

CMPSCI 187: Programming With Data Structures

Lecture 1: Course Overview
5 September 2012

What are we doing?

- Developing programming maturity in Java
- Studying some important data structures
- Beginning computer science thinking -- analysis of algorithms

Programming Maturity in Java

- Write programs using multiple classes and inheritance
- Write classes that can be reused in future programs
- Write longer programs that can't fit in your head all at once
- Learn software engineering techniques to make those work
- See more Java features like generics
- Develop an idea of the entire Java language (e.g., *Java Precisely*)

The Data Structures Idea

- Standard problems have standard solutions -- ways to arrange data
- Separate the specification from the implementation (information hiding)
- Specification given by a Java **interface**
- Learn details of implementations, different ones have different advantages
- Collections package in Java has code for many implementations
- See examples of how to apply each data structure

Computer Science Thinking: Algorithm Analysis

- Analyze general situations, not specific ones
- Different (from calculus) mathematics needed
- Basic idea -- how do resources needed increase with input size?
- Example -- finding an object in a linear array (constant, log, linear)
- Families of functions (constant, linear, quadratic) treated as single objects
- We don't prove anything now but revisit the subject in CMPSCI 311

Administrative Stuff

- Web site: www.cs.umass.edu/~barring/cs187
- Four TA's, contact info for all of us
- Help mail address: cs187help@cs.umass.edu
- Course requirements and grading
- Course blog on the 187 main page -- mass email only for crises
- Assignments (and solutions as given)
- Prior web site: www.cs.umass.edu/~barring/cs187f11 -- different textbook

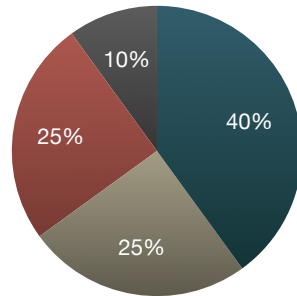
Course requirements and grading

- Components: Exams, HW, Projects, Discussions
- Two evening midterms (20% each) and a final (25%), (total 65%)
- Five projects, last one double-size, lowest not counted (25%)
- Discussions every Wednesday, in pairs, graded A/B/F (10%)

Special Feature: Choice of Weighting

- Basic Weighting has a low-stakes final

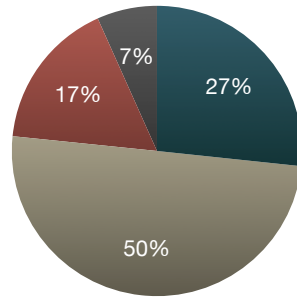
- Each component is on a 4.0 scale



Special Feature: Choice of Weighting

- If you do well on the final, I reward that
- You don't have to choose in advance

Midterms Final Exam
Projects Discussions



Academic Honesty Policy

- Exams -- you cheat, you die
- Projects and HW's -- talk it over, write it up **yourself**, two identical solutions means a problem, document sources
- Discussions -- help from TA's, the point is the experience of working the problem
- More details on the Requirements and Grading page -- you are responsible for reading this.

187's Place in the World

- We want the basic understanding of Java from CMPSCI 121
- Math won't come up much explicitly but calculus-ready is good
- 187 prepares for the four CMPSCI cores: 220, 230, 240, 250
- Pass 187 and you are three courses from a CMPSCI minor
- ECE 242 is a roughly equivalent course to 187
- Virtually everything later in CMPSCI depends on 187