CS 4721 (Database Design I) [Spring 2019]

Final Exam Study Guide

You need to focus on the following topics:

- **Concept of superkey, candidate key, primary key, and foreign key**
  - check the definition and significance of them, without using functional dependency concept in this context

- **Relational algebra**
  - Check what symbols and expressions mean in terms of a query
    - **You do not need to write any relational algebra expression**, but you need to know how to interpret them, or, what would be the output of a given expression on a relation
  - Check the conditions for UNION, INTERSETION, CROSS PRODUCT, and JOIN
    - When (condition) the operation can be applied on two relations
    - Focus on NATURAL JOIN (⋈) operation
    - check output of these operations on given relations

- **SQL Queries**
  - You need to know how to write a query and how to interpret a given one
    - Check whether you can identify the output if an SQL query statement is supplied for a given relation instance
    - Focus on complex queries involving clauses like COUNT, MIN, HAVING, GROUP BY, IN, NOT IN, etc.

- **Mapping of ER to Relation schema**
  - check the conversion rules

- **Functional dependencies and normalization**
  - Need to know how to use of attribute closure to
    - Find candidate key of a relation
    - Test whether a functional dependency hold on a relation
  - Testing of a decomposition for a given normal form

- Identifying violations of a given normal form, followed by decomposing further to remove the violations
    - For example, you may be supplied a set of relations and asked to identify the violations of a specific normal form (say 3NF), followed by decomposing it into 3NF by removing the violations.

- **JDBC**
    - Know how to write a small JDBC code to retrieve information from a database.
        - Partial code and other information will be supplied. You need to fill in the essential components of a JDBC code.
    - Focus on the syntax of loading driver, making connection, and executing query.
    - You may need to find the SQL query for a desired retrieval.

General tips:

- **Check slides and class notes for different algorithms and corresponding examples worked out in class**
    - **Slides are quite comprehensive; however, you are not discouraged to read the textbook.**

- **Concept is a must!! You need to know how to apply the concepts.**
    - **The test is more focused on testing/verifying conditions, identifying output, etc. rather than showing the work (steps).**

- ***You are allowed to use one page (US letter size) help sheet during the exam.***

========== ALL THE BEST ==========