

CS251 Data Structures – Fall 2011
Final – Review

Scheduled Time: 8:00-10:30, Thursday, Dec. 16

The final will focus primarily on these following topics, but you are expected to know all of the material covered in class throughout the semester. You can expect a question requiring a backtracking algorithm.

1. Sorting and Order Statistics
 - (a) Shell sort
 - i. Algorithm and implementation
 - ii. Analysis
 - (b) Order Statistics
 - i. min and max of a set
 - ii. largest and 2nd largest of a set
 - iii. k^{th} largest of a set
2. Trees
 - (a) Terminology
 - (b) General tree representation
 - (c) Binary trees
 - i. Traversals
 - ii. Recursive routines
 - iii. Java implementation
 - (d) AVL trees
 - (e) Red-black trees
 - (f) (2,4) trees
3. Hash Tables
 - (a) Basic operations
 - (b) Hash functions
 - (c) Chaining and open addressing
 - (d) Handling collisions
 - i. linear, quadratic probing
 - ii. double hashing
 - iii. Robin Hood and cuckoo hashing
 - (e) Rehashing

(over)

4. Priority Queues

- (a) Basic operations
- (b) Percolate up and down
- (c) `buildHeap()` operation
- (d) Merging
- (e) Implementations
 - i. binary heap
 - ii. pairing heap
 - iii. skew heap
 - iv. binomial queue

5. Projects and Homeworks