Welcome!

COMS W3136
Essential Data Structures in C/C++
Fall 2014
Who am I?

- Jae Woo Lee
  - Lecturer in Computer Science
    - Teaching first, research second
  - Just call me Jae (pronounced ‘Jay’)

- 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.
Teaching staff

• Instructor
  – Jae Woo Lee (jae@cs.columbia.edu)
  – Office hours TBA
    • I’ll hold the first one tomorrow, Wed, 9/3, 4-5pm
    • 715 CEPSR

• Teaching Assistants
  – 5 TAs
    • Louis Croce ljc2154@columbia.edu - Head TA
    • Vanshil Shah vs2409@columbia.edu
    • Jonathan Zhu jhz2110@columbia.edu
    • Di Ruan dr2763@columbia.edu
    • Swikriti Jain sj2615@columbia.edu
  – Office hours TBA
    • TA room – see http://ta.cs.columbia.edu for map
Prerequisites and course objective

- **Prerequisites**
  - One semester of introductory programming course
    - Ex) 1006 (Python), 1004 (Java), or equivalent
    - High school CS class you took 3 years ago does NOT count
  - No prior knowledge of C/C++ or UNIX is assumed

- **Course objective**
  - Meet the increasing demand for solid programming skills in many non-CS disciplines including EE & IEOR
  - Provide the minimum prerequisite for non-majors who are interested in taking upper-level CS courses
Course summary

• Follow-on course for ENGI E1006
  – Intended for non-CS majors
  – Bridges E1006 and many upper-level CS courses
  – Interleaves C/C++ language and data structure topics
  – Introduces professional UNIX programming tools

• Fusion of 3157 and 3134
  – 3157-lite: C & C++, but no heavy systems stuff
  – 3134-extract: only the most important data structures
  – Kill two birds with one 4-credit stone!
  – Perfect for EE & IEOR folks who came to 3157 to learn C/C++ but found it a bit too much
Recitation

• Logistics
  – 1 topic / week
  – Multiple sessions repeated by different TAs
  – Evening hours
  – Attendance officially required, but really up to you

• Topics
  – UNIX basics, editors, Git, etc. (in the beginning)
  – Lecture reviews
  – Lab assignment clarifications & reviews
  – Lab solutions walk-through
  – Exam preps
Participate in class, please!

• Classes is no fun (for me, at least) if we don’t interact
  – Answer questions I pose
  – Ask questions anytime
  – Embarrass me when I’m wrong
• People are afraid to ask when they think:
  – “I’m the only one who doesn’t know this.”
  – “I can’t frame this question clearly and eloquently.”
  – “Maybe he just said it when I dozed off just now…”
• Big class, so I may not entertain all questions, but:

NEVER BE AFRAID TO ASK ANYTHING, IN THIS CLASS AND IN LIFE!
Course structure and focus

• Start with C and move toward C++, interleaving data structures throughout
• Focus on programming with data structures, not mathematical analysis
• “Job postings just say C++. Why waste time with C?”
Grading

• You get overall score out of 100, comprised of:
  – HW assignments – 35%
  – Midterm exam – 30%
  – Final exam – 35%

• I look at everyone’s every score in a big spreadsheet sorted by the overall score

• I decide cutoffs for letter grades A+, ..., D, F
  – No predetermined formula for cutoffs

• Booster: I reserve the right to raise one’s overall score by a small amount (typically less than 0.5%)
Booster

- Grade boost based on subjective evaluation
  - Most people will not get it
  - Have been used to boost some borderline cases
  - Can be up to 5% in theory, but never been > 1%
- Based on:
  - Class participation
  - Mailing list participation
  - Beautiful code
  - Awesome documentation
  - Optional work (if any)
HW

• 6 HW assignments
  – Mostly programming assignments
  – Some of them may have written parts
  – Lowest score will be dropped (i.e. converted to zero)
    • In other words, everyone is forced to get zero on one hw
    • Note that labs have different weights (between 100 and 200), so you’d be at a disadvantage if you end up dropping a bigger one

• Deadline
  – Soft deadline, and then hard deadline 2 days later
  – Use your late days to submit after soft deadline
  – 5 late days total; up to 2 can be used for a single hw
  – Absolutely no exception under any circumstances
No cheating!

• Don’t:
  – Take code from friends
  – Search for code on the Internet
  – Look at solutions that your friend has from previous semester

• We can tell
  – We know about the Internet too
  – We look at not only your end result, but also your work history
    • Your submitted patch MUST contain at least 5 commits with meaningful logs

• Columbia guidelines to academic honesty
  – http://www.cs.columbia.edu/education/honesty

• Result of cheating
  – Referral to academic committee & Dean’s office
  – You will probably not do well on exams
  – You are a loser
Class mailing list

• Communication between all of us
  – Official announcements, lecture notes, lab assignments
  – Should be the 1st place to go for non-personal questions
  – Learn to manage high volume – ex) ANN in subject

• Do:
  – Ask & answer questions
  – Provide helpful tips and fun 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

• “Why would I help others when their loss is my gain?”
Required textbooks

• Required now
  – *Foundations of Computer Science: C Edition*
    • By Alfred V. Aho and Jeffrey D. Ullman
    • Out of print, but available for free
  – *The C Programming Language* (2nd ed.) – aka K&R C
    • By Kernighan and Ritchie
    • Simply the best
    • Available at Book Culture – [http://www.bookculture.com](http://www.bookculture.com)

• Probably required later in the semester
  – *C++ Primer* (5th ed.)
    • By Lippman, Lajoie, Moo
Recommended references

• Other data structures textbooks
  – *Data Structures and Algorithm Analysis in C++*
    • Mark A. Weiss
    • 4th ed. Is the latest, but any edition will do
    • Older editions based on C might be even better if you can find it
  – *Algorithms (4th Edition)*
    • Robert Sedgewick and Kevin Wayne
    • Best introductory DS & Algorithms book I have seen, but in Java

• Columbia has a free subscription to Safari Books
Homework 0 – due noon tomorrow

(1) Subscribe to 3136 ListServ today
   - https://lists.cs.columbia.edu/mailman/listinfo/cs3136
   - In the textbox labeled “Your name (optional)”, put Your Full Name (UNI)
     • For example, Jae Woo Lee (jwl3)
   - Announcements will start going out tomorrow afternoon
     • Archive: https://lists.cs.columbia.edu/mailman/private/cs3136/

(2) Send me an email to introduce yourself
   - Subject: “[3136] hw0-UNI”
     • Without the quotes, sole space before hw0, UNI replaced with your actual UNI in lowercase
   - Your name, major & school program, CS classes taken and/or other programming background
   - Optionally anything else you want to let me know

(3) Get a CS account (required for the course)
   - $50 per semester

(4) Get the textbook – K&R
   - Optionally (but strongly recommended) start reading Chapter 1,2,3,4