Martin Przyjaciel-Zablocki

Christian Schindelhauer

Peter Thiemann

February 6. 2017

Anas Alzoghbi

Exercise Sheet No. 5, Database

Energy Informatics

Winter 2016

Submission deadline: 07.02.2017, at 11:15 a.m.

Classroom Exercises

Exercise 1: Software Installation

In database exercises you will work on an Oracle database installed in one of the university's servers. In order to access this database we will use *Oracle SQL Developer* as a graphical interface to Oracle database. It will enable you to connect to Oracle server, post SQL queries to the server and get the results back.

- Get *Oracle SQL Developer* from one of the links provided in the lecture's web page under Installers. After downloading the suitable version, extract its content to the desired installation directory in your laptop[1].
- After the first run of *Oracle SQL Developer*, you need to establish a new database connection: File→New...→General→Connection→Database Connection. Get connection settings from your tutor
- You can find a guidance for using *Oracle SQL Developer* in the online documentation at: http://tinyurl.com/jkwcewk

Exercise 2: Overview of the database

In this course you will use *power_consumption* database, a database that contains an automatically generated data about households power consumption in different german cities. The following commands give you an overview of the course database. Run them in *Oracle SQL Developer* to explore the *power_consumption* database:

- To get all database tables:

  ```
  select table_name from user_tables;
  ```

- To describe a table:

  ```
  desc city;
  desc building;
  desc houshold;
  desc reading;
  ```

---

[1]If you wish to switch to the English interface, edit the file: sqldeveloper/sqldeveloper/bin/sqldeveloper.conf, add the following in a new line: AddVMOption -Duser.language=en

Exercise 3: Let's try SQL!

- Careate a new table "Lecture" with the following columns:*LectureID*, *Name*, *MaxStudents*, *level*. Choose suitable data types for the columns.
- Find the suitable column to be set as a primary key
- Delete the created table using the command: *drop table table_name;*
- Run the SQL queries from slides 17 and 18 from the lecture slides.

Graded Exercises (Submit your solution):

Exercise 4: (6 pts)
Given the following ER-Model for managing company's vehicles (Attributes were removed for simplicity):
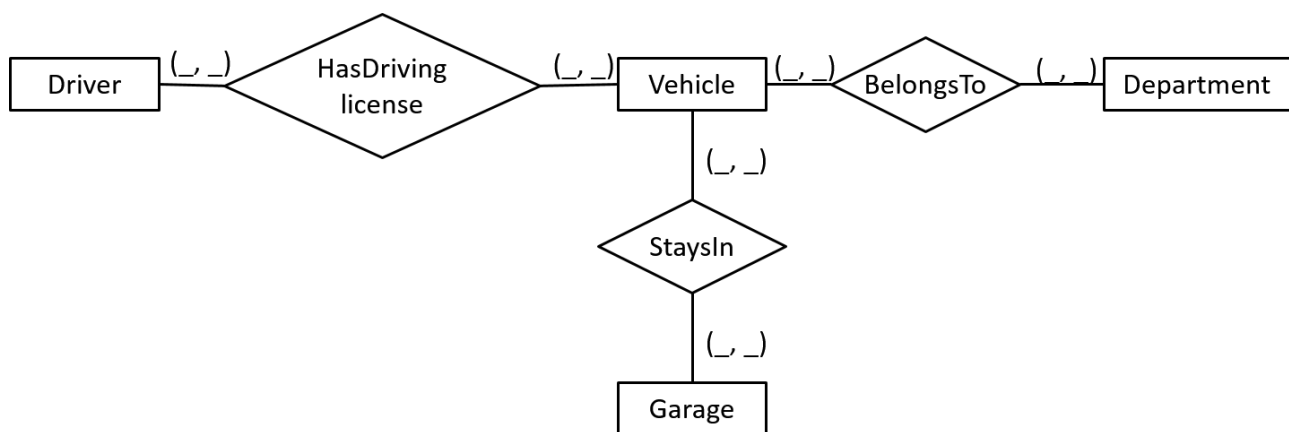
Give the cardinalities considering the following rules (There is no other constraints):

- Each vehicle belongs to one department at most, whereas each department has at least one vehicle.
- Only one vehicle fits in a garage.
- Almost all vehicles have a specific garage. All of the garages are occupied.
- For each vehicle there should be at least three persons with a suitable driving license.

Exercise 5: (4 pts)
Using *power_consumption* database, write SQL queries that find:

- All fuel types appear in the database.
- All readings information (fuel type, reading date, reading value) of cities with population less than 50000.