COP4710 Spring 2021 Final Examination Materials

We will cover all the materials after the midterm examination that I discussed in the lecture videos. You need to study the class notes, homework, and projects. This is a close book examination. Calculator and handheld devices are not allowed. This exam is fully online using the Honorlock (https://honorlock.com/students/) proctored system. Please visit our Student Proctored Exam Instructions (http://online.fiu.edu/currentstudents/exams) webpage for important information concerning proctored exams.

Through Canvas the final will auto-submit when (1) the timer runs out OR (2) the closing date/time is reached, **whichever happens first**. For example, if the final has a closing time of 11:59pm but the student begins the exam at 11:54pm, the student will only have 5 minutes to complete the final.

The following are the chapters and topics to be covered in the examination. Examination questions include but not limit to: True/False questions, explain the definitions, compare the differences between different terms or concepts, write queries using Tuple Relational Calculus and Domain Relational Calculus, SQL queries, etc.

1. **Chapter 8: The TUPLE Relational Calculus and Domain Relational Calculus**
   a. Introduction to Relational Calculus
   b. Formal Specification of Tuple Relational Calculus
   c. Free and bound Tuple Variables
   d. Quantifiers in Formulas
   e. Transforming Universal and Existential Quantifiers
   f. Domain Relational Calculus

2. **Chapter 6: SQL – The Relational Database Standard**
   a. Data Definition in SQL
   b. Retrieval Queries in SQL
      i. Simple SQL Queries
      ii. Alias, * and DISTINCT, Unspecified WHERE-Clause
      iii. Set Operations, Nesting of Queries, Set Comparisons
      iv. The EXISTS function, NULLs, Explicit Sets
      v. Aggregate Functions and Grouping

3. **Chapter 14: Functional Dependencies and Normalization for Relational Databases**
   a. Informal Design Guidelines for Relational Databases
      i. Semantics of Relation Attributes
      ii. Redundant Information in Tuples and Update Anomalies
      iii. NULL Values in Tuples
   b. Functional Dependencies
      i. Functional Dependencies (FDs) definition
      ii. Inference Rules for FDs
   c. Normal Forms Based on Primary Keys
i. Introduction to Normalization
ii. First Normal Form (1NF)
iii. Second Normal Form (2NF)
iv. Third Normal Form (3NF)
v. BCNF (Boyce-Codd Normal Form)