

CS 3335
Final Exam
May 7, 2009
100 points

Name: _____

For questions 1 through 5, write an SQL query based on the Jokes tables used in class all semester.

1. Find all the names of the users. (1)

2. Find all the names of the users who live on 10th Street. (2)

3. Find all the names of users who have written a joke with a content of 'R'. (4)

4. For each joke with at least 10 ratings, find the jokeid and the average rating. (8)

5. Find the title of every movie with every joke with content 'G'. (16)

6. Give an example of a student entity with a primary key (called ssn) and a name attribute. (1)

7. Show the takes relationship between students and courses, with a grade attribute. (2)

8. Show a total and disjoint generalization of professors and students to people. Include ssn, name, office and gpa as appropriate attributes. (4)

9. Using the relation $R = (A, B, C, D, E)$, provide a set of functional dependencies such that the schema is in 3NF but not BCNF. Prove your answer is correct. (8)

10. Prove that any schema with two attributes either contains only trivial dependencies or is in 5NF. (16)

11. What problem does ORM solve? (1)

12. When does the k-means algorithm terminate? (2)

13. Define the 4 ACID properties. (4)

14. Assuming a B+-Tree node holds 4 pointers, show the resulting tree after inserting the values 5, 10, 15 and 20 into the tree. (8)

15. *Show all steps and explain all work!* Given the matrix below, what would be the standard recommender system prediction for user u on item i , using the 2-nn? The scale for the ratings is 1-5. (16)

User	Items			
	i	j	k	l
u		3	4	5
v	4		5	4
w	3	5		5
x	4	3	5	

16. Impress me. Write the hardest question (related to this course) that you could answer that is not on this exam, then answer it. This question will be graded both on the difficulty of the question and the quality of your answer. (7)