Topical Outline  (in temporal order)

CS386 Database Management, Fall ‘05

Prof. Daniel P. Miranker

I. Introduction

II. UML as a Data Modeling Language (Parts of Ch 2 + Ch. 3 supplemental papers)
   A. Basic E-R Modeling
   B. Mapping of E-R modeling to UML
   C. Use of Rational Rose, (or other), CASE tool for data modeling.

III. Index Structures (Ch 13, 14 + supplemental papers)
   A. B-trees
   B. Bit-vector indexes
   C. Multidimensional Indexing
   D. Metric Space Indexing
   E. Extensible Hashing (time permitting)

IV. Query Execution (Ch. 15,16)
   A. Basic Join Algorithms
   B. Expression tree representation
   C. Cost functions
   D. Transformation rules
   E. System R Optimization Algorithm
V. Object-Relational Databases, Some XML (Ch 9 + supplemental XML materials)
   A. Declaration, Storage, Representation of New Datatypes
   B. Language Support
      1. SQL variants
      2. XML

VI. Views, Constraints, Rule Systems Management (Ch 7, 10)
   A. Views
   B. Integrity constraints
   C. Active-Database Systems
   D. Deductive Database Systems (Datalog) (time permitting)

VII. Transaction Managment (Ch. 17, 18)
   A. ACID Properties
   B. Logging and error recovery
   C. Serializability
   D. Two phase locking
   E. Distributed Commits

VIII. Advanced Topics (time permitting)
   A. Parallelism
      1. Parallel Query Processing (Ch 15.9)
      2. RAID storage (Ch. 11.7)
   B. Information Integration (Ch. 20)
      1. Warehouse vs. Mediator Architectures
      2. Wrappers and Federating Query Systems
      3. XML translation
   C. On-line Analytic Processing (OLAP) (Ch. 20.5, 20.5)