CSCI403 Exam I Review

October 23, 2015

1. 20 multiple choice and true false questions

2. Relational Model

   - Relations, attributes, tuples
   - Schemas
   - Keys, constraints

3. SQL

   - SELECT
     - Joins
     - Order by
     - Grouping and aggregate functions

4. Database Design

   - Entity-relationship diagrams
   - Mapping to SQL schema

5. Relational Algebra

   - Project, select, rename
   - Cross product and joins
   - Self operations

6. Normalization

   - Functional dependencies and Boyce-Codd Normal Form
   - Multi-value dependencies and 4th Normal Form

7. Not On Midterm

   - DDL
   - UML

- Relational algebra "extensions"
  - DIVIDE, etc.
  - Grouping and aggregation
  - Outer joins
- 1NF-3NF
- Programming in Python and Java

8. 4NF Example

- instructor course_id hobby
  CPW CSCI 262 Gardening
  CPW CSCI 262 Sci Fi
  CPW CSCI 403 Gardening
  CPW CSCI 403 Sci Fi
- Instructor multi determines course_id

9. Theta Join

- Relation R, S
- R $\bowtie_{cond}$ S
- cond $= r_1 \theta s_1$ AND $r_2 \theta s_2$ AND ...
- θ is an operator from: $=, <>, <, >, \geq, leq$