# COS 333:
# Advanced Programming Techniques

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Princeton University

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# COS 333
# Course Overview

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Princeton University

# Agenda

- **Introductions**
- Description
- Resources
- Topics
- Graded components

# Introductions

- Robert Dondero
  - rdondero @cs.princeton.edu

HELLO
my name is

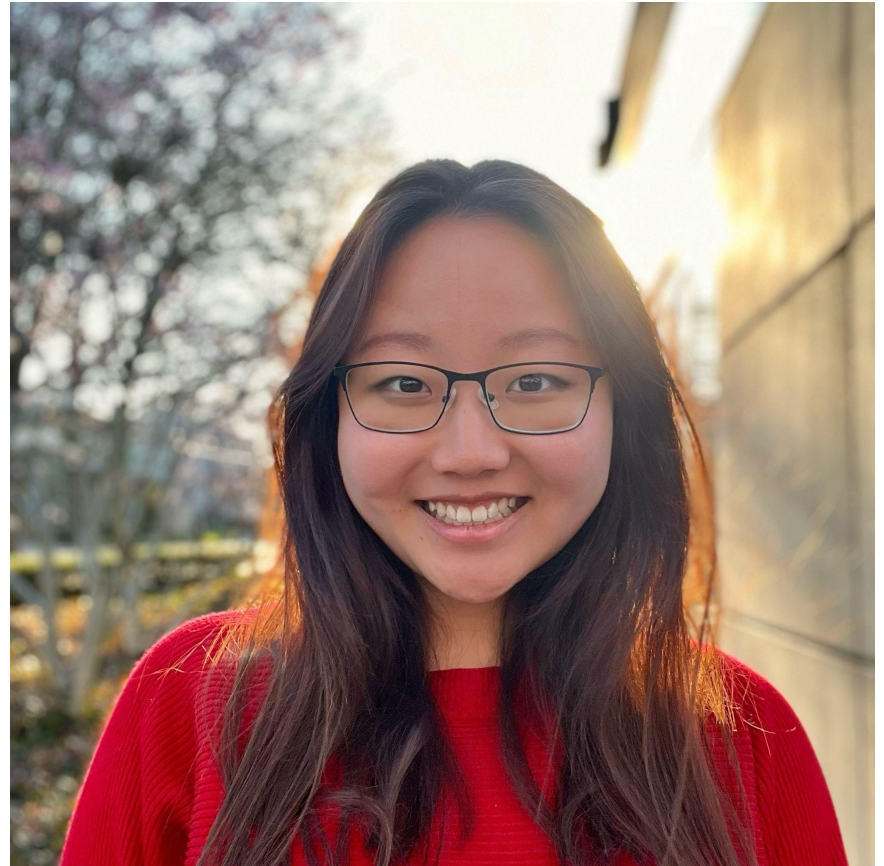Bob

# Introductions

- Graduate student TAs…

# Introductions

- Xinran Bi
  - xb4719
    @princeton.edu

# Introductions

- Jiawei (Ambri) Ma
  - jiaweim @princeton.edu

# Introductions

- Nimra Nadeem
  - nnadeem @princeton.edu

# Introductions

- Jipeng Sun
  - js2694
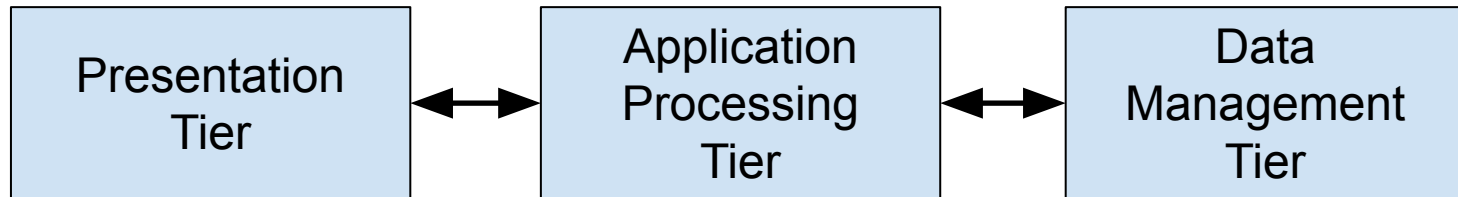    @princeton.edu

# Introductions

- You! ...

# Introductions

- Survey application
  - https://cos333survey.cs.princeton.edu

- **Please complete the survey by Fri 9/6 at 5:00PM**

# Agenda

- Introductions
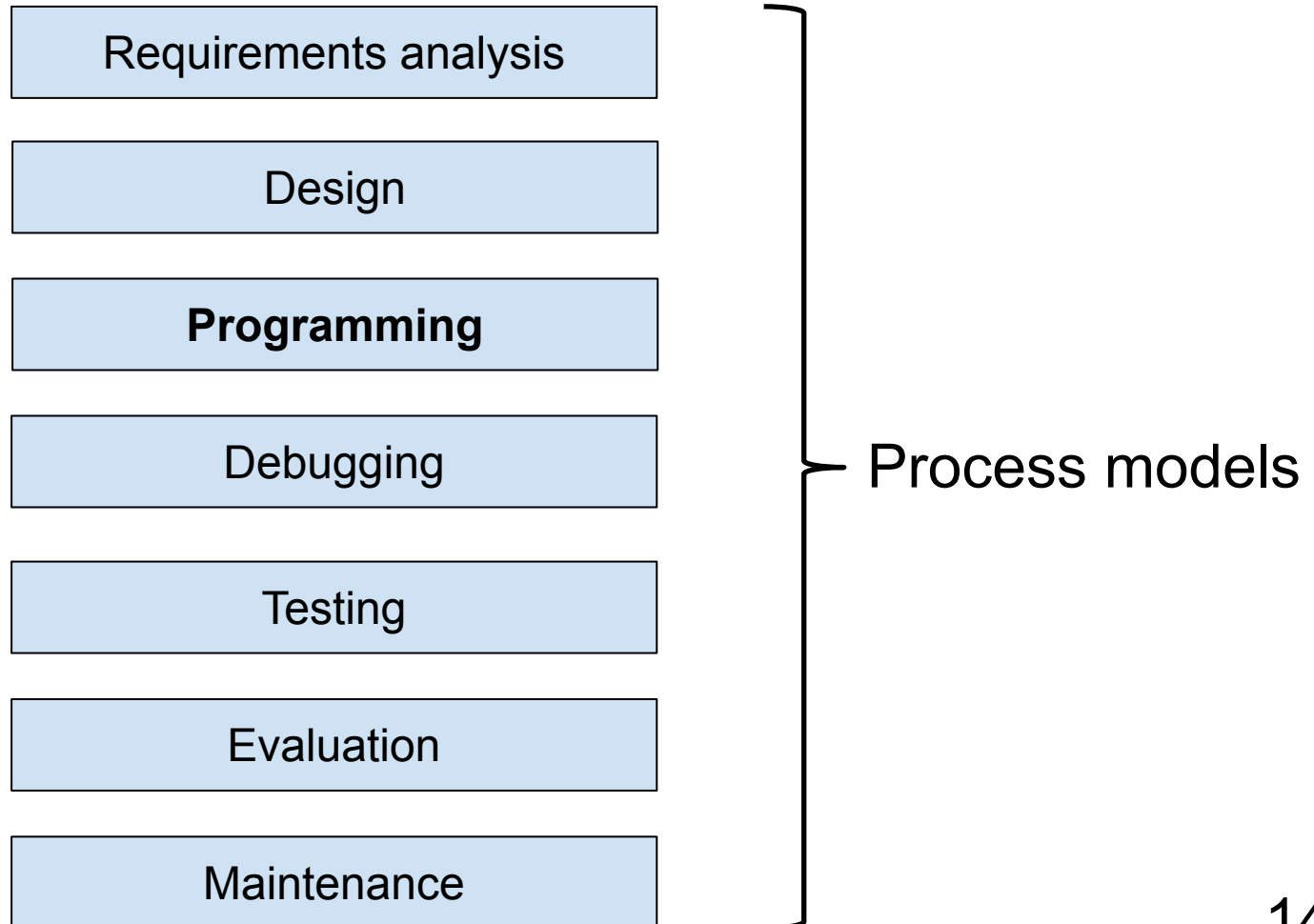- **Description**
- Resources
- Topics
- Graded components

# Description

Goal 1: ***Three-tier programming***
Alias ***full stack programming***

| Presentation Tier | ⟷ | Application Processing Tier | ⟷ | Data Management Tier |
|---|---|---|---|---|

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# Description

## Goal 2: *Software engineering*

| Requirements analysis |
|---|

| Design |
|---|

| **Programming** |
|---|

| Debugging |
|---|

| Testing |
|---|

| Evaluation |
|---|

| Maintenance |
|---|

Process models

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# Description

- How to achieve those goals?
  - Participate in lectures
  - Complete programming assignments
  - Complete a semester-long project

# Agenda

- Introductions
- Description
- **Resources**
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# Resources

(1) Course website

https://www.cs.princeton.edu/courses/cos333/index.html

- General information
- Lectures
- Assignments
- Project
- Schedule
- Policies

• **Please read the course website soon**

# Resources

(2) Lectures

- Slides and handouts via *Lectures* page

# Resources

## (3) Ed (EdStem, Ed Discussion)

- Access through Canvas:
  - https://canvas.princeton.edu
- Access directly:
  - https://edstem.org/us/courses/61557/discussion

# Resources

(4) Email

- – See *General Information* web page or previous slides for instructor email addresses

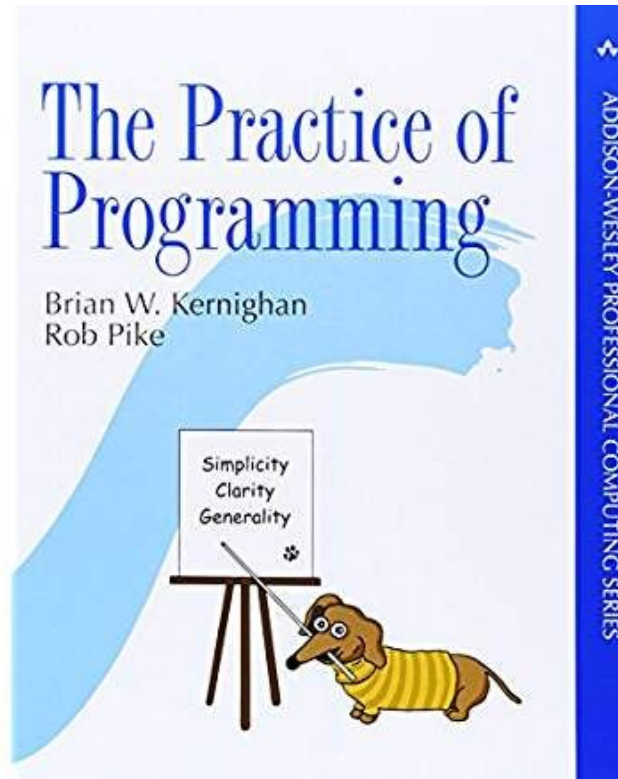# Resources

(5) Instructor meetings

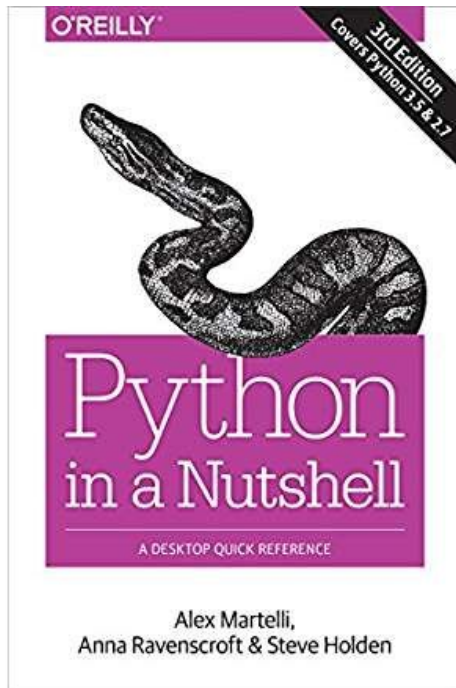- See *General Information* web page for office hours
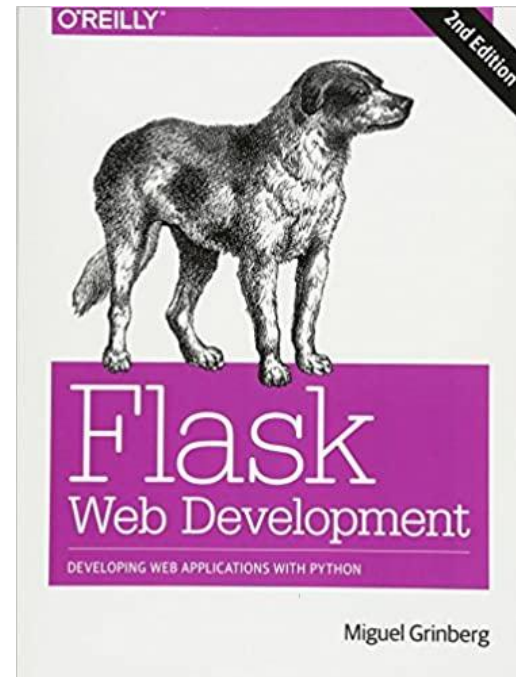
# Resources

(6) Books



Required

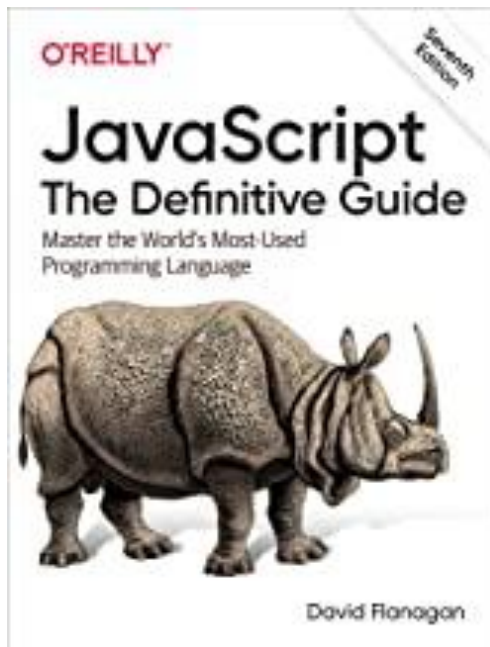# Resources

(6) Books (cont.)



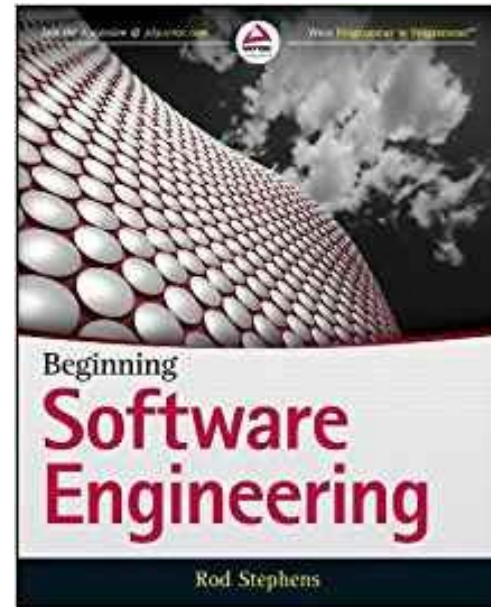Recommended                   Recommended

# Resources

## (6) Books (cont.)



Recommended



Recommended

# Resources

(7) Other resources

- See links on *Lectures* web page
- Particularly helpful:

# Resources

- Resources summary
  - (1) Course website
  - (2) Lectures
  - (3) Ed
  - (4) Email to instructors
  - (5) Meetings with instructors
  - (6) Books
  - (7) Other (e.g., Stack Overflow)

# Agenda

- Introductions
- Description
- Resources
- **Topics**
- Graded Components

# Topics

- Subject to change…

# Topics

- Version Control Systems
  - Material provided, not covered in lectures
  - See *Version Control Systems* lecture slides
  - See *Git and GitHub Primer* document

# Topics

- The Python Language

# Topics

- Database Programming

# Topics

- Network Programming

# Topics

- Concurrent Programming

# Topics

- Web Programming

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# Topics

- Server-Side Web Programming: CGI

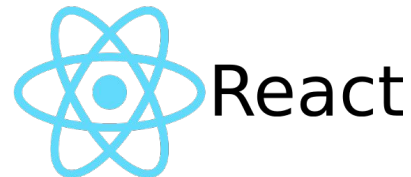# Topics

- Server-Side Web Programming: Python

# Topics

- The JavaScript Language

# Topics

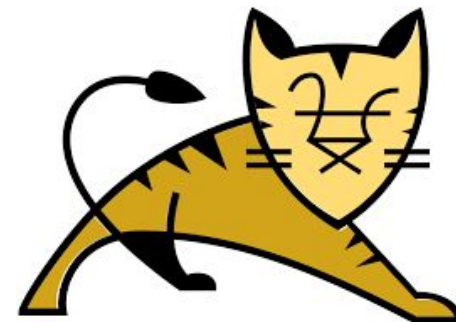- Client-Side Web Programming: JavaScript

# Topics

- Client-Side Web Programming: Cascading Style Sheets

# Topics

- (If time) Server-Side Options
  - Other options for doing **server-side** programming
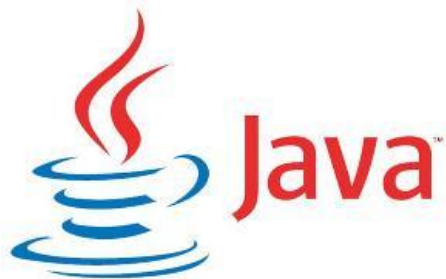
# Topics

- (If time) Client-Side Options
  - Other options for doing **client-side** programming
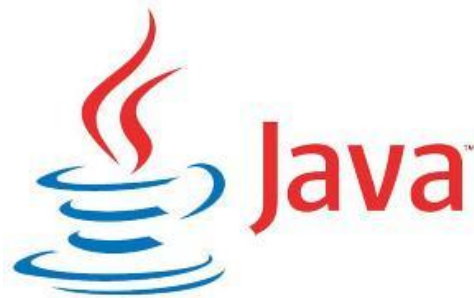
# Topics

- Security Issues in Web Programming

# Topics

- Software engineering
  - Requirements analysis
  - Design (UML, design patterns)
  - Programming
  - Debugging
  - Testing
  - Evaluation
  - Maintenance (profiling, refactoring)
  - Process models

# Agenda

- Introductions
- Description
- Resources
- Topics
- **Graded components**

# Graded Components

| Course Component | Approx Grade Weight |
|---|---|
| Assignments | 40% |
| Project | 50% |
| Participation | 10% |

# Graded Components

**Assignments**

| Num | Assignment |
|-----|------------|
| 1 | Registrar's office: baseline version |
| 2 | Registrar's office: networked version |
| 3 | Registrar's office: web version 1 |
| 4 | Registrar's office: web version 2 |

# Graded Components

- **Assignments**
  - Recommendations
    - Get the modularity right!
    - Teams of 2
      - Each teammate must understand all aspects of the assignment solution
    - Choose your Assignment 1 teammate wisely

# Graded Components

- **Assignments**
  - Computing environment
    - See document:  *A COS 333 Computing Environment*
      - On website via *Lectures* page

    - Please perform the instructions in the *A COS 333 Computing Environment* document soon

# Graded Components

- **Assignments**
  - Policies
    - Use any resources you want
    - General constraint:
      - The work must be essentially your own
    - Specific constraints:
      - **You may not look at any COS 333 assignment solution composed by someone else**
      - **You may not use ChatGPT or any other LLM**
    - Cite sources

  - **Please read the *Policies* web page soon**

# Graded Components

- **Project**
  - Teams of 3-5
  - Networked three-tier application

  - **Please read the *Project* web page soon**

# Graded Components

**Project**

| When? | Deliverable |
|---|---|
| Now | Entry in ProjectFinder app |
| Early | Project approval meeting; *Project Overview* doc |
| Mid | Weekly meetings with adviser; weekly updates to *Timeline* doc; wireframes, prototype, alpha, beta |
| Late | Project presentation; *Grader's Guide* doc; *Product Eval* doc; *Project Eval* doc; your application |

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# Graded Components

- **Project**

  - *ProjectFinder App*
    - https://cos333projs.cs.princeton.edu
    - **Your initial entry is due Sun 9/8 at 5:00PM**

# Graded Components

- **Project**
  - Policies
    - Use any resources you want
    - General constraint:
      - The work must be essentially your own
    - Cite sources

    - **Again… Please read the *Policies* web page soon**

# Graded Components

- **Project**
  - Notes
    - **Lectures** are aligned with **assignments**
    - **Lectures** are aligned with **your project**?

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# Graded Components

- **Participation**
  - Lecture participation
    - Quantity and quality of answers to questions
    - Must miss a lecture => tell me ahead of time
  - Adjustment
    - Were you helpful to the course in some extraordinary ways?
    - Were you detrimental to the course?

# In closing…

# Action Items

- By Fri 9/6 5:00PM

    – Use **Survey App** to express your expertise and interest in course topics
        - https://cos333survey.cs.princeton.edu

# Action Items

- By Sun 9/8 5:00PM

    – Use ***ProjectFinder App*** to indicate your project status and interests
        - [https://cos333projs.cs.princeton.edu](https://cos333projs.cs.princeton.edu)

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# Action Items

- Soon

    - Read **course website**, esp. *Policies* and *Projects* pages
        - https://www.cs.princeton.edu/courses/cos333/index.html/

    - Make sure you're comfortable with Git and GitHub
        - Version Control Systems lecture slides
        - ***Git and GitHub Primer*** doc

    - Create a COS 333 computing env for assignments
        - ***A COS 333 Computing Env*** doc

# Summary

- Course overview
  - Introductions
  - Description
  - Resources
  - Topics
  - Graded components