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Assignment 06: Views, Functions & Stored Procedures

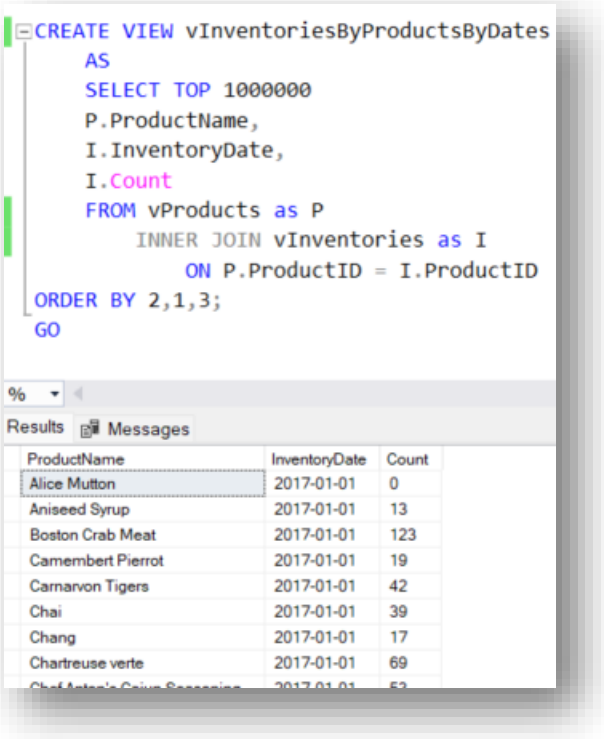
Introduction

Module 6 focuses on three SQL tools that can be used for managing and manipulating data. These are views, functions, and stored procedures. This paper will explain and compare the use of each.

SQL Views

SQL Views can be used for multiple scenarios. This includes when a user needs to simplify complex queries, secure data by restricting access, or show and summarize data in a specific format without changing the associated tables. Views can be thought of as virtual tables created by a query. Moreover, they can encapsulate joins, subqueries, and calculations. Views are helpful for presenting a consistent interface when the database schema changes. Additionally, they make it easier to reuse complex queries.

A simple example:



Comparing Views, Functions, and Stored Procedures

Similarities

Views, functions, and stored procedures have a few functionality similarities. To start, they are all database objects that help manage and manipulate data. All can encapsulate SQL queries, which allows both simplification of more complex operations and code reuse. Or more simply, they can make it easier to manage and update data by keeping more lengthy and complicated SQL code in one place. Additionally, each of these objects can make a database more secure by restricting direct access to the data and can apply business logic (e.g. rules or conditions) for how the data is used.

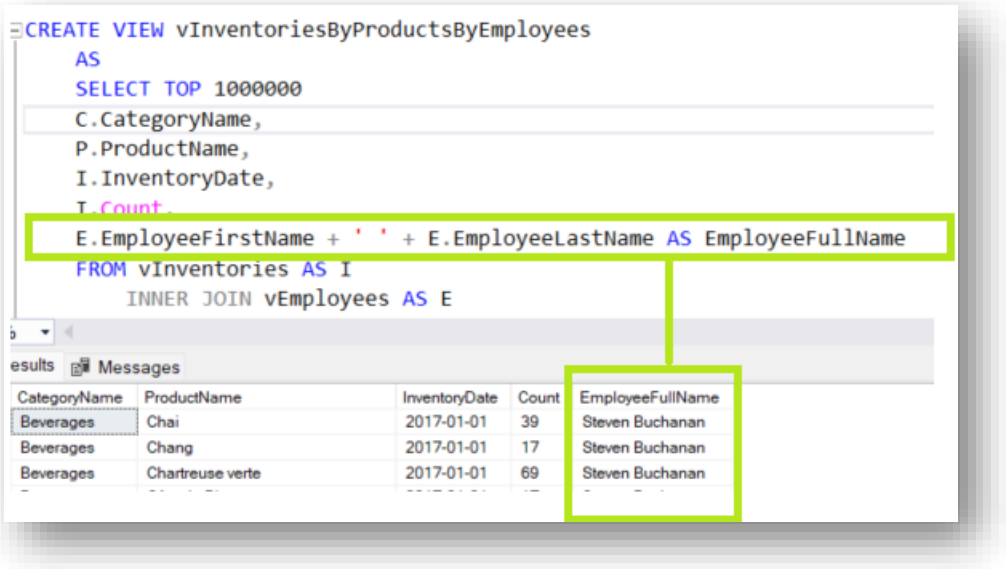
Differences

Ultimately, views, functions and stored procedures have their more specific uses.

Views, as described in the previous section, are virtual table interfaces that present data from one or more tables in a specific format. Their primary use is for data abstraction, which simplifies the data being represented, as seen in the previous example.

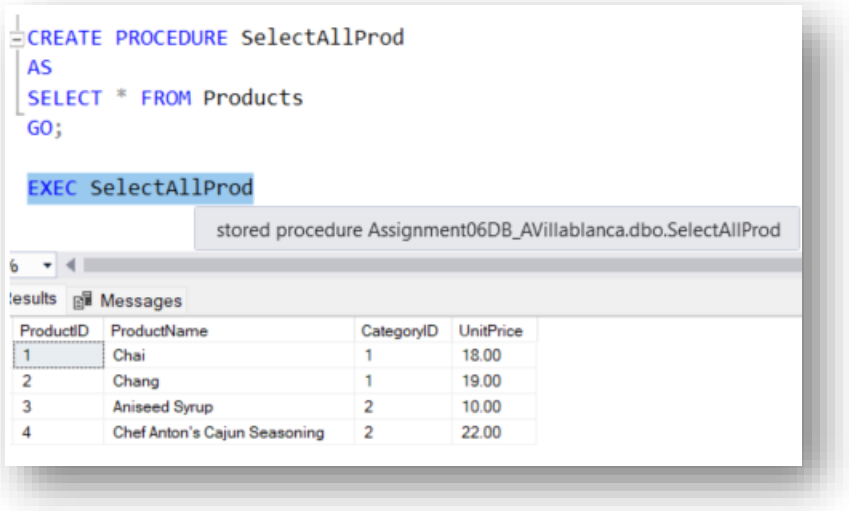
Functions perform repetitive calculations or operations to return a value or a table. SQL Server has many built-in functions, but they can be custom made as well. These can be used within SQL statements like SELECT, WHERE, or JOIN clauses to manipulate data. Unlike views, functions can be changed with parameters to receive different results.

Here is a simple example of a SQL Server string function of concatenation using the plus sign (+) to combine first and last names of employees to return a full name value in a column:



Stored procedures are the most powerful of the three because they allow more complex functionality. They can handle a predefined sequence of operations including conditional logic, loops, and error handling. They also can return multiple result sets and affect the database state by performing inserts, updates, and deletes. With this, if a user has a SQL query that they often use, instead of writing it repeatedly, they can save it as a stored procedure and call it to execute it.

Here is a very simple example of a stored procedure called *SelectAllProd* which retrieves all items from the Product table when executing the highlighted line:



Summary

Views, functions, and stored procedures are integral components of SQL databases. Each serves a unique purpose while sharing similar benefits like code reuse and enhanced security. In short, views simplify data presentation. Meanwhile, functions handle repetitive tasks and calculations within queries. Finally, stored procedures execute more complex sequences of operations. Using all of these in tandem can improve database efficiency, maintainability, and security.