

CS166 Final Exam
Winter 2020

The CS166 final exam will be distributed online (open notes/books) via Gradescope. Here is the tentative information about the exam. If anything changes, I will let you know via CampusWire.

1. Final exam will be distributed via gradescope (you will receive an email) on [Thursday, March 19, 11:30 a.m. - 2:30 p.m.](#) during our normal final exam time. It will be a timed exam (2 hours), and once you begin the exam, you must submit it in one setting.

2. The final exam will contain questions of the following format:

- a. multiple-choice questions
- b. true-false questions
- c. text response questions
- d. (tentative) file/image submission (for example, draw a B+ tree in a word processor or on paper and submit it during the exam).

3. I will be online (via CampusWire) during the exam time, and hence if you have any questions or encounter any technical issues you can message me directly. If errors occur during the exam, take screenshots to share. Just in case, it is a good idea to have a local backup of answers in case your browser crashes (not very likely).

4. While you are allowed to use notes/book, I ask you not to share questions during the exam. The exam and final grades will be based on a curve, and hence you will skewing grades if you cheat in this fashion.

5. Topics Covered

- ER Diagram design
- Converting ER diagram to relational model
- Understanding of terminology like : primary key, foreign key, super key, candidate key, etc.
- Understanding of update, insert, or delete anomaly
- Understanding of advantages provided by a Database (ex. ACID properties:
Atomic - a transaction is either fully successful or rolled back if only partly

successful, Consistency - data must be in consistent state if multiple users are accessing the same data, Isolation - concurrent transactions generate same results as sequential transactions, durability - if database crashes, we don't lose data).

- SQL - be able to write a SQL query for a given set of relations (Most important)
- Relational Algebra - be able to write a query in relational algebra
- Understand the advantages of the various index structures we covered (which type of index is good for range queries??)
- Know how to insert into a B+ tree, linearHashing index, extensible Hashing index
- Know how to identify 1NF, 2NF, 3NF, and BCNF
- Know what is a prime vs non-prime attribute