12 Database Programming

12.1 JDBC – Databaseaccess via java

Installation of the JDBC driver

Download the database driver mysql-connector-java-5.1.30-bin.jar from the course homepage[1]. Copy the file to an arbitrary folder on your computer.

For each project that requires this database driver, open menu "project/properties" in Eclipse. Choose "Java Build Path". Go to "Libraries" and select "Add External JARs", then choose the jar file you just downloaded. Now the JDBC driver is accessible from within the project.

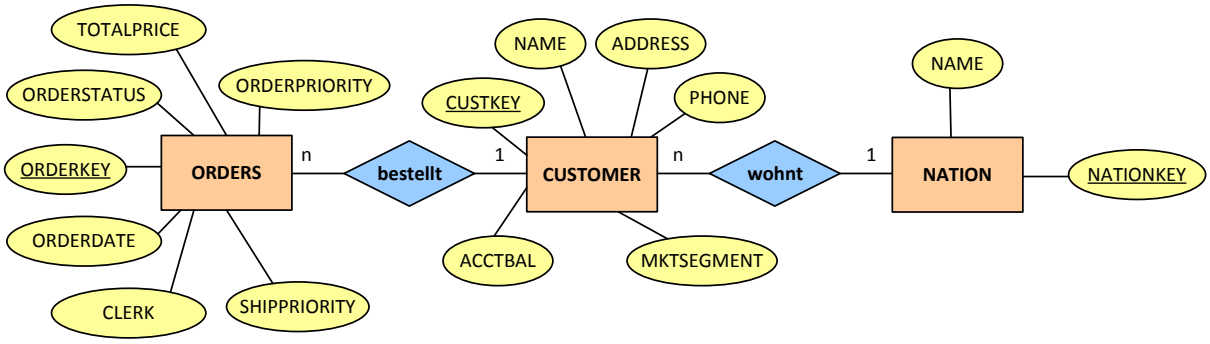
If you have installed the driver successfully, then the following code

```
1    try{
2        Class.forName("com.mysql.jdbc.Driver");
3    } catch (ClassNotFoundException e) {
4        e.printStackTrace();
5    }
```

should run without raising an exception. You may use the code from the lecture, which is as always available on the course homepage, as template for your exercise.

Query

We consider the schema from exercise 10.3.2:



and the following Query

"What is the name of the coutry for which the overal value of non-delivered orders is maximal?"

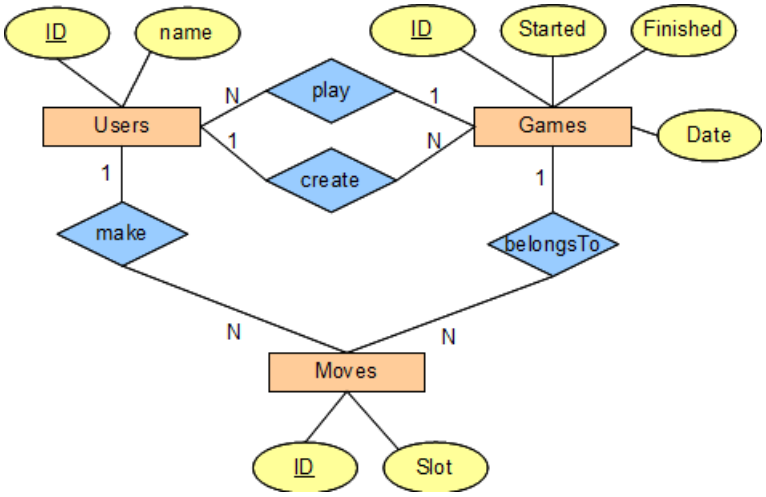
Implement this query in Java using the MySQL database server that you have setup in Exercise 10.3. The connection to the database server should be provided via the JDBC interface. The result should appear on the console!

[1] Alternative: download driver from `http://dev.mysql.com/downloads/connector/j/` ("Platform Independent") and extract from the (tar or zip) file the respective database driver jar-File

12.2 Four in a Row

This assignment is about shared database access by several users. We have implemented a game ("four in a row") in Java. This game uses a database that we have setup initially. It is conceptually possible for an arbitrary number of players to play at same time in groups of maximally 8 players.

The following schema models the relationships in the game:



(a) Following the rules provided in the course, construct a relational model to the given schema.

(b) Download the java project of the game from the course homepage. It should be possible to compile the project, start the game and get access to the database. However, you can *not yet* really play the game.

(c) Understand the general idea of the implementation of the game by drawing a class diagram of the java program four in a row. Hint: each file of the project contains one separate class.

(d) Insert the required SQL statements in the class DataBase.java. We have marked each position where such a statement occurs in the project with a "STUDENT" comment. In addition, we have formulated the respective statements in natural language (German). We refer to local Java variables or parameters within such statements using angle brackets, i.e. as in <gameId>. The following collection of such statements may provide an initial impression:

a) `Query: Zeilen der Tabelle Users mit Name=<name>`

b) `Einfuegen: neue Zeile (Started, Finished, Creater) in Tabelle Games mit Werten ("0", "0", <userId>)`

c) `Update: Spalte GameID neuer Wert <gameID> in Tabelle Users der Zeilen mit ID = <userID>`

Hints:

- In MySQL "0" and "1" stand for boolean values `true` and `false` of Java.
- Values have to be provided in MySQL using double quotes ".
- In order to provide MySQL-Strings in Java-Strings, the double quotes have to be *esacped* in Java Strings using a backslash, i.e. use \" instead of ".

(e) Play the game against each other. Have fun!