

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.