CSIS 3103 Exam 3 Topic Overview

Section exercises, Quick-check exercises, and Review questions are good sources of review.

Ch 6: Binary Search Trees, Heaps, Priority Queues

General trees and binary trees
Tree terminology – root, children, leaves, levels, etc.
Binary tree traversals – inorder, preorder, postorder, breadth-first
Binary tree operations
Binary search trees and operations
Priority queue vs. "regular" queue
Heap vs. BST
Heap used to implement priority queue
Insert and delete in a heap and the "re-heap" operations
Implementation alternatives – linked, array
Big-O analysis

Ch 7.1 – 7.6: Sets, Maps, Hash Tables

Sets and Maps
Hash tables – compared to other data structures
Open addressing
Collision resolution techniques
Chaining
Load factor
Big-O analysis

Ch 8.1 – 8.5, 8.7 – 8.10: Sorting

Selection sort, insertion sort, merge sort, heap sort, quick sort, radix sort
Big-O analysis of sorting algorithms

Ch 10.1 – 10.4 (selected topics): Graphs

Terminology – vertex, edge, undirected graph, digraph, weighted graph, adjacency list, adjacency matrix, breadth-first search

Know the terms we've covered and how to use them.
Be prepared to trace execution of program segments.
Be prepared to draw pictures to illustrate operations performed on various data structures.
Be able to read specifications and use them to write Java methods.
Be able to use Big-O notation to describe performance of various algorithms.
Be able to choose the most appropriate data structure for a given application.
Be able to combine concepts of different data structures to describe solutions to problems.