CSCI 1323 (Discrete Structures), Spring 2003
Review for Final Exam

1   Format of the exam

The exam will be at the scheduled exam period, May 12 at 2 pm. It will be about twice the length of the in-class exams and so should take about 2.5 hours, but you will have the whole three-hour exam period if you need it. You may use your textbook and any notes or papers you care to bring, but you may not use other books, a calculator or computer, or each other's papers.

The questions will be similar in form to those in the homeworks and quizzes and the previous exam. The exam will cover everything we have done this semester, but there will be an emphasis on material not covered in the midterm.

2   Lecture topics to review

You are responsible for all material covered in class or in the assigned reading. (See Lecture Topics and Assignments[1] for a list of assigned reading.) You should review in particular the following topics, plus those mentioned in the review sheet for the midterm exam. This list is *not necessarily exhaustive*, but should give you an idea of what topics I consider most significant.

- Recursion and recurrence relations:
    - Recursive definitions of sequences, sets, operations, and algorithms.
    - Defining and solving recurrence relations.

- Analysis of algorithms:
    - Defining and solving recurrence relations to estimate the number of basic operations performed by a recursive algorithm.

- Sets:
    - Defining sets.
    - Operations on sets.

- Counting:
    - Multiplication and addition principles.
    - Principle of inclusion and exclusion.
    - Pigeonhole principle.
    - Permutations and combinations.
    - Permutations and combinations with repetitions.

- Relations:

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[1] http://www.cs.trinity.edu/~bmassing/Classes/CS1323_2003spring/schedule.html

- – Definition and properties (reflexivity, symmetry, transitivity, antisymmetry).
- – Partial orderings.
- – Equivalence relations.
- – Closure.
- – Topological sorting.

- Functions:

  - – Definitions and properties (one-to-one, onto).
  - – Composition and inverse functions.
  - – Set equivalence.
  - – Order of magnitude of functions.

- Matrices:

  - – Operations on matrices.

- Graphs:

  - – Definitions and terminology.
  - – Computer representation (adjacency matrices and adjacency lists).

- Trees:

  - – Definitions and terminology.
  - – Tree traversals.
  - – Recursive definition, recursive algorithms, inductive proofs.