

Name:  
Do your own work, state any assumptions necessary.

CS 687 Test 1  
February 4, 2003

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Draw an example of a weak entity, other than one given in class. Include all attributes necessary to uniquely identify the weak entity. Why is this a good example of a weak entity?

Explain whether the above weak entity could be represented with composite attributes.

What, if anything, does a partial participation constraint imply about the cardinality of the relationship?

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Suppose that a database has records of size 1000 bytes, of which 20 bytes represent the key. Assume a disk block has 522,488 bytes. Assume a pointer to a disk block occupies 30 bytes.

- a) Describe a secondary index for database.
- b) How many blocks would be required for the above secondary index if there were 10,000,000 records.
- c) Assume a tree pointer in a B+ tree of order 20 has a size of 10 bytes. Calculate the maximum size in bytes of an internal node.
- d) Is 20 a good size for the order of the B+ tree? Explain.

Suppose there is a database with 2,000,000 records of 1000 bytes each and that the dedicated machine the DBMS is running on has 3 terabytes of primary memory.

- a) How do these operating parameters affect the decision to create primary and secondary indexes?
- b) What change, if any, is there to the benefit that indices provide?

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Draw an example of a weak entity, other than one given in class. Include all attributes necessary to uniquely identify the weak entity. Why is this a good example of a weak entity?

Explain whether the above weak entity could be represented with composite attributes.

What, if anything, does a total participation constraint imply about the cardinality of the relationship?

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Suppose that a database has records of size 1000 bytes, of which 20 bytes represent the key. Assume a disk block has 542,288 bytes. Assume a pointer to a disk block occupies 30 bytes.

- a) Describe a secondary index for database.
- b) How many blocks would be required for the above secondary index if there were 10,000,000 records.
- c) Assume a tree pointer in a B+ tree of order 20 has a size of 10 bytes. Calculate the maximum size in bytes of an internal node.
- d) Is 20 a good size for the order of the B+ tree? Explain.

Suppose there is a database with 2,000,000 records of 1000 bytes each and that the dedicated machine the DBMS is running on has 3 terabytes of primary memory.

- a) How do these operating parameters affect the decision to create primary and secondary indexes?
- b) What change, if any, is there to the benefit that indices provide?