

## 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 must 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. Normal Forms
  - 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
4. Transaction Management
  - a) Definition of ACID properties
  - b) Types of schedules: Serial, Equivalent, Serializable
  - c) Anomalies with interleaved execution (dirty read, unrepeatable read, ww conflict, and phantom read)
  - d) Lock based concurrency control
  - e) Isolation levels
5. NoSQL databases (concepts)
  - a) Types of NoSQL databases
  - b) Key-value databases
  - c) Consistent Hashing
  - d) Dissemination
  - e) CAP theorem
  - f) BASE properties

**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
- 16.1 - 16.6
- 18.2 - 18.4
- 19.1 - 19.8