MIS2502 SEC 004: Exam 1 Study Guide (Spring 2018)

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The exam will be a combination of multiple-choice and short-answer questions. It is a closed-book, closed-notes exam. You will not be able to use a computer during the exam. You may be asked to draw ERD and/or schema by hand.

The following is a list of items that you should review in preparation for the exam. Note that ***not every item on this list may be on the exam, and there may be items on the exam not on this list.***

**The Things You Can Do With Data/The Information Architecture of an Organization**

* What is the difference between data and information? Give examples.
* What is a transaction?
* What are the characteristics of a transactional database?
  + What are the goals and benefits of this type of database?
* What are the characteristics of an analytical data store?
  + What are the goals and benefits of this type of database?
* What is the relationship between a transactional database and an analytical data store?

**Relational Data Modeling**

Entity Relationship Diagram (ERD)

* Be able to draw an ERD based on a scenario description using the correct symbols and cardinality
* Be able to interpret ERDs
* Identify and define entities, relationships, and attributes
* Identify primary key and non-key attributes
  + Make sure that you have a primary key for every entity
* Cardinality
  + Maximum cardinality: One-to-one, one-to-many, many-to-many
  + Minimum cardinality: optional or mandatory (i.e., 0 or 1)
* Identify when attributes describe entities and when they describe relationships
* Best practices for normalization
  + If an entity has multiple sets of related attributes, split them up into separate entities
  + Each attribute should be *atomic*

Database Schema

* Be able to draw the corresponding schema of an ERD
  + Identify tables based on entities and relationships
  + Understand and implement primary key/foreign key relationships
  + Decomposing many-to-many relationships in an ERD into one-to-many relationships in the schema
* Given data from two tables, be able to draw the results of a join of those tables with the data correctly “matched up” (see the examples from the slides)

**Basic SQL**

* **Simple SQL queries by SELECTing from a single table will be on this exam (Only topics in “SQL 1: Getting Information Out of a Database – Basic”).**
* **JOINS, subselects, etc. will be on the second midterm exam. Creating, updating, and deleting tables and rows will also be on the second midterm exam.**
* Given a schema of a database, be able to create a SQL statement to answer a question
  + e.g.:
    - In which state does customer Bob Smith live?
    - How many people live in each state?
    - What is the average SAT score among freshmen?
* Understand how to use
  + SELECT
  + FROM
  + DISTINCT

General syntaxes of the basic SQL statements will be provided on the exam question sheets!

* + WHERE (and how to specify conditions)
  + AND/OR
  + COUNT, AVG, MIN, MAX, SUM
  + GROUP BY
  + ORDER BY (ASC/DESC)
  + LIMIT
* Put single quotes around string (non-numeric) values.
  + For example, 'NJ'
* Surround schema, table or column names with back quotes (in the form of `name`) when the name
  + crash with **SQL reserved words**
  + or contains **blank space or special characters**