Introduction to Databases (summer term 2007)

Assignment 10

hand in on July 2, 2007 during the tutorial

Please hand in your solutions in groups of up to 3 students.
Do not forget to write down your name and matriculation number on the solutions you hand in. Please also add your study course (e.g. Dipl.-Inf., Master SSE, ...).

Task 10.1 (ODL and OQL)  (3 Points)
Consider the UML diagram below. It models a database system that stores information about countries located on continents and their cities and lakes. The position of cities is given in longitude and latitude degrees.

![UML Diagram](image)

a) Formulate ODL class definitions that implement the UML model. Use struct-types where appropriate.

b) Formulate the following information demand in OQL:

List the names of all countries in Africa together with the summed size of the lakes that are connected to it and the number of inhabitants of its capital. The result should be returned as a a list of objects.

Task 10.2 (Mapping ER to ORDB)  (2 Points)
Consider an n:m relationship between the entities Student and Lecture.

![ER Diagram](image)

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.
Task 10.3 (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.\(^1\)

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.

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