

Topics Covered Thus Far

(Note that this is only a big-picture overview – it leaves out a lot of detail)

- Abstract Data Types (ADTs) and Data Structures
- Stacks and Queues
 - Linked list implementation
 - Array implementations (including circular arrays)
- Asymptotic Analysis
 - Big-O of code snippets
 - Inductive Proofs
 - Recurrence Relations (and when to apply them)
 - Formal definition of Big-O
 - Big-O and -Omega, Theta, little-o and -omega
 - Amortized Analysis
- Dictionary ADT
- Hash Tables
 - Hash functions, hash values, and indexing
 - insert, find, remove
 - Collisions
 - Separate chaining
 - Open addressing / probing
 - Linear probing
 - Quadratic probing
 - Double hashing
 - Rehashing
- Generic trees
 - Terminology
- Binary trees
 - Terminology
 - Representation
 - Calculating the height
 - Traversals
- Binary Search Tree (BST)
 - find
 - insert
 - delete (3 cases)
 - buildTree
 - Terminology (e.g. successor, predecessor)
 - Balanced vs unbalanced trees
- AVL Trees
 - Balance conditions
 - AVL balance condition
 - Rotations
 - insert (4 cases)
- Priority Queue ADT
- Heaps
 - insert & delete
 - Percolations
 - Array representation/implementation
 - buildTree (client version and Floyd's Method /heapify)
 - d-heaps
- For each data structure
 - Ways to implement
 - Pros, Cons, and other reasons to choose one over the other