Exercise Sheet 2: Data Modeling

(until Thursday 01.11.2012)

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 to write your "Matrikelnummer" and your tutorial group number on your solutions. Your solutions may be in German or English. Please note: To pass the "RDB 1 Modul" you need both the exercise points and the exam!

Exercise 2.1 (5 points)

Please explain in your own words:

   a) Explain the three layers of the ANSI-SPARC Architecture. (3 points)
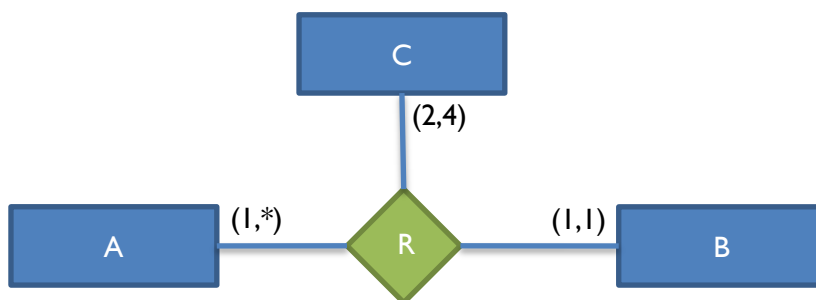   b) Briefly explain the concepts of physical - and logical data independence. (2 points)

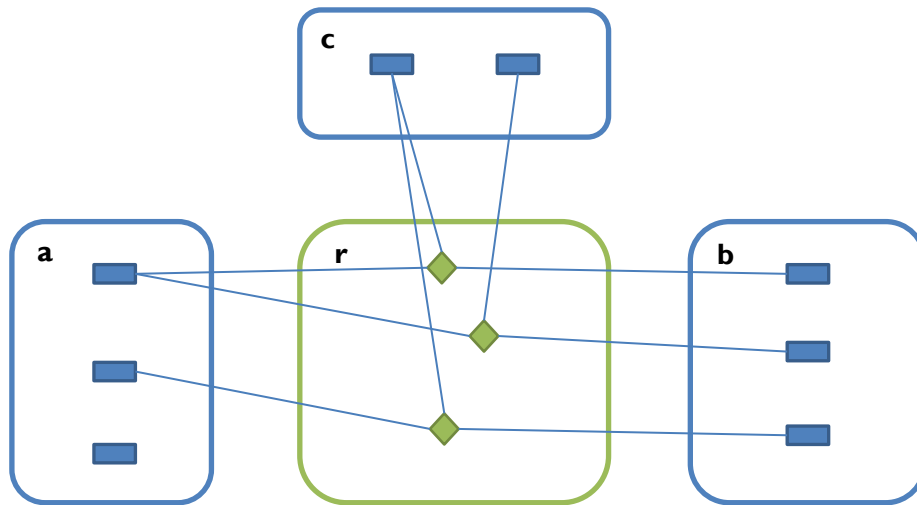## Exercise 2.2 (7 points)

Please explain in your own words:

   a) What is the difference between an entity and an entity type? Please give an example. (1 point)
   b) What is a derived attribute? Please give an example. (1 point)
   c) Briefly explain the following terms: (3 points)
      - relationship type
      - relationship
      - relationship set
   d) What are key attributes? Why do we need them? (2 points)

Exercise 2.3 (4 points)

Given the following ER-Diagram:

Is the relationship set **r** described in the following figure a valid instance of the relationship type **R**? If not, list all conflicts that violate the constraints described in the ER-Diagram above and provide an adaptation of **r** that would make **r** a valid instance of **R**.

Exercise 2.4 (3 points)

Draw a Chen ER-Diagram for the following entity type:

Student = (<u>matno</u>, name, (address(street, no, zip, city)), {telephone(prefno, no)})

Exercise 2.5 (6 points)

Create an ER diagram (Chen) for the following scenario:

You are organizing an exhibition. There are a number of halls identified by a unique number. Additionally each hall has a name. In each hall there are several stands described by a number which is only unique within the hall. Stands are rent by Companies. Companies are identified by the company's name. Besides the stands there are special rooms for presentations identified by a number. Companies may register a presentation in a fixed time slot. Time slots do not change during the exhibition and are identified by a start time and an end time.