Preliminaries

CS 331: Data Structures and Algorithms
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College of Science

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- Hours: Wed/Fri 3:15PM-5:15PM

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Agenda

- Course overview & Administrivia

  - Prerequisites

  - Topics & Resources

  - Grading

  - Dev environment & Class procedures

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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?

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Prerequisites

- I assume you are …

  - fluent in some programming language

    - familiar with procedural & OO paradigms

  - comfortable with development processes:

    - compilation, debugging, testing

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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/saelee

   - static information

     - lecture calendar, slides,
       external resources, etc.

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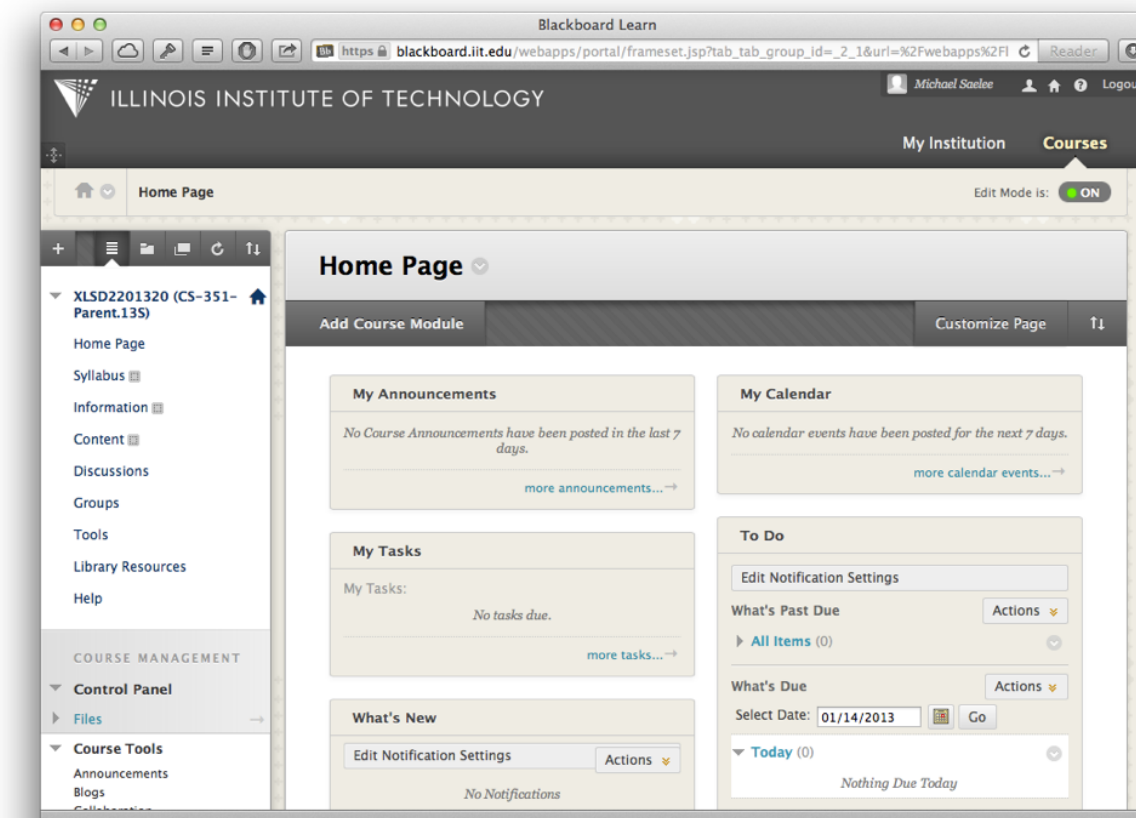College of Science
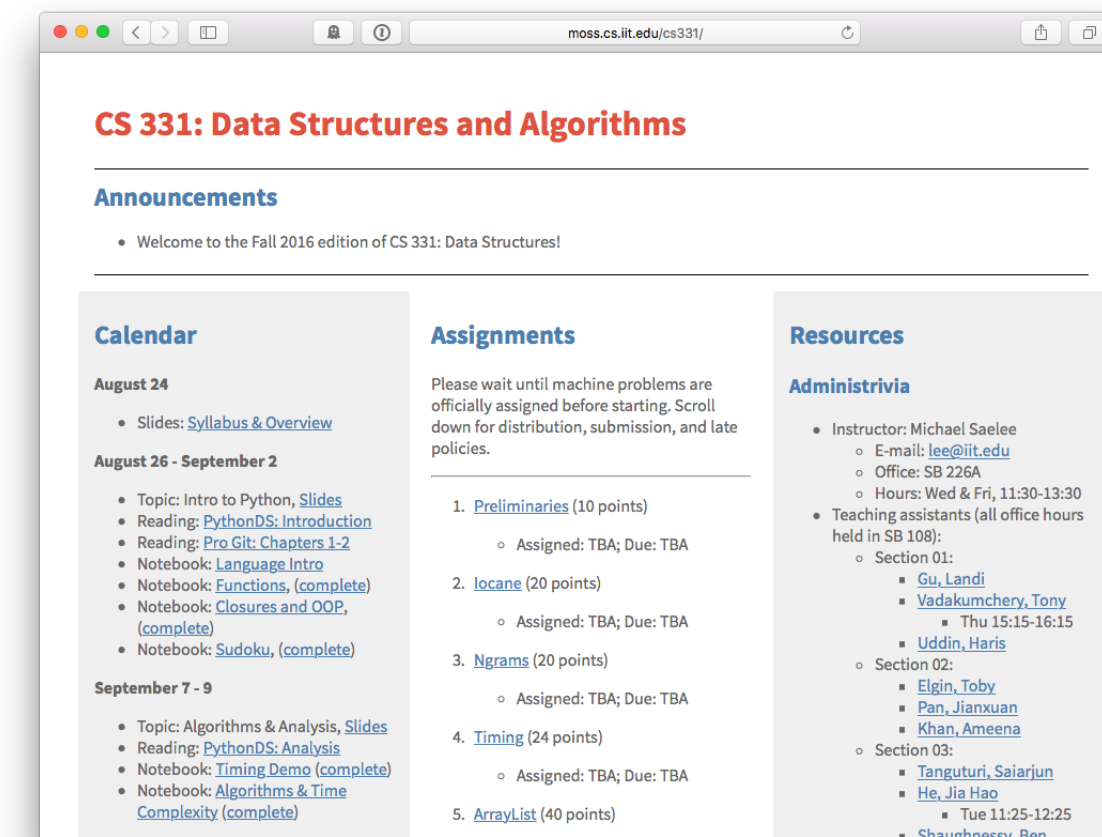
Online resources

2. Learning platform: <u>Mimir</u>

  - interactive lab and lecture notebooks (using Project Jupyter)

  - quizzes for self-evaluation
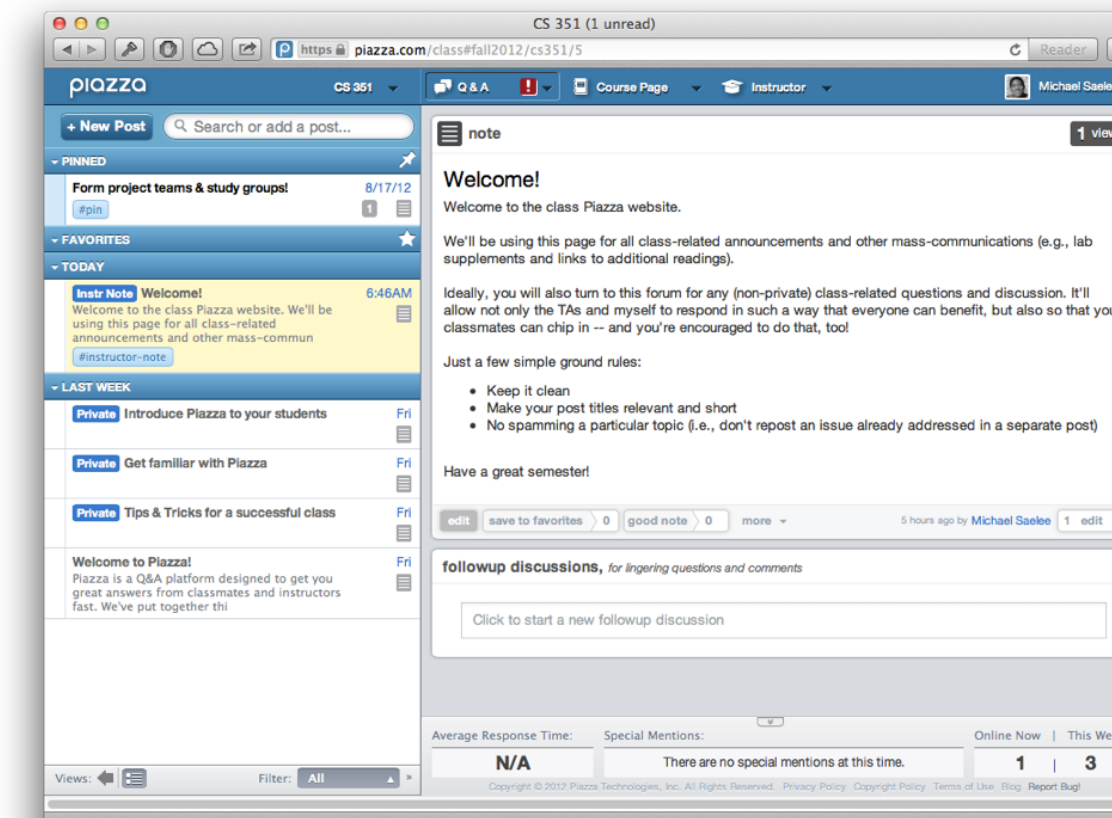
Online resources

3. Blackboard

- *only for grade reporting*!

Online resources

4. Piazza: discussion forum

- all class-related questions

- monitored by TAs

- scales *way* better than e-mail

Teaching Assistants (SB 108)

- Section 02: **Matthew Anderson**

  - Hours: TBA

- Section CPS: **Truong Pham**

  - Hours: TBA

- Section CPS: **Vincent Tran**

  - Hours: TBA

- Section CPS: **Mohit Jha**

  - Hours: TBA

- Section CPS: **Ismael Lopez**

  - Hours: TBA

- Section CPS: **Aakef Waris**

  - Hours: TBA

Supplements

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

- Problem Solving with Algorithms and Data Structures Using Python
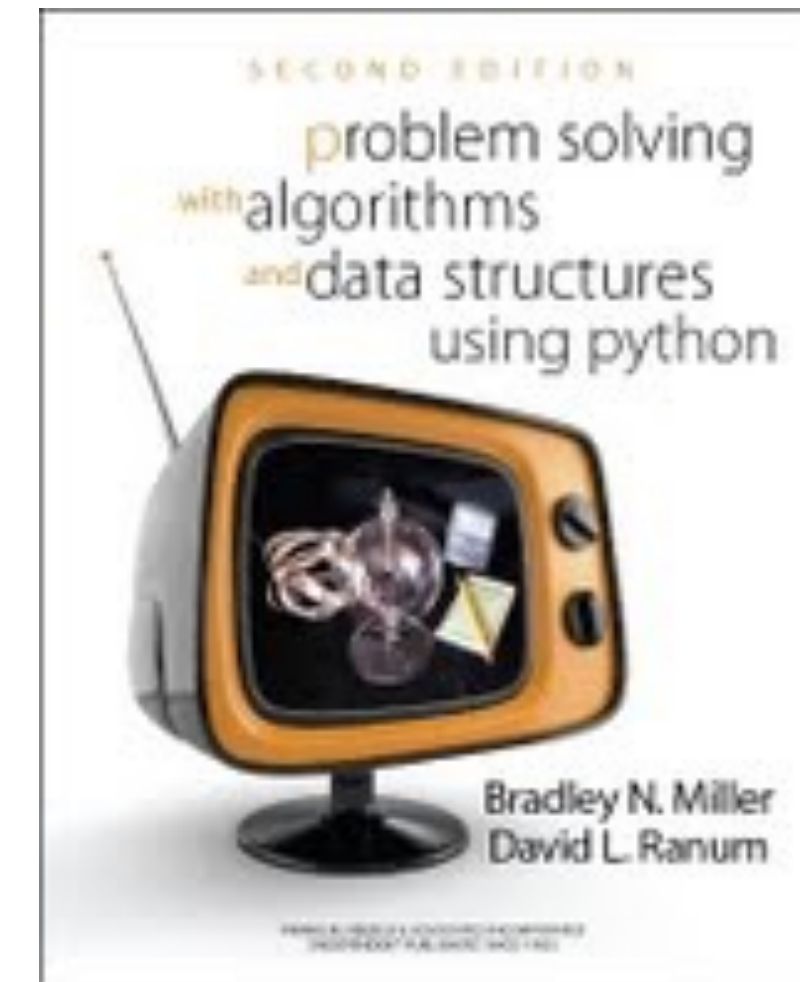
Grading

- 35% Machine Problems

- 5%   Quizzes / Self-evaluation

- 60% Exams (3 total: 2 midterms + final)

On Exams

- Tentative midterm exam dates published on class website

    - Feb 21, Apr 1: coverage will be announced

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

  - Install via Anaconda ("classic" Jupyter Notebook with Python3) — see http://jupyter.org/install.html

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