A Java Environment For A Semantic Query Interface for Relational Databases

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Introduction

As advances in computer technology allow for the efficient storage of information in databases, equally efficient methods for extracting this data become necessary. Database querying is commonly performed using SQL. SQL queries often become long and complicated as the size of the database increases and the relationships grow in number and complexity. Additionally, writing SQL queries requires a significant knowledge of the database structure. Unity **[1]** is a system for semantic querying that simplifies query formulation compared to SQL. It uses dictionary terms instead of database structure to build SQL queries. This allows users to generate relatively complex SQL queries with minimal knowledge of database concepts, such as relationships, or even SQL itself. The application was written using Microsoft's MFC library and ODBC, and is thus limited in the number of platforms for which it is available. It is necessary to implement Unity using a more universal framework. This project is focused on developing a Java Graphical User Interface (GUI) for the Unity application that will eventually be entirely ported to a Java environment.

Hypothesis/Goals

Using various database tools, it will be possible to create a system similar to Unity, but implemented in Java. A Java implementation will enable universal access to a program that automates data source integration, thereby transparently generating queries to relational data sources without user knowledge of such concepts.

Methods

The Java Applet will most likely be written either in Microsoft Visual J++ or in a standard text editor and compiled using Sun's Java Toolkit for Linux. MySQL will be used for database management and will be accessed using mm.mysql, which enables JDBC access to MySQL databases. PHP may be necessary for some aspects of the web-based environment. The Applet will be hosted on an Apache server on a Linux box running Red Hat 7.3. The intention is to first create a prototype that mimics the Unity GUI and has database access. At that point, the advanced Unity features will begin to be ported from C++ to Java and implemented in the Java Applet.

Bibliography

1 Lawrence, Ramon and Barker, Ken. "Querying Relational Databases without Explicit Joins". *International Workshop on Data Semantics in Web Information Systems*, 2001.

2 Lawrence, Ramon and Barker, Ken. "Integrating Relational Database Schemas Using a Standardized Dictionary." *16th ACM Symposium on Applied Computing,* March 11-14, 2001, pages 225-230.

3 Lawrence, Ramon and Barker, Ken. "Using Unity to Semi-Automatically Integrate Relational Schema" *Demonstration at ICDE 2002 – 18th International Conference on Data Engineering*. February 26-March 1, 2002, San Jose, California, pages 329-330.