Database Concepts (Summer Term 2018)
Exercise 4

1. Use SQL to create a relation for football players! Football players have a first and a last name, a birth date, a shirt number and a position, where they are playing. The position is restricted to following values: Goalkeeper, defence, forwards and midfield. Prepare two different solutions to check the value domain of the position attribute.

2. Your task is to design a database about software products. Every software product has a name, a version number, a price and is created by a software company. It must be possible to store different versions of a software product. Additionally, some software products require other software products to run (e.g., Oracle8i requires Java). Thereby, a software product can be required by more than one other software product or not at all.

Prepare an entity-relationship schema of the requested database about software products!

3. The government needs a database about universities and their faculties. A university has a unique name, an address and a number of enrolled students. Moreover, every university has at least two faculties. Thereby, faculties belong to exactly one university. Within one university, faculties are uniquely identified by their name. That means, faculties of different universities can have the same name. Additionally, for every faculty the name of the faculty's head must be stored.

Prepare an entity-relationship schema of the requested database about universities!

4. Your software company wants to sell an application for universities to manage students and their exercise results. Your task is to prepare an entity-relationship schema describing the required database. Thereby, you must define all key attributes and cardinalities. Moreover, you should provide additional information if necessary. Following list contains the initial requirements:

   (a) Following information must be stored about students: name, student ID, semester address including phone number, home address including phone number, birth date and gender. Moreover, a student is enrolled in a specific faculty and studies in certain semester. If known, the currently targeted graduation should be stored.
(b) Following information about faculties must be stored: name, ID, secretary and phone number.

5. The requirements analysis team just finished the requirements analysis to store student’s exercise results. Here are the requirements:

(a) The database must store courses. Every course has a name, a description, a course number, credit points and a difficulty level. Thereby, every course is offered by a specific faculty. Course numbers are unique.

(b) Courses can offer exercises. Besides the related course, for every exercise, the term and year, when it is offered, must be stored. Additionally, the exercise instructor and exercise number must be stored. Thereby, the exercise number is unique for all exercises that are offered in the same term and year. Exercises within one term and year are numbered consecutively starting with 1, 2, 3, ... up to the number of offered exercise classes.

(c) In the end of the course, students’ exercise results are stored. Therefore, the student, the attended exercise and the achieved grade must be stored.

Good Luck!