

## **CS 336 – FINAL EXAM GUIDE**

### **FINAL EXAM FORMAT:**

1. Multiple choice section (less than 20% of the exam) which is cumulative but only includes concepts.
2. Problems (about 80% of the exam) topics only from this study guide. The problems will be written in multiple choice form, but you have to solve the problems to find the correct choice.

### **TOPICS:**

#### **1. Functional Dependencies**

- a) Definition of Functional dependency
- b) Definition of a Key and a Superkey

#### **2. Rules about fd's**

- a) Armstrong Axioms
- b) Split-combine rule.
- c) Closure of a set of attributes

#### **3. Normalization**

- a) Lossless and lossy decomposition
- b) Definition of 1NF, 2NF, 3NF, and BCNF
- c) Hierarchy of normal forms
- d) Finding the normal form of a given (R, F)
- e) BCNF decomposition
- f) Minimal cover
- g) 3NF decomposition
- h) Multivalued dependencies and redundancy
- i) 4NF

#### **4. Transaction Management**

- a) Interleaving (advantages/disadvantages)
- b) Transactions
- c) Schedules
- d) ACID properties
- e) Anomalies with interleaved execution (dirty read, unrepeatable read, ww conflict, and phantom read)
- f) Types of schedules: Serial, Equivalent, Serializable
- g) Lock based concurrency control (S-lock, X-lock)
- h) Isolation levels
- i) Write-Ahead-Logging (WAL) definition

**Book sections covered in the course:**

- 1.1 – 1.8
- 2.1 - 2.5
- 3.1 - 3.6
- 4.1 - 4.2
- 5.1 – 5.8
- 6.1 – 6.5 (project)
- 7.1 – 7.7 (project)
- 16.1 - 16.6
- 18.2 - 18.4
- 19.1 - 19.8