Sample Final

Handout 14
CSCI 136: Spring, 2007
4 May

The final will be a self-scheduled exam that may be picked up between 9:00 a.m. and 6:00 p.m. between Saturday, 12 May, and Sunday, 20 May from the monitor in the Registrar's Office on the second floor of Hopkins Hall. Self-Scheduled exams must be returned to the monitor within two and one-half hours after they are taken out.

Here are the instructions from the front page of the exam:

This is a *closed book* exam. You have 150 minutes to complete the exam. All intended answers will fit in the space provided. You may use the back of the preceding page for additional space if necessary, but be sure to mark you answers clearly. You must hand in all paper used while working on the exam.

Look through all of the questions before you begin working. Be sure to give yourself enough time to answer each question— the points should help you manage your time.

If you do not understand what part of a question is asking, answer it as best you can and state any assumptions you are making in your answer. I will try to be available in my office (x4260) or at home (458-1308) if you have questions.

You may not discuss any aspect of this exam with anyone except me until after the entire exam period is over. This includes students in the class, other students, other faculty, etc. If asked about the exam, the only acceptable response is "I'm not allowed to discuss it."

I have neither given nor received aid on this examination.

Signature: _____

Name: _____

Time Started: _____

Time Finished: _____

You are responsible for anything we covered in class or in lab, and everything in the assigned reading from *Java Structures*, up to and including Dictionaries and HashTables. The exam is cumulative and will cover all topics from this semester. However, material covered since the second midterm will be emphasized. The topics covered since the second midterm include:

- Binary search trees
- Graph Representations: adjacency matrix and adjacency lists
- Graph algorithms: beadth-first and depth-first searches, reachability, topological sorting, Dijkstra's algorithm
- Dictionaries
- Hashtables

Here are the lists of topics from the first two midterms:

- Java syntax, as we have used it in our programming assignments.
- Classes, interfaces.
- Generic classes.
- Java memory management. What is allocated and how / when regular variables, arrays, and classes are created?
- Information hiding and why it's good.
- Extending classes with inheritance.
- Pre- and post-conditions, and assertions.
- Vector, its implementation in the structure package, and its methods.
- Complexity: Big "O" definition. Determining the asymptotic behavior of mathematical functions. Determining the time and space complexity for a given algorithm. Worst, average, and best case analysis.
- Linear and binary search.
- Recursion and induction.
- Sorting. Bubble sort, selection sort, insertion sort, merge sort, quicksort. Using `Comparator`s for sorting.
- Singly and doubly linked lists.
- Stacks, Queues, Linear structures
- Iterators
- Ordered structures
- Trees, binary trees, general trees, tree traversals
- Heaps
- Priority queues
- Heapsort