SQL Island: An Adventure Game to Learn the Database Language SQL

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=== SQL Island ===

Imagine, you are marooned on an island. The inhabitants only understand the database language SQL. The adventure game SQL Island (http://www.sql-island.de) is controlled through sending SQL queries which teach the fundamentals of the language in an entertaining and funny way. The player learns how to search and manipulate data in a relational database. Prior knowledge of the SQL language is not required.

Our goal was to develop a new type of educational games, namely a combination of classic programming tutorials and text-adventure games. Tutorials include both the matter of study as well as a subsequent quiz. In text-adventure games, the user controls a fictional character by using text commands in order to achieve a certain goal. A typical command in said text-adventure games would be for example: "Collect the ring". In SQL Island, the user would enter: “UPDATE item SET owner = 20 WHERE item = ‘ring’”.

In the beginning of the game, the player is marooned on an island and encounters the people there. Luckily they are in the company of a pilot who could help you escape but he is being held captive. The player's task is to earn money, sell items and buy a sword which will help him to free the pilot from the fetters of the kidnapper.

The system presents the very first SQL queries to help the player find their way around the island. Following this, they are asked to apply their knowledge in other queries in order to solve different problems and answer questions. The complexity of the SQL language increases logically and inevitably must be incorporated to progress and to finally reach the end goal. The game, consisting of 30 levels roughly, can be finished in about an hour and will train the player in the basics of SQL.

=== Target ===

SQL Island is mainly addressed to university students and shall help them apply concepts as taught in database lectures and is certainly suited for their exam preparation. However, it was designed especially for computer-science introducing courses in schools. We consider writing SQL queries a good method to teach children how to command a machine, focusing on the accuracy and precision of the input which is applicable to all programming languages.

It only stands to reason that the approach of combining tutorials with text-adventures can be adapted to other scientific areas as well, e.g. other programming languages or mathematics. SQL Island proves to be motivating, effective and efficient: After just one hour of playing the game, the student has a better knowledge of SQL than after studying a book in the same time. This is because they are confronted with writing queries on their own from the very beginning . Making progress in the game is consistent with the learning progress of the student and keeps them motivated.

=== Related Work ===

With SQL Island, we wanted to put motivation, fun and action in the learning process. It is supported by the fact that nearly every school and university student uses a notebook, tablet or smartphone and in the last few years these technologies are more and more used in lectures. Massive Open Online Courses (MOOCs) [1] are online lectures which usually consist of videos and exercises. These exercises

can be in form of exercise sheets which have to be solved and submitted online, or in form of a quiz or a game.

Many universities use interactive SQL learning tools for trying out SQL queries. Usually they are browser-based, so students can check at home if their solution to an exercise leads to the correct result. Two examples for those tools from universities in Germany are edb [3] (FH Köln) and SQLcoach [4] (FH Zweibrücken). Additionally to that, we shortly want to present SQL Fiddle and mySQLgame. SQL Fiddle allows to create arbitrary relational tables and to insert data into them. After that, one can try out SQL queries. The mySQLgame is a multi-player browser game in which each player owns one row in a table. The columns contain the amount of money, resources and military units and the user can execute predefined SQL queries to attack other rows. Both for SQL Fiddle and mySQLgame, prior knowledge is needed and there is no story.

A browser-based tutorial “Try jQuery” [5] doesn't require prior knowledge. The user learns how to use the Javascript Framework jQuery and he or she has to solve exercises interactively. The tutorial consists of aspects which are known from games, namely levels and a points system.

In [6], seven classes of educational games are presented: Trainers, simulations, trainers with story and fun elements, quiz, virtual worlds, adventures and learning without being aware of. The latter class is not usable for teaching SQL. SQL Island is based on text-adventures [2], a genre of computer games from the seventies. We developed an adventure game because it's something completely new for learning SQL and it is fun due to the story.

=== References ===

[1] Pappano, Laura: The year of the MOOC, 2012, The New York Times

[2] German Wikipedia: Adventure, 07.08.2013

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[5] Learn the basic building blocks of jQuery, 2013, try.jquery.com

[6] Meier, Christoph and Seufert, Sabine: Game-based learning: Erfahrungen mit und Perspektiven für digitale Lernspiele in der beruflichen Bildung, 2003, Grundlagen der Weiterbildung. Praxishilfen. Neuwied, Kriftel, Berlin