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Abstract

WebSQL is an interactive Internet tool for teaching Structured Query Language (SQL). It can be accessed from a Web Server running at the University of Minnesota or downloaded and installed on a Web Server at any accredited educational institution. It facilitates the learning of SQL by providing an interface to major database management systems for query execution on the web. The accompanying interactive SQL tutorial allows students to invoke the WebSQL query interface and dynamically modify and execute any example query.

Introduction

WebSQL (www.websql.org) is an interactive Internet tool for teaching Structured Query Language (SQL). It can be accessed from a Web Server running at the University of Minnesota or downloaded and installed on a Web Server at any accredited educational institution. The installation at the University of Minnesota provides real time access to a number of different databases implemented in a number of different database management systems (DBMSs), including Oracle 8, MS SQL Server 7, Interbase 5, and MS Access 2000.

This technology demonstration will have three parts. First, the basic functionality of WebSQL will be demonstrated. Second, the process of configuring WebSQL and setting up accounts for use from the University of Minnesota web site will be demonstrated. Third, the process of downloading and installing the system for local use (including an ANSI SQL'92 compliant database engine) will be shown. This session is intended to teach professors all they need to know to begin using WebSQL as an instructional tool.

WebSQL

WebSQL allows students using an Internet browser to connect to major, client/server database engines to formulate and dynamically execute SQL queries in real time. The interface provides a means to restrict the amount of data that are returned to the browser, making it ideal for students using a dial-up connection. Since WebSQL does not interpret the query (instead, it simply passes the query to the target database management system), students have access to all of the functionality that is implemented by the currently connected database management system. Along with displaying the results of queries, WebSQL provides a means for users to download the results of any query in one of many available delimited-text formats for further analysis and presentation.

One of the great advantages of WebSQL (especially to smaller schools) is that it can allow professors to teach SQL using rich sets of data without the associated problems of installing and maintaining a client/server database management system. When using WebSQL from the University of Minnesota, several databases are available for students to explore and for professors to use as the basis for homework assignments. Creating meaningful homework assignments easy with access to databases ranging from topics such as recipes and nutrition, to all complaints about automobiles ever filed with the National Highway Traffic Safety Administration.

When professors decide to download WebSQL and run it locally for their students, they can also download an ANSI SQL'92 compliant, client/server relational database management engine at no charge. This approach allows a professor to be in more complete control of the system, making available any database desired.
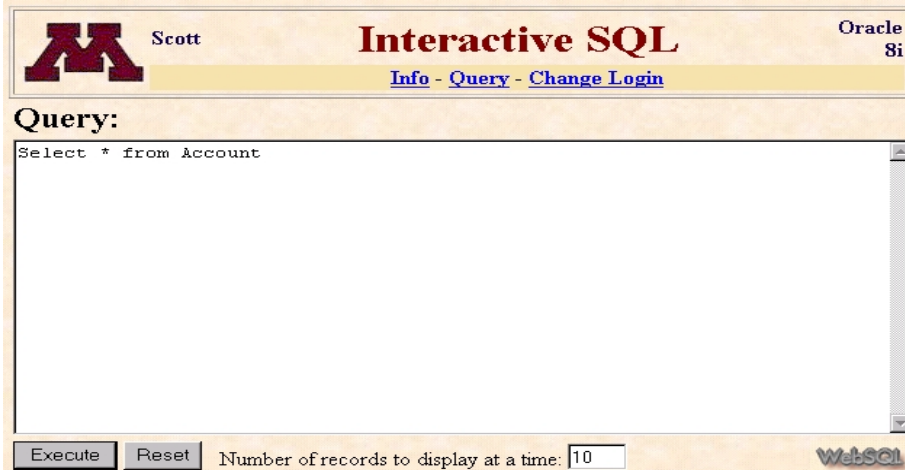

Figure 1: Database Connection

Figure 2: Query Specification

There are two steps necessary to access a database using WebSQL, connecting to the desired database and specifying the query. Students connect to the desired database by selecting from a list of available databases and supplying the proper username and password for the selected database. The WebSQL login page is shown in Figure 1.   Once a connection is established, a blank screen is displayed in which the user can specify a query as seen in figure 2. Since WebSQL passes the query on to the connected database, the only constraints placed on which queries can be executed are those imposed by the database engine itself. Upon execution of the query, the specified number of records from the response set are returned to the browser and the page is rendered and displayed as illustrated in figure 3.

Once a query has executed successfully, users can download the result set in one of several delimited formats by following the "Save Results" link as seen at the bottom of figure 3. This allows students to import the results of their query into another program for further analysis and presentation (a feature not implemented by most interactive SQL tools).

WebSQL comes with an interactive Structured Query Language tutorial which gives student the chance to practice what they are learning about SQL immediately by following links which directly invoke the WebSQL interface for a particular query. The tutorial uses a large database (more than 500 megabytes, consisting of several tables which have hundreds of thousands of records) so that students can get a sense of the power that today's database management systems

Figure 3: Query Results

2184