

12/6/05

## SEMESTER/EXAM OVERVIEW

- FINAL 12/20 6pm
- CLOSE BOOK/CLOSED NOTES
- ENTIRE SEMESTER (ONE PIECE OF PAPER)
- CALCULATORS NOT NEEDED BUT ALLOWED

## BASIC STUFF

- WHAT ARE DBs USED FOR?
- ADVANTAGES/LIMITATIONS
- LEVELS OF ABSTRACTION

## ER MODEL

- BASIC UNDERSTANDING
  - WHAT DO SYMBOLS MEAN?
  - HOW TO EXPRESS GIVEN PROBLEM?

## RELATIONAL MODEL

- HOW TO TRANSLATE FROM ER?
- BASIC PROPERTIES OF MODEL
- BASICS OF RELAT. DESIGN
  - FUNCTIONAL DEPENDENCIES
  - BCNF

## SQL

- DEFINE RELATIONS AND KEYS
- QUERIES
  - BASIC
  - AGGREGATE
  - NESTED
  - GROUP-BY
- EXECUTION MODEL (HOW SQL QUERY IS TRANSFORMED INTO ALGEBRA)
- VIEWS
  - NO COMPLICATED CONSTRAINTS
  - NO TRIGGERS
  - NO ODBC, EMBEDDED SQL
  - NO UPDATES THROUGH VIEW

## RELATIONAL ALGEBRA AND CALCULUS

- WRITE QUERIES
- TRANSLATE QUERIES TO/FROM SQL (→ NOT ALWAYS POSSIBLE)
- WHAT DOES A QUERY DO?
- YOU CAN CHOOSE DRC OR TRC
- RELATIVE POWER OF LANGUAGES

~~QBE~~

~~DATALOG~~

## DISKS AND FILES

- DISK PROPERTIES
  - SEEK TIME, DELAY, TRANSFER
- BUFFERING
  - BUFFER POOL
  - BUFFERING POLICIES
- BLOCK MODEL AND LATENCY / TRANSFER MODEL
- (• PAGE AND RECORD FORMATS)
- SORTING

## INDEXING

- ~~ISAM~~ AND B<sup>+</sup>-TREES
  - HOW TO INSERT, DELETE, SEARCH, RANGE SEARCH
- CLUSTERED VS NONCLUSTERED
- SPARSE/DENSE
- INDEXES AND DISK PROPERTIES
  - BLOCKSIZE AND DEGREE
  - CLUSTERING
- HASH INDICES
  - BASIC
  - EXTENDABLE

## QUERY EVALUATION

- SORTING
  - MERGESORT
  - BUFFER ALLOCATION
- JOINS
  - BLOCK-NESTED LOOP JOIN
  - SORT-MERGE JOIN
  - HASH JOINS (BASIC)
  - JOINS USING INDICES
- OTHER OPERATORS (BASICS ONLY)

## QUERY OPTIMIZATION

- ~~QUERY PLAN TREES~~
  - ~~REDUCTION FACTOR FOR INDICES~~
  - ~~BASIC COST ESTIMATION~~
    - (NO COMPLICATED QUERIES)
    - (NO MULTI-ATTRIBUTE INDICES)
- ONLY FUNDAMENTAL CONCEPTS COVERED! READ & UNDERSTAND

# TRANSACTION MANAGEMENT

- 2PL AND STRICT 2PL
  - HOW DO THEY WORK?
  - WHAT TYPES OF SCHEDULES ARE PRODUCED?
- CONFLICT SERIALIZABILITY
  - IS SCHEDULE SERIALIZABLE?
  - CONFLICT GRAPH?
- ~~BASIC KNOWLEDGE OF TIME STAMPING AND GRAPH PROTOCOLS~~

- GENERAL SERIALIZABILITY
- VIEW SERIALIZABILITY
- RECOVERABILITY AND CASCADING ABORTS
- ACID PROPERTIES
- ONLY BASIC CONCEPTS OF RECOVERY (LOGGING)
- DEADLOCK DETECTION

} BASICS ONLY

## PROJECT #2:

- DUE BETWEEN 12/21 - 12/31
- DEMO BEFORE/AFTER XMAS
- WAIT FOR MAIL, SIGN UP FOR TIME SLOT