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

Sea turtles hatching

- https://www.youtube.com/watch?v=sZYd0-egqbc

Prof Rodger

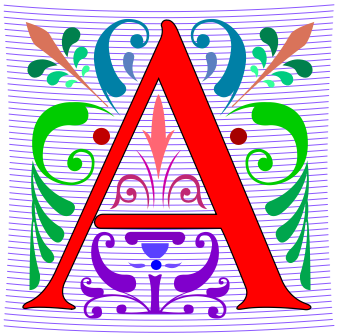
MS. Yesenia Velasco

Teaching Associate

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

- Handles accommodations
  - Email her your accommodation letter
  - yvelasco@cs.duke.edu

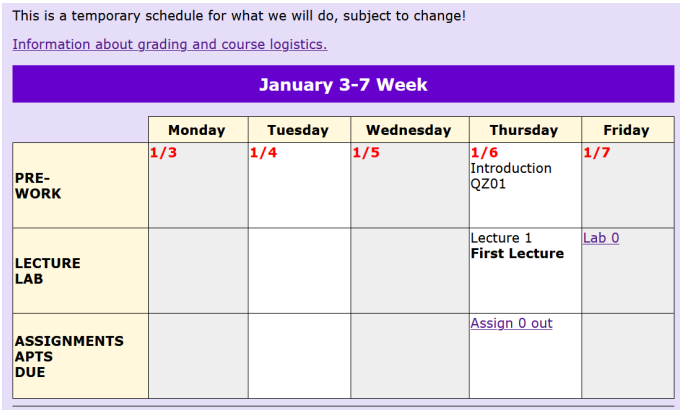
A is for …



- **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?



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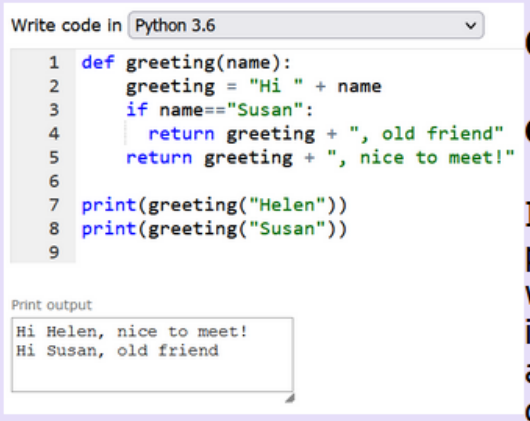
- **Assignment 0 is already out!**
- **Lab 0 on Friday**
- **Prelab for Lab1 (install Python)**
- **You will see a link to this video!**

Go over CompSci 101 webpages

CompSci 101, Spring 2022
Home

Home | About | Dates | Labs | Assign | APTs | Help | Forms | Resources | Sakai



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.

Course overview, logistics

www.cs.duke.edu/courses/spring22/compsci101

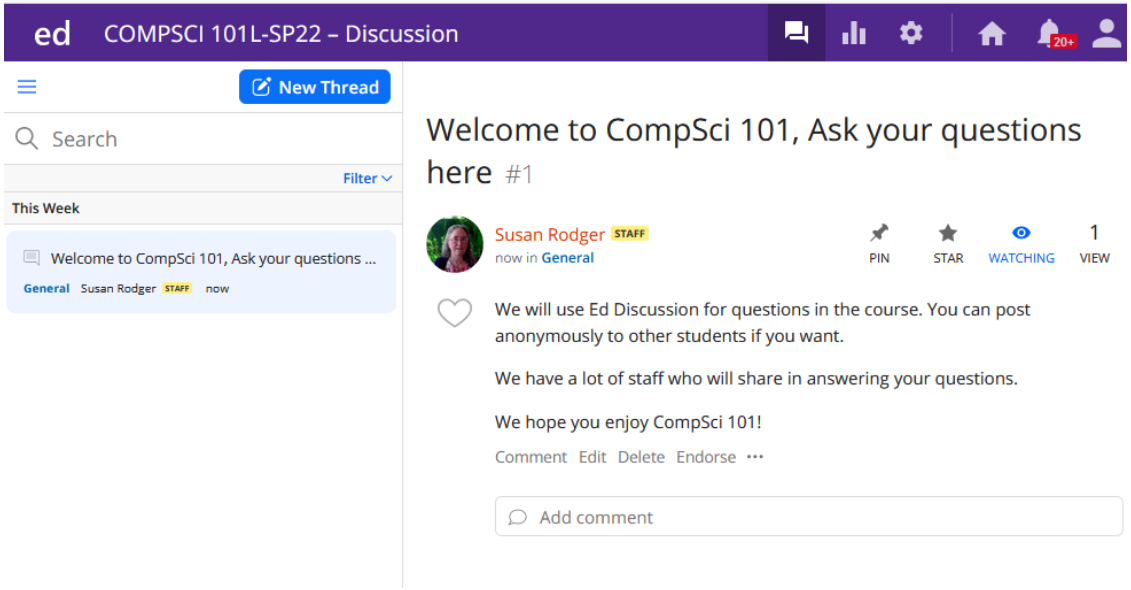
- Programming assignments: APTs and Assignments
  - Acknowledge assistance, to learn to program …
  - Be aware of late policy
- Labs
  - Attend each Friday
- Lecture - Classwork
  - Attend the live lecture - participate
  - If you can't attend you must watch it and participate within 24 hours
- Exams: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

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

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!



WOTO – Working Together

http://bit.ly/101s22-0106-1

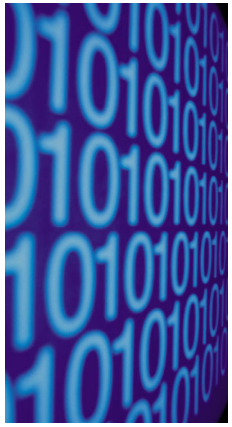
(breakout rooms in zoom)

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

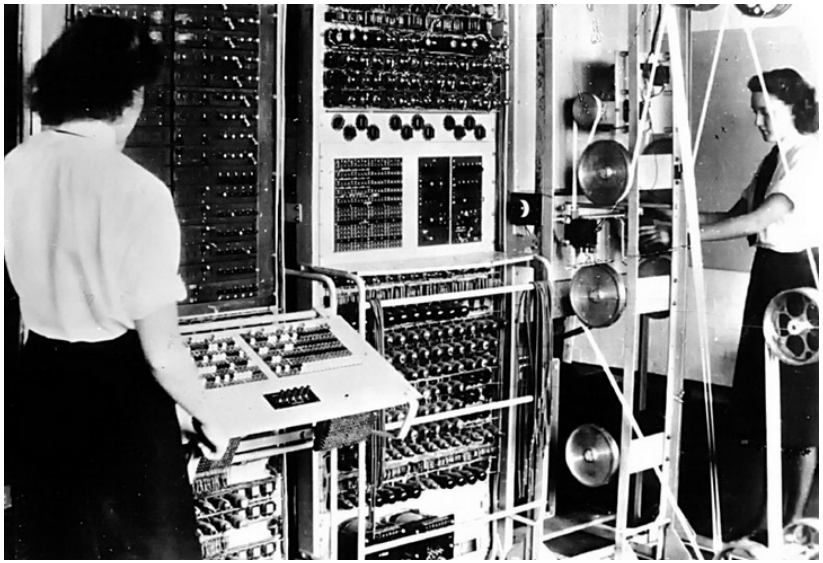
What is Computer Science?

CompSci 101
Data into Information and Knowledge

Computer Science



How it started How it's going



Vacuum Tubes 1906

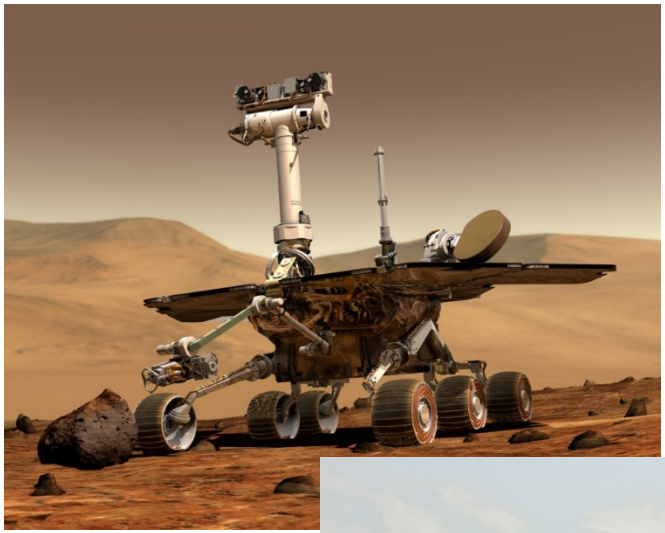
- Control electric current using the vacuum
- Can be used to start/stop, or change the flow based on the current

- Off/On→0/1
- 00000011

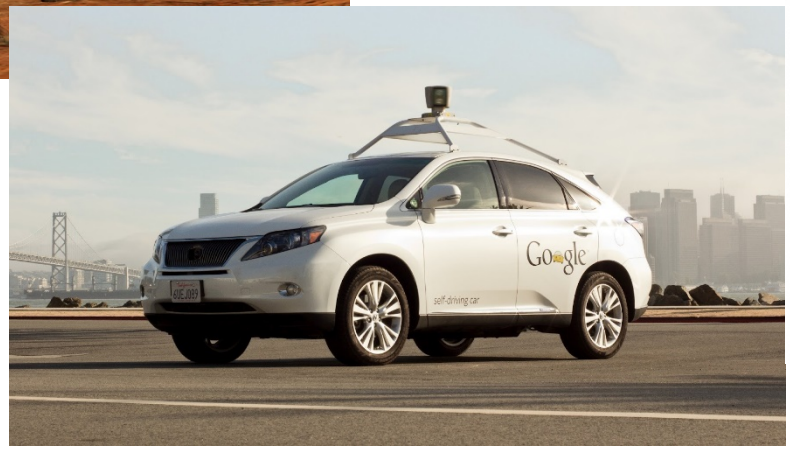
What is Computer Science?

- Artificial Intelligence

Roomba



Spirit,
Mars Rover



Self-driving car

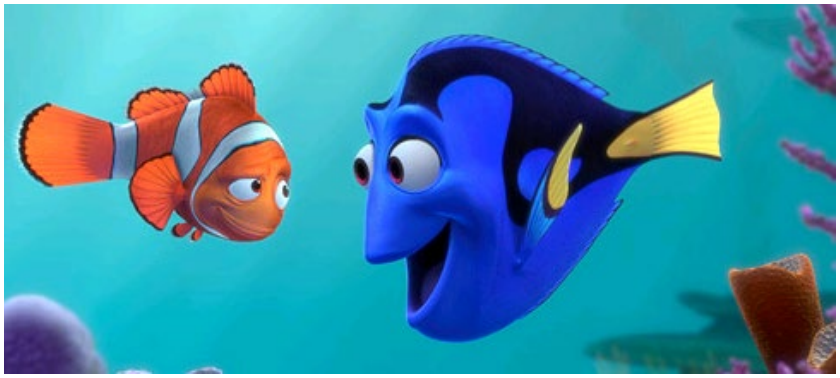
Personal Robot

What is Computer Science?

- Medicine, Genomics

What is Computer Science?

- Animation



Prerequisites for Compsci 101

Who has taken CompSci 101?

Why is it called Python?

A

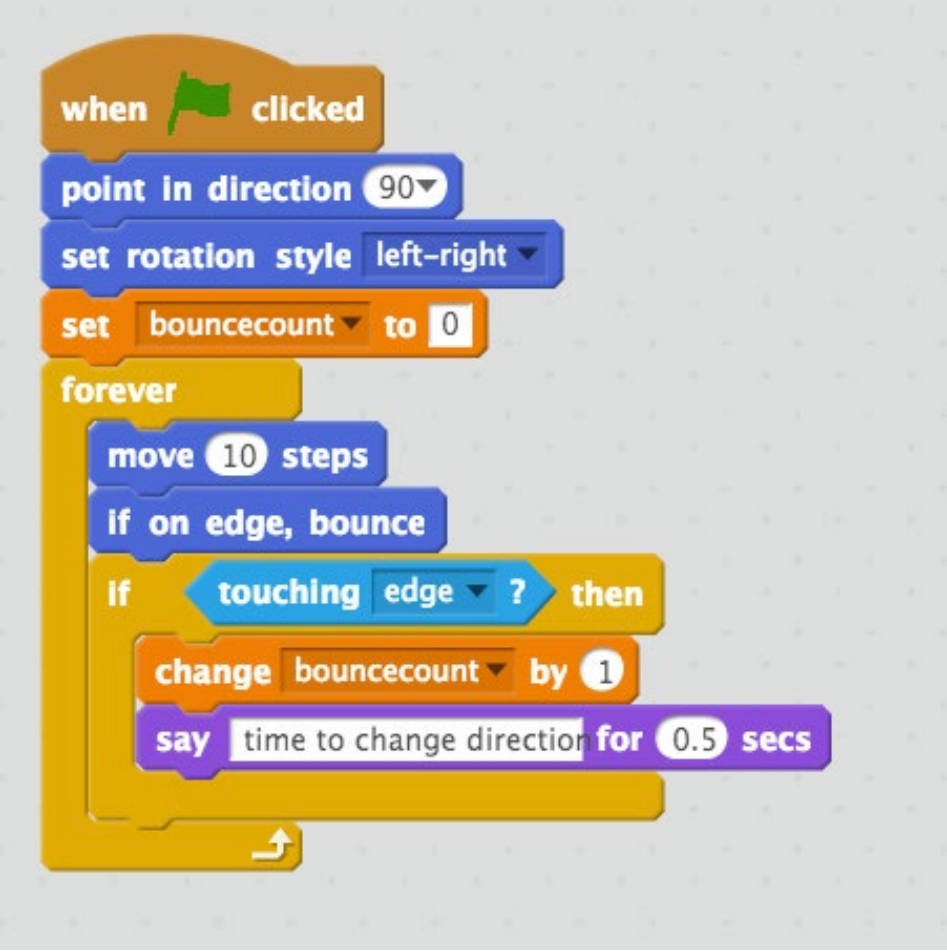
B

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?

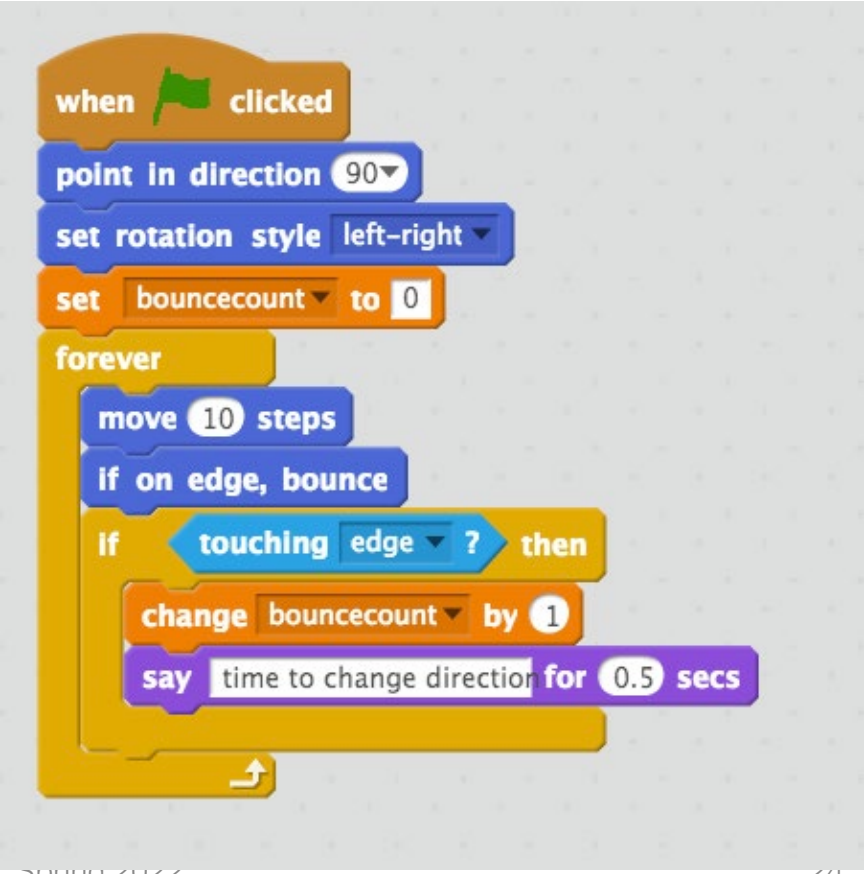


- "Hello World"
- Scratch Program
- Colors
  - Duke blue: motion
  - Mustard: control
  - Light blue: sensing
  - Orange: data
  - Purple: looks

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 von Rossom

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

Why is programming fun?

Fred Brooks

- First is the sheer joy of making things
- Second is the pleasure of making things that a 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.