CS124 Midterm Exam (2): Study Guidelines

How to study:
- Review the materials based on the lecture slides, and read the textbook to enhance your understanding.
- Make sure that you can do all Assignments 2 & 3 questions.

What to study:

Chapter 4 (Trees, Sections 4.4, 4.5 and 4.7):
- Definitions of AVL trees and splay trees.
- For each tree structure, the property, running examples of inserting or finding nodes for a given input key sequence, and running time complexity (no formal proof but an informal argument as presented in the lecture slides).
- Concepts: (example questions below)
  - Why is it important to balance a binary search tree?
  - What is the difference in the balancing approaches used by an AVL tree and a splay tree?
  - What is the splay operation and what is the rationale for such splaying?
- Definition of B-trees.
- B-tree insertion and deletion.
- Running time and B-tree operations.

Chapter 5 (Hashing):
- Concept of address mapping in hashing; the criteria of a “good” hash function.
- Hashing key generation from a floating-point number or an ASCII string.
  - Horner’s rule
  - Modules equivalence rule
- Collision resolution: separate chaining, linear hashing, quadratic hashing, double hashing, dynamic hashing. Comparison among them. Hashing examples.