Review Topics

Topics Other Than Sorting

- Stacks, Queues (implementing)
- Hash maps
  - Increasing size when full
  - Chaining
  - Linear / Quadratic Probing
- Runtime Analysis
- Binary Search
- Trees
- Graphs
- Heaps

Runtime Analysis

- Big O notation: given runtime (number of operations) as a function of the size of the input (N), big-O or **asymptotic** notation specifies what complexity class the runtime falls into **as N becomes very large**
  - How does program *scale*?
- Best case / worst case: Behavior of program with respect to input **structure**, not input **size**
  - Already sorted list vs. Reverse sorted list vs. Random elements
  - How *robust* is the program to input structure?

Trees

- Binary Search Trees
- Self-Balancing Trees (concepts, definitions)
- Height, Depth
- Traversals (pre, post, in-order)
  - Recursive vs. procedural

Graphs

- Definitions, Representations
- Graph search: Breadth-first, Depth-first
- Dijkstra shortest path search
- Spanning Trees (definition, find one in graph)
- Directed Graphs
- Strongly and weakly connected graphs

Heaps

- Definition
- Adding / removing elements
- Array vs. Tree representation
- Heap sort
- Priority Queues

Java Programming

- Object inheritence
- Interfaces