Topics for the CSCI 151 Final Exam
Wednesday, June 1
9-11 AM
Java and Programming Techniques
• Types
• Inheritance
• Generics
• Abstract classes and interfaces
• Exceptions
• Recursion
• Writing recursive methods
• Dynamic Programming
B. Data Structures
   • ArrayLists
   • Linked Structures, especially singly and doubly linked lists
   • Stacks
   • Queues
   • Binary Search Trees
   • AVL trees
   • Heaps and Priority Queues
   • Hashing, Hash Tables, and Hash Maps
   • Graphs
Algorithms

• Big-Oh notation
• Algorithm analysis
• BubbleSort, SelectionSort, InsertionSort
• Lower bound for sorting
• MergeSort, QuickSort, HeapSort
• Insert, Search, and Remove algorithms for each of our data structures
• Shortest Path algorithms for a directed graph
• Topological Sort for a directed graph
➢ For each data structure you should know how it is implemented, how it works, what it is good for, and Big-O estimates of the running times of its methods.

➢ There will not be any LONG programs to write, but you will be asked to write some code, just as on our midterm exams.

➢ In general I am more interested in whether you know how our data structures work and how they can be used than whether you can code their methods during the exam.

➢ You should know by now that I like questions that ask you to mimic a data structure on paper. For example “Here is an AVL tree; what tree do I get if I insert value X into this tree?”

➢ Our hour exams had 6 questions. The final will be two hours and will probably have 8 questions. You shouldn’t need to rush.