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Foundations of Databases and SQL Programming Class

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GitHub Link: <https://github.com/lbadmadja/DBFoundations/upload/main>

Assignment 06

SQL Joins

Introduction

In this article, I would like to talk about SQL Views and differences and similarities between a View, Function, and Stored Procedure.

SQL Views

An SQL View is “a virtual table whose contents are defined by a query” (external link: <https://docs.microsoft.com/en-us/sql/relational-databases/views/views?view=sql-server-ver15>, accessed on November 21, 2021). In a Relational Database Management System, Views are one of database abstraction layer tools. Views are similar to tables, but, unlike tables, they do not exist as stored data in a database unless they are indexed. Views are a result of one or more stored queries referring to one or more tables or views from one or more servers (external link: <https://docs.microsoft.com/en-us/sql/relational-databases/views/views?view=sql-server-ver15>, accessed on November 21, 2021). They are used to present data, enable users to use table(s) with minimal interruptions as tables or databases are updated, and allow users to use table(s) without having direct access to the actual table(s) to protect data integrity by avoiding accidental modification of data by users. Other usage of Views (external link: <https://docs.microsoft.com/en-us/sql/relational-databases/views/views?view=sql-server-ver15>, accessed on November 21, 2021):

1. To allow users to use tables that used to exist, but whose schema has changed.
2. To copy data and partition them to improve query performance.
3. To enable users to join data from different tables and create their own tables.

SQL View, Function, and Stored Procedure

In this section I would like to talk about similarities and differences between a View, Function, and Stored Procedure, but before I do this, I would like to talk a little bit about Functions and Stored Procedures.

SQL Functions “are simply sub-programs, which are commonly used and re-used throughout SQL database applications for processing or manipulating data” (external link: <https://study.com/academy/lesson/what-are-sql-functions-use-examples.html> , accessed on November 21, 2021). There are built-in functions, functions that are built into SQL applications, and user-defined functions, functions created by users for a specific purpose. Functions can return a single value, a list of value, or a table of value (external link: <https://study.com/academy/lesson/what-are-sql-functions-use-examples.html> , accessed on November 21, 2021). Functions are usually used (external link: <https://study.com/academy/lesson/what-are-sql-functions-use-examples.html> , accessed on November 21, 2021):

1. To Improve performance and efficiency of a database and query.
2. To decompose complex programming logics into simpler functions to make them easier to understand and maintain.
3. Because functions need to be written only once and can be reused, they can save time and effort and support modular programming.

A Stored Procedure is “a prepared SQL code that can be saved, so that it can be reused over and over again” (external link: https://www.w3schools.com/SQL/sql_stored_procedures.asp, accessed on November 21, 2021). It is used to save query(ies) and parameter(s) that are used over and over again, so that users do not need to rewrite them every time they need them and only need to execute the stored procedure when they need to run or call these queries or parameters (external link: https://www.w3schools.com/SQL/sql_stored_procedures.asp, accessed on November 21, 2021). Stored Procedures are similar to Functions and, like Stored Procedures, there are also system and user-defined Stored Procedures (external link: <https://docs.microsoft.com/en-us/sql/relational-databases/stored-procedures/stored-procedures-database-engine?view=sql-server-ver15> , accessed on November 21, 2021).;

however Stored Procedures cannot be used in queries In addition to reusability, the other benefits of a Stored Procedure are (external link: <https://docs.microsoft.com/en-us/sql/relational-databases/stored-procedures/stored-procedures-database-engine?view=sql-server-ver15> , accessed on November 21, 2021):

1. They reduce server/network traffic because commands in a Stored Procedure are executed as a single batch of coded.
2. They provide stronger security.
3. They improve performance.
4. They ease database maintenance.

Based on the View, Function, and Stored Procedure descriptions above, we can say that similarities and differences between a View, Function, and Stored Procedure are:

1. Similarities:

- 1.1.All of them allow users to save and reuse codes.
- 1.2.All of them can be used to improve query and database performance.
- 1.3.All of them ease database maintenance.
- 1.4.All of them allow users to join multiple table(s) or view(s) for their specific purpose.
- 1.5.The codes to create all of them are similar.

2. Differences:

- 2.1.There is not a built-in View in SQL applications, but there are both built-in and user-defined Functions and Stored Procedures in SQL applications.
- 2.2.Only Select statements are allowed in Functions. Data manipulation queried are not allowed in Functions, but allowed in Views and Stored Procedures.
- 2.3.Views and Functions can be called using a Select Statement, but Stored Procedures cannot.

Summary

In this article, I talked about SQL Views and differences and similarities between a View, Function, and Stored Procedure. To summarize:

1. An SQL View is “a virtual table whose contents are defined by a query”.
2. Views are used to present data, enable users to use table(s) with minimal interruptions as tables or databases are updated, and allow users to use table(s) without having direct access to the actual table(s) to protect data integrity by avoiding accidental modification of data by users. They also allow users to use tables that used to exist, but whose schema has changed; copy data and partition data to improve query performance; and enable users to join data from different tables to create their own tables.
3. Functions “are simply sub-programs, which are commonly used and re-used throughout SQL database applications for processing or manipulating data”.
4. Stored Procedures are SQL codes that can be saved, so that it can be reused over and over again.
5. Similarities and differences between a View, Function, and Stored Procedure are:

5.1.Similarities:

- 5.1.1.All of them allow users to save and reuse codes.
- 5.1.2.All of them can be used to improve query and database performance.
- 5.1.3.All of them ease database maintenance.
- 5.1.4.All of them allow users to join multiple table(s) or view(s) for their specific purpose.
- 5.1.5.The codes to create all of them are similar.

5.2.Differences:

- 5.2.1.There is not a built-in View in SQL applications, but there are both built-in and user-defined Functions and Stored Procedures in SQL applications.
- 5.2.2.Only Select statements are allowed in Functions. Data manipulation queried are not allowed in Functions, but allowed in Views and Stored Procedures.
- 5.2.3.Views and Functions can be called using a Select Statement, but Stored Procedures cannot.

References

1. Microsoft SQL Documents (2021). *Views*. Microsoft Corporation. Retrieved November 21, 2021, from <https://docs.microsoft.com/en-us/sql/relational-databases/views/views?view=sql-server-ver15>
2. Study.Com SQL Lesson. *What are SQL Functions? - Use & Examples*. Study.Com. Retrieved November 21, 2021, from <https://study.com/academy/lesson/what-are-sql-functions-use-examples.html>
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4. Microsoft SQL Documents (2021). *Stored Procedures (Database Engine)*. Microsoft Corporation. Retrieved November 21, 2021, from <https://docs.microsoft.com/en-us/sql/relational-databases/stored-procedures/stored-procedures-database-engine?view=sql-server-ver15>