

Advanced Data Modeling

Summer Semester 2009

- Exercises I -

To be handed in before 2009-05-12, 23:59 via email to
bercovici@uni-koblenz.de **AND** dividino@unikoblenz.de
subject line: [ADM] ...

1. Model the following scenario using the logic schema of relational database.
List all relation schemata, including domains of the attributes.[2points]

Scenario: Photo management platform. Lets photoSharing be a platform for publishing and sharing your photo on internet (a simplistic version of Flickr), this platform has four main types of entities: photos, users, groups and tags. Each of these entities has several characteristics. Each photo has a name, tags, and belongs to a user (consider as the right holder). Each tag owns a label. Every user has a name and an e-mail address. Additionally, users are members of groups. Every group has a name and one administrator who is an user. Sub-groups are groups which are part of another groups.

2. Create an instance of your database schema, modeling the following world knowledge.[2points]

John, Thomas, Felix and Marie are users of PhotoSharing. The email of john is john@web.de. John is the administrator of the group "Koblenz in Summer" and "uni-Koblenz in Summer", this last group is a sub group of the first one. Marie is the administrator of the group "Summer" and Felix is the administrator of the group "Winter". The group "Koblenz in Summer" is part of the group "Summer". Thomas is member of the group "uni-Koblenz in Summer", and John and Marie are members of the group "Winter". Marie has one photo: "LastSummer.jpg". The photo "LastSummer.jpg" has tags "Summer 2008", and "Summer". The photo "LastWinter.jpg" which belongs to Felix, has tags "Winter" and "Winter 2009". The photo of Thomas "Koblenz.jpg" has tags "Summer 2008" and "Koblenz".

3. Formulate the following queries using relational algebra. Is it possible to model the queries using relational algebra? If not, why? If yes, list the results.[3points]
 - (a) List all members of group "Summer" which are also member of group "Winter"
 - (b) List all members which are not in the group "Winter"
 - (c) List all photos' tags from the members of the group "Winter"
 - (d) List **all** subgroups of the "Summer" group
4. How would you model the following integrity constraints (using first order logic, or using relational algebra queries, which select invalid entries)? List all tuples violating the constraints.[3points]
 - (a) No Person is a member and administrator of a group.
 - (b) Every group has at least two members.
 - (c) Every group has at most one administrator
 - (d) No group includes itself.
5. During the next tutorial, the Neon toolkit will be introduced. The Neon toolkit will be used for furthers assignments. Please download and install the NeOn toolkit in your laptop.

Download site: <http://www.neon-toolkit.org/>

If you have any problems, please contact us.