Preliminaries

CS 331: Data Structures and Algorithms
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Agenda

- Course overview & Administrivia
  - Prerequisites
  - Topics & Resources
  - Grading
  - Dev environment & Class procedures
Data Structures
- How do we store, organize, and retrieve data on a computer?

& Algorithms
- How can we efficiently (in space/time) carry out some typical data processing operations?
- How do we analyze and describe their performance?
Prerequisites

- I assume you are …
  - fluent in some programming language
  - familiar with procedural & OO paradigms
  - comfortable with development processes:
    - compilation, debugging, testing
Python

- We’ll use the Python programming language to explore data structures & algorithms

- Easy-to-learn, clean (“one obvious way to do” things), and popular language

- Ton of useful, powerful libraries
Topics

- Python crash course
- Algorithmic analysis
- Linear data structures (Lists, Stacks, Queues)
- Hashing and Hashtables (aka Maps)
- Recursion and Trees
Online resources

1. Course website: moss.cs.iit.edu/cs331
   - static information
   - lecture calendar, slides, external resources, etc.
Online resources

2. Learning platform: Mimir
   - interactive lab and lecture notebooks with built-in tests
   - quizzes and exams
Online resources

3. Blackboard
   - Collab Ultra (for labs)
   - Final gradebook
Online resources

4. Discord: discussion forum
   - text/voice chat + screen share
   - monitored by TAs and myself
   - all office hours here!
Supplements

- The Python Tutorial (docs.python.org/3/)

- Problem Solving with Algorithms and Data Structures Using Python
Grading

- 50% Machine Problems
- 25% Midterm Exam
- 25% Final Exam
On Exams

- June 16 Midterm, July 2 Final

- Available for 8 hour period on Mimir
Machine Problems

- New programming assignment most weeks
- All assignments are retrieved and submitted on Mimir
  - Provided codebase typically covered in preceding lectures
Jupyter Notebook

- In-browser Python development platform
  - “Cells” can contain plain text, code, output (and more)
  - All lecture notes, demos, and assignments will be distributed as notebook files
Jupyter Notebook

- You can optionally install a notebook server on your own computer for convenience

- See http://jupyter.org/install.html — either JupyterLab & “Classic” Jupyter Notebook are fine (with Python3)
Interactive Lectures

- Lecture notebooks released as 0-point “assignments”
  
  - Open on Mimir (or download into local notebook server) to edit and follow along during class
  
  - Class is usually one long interactive demo. Bring your laptop to follow along!
  
  - Completed notebooks will be posted on the class website
§ Demo