

Test #1 Preparation

Both topics covered in the readings in the textbook *and* in class are fair game, but with an emphasis on the class lectures. (The lectures and the readings do cover the very same materials.) The readings covered are indicated in the topic list below.

- I. Basics and Overview [Ch 1]
 - o evolution of database systems
 - o what functions database systems provide
- II. Data Models (& Schemas) [Ch 2: §1–3]
 - A. overview of data models
 1. what is a data model?
 2. the relational model, in brief
 - B. the relational model
 1. basics
 2. data independence
 - C. defining relational schema in SQL
- III. conceptual modelling [Ch 4: §1–6 & Ch 7: §1.1 & 1.2]
 - . entity/relationship model
 - entity sets, relationship sets, & attributes
 - multiway relationships
 - multiplicity in relationships
 - “recursive” relationships and roles
 - subclasses (“isa”)
 - A. design principles
 0. fidelity / faithfulness
 1. brevity: avoiding redundancy
 2. simplicity
 3. naturalness
 - B. constraints in the E/R model
 - keys!
 - referential integrity
 - C. weak entity sets
 - D. from E/R diagrams to relational designs
 - E. converting subclass structures to relations
 - from entity sets to relations (tables)
 - from E/R relationships to relations
 - combining relations
 - handling weak entity sets
 - using *foreign key constraints* to enforce referential integrity [Ch 7: §1.1 & 1.2]
- IV. design theory [Ch 3: §1, §2, §3.1, & §3.3]
 - . keys & *functional dependencies*
 - *keys, superkeys, & functional dependencies* (FDs)
 - reasoning about FDs
 - A. the normal forms [**design theory slidedeck**]

- anomalies
 - what each normal form protects against
 - how to test a relation for a normal form
- B. decomposition [Ch 3: §3.2, §3.4 & §4]
- C. synthesis [Ch 3: §5]