Exercises on MMDB
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Exercise 8

Subject: Querying

Aufgabe 1: Difference between relational and object-relational databases

Outline the main differences between relational and object-relational database systems. Explain in particular the complexity of the used data structures, their indexing, the request predicates and the advantages and disadvantages of each type of system.

Aufgabe 2: Definitions

Explain the following notions related to object-relational databases and give examples for each notion (You can find more information on this topic at: `https://docs.oracle.com/database/121/ADOBJ/adobjint.htm#ADOBJ7025`):

- User-defined data type
- Inheritance
- Table of objects
- Polymorphism
- OID
- Relations between user-defined data types (1:n, 1:1)
- REF and DEREF
- Collections
- Dot-operator

Aufgabe 3: Content-based Image Search Using SQL/MM

The goal of this exercise is to develop a DB-application to manage a zoo. The DB must include information about animals, keepers and cages. Animals are characterized by a Name, Gender, Type, Age and an image. Keepers are are characterized by a Name and a Pass-photo. Cages are assigned a pitch, and at least 1 keeper.
The application offers the possibility to search for animals, based on SQL/MM features.

1. Sketch the entity–relationship model (ER model) for the given DB.
2. Write object-relational SQL statements to create the DB.
3. Write SQL/MM queries to content-based search for animals. (Query-by-Example).

Aufgabe 4: MPEG Query Format (MPQF)

Formulate the following natural language queries, into the corresponding MPQF queries. Consider the MPEG-7 standard data model as a starting point.

1. Search for images and their titles, which are similar to a presented example image, taken in Berlin, and not bigger than 2048K. Take the similarity criterion as the most important.

2. Search for images, which have in their northern part a house and their southern part a tree. Furthermore, the images must obey the following dominant color distribution (Red 30%, Green 50% and Blue 20%). The search must return only JEPG images, and 30 at the maximum. Results must sorted by the title, similarity reference, and the file size.