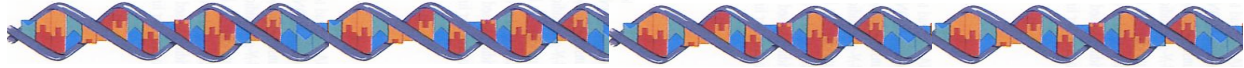


Review Sheet, Test 2

CS347,
11/6/09
V1.0



Test 2: November 13 in class – closed book

This review sheet is intended only as a study guide concerning the breadth of the exam. You are expected to know all the terminology presented as covered in class, the text and the required supplemental reading.

Reading:

Texts:

- • Jewett text, all
- • Schaum book, chapter 1,2, 5 & 7.

Papers:

- • Mapping Objects to Data Models with the UML, IBM Rational Technical Documentation 2003

Material:

1. Basic Relational Database Concepts

- a. What is a database?
- b. What is a database management system?
- c. Three tier architecture.
- d. Basic terminology of the relational model,
 - i. Relation schema
 - ii. Database schema
 - iii. ...
- e. SQL, and its three components
 - i. DDL
 - ii. DQL
 - iii. DML
- f. Keys and Content Addressability
 - i. How many “key” definitions? (make sure you know them all)
 - ii.
- g. Storage Structure, existence and role of B-tree indexes (*not the recent detailed material*)
 - i. Primary index
 - ii. Secondary index

2. Data Modeling

- a. What is a data model?
- b. . What are the steps of a data modeling effort?
 - i. planning and analysis
 - ii. conceptual design // logic without the details
 - iii. logical design
 - iv. physical design
 - v. implementation
- c. Terminology, with particular attention to the fact that there are many synonyms. The following list is not exhaustive
 - i. Data model
 - ii. Entity, attribute, identifier, relation/association
 - iii. Logical model, Physical Model, DDL
- d. UML Class Diagrams for data modeling
 - i. Vocabulary of the graphical language, e.g.
 1. Package, class, association

2. Multiplicity, Aggregation, identifying/nonidentifying

3. Inheritance

ii. Compiling using Rational Rose

1. How are individual constructs compiled to a physical [data] model

2. What additional details must (and how) be addressed in the physical model specification panel.

e. Design Patterns and Models

i. [That] Repeatable patterns in models may connect to abstractions of problem solving at a higher level.

ii. Text is organized around this concept.

3. Constraints and Application Semantics

a. Referential integrity constraints (i.e. foreign key constraints)

i. How to define.

ii. How they operate (details)

1. Conceptually

2. Syntax

3. Operational aspects, particularly wrt to the transaction system (e.g. deferred vs. immediate execution)

b. Other constraints e.g.

i. Not null

ii. Primary key

iii. Check

c. Triggers

1) applications

2) integration with and implications of the transaction manager

d Views

i. Syntax/Semantics

ii. Use as a subroutine mechanism (nested queries)

iii. Use per logical restructuring of a database, (re: external schema).

iv. Maintaining a materialized view

~~4. Supply Chain and EDI~~

~~a. Basic definitions~~

5) SQL and the Relational Algebra

a. Basic and advanced Relational Operators

i) select, project, join, ...

ii) groupby ordered by, aggregations e.g. min,...

b. Use of Algebra

i) Algebraic Identifies

ii) Relational between logical and expression tree forms.

c. Nested SQL Queries

d. Many Join operators

- natural, theta, inner, outer....

6) Advanced Topics

a. Data Warehouse

i) What is it

ii) Organizationally what are its parts

iii) Federated/Enterprise Schema

b. OLAP (on-line analytic processing)

i) Star & Snowflake schema

ii) groupby/aggregation queries