CSE 373 FINAL Review List
Two Two-Sided 8.5 by 11.0 Crib Sheets Allowed

1. Complexity
   - Be able to analyze and compare the time complexities of various algorithms using Big-O notation.
   - Be able to determine which is the best structure (from a list) for a given application.
2. Lists, Stacks, and Queues
   - Be able to work with these structures, using abstract operations or implementing new operations as needed or determine which is the best structure for a given application.
3. Recursion/Induction
   - Be able to prove the correctness of a recursive procedure for binary trees using induction, like the problem on the midterm.
4. Trees
   - Be able to show how to insert items into a splay tree
   - Be able to show how to insert items into a B+-tree
5. Hashing
   - Be able to show how separate chaining works on given data.
   - Be able to show how open addressing works with various collision-handling schemes (linear probing, quadratic probing, double hashing, rehashing or some given scheme) on given data. data.
   - Be able to determine when hashing is needed in the solution of an application problem.
   - Be able to analyze the complexity of given hashing schemes or algorithms that use them.
6. Heaps
   - Be able to show how to add items to binary min-heaps.
   - Be able to show how to do deleteMin operations.
   - Be able to determine when to use binary heaps (min or max) for some given application.

7. Union-Find (Up Trees)

   - Be able to show how to do union operations.
   - Be able to show how to do find operations.
   - Be able to determine when this is the best structure to use for some application.

8. Graphs and Digraphs

   - Be able to work with all the variations: directed graphs, undirected graphs, weighted and unweighted graphs, labeled and unlabeled graphs, etc.
   - Be able to use the two different representations we covered: adjacency matrices and adjacency lists.
   - Be able to show how the following algorithms work on given data:
     - breadth-first and depth-first traversal
     - topological sort
     - the Floyd-Warshall matrix algorithm for determining the minimum costs of all paths among vertices
     - the Dijkstra algorithm for finding the shortest path
     - the Kruskal algorithm for finding the minimal spanning tree of a weighted graph
     - the backtracking tree search algorithm for subgraph isomorphism.

9. Sorting

   - Be familiar with the algorithms and their complexities