Web-based SQL-Teaching

Markus Siepermann

Technische Universität Dortmund (Germany)
markus.siepermann@tu-dortmund.de

Abstract

SQL is the still the number one database language that is used in enterprises as well as in university teaching. As a kind of programming language, SQL cannot only be taught with paper and pencil but it is evident to use computers. Students have to make experiences with a real data base in order to understand how they work. When teaching SQL the main problem is that students may "get lost" in the data base: They can destroy the underlying data base scheme or delete too many data sets. Then, case studies or exercises that build upon each other cannot be solved correctly or students cannot verify if they solved the exercises correctly because they work on a modified data base that is different to the one that is assumed when creating the exercises and computing the reference output of SQL queries. Besides, if students work on the same data base one student can influence or destroy the work that was done by another student. Thus, the learning progress of a student can be negatively affected not only by himself or herself but by other students.

In order to solve this solution, an e-learning system for teaching SQL was realised. This SQL system provides a data base environment to each single student that is separated from other students and cannot be influenced by others. There, students can build their own "private" data base with which they can work during the courses. In order to be able to provide case studies and consecutive exercises predefined databases and schemes are provided so that students can always return to a standardised data base state.

As the e-learning system is web based, the usage is not restricted to courses. It can also be used by students at home or whereever and whenever they have access to the internet and want to practice. It is accompanied by exercises that explain the usage and functionality of a data base step by step. During this learning process, there are different milestones like data base schemes and/or data sets. These milestones are provided by the system so that it is not necessary to always start from the beginning. If students are already experienced in SQL they can start at a predefined milestone and continue their learning process.

The SQL system is used since several years during lectures in bachelor as well as in master courses. We analysed the usefulness of the system concerning the learning progress of students. In both courses (bachelor and master), the use of the system has clearly led to a better understanding of SQL.