Welcome to CS 101

Introduction to Programming for Engineers and Scientists
Introducing Your Instructors

Ruby Tahboub
- PhD 2019 from Purdue
- Research Interests:
  - Data Management
  - CS Education

Mattox Beckman
- PhD 2003 from UIUC
- Research Interests:
  - Programming Languages
  - CS Education
  - Society and Technological Studies
CS 101 is a *cookbook* course

- Python programming as a *calculator* to code math-related topics
  - Computing derivatives, integration, numerical ways for derivation and integration, and optimization (brute-force, greedy, and Montecarlo)
  - MATLAB (matrices, basic stats, fitting, etc.)
- *Prerequisite calculus I*
What else *SHOULD* we be learning?

- Learn programming for **PROBLEM SOLVING**
  - Effective use of various programming structures (decision, loops, lists, dictionaries)
- Write efficient code:
  - Avoid unnecessary steps
  - Avoid using extra storage
Tour of the Course

- Relate webpage
  
  https://relate.cs.illinois.edu/course/cs101-sp23/

- Sign in using Illinois Email

- No Labs in week #1

- No Office Hours in week #1
▸ We sent invitation to **ALL students**

▸ Online forum for questions, discussions, and announcements.

▸ Our TAs are great in answering CampusWire questions quickly.

▸ Before posting questions, **please read the most recent posts**
  ▸ Very often the same questions is asked multiple times.
Email Communication

- Ruby: rubyt@illinois.edu or cs101admin@cs.illinois.edu
- Mattox: mattox@illinois.edu or cs101admin@cs.illinois.edu
- Lab TA: check course webpage
- Request a Lab makeup: cs101admin@cs.illinois.edu
- General: cs101admin@cs.illinois.edu
Addressing COVID/ Health Challenges

- In case of **COVID** exposure (or other *infections*)
  - Work out the lessons and HW remotely
  - Arrange for a makeup lab (will post instructions soon)
  - Seek assistance during virtual office hours or CampusWire
  - If an extension is needed email cs101admin@cs.illinois.edu

Interesting article about *Viral Interference* 😊

HOW TO DO WELL IN CS 101?

- Before the lecture: go over the lesson
- Lecture: work on in-class coding activities
- Start working early on homework
- Ask A LOT of question
  - In lecture
  - Office Hours
  - CampusWire
Grading

Lessons: 1% each, 25% total
- Due on Wednesdays
- Lowest 3 dropped

Homework: 2.5% each, 30% total
- Due on Mondays at 10pm
- Lowest score dropped

Labs: 2.5% each, 25% total
- Lowest score dropped
- Instructions for making up missed labs to be posted on Campuswire
Exams (Three Exams and two feedback surveys 20%)

- Exam 1 (5%)
  - CBTF Week #6 Thu 2023-02-23 - Sun 2023-02-26, 50 min

- Exam 2 (5%)
  - CBTF Week #13 Thu 2023-04-13 - Sun 2023-04-16, 50 min

- Exam 3 (5%)
  - Take-home week #15

- Two Feedback Surveys 5% (2.5% each)
  - Middle and end of semester
Today’s Topics

- Lesson 00 Computational Basics
- Python Environment
  - Jupyter Notebook
  - Writing the first Python program
Lesson 00 Introduction to Computations

- Abstraction
- Computational Thinking Lesson 00-10
- Marr’s Levels Lesson 00-12
Abstraction

The process of making something easier to understand by removing some of the details

https://www.youtube.com/watch?v=0w_rla7GodI&ab_channel=ProjectGUTS
Computational Thinking

Thought processes involved in expressing solutions as computational steps or algorithms that can be carried out by a computer
Marr’s Levels

Any problem can be decomposed into three levels:

- Computational theory
- Representation and algorithm
- Hardware implementation
Anaconda

- Environment management system that provides Python, R and many applications including Jupyter Notebook

https://www.anaconda.com/products/individual
Wrap-up

Today’s Lecture

Lesson 00 Computational Basics

Python Environment

Next Lecture

Lesson 01 Python Basics