Review

Chapter 1 – Overview

- Database
  - DB now vs. then
  - Requirements
  - People involved
  - Applications (OLTP/OLAP)
- Transactions
  - Properties (ACID)

Chapter 2 – Big Pictures

- Introduction on relational databases
  - Tables
  - Relations (Tables as relations)
  - Operations on relations
- SQL
  - select … from … where
    - Simple
    - Joint
    - Aggregations: Count
  - Modifying tables: insert, update, delete
- ACID

Chapter 3 – Relational Data Model

- Three levels of schema of relational data model
- Data model
- Relational model
- Relation instances (concrete data)
- Relation schema (name, attributes & domains, constraints, default values)
- Relational database (set of relations & constraints among them)
- Integrity constraints (key, super key, candidate key)
- Referential constraints (foreign key, inclusion constraint)
- SQL:
  - create table WITH PRIMARY KEY, UNIQUE, FOREIGN KEY, etc.
  - CHECK, ASSERTION, DOMAIN
  - Handling foreign key violations
  - Views
- Access control

Chapter 4 – Database Design

- ER-model
  - Entity (attributes) & Relationship (attributes & roles)
  - Entity type & Relationship type
  - Representation in
    - ER model
    - Relational model (Schema for entity type and relationship type)
    - SQL
- Translation E/R diagram into set of relations
- Design decision

Chapter 5 – Relational algebra & SQL

- Relational algebra
  - Basic operators (union compatible)
  - Defined operators (join, division)
  - Complex expressions
- SQL
  - Simple
  - Complex (nested, correlated nested)
  - Aggregations (with Group By, Having, Order By)
  - Views