

Name:
State all assumptions necessary to answer the questions.

CS 487 Final
August 3, 2005

Using views to implement security is most similar to which of the following; a) discretionary access control, b) mandatory access control, or c) role based access control. Explain your choice and compare and contrast it with views.

Describe how optimistic concurrency control works and how it addresses the issues of deadlock and starvation.

What is a blind write and how does it affect serializability?

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Find a cover for the following set of dependencies with five or less dependencies. For each of the original dependencies show how to derive them from the cover and inference rules. All of the new dependencies should be in canonical form.

1. $ABC \rightarrow DE$	2. $A \rightarrow BD$
3. $AB \rightarrow ED$	4. $B \rightarrow D$
5. $AD \rightarrow E$	6. $C \rightarrow D$
7. $AC \rightarrow ACE$	8. $BD \rightarrow B$

Give an example of relations (tables) that are in 2^{nd} normal form, but is not in 3^{rd} normal form.

What does the term translucent database mean?

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What problem(s), if any, is there with the following schedule? The letter is the operation read/write, the left number is the transaction number, and the right number is the sequence number. Include a conflict graph.
S: $r_{1,1}:(X)$; $w_{1,2}:(Z)$; $r_{1,3}:(Y)$; $w_{2,1}:(X)$; $w_{1,4}:(X)$; $r_{3,1}:(Z)$; $r_{2,2}:(X)$; $w_{3,2}:(Z)$;

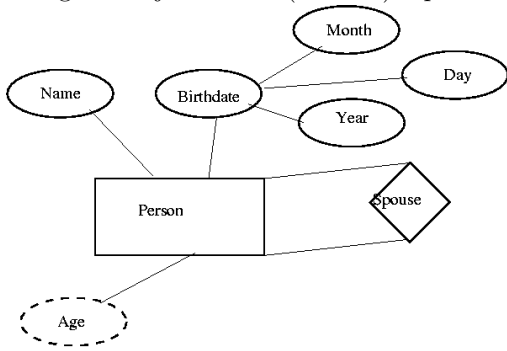
If the Timestamp Ordering protocol was being used, what would be the timestamp values associated with the variables X, Y, and Z after all of the previous operations have executed?

Describe a simple algorithm to create a serializable schedule when the database uses two-phase locking.

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Using the object model (ODMG) represent the following ER diagram.



Would the spouse be connected via ownership or reference semantics? Explain.

How are object identifiers for OO databases different from identifiers for relational databases?

Write a query to find couples who are both over the age of 70.

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Give an example ER diagram to illustrate the difference between weak entities, strong entities and attributes. Use the example to explain the differences.

Give examples of a safe and unsafe expression for relational calculus and describe why safe expressions are important.

What are the three different ways to map a superclass/subclass relationship in an EER diagram into the relational model (tables)?

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```
SELECT file
FROM file AS f JOIN person AS p USING (file)
      JOIN person AS q USING (file)
WHERE
  (SELECT count (*)
   FROM file JOIN person USING (file)
   WHERE file = f.file
   GROUP BY file) = 2 AND
  p.id <> q.id
```

What does the above query do?

Write the same query in domain calculus without using the count function.

Could you use the division operator to achieve the same result in relational algebra if two specific people were chosen? Explain.