci 101, Spring 2022 Home

Home About Dates Labs Assign APTs Help Forms Resources Sakai

```
Write code in Python 3.6
1 def greeting(name):
2     greeting = "Hi " + name
3     if name == "Susan":
4         return greeting + ", old friend!"
5     return greeting + ", nice to meet!"
6
7 print(greeting("Helen"))
8 print(greeting("Susan"))
9
```

Print output  
Hi Helen, nice to meet!  
Hi Susan, old friend!

#### CompSci 101: Introduction to Computer Science

##### Course Description

Introduction to practices and principles of computer science and programming and their impact on and potential to change the world. Algorithmic, problem-solving, and programming techniques in domains such as art, data visualization, mathematics, natural and social sciences. Programming using high-level languages and design techniques emphasizing abstraction, encapsulation, and

problem decomposition. Design, implementation, testing, and analysis of algorithms and programs. No previous programming experience required. For this version of the course, you will learn the programming language Python 3.

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## Course overview, logistics

[www.cs.duke.edu/courses/spring22/compsci101](http://www.cs.duke.edu/courses/spring22/compsci101)

- Programming assignments: APTs and Assignments
  - Acknowledge assistance, to learn to program ...
  - Be aware of late policy
- Labs
  - Attend each Friday
- Lecture - Classwork
  - Attend the live lecture - participate
  - If you can't attend you must watch it and participate within 24 hours
- Exams: midterms and final
  - All old midterms available

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# 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

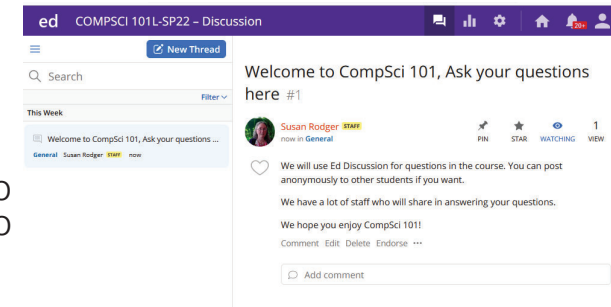
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# Questions?

- Don't send us email!!!!!!!!!!!!!!
- Post your questions on Ed Discussion
  - We will answer them there!
  - You should try to answer them too
    - Want to be a UTA one day? Answer questions!
- Post Questions during lecture!



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# WOTO – Working Together

<http://bit.ly/101s22-0106-1>  
(breakout rooms in zoom)

Discuss with others, then everyone fills out their own form.

# What is Computer Science?

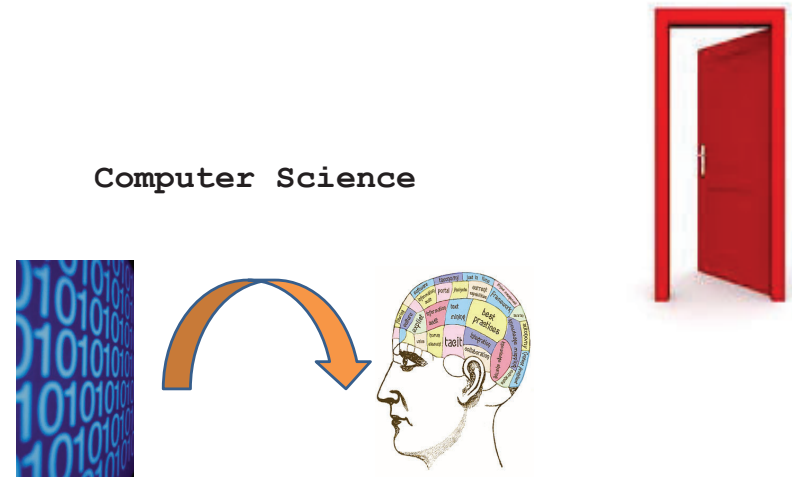
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# CompSci 101

## Data into Information and Knowledge

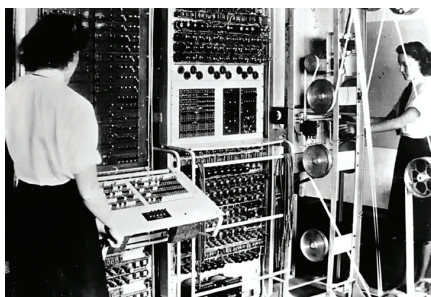


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## How it started    How it's going



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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

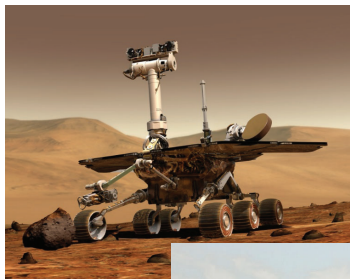
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## What is Computer Science?

- Artificial Intelligence



Spirit,  
Mars Rover



Self-driving car



Roomba



Personal Robot

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## What is Computer Science?

- Medicine, Genomics



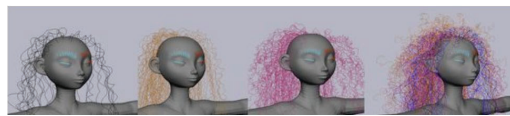
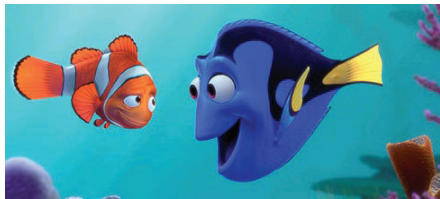
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# What is Computer Science?

- Animation



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# Prerequisites for Compsci 101



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# Who has taken CompSci 101?



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# Why is it called Python?

A



B



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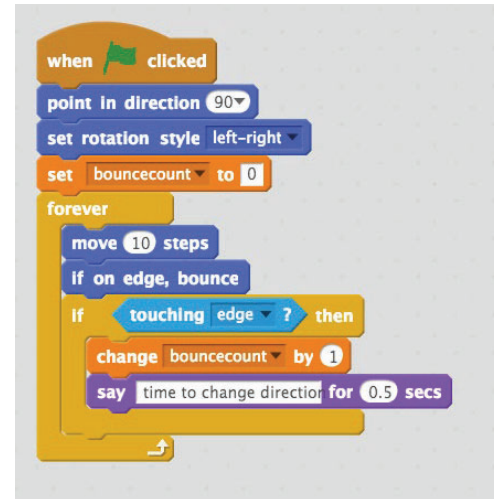
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# Who are you?

- Let's look at survey to see who is taking CompSci 101 in Spring 2022
  - 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

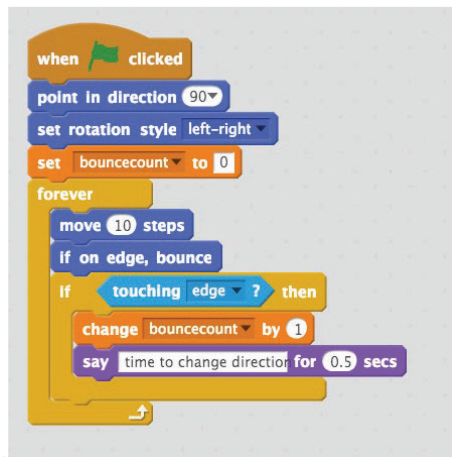
# What does this program do?



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

WOTO: WOrking TOgether  
<http://bit.ly/101s22-0106-2>

Analyze this  
Scratch Program?



# Scratch Program

- If you want to experiment with this scratch program, here is the link:

<https://scratch.mit.edu/projects/94064630/>

You don't have  
to understand  
this yet!!

# What language will we learn?

- <http://www.python.org/>
- Python is a multi-paradigm language
  - Procedural
  - Functional
  - Object-Oriented
- Simple, libraries, widely used
- Guido van Rossum



## Python code hello.py

```
1  """
2      Created on 1/6/2022
3
4      @author: Susan H. Rodger
5  """
6
7  if __name__ == '__main__':
8      print("Hello CompSci 101!")
```

OUTPUT:

## Python Code, second program

```
6  def greeting(name):
7      print("Hello " + name)
8
9  if __name__ == '__main__':
10     greeting("CompSci 101!")
11     greeting("Beenie, Keeah and Moe")
```

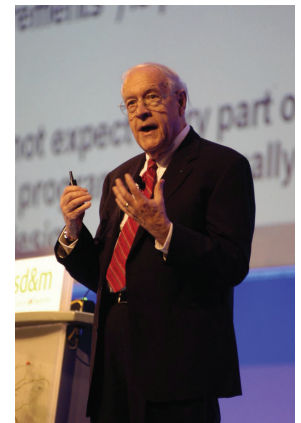
OUTPUT:

## Duke Connection: Fred Brooks '53

- 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 - [https://commons.wikimedia.org/wiki/File:Fred\\_Brooks.jpg#/media/File:Fred\\_Brooks.jpg](https://commons.wikimedia.org/wiki/File:Fred_Brooks.jpg#/media/File:Fred_Brooks.jpg)



# 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.

