Welcome!

COMS 4118
Operating Systems I
Spring 2020
Teaching staff

• 6 TAs
  – Hans Jr Montero hjm2133@columbia.edu – Head TA
  – Lucie le Blanc ll3163@barnard.edu
  – Zachary V Schuermann zvs2002@columbia.edu
  – Stanley Yu sy2751@columbia.edu
  – Matthew Broughton mb4207@columbia.edu
  – Dave Dirnfeld dd2912@columbia.edu

• TA email & office hours
  – Email to cucs4118-tas@googlegroups.com goes to all teaching staff
  – TA room – 1st floor, Mudd building
  – TA calendar: http://bit.ly/4118-cal (will be filled by this weekend)

• Instructor email & office hours
  – Jae Woo Lee jae@cs.columbia.edu – 715 CEPSR
Who am I?

• Jae Woo Lee
  – Senior Lecturer in Computer Science
    • Teaching first, research second
  – Just call me Jae (pronounced ‘Jay’)
    • Note that this is NOT a general rule – address instructors as Professors unless told otherwise

• My background
  – Undergrad in Columbia College
  – Many years of professional experience
    • Designing and coding large-scale software systems
    • Running a start-up company
  – Came back to Columbia for Ph.D.

• I’m not an OS researcher
  – Interested in possibly joining OS research group?
  – Then take OS with Prof. Jason Nieh
Prerequisites

1. PLEASE PLEASE DO NOT TAKE THIS COURSE IF YOU DON’T KNOW C COLD

2. UNIX
   – Must be comfortable at command line
   – Don’t take the course if you never worked on UNIX

3. Computer architecture
   – Basic knowledge of computer hardware: register, cache, bus, etc.
   – Should be able to read simple assembly code: load, store, add, jmp, etc.

4. Data structures
   – Nothing fancy, but must be solid on the basics: list, tree, stack & queue

Columbia courses:
For 1 & 2:
   W3157
   Advanced Programming
For 3:
   W3827
   Fundamentals of Computer Systems
For 4:
   W3134, W3136, or W3137
   Data Structures
Topics

• General OS theory
  – Throughout the whole semester
• Advanced UNIX programming
  – First 1/3 of the semester
  – UNIX from outside
    • Processes, threads, networking, concurrency, signals, non-blocking & async I/O
• Linux kernel implementation
  – Later 2/3 of the semester
  – UNIX from inside
    • Syscalls, wait queues, scheduler, file systems, virtual memory
Textbooks

1. Operating Systems: Three Easy Pieces
   - Version 1.00, 2018 – by Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau
   - Free in PDF form: http://pages.cs.wisc.edu/~remzi/OSTEP/

2. Linux Kernel Development

3. Advanced Programming in the UNIX Environment

4. And a few other online materials that will be assigned

Get them wherever you usually get your textbooks from...
Class mailing list

• 4118 ListServ
  – Communication between all of us, including official announcements
  – Do:
    • Ask & answer questions – 1st place to go for non-personal questions
    • Provide helpful tips & links for your classmates
    • Be considerate & friendly
  – Don’t:
    • Ask questions without first trying to solve it on your own
    • Post code or critical info that leads directly to solution
    • Be impatient & rude

• TAs and I respond to emails in this order:
  – ListServ, cucs4118-tas@googlegroups.com, then individual emails
  – NEVER send a same question separately to multiple people
    • You will get banned from ever sending emails if you get caught doing this.

• Learn to manage high volume
  – [ANN] in email subject for announcements – set up Gmail filter
  – Yes, I know about Piazza. Thanks for your suggestion.
Homework

• 7-8 assignments (subject to change)
  – Some are individual, some are group assignments
  – Some are short & light, some are long & heavy
  – Assignments carry different weights

• Some assignments may not be graded
  – But you won’t know until after the deadline
  – HWs picked for grading will be 40% of your grade

• Late policy
  – 20% penalty after deadline up to 24 hours; zero afterwards
15 million lines of code

• “As of 2013, the Linux 3.10 release had 15,803,499 lines of code”
  – Learn to navigate a large code base
  – Learn to read code rather than documentations that are often vague, out-of-date, or flat-out wrong

• You will probably encounter a large existing code base wherever you get a job
Exam

- Two in-class exams
  - Exam #1: **Wed Mar 11th**
  - Exam #2: **Wed Apr 29th**
  - No final exam
  - There are **no make-up and no alternate exams**
    - Please take OS next semester if the exam dates don’t work for you

- Your overall grade
  - HW 40%, Exam #1 30%, Exam #2 30%
Zero tolerance on cheating

- **REQUIRED READING:**

- You are cheating if you:
  - Take code from friends, or search for code on the Internet
  - Look at solutions that your friend has from previous semester
  - Upload any class materials (including your own code) to public repository (ex. GitHub) during or after this semester

- We can tell
  - We compare you submissions to **CURRENT AND PREVIOUS** submissions
  - You submit work history – **minimum 5 commits required**
  - Once you look at cheat code, you won’t be able to come up with anything else

- Result of cheating
  - Academic penalty – 1 letter grade down for mild cases; F for severe ones
  - Referral to the Office of Judicial Affairs
Let’s get to work

1. **Subscribe to 4118 ListServ TODAY**
   - In the textbox “Your name (optional)” put **Your Full Name (UNI)**
     - For example: Jae Woo Lee (jwl3)
   - **You must reply to the confirm email (which might be in your spam folder)**
   - Then receive “Welcome to the "Cs4118" mailing list”
     - This email contains your password for accessing archives of past postings

2. **Read the following two documents:**

3. **HW0 (50 points) – due Fri, 1/24, 11:59pm**
4. **HW1 (100 points) – due Sun, 2/2, 11:59pm**
5. **Reading assignments**
   - See course home page for HW0, HW1, and reading assignments: [http://www.cs.columbia.edu/~jae/4118/?asof=20200121](http://www.cs.columbia.edu/~jae/4118/?asof=20200121)
6. **Start forming groups of 3 – feel free to advertise on listserv**