



## **Exercise Sheet 3: Data Modeling 2 (until Thursday 17.11.2011)**

Please note that you need **50%** of all exercise points to receive the “Studienleistung”. Exercises have to be turned in until **Thursday** of each respective week and must be completed in teams of two students each. You may hand in your solutions either on paper **before the lecture** or into the mailbox at the IFIS floor (Mühlenpfordtstraße 23, 2nd floor). Please do not forget your “Matrikelnummer” and your tutorial group number on your solutions. Your solutions may be in German or English. Please note: To pass the “RDB I Modul” you need the exercise points and the exam!

### **Exercise 3.1 (5 points)**

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

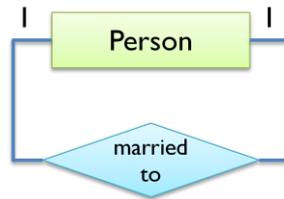
### **Exercise 3.2 (10 points)**

Draw an ER diagram (Chen) for the following scenario. Remember to use the extended ER concepts if necessary. Write down all constraints that cannot be modeled in ER in text form.

You have to model a soccer database for the European Championship 2012. There are teams that are identified by their country. Each team consists of a number of players having different positions. A team can have 2-3 goalies, 8-9 defence, 8-9 midfield and 4-5 offence players. A player is only allowed to have exactly one position. Each player is identified by its player-pass-id (ppid). Furthermore, for each player its name, birthday, age, several telephone numbers (mobile, home, ...), number of games he played for his country, and the club he is currently playing for is stored. In addition, for goalies also the number of shutouts and the total number of goals against them are stored. Each team participates in a game, identified by an id and having a score. 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. Of course, the capacity has to be equal to the number seats in the stadium.

### Exercise 3.3 (3 points)

During the last lecture the following model was introduced:



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