Introduction to Databases (winter term 2005/2006)

Assignment 9

hand in on January 16, 2006 during the tutorial

The i5 team wishes you a happy and successful new year 2006!

**Task 9.1 (Updateable Views)** (1 Point)
Consider the implementation of a 1:n relation between two entities EntA and EntB in an relational database as defined by the following SQL statements:

```sql
CREATE TABLE EntA (AId INT PRIMARY KEY, A1 VARCHAR(100), A2 INT, A3 DECIMAL(5,2));
CREATE TABLE EntB (BId INT PRIMARY KEY, B1 INT, B2 VARCHAR(13), B3 DATE, RefToA INT,
FOREIGN KEY RefToA REFERENCES EntA);
```

Furthermore, we assume that the join between EntA and EntB has been defined as a view:

```sql
CREATE VIEW JoinV AS SELECT * FROM EntA, EntB WHERE AId = RefToA;
```

The statement `UPDATE JoinV SET A2 = B1` is not allowed, the statement `UPDATE JoinV SET B1 = A2` is executed on an Oracle DBMS without problems. Why? What would be the problem, if the first statement was possible?

**Task 9.2 (ODL and OQL)** (3 Points)

Given is the following ER diagram:

![ER Diagram](image)

The class of the hotel is between 1 and 5 stars, the capacity is measured by the number of beds, the category of a room can be 'single' or 'double'. The occupation of the maid can be 'full-time' or 'part-time'. To realize enumeration types, use the type constructor `enum {value1, value2, ...}`, e.g.:

attribute enum {male, female} gender.

a) Map the above ER schema to ODL classes including definitions of extents as entry points for the queries below. For one of the classes of your choice, include two appropriate methods declarations describing meaningful operations on the object data.
b) Specify in OQL the following queries on the basis of your object model:

- List the SSN, the name of and the email address of managers who work for a hotel with 3 stars.
- List the SSN and salary of all maids together with the average price of rooms they are responsible for.

Task 9.3 (Object-Relational Databases) (5 Points)
We consider the scenario of a small information system for a CD collection, which is illustrated by the following ER diagram:

Albums can contain up to 30 songs. A song is performed by arbitrarily many performers. It has a title and a length (given in seconds). An album is produced by a producer. Producer and performers are special persons.

a) Model the above scenario using Oracle’s object-relation model facilities by declaring appropriate types and tables to store the objects. For simplicity we do not consider methods in this task.

b) Create 3 producers and 5 performers and store them in your defined tables. Then compile 2 albums produced by some of the producers with songs performed by some of the performers.

c) Use Oracle’s syntax to formulate queries for the following information demands:

(a) Show the addresses of all producers who have produced an album of genre ‘Funk’.
(b) Show the names of all performers who played in songs of an album of genre ‘Funk’.
(c) Show the names of all performers who play the ‘Piano’.
(d) Show the cities and the styles of producers who made an album which contains songs performed by a Guitarist.

Task 9.4 (Mapping ER to ORDB) (2 Points)
Consider an n:m relationship between the entities Student and Lecture.

a) Map this conceptual model to an object model as presented in the lecture (slides 68ff) by giving appropriate CREATE TYPE declarations for an ORDBMS.

b) What alternative mapping of the relationship exists? Give the type declarations following this approach.

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1It makes sense to use attribute values that occur in the queries of subtask c. So you can use your data to test these queries.