CSE 344

JUNE 1ST – FINAL REVIEW
EXAMINATION STATIONS

• Exam Wednesday June 6
  • 8:30-10:20
• One sheet of notes, front and back
• Practice exam/solutions out after class
• Good luck!
EXAM LENGTH

• 1:50 minutes
• Roughly 50% longer than midterm
• Will focus on material from second half of the course
  • Practice Exam
  • Midterm exam
FIRST HALF TOPICS

• Databases
  • Motivations and definitions
• Relational Databases
  • SQL
  • Relational Algebra
  • Datalog
• Semi-structured Data
  • Motivations and definitions
FIRST HALF TOPICS

• Internals
  • Indexes
  • Physical plans/Cost Estimation
  • Disk I/o

• Parallel
  • Shared Nothing
  • Map Reduce
NEW MATERIAL

• Database Design
  • E/R Diagrams
  • Constraints
  • 1NF, BCNF
  • Decomposition
  • Loss/Chase test
NEW MATERIAL

• Transactions
  • Schedules
  • Concurrent behavior
  • ACID
  • Locking
DATABASE DESIGN

• E/R Diagrams
DATABASE DESIGN

• E/R Diagrams
  • Entities, Relations, Attributes
  • Many-to-many, etc
  • Weak entities
  • Constraints
  • Converting to schema
DATABASE DESIGN

• Normalization
DATABASE DESIGN

• Normalization
  • Functional Dependencies
  • Closures
  • Keys/super keys
  • Normal Forms
    • 1NF, BCNF
DATABASE DESIGN

• BCNF
DATABASE DESIGN

• BCNF
  • Recognizing BCNF
  • Decomposing
  • Generating schemas from FDs
  • Lossless decomposition
  • Chase test
  • Views (Materialized and Virtual)
TRANSACTIONS

• Motivations
TRANSACTIONS

• Motivations
  • Concurrent behavior
  • Throughput v. Safety
  • Conflicts
  • ACID
  • Deadlock
TRANSACTIONS

• Schedules
TRANSACTIONS

• Schedules
  • Serial
  • Serializable
  • Conflict-serializable
    • Precedence Graphs
  • (Recoverable)
TRANSACTIONS

• Schedulers
TRANSACTIONS

• Schedulers
  • Locking
  • SQLite
  • 2PL, Strict 2PL
  • Granularity (DB v. Records)
  • Phantom problem
  • Isolation level
TRANSACTIONS

• Design considerations
TRANSACTIONS

• Design considerations
  • Throughput
  • Thrashing
  • Deadlock
  • ACID
  • Transactional v. Analytical
ON THE EXAM

• Short answer
  • General/1\textsuperscript{st} half
  • Database Design
  • Transactions
  • \textit{May have differing point values}
LONG ANSWER

• BCNF Decomposition
• E/R Diagrams
  • Schemas and Diagrams
• Schedules
  • Conflict-Serializability
SOME OF THE FOLLOWING

• From the midterm
  • SQL/Datalog/RA
  • Cost Estimation

• Missing from Midterm
  • SQL++
  • MapReduce (pseudocode only)
SOME OF THE FOLLOWING

- Database Design
  - Views/Indexes
    - Workload
  - Isolation levels
  - Client-specification/Design Pipeline
SOME OF THE FOLLOWING

• Transactions
  • Producing schedules
  • Verifying schedules
  • Locks and unlocks
  • Constraints
ADVICE

• Look through the exam first
  • Try and do easiest questions first
  • Short answer questions *may not* be worth equal amounts
    • Points per on exam
• Be ready for tricky questions
  • Most problems in familiar format
FINAL ASSORTED MINUTIAE

• Office hours (CSE 214)
  • Monday 12-2
  • Tuesday 2-4
  • These are the only office hours

• Course evaluations
  • In by Sunday

• HW8 Due Tonight 11:30
  • Up to two late days
  • Please only tag once