



## **Exercise Sheet 3: Data Modelling II (until Thursday, 10.11.2016) (33 points)**

**Please note:** you need **50%** of all exercise points to receive the *Studienleistung* for this lecture. In order to pass the RDB I Module, you need both the *Studienleistung* **and** you need to pass the exam. Exercises have to be turned in until **Thursday before the lecture** either in the lecture hall or into our mailbox (Informatikzentrum 2<sup>nd</sup> floor). Please do not forget your **Matrikelnummer** and your **tutorial group number** on your solutions. Your solutions may be in German or English. Unless otherwise specified: **Always use your own words!**

### **Exercise 3.1 (6 points)**

Decide whether the following statements are (1) always false, (2) always true, or (3) true in some cases but false in others. Please, explain your answers.

- a) The number of entities belonging to a superclass is always equal to the number of entities belonging to all subclasses.
- b) It is possible that a subclass entity type only inherits some of the attributes and constraints from its superclass entity type.
- c) If an entity is deleted from a superclass it can still be preserved in the respective subclasses.
- d) In a total and overlapping specialization no entities are members of a superclass without being members of any subclass, but each entity may be contained in more than one subclass.
- e) There is no difference between predicate-defined and attribute-defined specializations.
- f) A subclass has more attributes than its superclass.

### **Exercise 3.2 (3 points)**

Briefly explain in your own words:

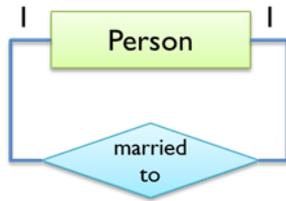
- Inheritance
- Subclass
- Union Type

### **Exercise 3.3 (2 points)**

"Animal" can be specialized into "horse" and "cow". Is this specialization **overlapping** or **disjoint**? Is it **total** or **partial**? Briefly explain your answer.

### Exercise 3.4 (2 points)

During the last lecture the following model was introduced:



How can it be modified such that nobody can marry himself or herself?

### Exercise 3.5 (10 points)

Model the following mini-world in EER.

In this world we have persons that work for a company. Each person has an identifying ID, a name, years of experience and number of projects they have participated. A person with more than 10 years of experience is considered a top employee. Each top employee is either a project manager candidate, if it has participated in more than 100 projects, or a reliable employee otherwise. Each person works in at least one department which is identified by its address, consisting of country, street and zip code. A department also has a number of private offices. A department might however be manager oriented or employee oriented (or both, if a project manager candidate and a reliable employee work in the same department). A manager oriented department always has a number of coffee machines and relaxing shared spaces. An employee oriented department always contains a kitchen. A project manager candidate always works in at least one manager oriented department and in a manager oriented department always work at least one project manager candidate. The same goes for reliable employees and employee oriented departments.

### Exercise 3.6 (10 points)

Model the following mini-world in EER. You are allowed to write the constraints that cannot be modeled with EER.

You have to model a simplified representation of the NBA (National Basketball Association) tournament for the season 2016-2017. There are teams identified by the name of the city that owns the team and an alias. Each team has a number of players with different positions. A team can have 2-3 Forwards, 3 Centers and 2-3 Guards. A player can only played in one position. Each player is identified by an id. Moreover, for each player his name, age, number of games played in the league, the average points per game and his country of origin are stored. In addition, for Centers the number of blocks and rebounds are stored. For Guards the number of assistances and the number of 3-points are stored. A game takes place in a stadium at a specific date. Each stadium is identified by its name, is located in a city and has a certain capacity. Furthermore, it has a number of seats, identified by a block, row-number and seat-number. The capacity has to be equal to the number seats in the stadium.