Lecture 24:
Final Review

Friday, March 10, 2006

The Final

- Date: Wednesday, March 15, 2006
- Time: 2:30-4:20
- Place: this room
- Open book exam

Problem 1

- Data modeling/relational model/SQL

Data Modeling

- E/R diagrams
- Keys
- Relationships
- Inheritance
- Mapping to relations

Relational Model

- Relations
- Keys
- Functional dependencies
- Decomposition
- Normal forms

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SQL

- Select-from-where
- Subqueries
- Aggregation
- Nulls
- Outer joins

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SQL (continued)

- Database modification
- Defining and modifying relation schemas
- Constraints
  - On attribute values
  - Keys
  - Foreign keys

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Problem 2: XML

- Xquery/Xpath

- XML syntax
- DTD
- From relations to XML
- From XML to relations

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XQuery

- Selecting data from XML (often in Xpath)
- Constructing new XML values (RETURN)
- Aggregates
- Duplicate elimination (!!)

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Problem 3: Transactions

- ACID properties
- Recovery
- Concurrency

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Recovery

- Undo log
- Redo log
- Undo/redo log

- This was already on the midterm, so will likely be a small question or none

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Concurrency control

- Serializability
- Conflict serializability
- Locks
- Timestamps
- Validation

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Problem 4: Database Implementation

- Indexes
- Physical operators
- Optimizations
- Size estimation

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Index Structures

- Terminology:
  - Dense/sparse index
  - Primary/secondary index
- B^+-trees
- Hash tables
  - Basic hash tables
  - Extensible hash table

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Physical Operators

- One-pass algorithms
- Nested-loop joins
- Two-pass algorithms based on sorting
- Two-pass algorithms based on hash tables
- Index-based algorithms

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General Advice

- Some problems will require thinking
  - Use judgment
- Problem difficulty may be uneven:
  - do the easy ones first

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Grading

–Homework 25%

–Project: 30%

–Midterm: 15%

–Final: 25%

–Intangibles: 5%

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COMMIT
(The End)

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