

EFREI – M1 – RDBMS – 2008-2009
Written Exam - 2nd session (2 hours)

Yann Thierry-Mieg – Yann.Thierry-Mieg@lip6.fr

April 10, 2009

All documents authorized.

1 General Questions (6/20)

Answers should be about one paragraph long.

1. How can one specify a user access policy in Oracle ? Give a brief list of the main commands you need to use.
2. Can a view be updated (i.e. write data into it) ? Why ?
3. What is the nature and purpose of a trigger ?
4. Which are the most costly relational algebra operators ? How do they map to SQL queries ?

2 Design (7/20)

We want to design a database to store data on a tennis competition. Each player participates in several matches. The information concerning a match consists in the planned date, the two opponents, and once it has been played, the effective start and end date, and the resulting winner. A match is composed of 1 to 3 games, each game is composed of several set, for each set we have the score of each participant. The order of both games within the match and sets within each game is important. A competition consists in a set of matches, where each match is associated to a stage in the competition, such as qualifications, quarter-final, final... All matches in the database correspond to a competition.

1. Design an E/R schema to represent this system.
2. Give the relational model obtained from the E/R schema of question 1 by application of translation rules.

3 SQL (8/20)

We consider the database LIBRARY of schema :

DOCUMENT (DID, DTITLE, DDATE)

AUTHOR (AID, ALNAME, ANAME)

WRITE (*DID*, *AID*)

COPY (CID, *DID*)

USER (UID, UNAME)

LOAN (LID, LSTART, LEND, *CID*, *UID*).

DID, AID, CID, UID and LID are unique identifiers. Primary keys are underlined. Italic fields are foreign keys; e.g. WRITE.DID is a foreign key to DOCUMENT. LOAN.LSTART and LOAN.LEND are dates that give the loan start and end date. LOAN.LEND is NULL when the copy has not been returned yet.

1. Give the number of documents in the database.
2. Give the number of copies of documents in the library (i.e. not currently loaned).
3. Give the number of documents available in the library (i.e. at least one copy not currently loaned).
4. Give the name of the most prolific author (most books written).
5. Give the name of authors of books which contain the word “database” in their title.
6. Give the title of all books in the library, sorted by popularity (i.e. number of loans of copies of this book). Present the result as a table (DTITLE, POPULARITY).
7. Give the list of loans which are late (not yet returned and more than 15 days since loan start date). Use the system date to answer.
8. Give the average, min and maximum number of authors per document in the database.
9. Give the list of documents for which each copy has been loaned at least once.
10. Give a table creation script for table LOAN, assume that ID are all fixed length 5 character strings.