Midterm Exam Study Guide

1 Linked List (Chapter 17)
  • implementation of insert/delete
  • double vs. singly linked lists

2 Iterators

3 Algorithm Analysis (Chapter 5)
  • $O$, $\Omega$, $\Theta$
  • Asymptotic analysis, ordering of functions as $n \leftarrow \infty$
  • finding running time of algorithms
  • logarithms

4 Recursion (Chapter 7)
  • Basic recursion
  • base case
  • inductive hypothesis
  • Divide & Conquer
  • Solving run-time recurrences
  • pitfalls of recursion
  • memoization
  • dynamic programming
  • backtracking

5 Sorting (Chapter 8)
  • Bubble Sort
  • Selection Sort
  • Insertion Sort
  • MergeSort
  • QuickSort
  • worst case, best case, avg case
  • picking the pivot
  • lower-bound for comparison based sort

6 Stacks and Queues (Chapter 16)
  • array implementation
  • linked list implementation

7 Trees (Chapter 18)
  • Structure/definition
  • depth, height, size
  • parent, child, ancestor, descendant, sibling
  • leaf
  • path length
  • first child/next sibling storage
  • binary trees
  • implementation of size, height
  • traversals (pre-order, in-order, post-order, level-order) and (sequential and recursive) implementations