



Data Structures and Algorithms Weekly Schedule Spring 2007

Photo (c) 2002 David Robertson (comp sci '00) All rights reserved. Used with permission. Visit Dave's web site at www.fragmente.org

Feb 5, 7, 9

Objectives To review object orientation and Java from COSC 182

Text reading Chapters 0, 1 (Review of Object orientation); Appendix B (Review of Java)

Some things to know

Standards of style, defining your own equals method, processing of command line arguments, precondition and postcondition (more next week).

Activities

Individual Lab 1: Modifying the way in which a method solves a problem without modifying what it accomplishes. Unit testing of a single object in the development environment of your choice.

In-class activity: Developing an abstract data type (Exercise 1.12)

Feb 12, 14, 16

Objectives

To build teams, to review 2D arrays, to use the Java Vector and Random objects; to learn Java 5 generics

Text reading Chapters 2, 3, 4

Some things to know Lindenmayer systems, when to use

Activities

A volunteer will tell us about javadoc from Chapter 2 on Wednesday.

Team Lab 2: The Silver Dollar Game (pages 68f.)

Feb 19, 21, 23

Objectives

To review time & space complexity, asymptotic time complexity, recursion, and comparison sorts; to learn a distributive sort

Text reading Chapters 5, 6 (Sections 6.1–6.5 continue review COSC 282)

Some things to know Time-space tradeoff, more practice choosing the right data structure.

Which sorts are stable, heapsort (class handout), radix sort.

Activities

Radix sort (in class)

Individual Lab 3: Timing sorting algorithms that use comparators

Feb 26, 28, Mar 2

Objectives To use iterators of your own design

Text reading Chapters 7, 8

Some things to know How to use filtering iterators & state-based programming

Activities Team Lab 4: Two-towers problem (p. 182ff.)

Mar 5, 7, (9)

Objectives To design good data structures using interfaces and abstract base classes

Text reading Chapter 9

Some things to know List interface and implementation via Vector.

Single- and double-linked lists, circular lists, using dummy nodes in linked lists.

Activities **Exam 1 will be Friday, March 9**

Special exception to note I'll be in Kentucky for the annual meeting of SIGCSE on March 9.

Mar 12, 14, 16

Objectives To evaluate list- versus vector-based stacks and queues

Text reading Chapter 10

Some things to know Stacks and queues

Activities No homework. Catch up. Relax over Spring Break.

—**Spring Break, Saturday, March 17 through Sunday, March 25**—

Mar 26, 28, (30)

Objectives To use ordered structures and binary trees when appropriate

Text reading Chapters 11, 12 (through 12.6)

Some things to know Pre-order, in-order, post-order, and breadth-first traversal

Activities Individual Lab 5: [Binary tree problem to be assigned]

Special exception to note

I will be in California for my son's wedding, with my department chair's permission on March 30 and April 2. Class is canceled on March 30. Use the time to study for Exam 2 which will be on Monday, April 2.

Apr (2), 4

Objectives To learn the basis for compression techniques and priority queues

Text reading Chapters 12 (12.7–12.9), 13

Some things to know Huffman coding, vector-based heaps

Activities **Exam 2 will be Monday, April 2**

Special exception to note Exam will be given in my absence.

—**Easter Break, Friday, April 6 through Monday, April 9**—

Apr 11, 13

Objectives To learn the benefits of hierarchical data structures for searching

Text reading Chapter 14
Some things to know Comparing binary search trees with red-black trees
Activities Catch up!

Apr 16, 18, 20

Objectives To see how hash tables uses the idea of a distributive sort to speed searching
Text reading Chapter 15
Some things to know Hash coding; open addressing versus external chaining
Activities Team Lab 6: [To be decided]
A volunteer will tell us about: How hashing is used in computer security

Apr 23, 25, 27

Objectives To contrast adjacency matrix versus linked representations of graphs
Text reading Chapter 16
Some things to know Reachability, topological sorting, diameter of a graph, idea of a greedy algorithm
Activities Catch up!

Apr 30, May 2

Objectives To compare three methods of hashing
Text reading Chapter 14
Some things to know Copy constructor, perfect hashing, linear probing, quadratic probing, external chaining
Activities A volunteer will tell us about: What built-in support Java has for the data structures we've seen this semester so far.

May 4

School of MEB Scholarship Day. Attendance is required, except for times that you have classes in other Schools.

Activities

Submit a report of six paragraphs, in writing and in your course folder on the Q: drive. Write two paragraphs on each of three presentations that you attended. Do not count poster presentations. The first paragraph should be an objective part of what you heard, different from any printed abstracts that are available. The second paragraph is your evaluation of the presentation. Be sure to give name of speaker and title of presentation.

May 7

Objectives To see how our course fits together
Text reading No new chapters
Some things to know (Review)
Activities Team Lab 7: Timing hashing via linear versus quadratic probing methods

During Final Exam Week, Monday, May 14

10:30–12:30 a.m. **Exam 3**, not comprehensive, covering only since second exam.