

CLASS CONTENT

Evaluating SQL commands

Relational Algebra

Convert SQL to Relational Algebra

Convert RA to SQL

Evaluate table using RA

Database constraints

Transactions

Convert E/R diagrams to relational schema

Functional dependency

Armstrong's AXIOMS

Set Closures & Candidate Keys

BCNF

Decomposition & Dependency Preservation

LOSSY & LOSSLESS → counterexamples

Extraneous Attributes

Canonical Cover

Multivalued Dependencies

NoSQL

Speedup / Amdahl's Law

Apache spark

Map Reduce

Convert SQL to Spark and viceversa (EXPLAIN)

MongoDB

Skew

Hash partitioning

Partial aggregation

Disks / Storage Representation

Storage types

Seek time & rotational latency

RAM

Serialization / Deserialization

Dot structure (e.g., Stotted page)

row vs. column representation

Calculate blocks (??)

B+- Tree

identify how to insert & delete items

search keys

Hash Indexes

Query Processing

Hash Join

Evaluation of Expressions

→ Pipelining

→ Materialization

→ Blocking operations

Query Optimization

Query plans

Equivalence of Expressions

RULES: 1, 2, 3, 5, 7a

Identify validity of expressions on LHS & RHS

Selectivity Estimation

Concurrency Control

Lock-based Protocol

2Phase Locking (strict)

Deadlocks

Time-stamp Based

Optimistic Concurrency Control

Snapshot Isolation

Recovery

STEAL

FORCE

Logging

UNDO

REDO