

CS/ENGRD 2110 SPRING 2013

Lecture 1: Overview
<http://courses.cs.cornell.edu/cs2110>

Welcome to CS2110!

- We'll be learning about...
 - OO, abstract data types, generics, queries on Java collections, other cool Java features
 - Reasoning about complex problems, analysis of the algorithms we create to solve them, and implementing those tricky algorithms with elegant, easy to understand, correct code
 - Recursion on graphs and other linked structures
 - Algorithmic complexity
 - (+ lectures on cloud computing & quantum computing)

Is CS2110 right for you?

- **Knowledge of Java not required**
 - About 40% of students know Java
 - Others know Matlab, Python, ...
 - Requirement: comfort with some programming language. Prior knowledge of OO and "strong typing" not required.
- Don't take cs1110 just because you are worried that your high school programming experience won't do
- *We recommend against skipping directly to cs3110. cs3110 requires permission from both Prof Birman and Prof Joachims!*

Lectures

- TR 10:10-11am, Statler auditorium
 - Attendance is mandatory
 - Old videonotes from 2010 are available but the course has evolved since then ...
- ENGRD 2110 or CS 2110?
 - **Same course!** We call it CS 2110 in online materials
 - Non-engineers sign up for CS 2110
 - Engineers sign up for ENGRD 2110

Sections

- Like lecture, attendance is mandatory
- Usually review, help on homework
- Sometimes new material
- Section numbers are different for CS and ENGRD
- Each section led by member of the teaching staff
- No permission needed to switch sections, but do register for whichever one you attend

CS2111

- **New!**
 - An "enrichment" course
 - Aimed at students who want slightly more help understanding core ideas behind Java, objects, and programming
 - Taught by Professor Gries, 1 credit S/U, only for students who also take CS2110.
- We hope to help students who might otherwise feel overwhelmed by CS2110

Academic Excellence Workshops

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- Two-hour labs: students work together in cooperative setting
- One credit S/U course based on attendance
- Time and location TBA
- See website for more info:

www.engineering.cornell.edu/student-services/learning/academic-excellence-workshops/

Resources

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- Book: Frank M. Carrano, *Data Structures and Abstractions with Java, 3rd ed.*, Prentice Hall
 - Note: 2nd edition is okay
 - Sharing textbook: fantastic idea. You don't need a personal copy. You do need access to it from time to time
 - Copies on reserve in Engr Library
- Additional material on Prentice Hall website
 - "e-Book" not required
- Great Java resource: online materials at Oracle JDK web site. Google has it indexed.

Obtaining Java

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- Follow instructions on our « resources » web page
 - Make sure you have Java JDK 1.6 or 1.7, if not download and install. We explain how on the page.
 - Then download and install the Eclipse Juno « IDE » for Java developers from Eclipse IDE for Java Developers
- Test it out: launch Eclipse and click "new>Java Project"
 - This is one of a few ways Java can be used
 - When program runs, output will be visible in a little console window

Eclipse IDE

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- IDE: Integrated Development Environment
 - Helps you write your code
 - Protects against many common mistakes
 - At runtime, helps with debugging
- Follow "Resources" link to download



"In my country of Kazakhstan everyone is use Eclipse and Java!
Java 1.7 is best for hack American web site and steal credit card."

Learning Java

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- CS 2110 assumes that students are totally new to Java —we'll teach you the language
- We assume you are comfortable programming in some other language, so we'll teach Java at a pretty fast pace
- By end of course, you'll have seen some "extreme Java" capabilities...



Coursework

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- 5 assignments involving both programming and written answers (45%)
- Two prelims (15% each)
- Final exam (20%)
- Course evaluation (1%)
- Possible surprise in-class quizzes (4%)

Assignments

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- A1 and A5: do by yourself
- A2-A4: teams of one or two (not more than two)
 - ▣ A1 will be posted soon on CMS
 - ▣ We encourage you to do them by yourself and have considered making this the rule
 - ▣ Finding a partner: choose your own or contact your TA. Piazza is incredibly helpful.

Piazza

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- Click link on our web page to register
- Incredible resource for 24x7 help with anything
- We keep an eye on it, but people help each other out too.



Academic Integrity... Trust but verify!

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- We use artificial intelligence tools to check each homework assignment
 - ▣ The software is very accurate!
 - ▣ It tests your code and also notices similarities between code written by different people
- Sure, you can fool this software
 - ▣ ... but it's easier to just do the assignments
 - ▣ ... and if you try to fool it and screw up, you might fail the assignment or even the whole course.



What's CS 2110 about?


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- Computational tools are "universal" but the key is to master computational thinking.
 - ▣ Looking at problems in ways that lead naturally to highly effective, correct, computational solutions
 - ▣ There are many ways to do anything, but some are way better than others
- Mastery of computational thinking will help you become a master of the universe!
- Also: Great job prospects with high salaries...



Example (we'll see it again in April...)

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- Suppose you wanted to build a massive database of pictures of people and stuff about them
- ... then create smart eyeglasses
 - ▣ 
- In the past a concept like this was crazy...
 - ▣ Today, it can be solved with "cloud computing" + Java programs to search huge image databases fast...
 - ▣ ... With CS2110 you'll be about 1/3 of the way there
 - Also: Snavely's vision course + Ken's cloud computing course

A class declaration defines

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- Format/content of **objects**, which can contain variables and functions/procedures
- Variables and functions/procedures for which only ONE copy exists

```
Circle@75ab39f2
radius 10.2
setRadius(double)
diameter()

Circle@75ab302b
radius 3.4
setRadius(double)
diameter()

PI 3.1459          area(Circle)
```

A class defines the form and behavior of some type of objects.
But your program needs to explicitly create them.

World's simplest Java program

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- Writing "Hello world" in Java using Eclipse
- Running it
- Understanding line by line exactly what it says

Let's launch Eclipse and see these steps in action

Next steps?

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- Attend a recitation section this week
- Repeat what we just did but do it yourself
 - ▣ Try making mistakes and see what Eclipse "says"
 - ▣ Try making it a little fancier
- Drop in to see what CS2111 is about this afternoon (two times, on Tuesday)