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IT FDN 130 A Sp 22: Foundations of Databases & SQL Programming

Assignment 06

GitHub - https://github.com/rtabuw/DBFoundations

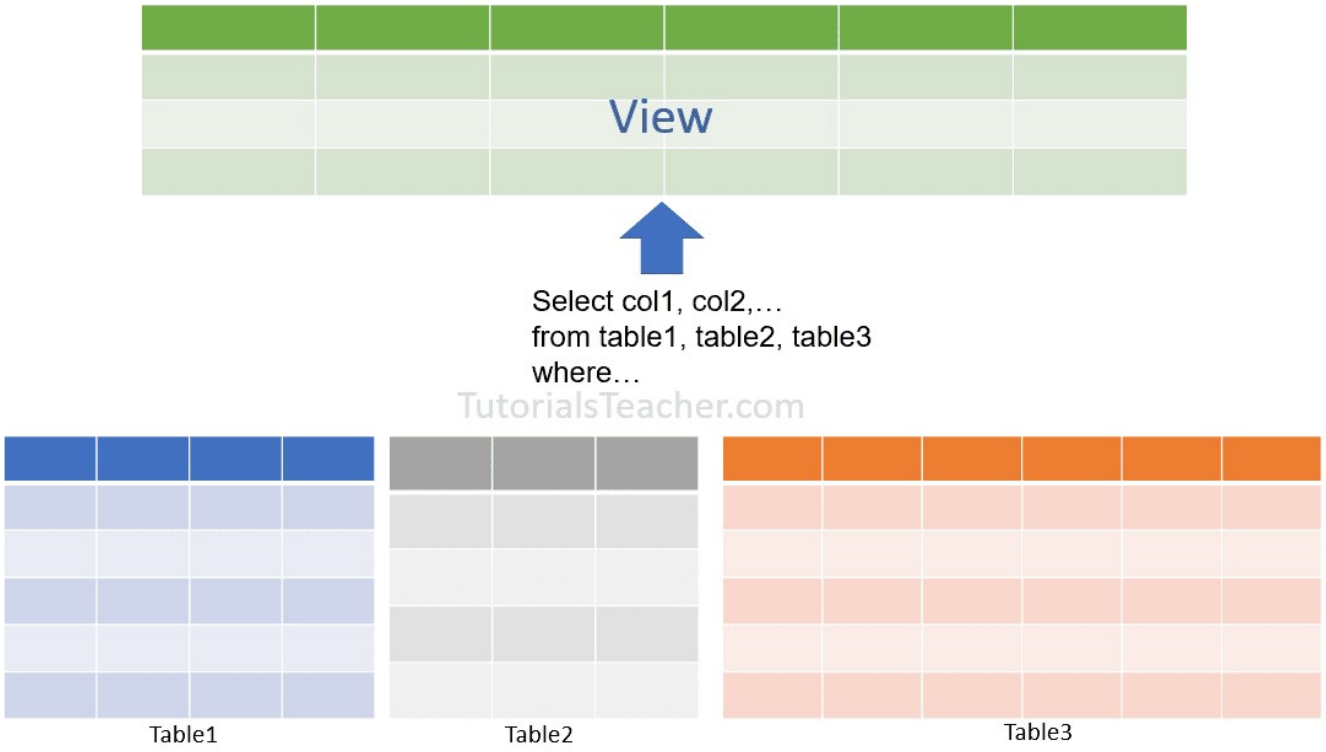
Views

Introduction

In this Module we learned more about SQL Views. I will define what a SQL View is and explain when to use a SQL View. I will also explain the differences and similarities between a View, Function, and Stored Procedure.

SQL Server Views

The TutorialsTeacher.com website (https://www.tutorialsteacher.com/sqlserver/views - external site) defines SQL Server Views as, "…a virtual table whose values are defined by a query. In another word, a view is a name given to a query that can be used as a table. The rows and columns of a view come from tables referenced by a query." The same website displayed the image below to visually illustrate a SQL View.



When to Use SQL Views

As a beginning SQL student I'm finding out that there are many reasons when to use SQL Views. However, there are two examples that are significant to me. One, SQL Views can be used when the code writer wants to give end-users specific data needed from one or more tables. This secures the other data in the same tables. Two, the code writer can use SQL Views to hide complex queries. Many users don't need to know the coding details of a SQL query, especially complex ones, for their report, etc. SQL Views provides a nice alias instead of the detailed query.

Differences and Similarities Between Views, Functions, and Stored Procedures

Regarding the similarities between Views, Functions, and Stored Procedures I really like the explanation from my coworker and DBA for our team. He said the important similarity is Views, Functions, and Stored Procedures all contain useful code that can be named, saved, and used again for reporting, coding and other database purposes.

As far as differences go, I took a screenshot from the following TECNOVIQ YouTube video (https://www.youtube.com/watch?v=TSCPXpXL4OI - external site) to explain the differences and some similarities.

Stored Procedure	Function	View
Accepts Parameters	Accepts Parameters	Does NOT Accept Parameters
Can contain several statements	Can contain several statements	Can contain only one single SELECT query
Can call functions and views	Cannot call stored procedures but can call views	Cannot call stored procedures but can call functions
Can return multiple values/tables	Can return a single value/table	Can return a single table
Exceptions can be handled using try-catch block	Exceptions cannot be handled	Exceptions cannot be handled
Allows insert/update/delete/select	Only allows select statement	
CANNOT be used in a SELECT query	CAN be used in a SELECT query	CAN be used in a SELECT query
NOT mandatory to return a value	SHOULD return a value	SHOULD return a table

Below is some additional information about Functions and Stored Procedures.

SQL Server Functions from the TutorialTeacher.com Website:
(https://www.tutorialsteacher.com/sqlserver/user-defined-functions - External Site)

Functions in SQL Server are similar to functions in other programming languages. Functions in SQL Server contains SQL statements that perform some specific tasks. Functions can have input parameters and must return a single value or multiple records.

If your scripts use the same set of SQL statements repeatedly then this can be converted into a function in the database.

Types of Functions
SQL Server Functions are of two types:

System Functions: These are built-in functions available in every database. Some common types are Aggregate functions, Analytic functions, Ranking functions, Rowset functions, Scalar functions.

User Defined Functions (UDFs): Functions created by the database user are called User-defined functions. UDFs are of two types:

Scalar functions: The function that returns a single data value is called a scalar function.

Table-valued functions: The function that returns multiple records as a table data type is called a Table-valued function. It can be a result set of a single select statement.

SQL Server - Stored Procedures from the TutorialTeacher.com Website:
(https://www.tutorialsteacher.com/sqlserver/stored-procedures - External site)

In SQL Server, a stored procedure is a set of T-SQL statements which is compiled and stored in the database. The stored procedure accepts input and output parameters, executes the SQL statements, and returns a result set if any.

By default, a stored procedure compiles when it gets executed for the first time. It also creates an execution plan that is reused for subsequent executions for faster performance.

Stored procedures are of two types:

User-defined procedures: A User-defined stored procedure is created by a database user in a user-defined database or any System database except the resource database.

System procedures: System procedures are included with SQL Server and are physically stored in the internal, hidden Resource database and logically appear in the sys schema of all the databases. The system stored procedures start with the sp_ prefix.

Difference between Functions and Stored Procedures in SQL Server:
(https://www.tutorialsteacher.com/articles/functions-vs-stored-procedures-in-sqlserver - External site)

Function	Stored Procedure
Always returns a single value; either scalar or a table.	Can return zero, single or multiple values.
Functions are compiled and executed at run time.	Stored procedures are stored in parsed and compiled state in the database.
Only Select statements. DML statements like update & insert are not allowed.	Can perform any operation on database objects including select and DML statements.
Allows only input parameters. Does not allow output parameters.	Allows both input and output parameters
Does not allow the use of Try...Catch blocks for exception handling.	Allows use of Try...Catch blocks for exception handling.
Cannot have transactions within a function.	Can have transactions within a stored procedure.
Cannot call a stored procedure from a function.	Can call a function from a stored procedure.
Temporary tables cannot be used within a function. Only table variables can be used.	Both table variables and temporary tables can be used.
Functions can be called from a Select statement.	Stored procedures cannot be called from a Select/Where or Having statements. Execute statement has to be used to execute a stored procedure.
Functions can be used in JOIN clauses.	Stored procedures cannot be used in JOIN clauses

Summary

For this assignment we learned more about SQL Views. With the help of various website resources, I defined what a SQL View is and when to use it. Using the code from Assignment 05 made understanding Views easier for me. Since I'm a beginning SQL student I will concentrate on using Views for my initial work project tasks later this year.

Also with help from website resources I attempted to explain the differences and similarities between a SQL View, Function, and Stored Procedure. For Functions and Stored Procedures, I don't fully understand the concepts yet but I will study them out in the upcoming months. My coworkers said they help tutor me since Functions and Stored Procedures can be difficult to understand and use for beginning coders. So far this SQL journey has been frustrating, but I'm doing the best I can given the limited time I have for the course.