Data Structures Study Guide

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Programming Topics

- Big O notation
- Recursion (especially related to trees)
- Sorting
  - Insertion Sort
  - Quicksort and partition
  - Merge Sort
- Huffman Encoding

Data Structures For the exam, you will not write any data structures, but you need to know how to write code that uses them.

- Lists
  - Types:
    - ArrayList
    - LinkedList
  - Big O for `add, remove, get, set` differs based on type.
- Stacks
- Queues
- Trees
  - Tree vs Binary Tree vs Binary Search Tree
  - Tree algorithms are recursive and are either `find`-based or `traversal`-based.
- Heap
  - Always a complete tree
  - How to turn array into heap in $O(n)$ time.

- Graphs
  - BFS
  - DFS
  - Dijkstra's