CS221- Data Structures: Minimum Content

Revised: 1/6/1999

The ordering of topics is left to the discretion of the instructor. Topics have been expressed in a language neutral manner; the choice of language, and in some cases of the programming tools used, will affect the presentation of some topics. For example, generic programming is not well supported in Java. Presentation of this topic might be a good opportunity for a comparative discussion of other languages and how they support generic programming.

1. Review of relevant language concepts

    1.1. Basic program structure
    1.2. Control structures
    1.3. I/O
    1.4. Arrays
    1.5. Parameter passing

2. New language constructs and support utilities (to be introduced as needed)
    2.1. Pointers/References
    2.2. Simple classes
    2.3. Use of a symbolic debugger (can be postponed until linked lists are introduced. Optional, depending on availability.)
    2.4. Constructors, copy constructors
    2.5. Generic programming, as supported by the language used
    2.6. Exception handling
    2.7. Inheritance

3. Recursive definitions, recursion as a programming technique

4. Big Oh notation, basic analysis of algorithms

5. N log N sorts - Quicksort, Mergesort

6. Linked lists

7. Searching

8. Stacks

9. Queues

10. Hash tables

11. Binary trees
    11.1.Implementation
    11.2.Traversals
    11.3.Binary search trees