Jourieh Hage
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Foundations of Databases & SQL Programming
Assignment 06
https://github.com/J-Hage/DBFoundations

Views, Functions, and Stored Procedures

Introduction

In this paper we will learn about what a SQL (Sequence Query Language) VIEW is and when we would use it. In addition, we will look at the differences and similarities between VIEWS, FUNCTIONS, and STORED PROCEDURES.

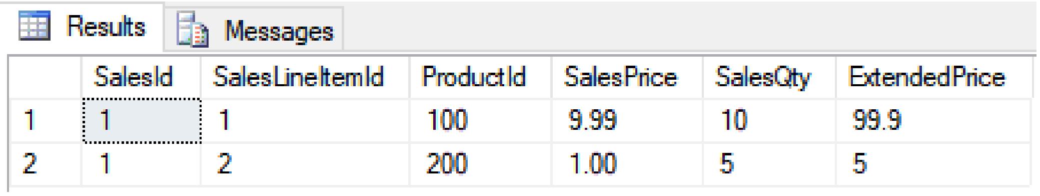
Views

A VIEW in SQL is a saved SELECT statement in the database. VIEWS are not a stored set of data in the database, but instead a virtual table which references the data present in tables. Depending on the type of VIEW created, VIEWS can be written to pull from multiple tables or from one table. A *base view* is an exact clone of one table. The best practice in the industry is to create a base view for every table, restrict access to the tables, and allow users only access to the VIEWS. Another type of VIEW is a *reporting view,* which is used when running a query of specific data.

VIEWS are used in SQL for a variety of reasons including simplifying, customizing, restricting permissions, and summarizing data. First, VIEWS take complex coding and simplify it into a format that works for specific users. Secondly, VIEWS can be customized so the data is organized specifically to what the user finds instinctive. Thirdly, VIEWS provide protection to our data integrity by allowing users only access to data through the VIEWS and restricting access to the tables. Fourthly, VIEWS can also be used to split the data either vertically or horizontally, allowing us to pull only certain data, thus speeding up the query and improving performance. Finally, VIEWS enable us to condense data into a summary report.

Functions

In SQL, we can create custom functions known as *User Defined Functions (UDFs)*. Similar to VIEWS, UDFs can be saved in the database and UDFs help with performance by allowing for faster execution. A difference between VIEWS and UDFs is that a UDF can accept parameters and can complete complex calculations, returning only the values in the report. As shown in Figure 1: UDF, we are using a function of multiplying ‘SalesPrice’ by ‘SalesQty’ to return the values in ‘ExtendedPrice’.



	SalesId	SalesLineItemId	ProductId	SalesPrice	SalesQty	ExtendedPrice
1	1	1	100	9.99	10	99.9
2	1	2	200	1.00	5	5

Figure 1: UDF

Creating Views Functions and Stored Procedures by Randal Root (Link to External Site)

Stored Procedures

Another component of SQL is STORED PROCEDURES. Similar to both VIEWS and UDFs, STORED PROCEDURES are a set of named SQL statements saved in the database. Additionally, similar only to UDFs, STORED PROCEDURES can set parameters. However, STORED PROCEDURES can have both input and output parameters, whereas UDFs can only have input parameters. Unlike VIEWS and UDFs, STORED PROCEDURES are a batch of code that is compiled once, saved to the database, and then executed.

Summary

In summary, VIEWS, UDFs, and STORED PROCEDURES are all helpful tools in SQL. All three will save SQL statements in the database that can be called on throughout programming. VIEWS are virtual tables that provide simplicity, security, and improved performance for the user. UDFs are customized functions that can have parameters which will return a single value or a table of results. STORED PROCEDURES are saved batches of code that can be executed. STORED PROCEDURES can have both input and output parameters that will determine which results, if any, are returned.

References

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