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Assignment 07

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https://github.com/SBNEIFFER/DBFoundations.git

**Introduction**

In this document, I’ll explain when it would be necessary to utilize an SQL User Defined Function. I’ll also discuss the differences between the three types of SQL functions: Scalar, Inline, and Multi-Statement. Built-in SQL functions are fundamental when extracting pertinent information from databases, and the ability to create custom functions provides many options for creating reports.

**User Defined Functions**

SQL User Defined Functions perform actions based specified parameters, and return results based on that action. Those results can either display as a table or a single value. One benefit offered by UDF’s is the ability to store the function within the database after creating it, then calling it at any point within a query. This makes UDF’s incredibly modular and customizable. Other benefits include both decreased bandwidth usage and execution time.

User Defined Functions are best used when a calculation needs to be repeated throughout a database. They will return the desired results based on pre-defined parameters even as the amount of data increases or changes.

**Scaler Functions**

Scalar functions are a type of User Defined Function in SQL that performs either an operation or calculation based on parameters passed to it. The scalar function’s main characteristic is that it returns only a single value as a result. The fact that they can be called within any expression and used to generate a result to be used as a column value makes them versatile.

**Inline Functions**

Another type of User Defined SQL Function is the Inline Function. Its main characteristic is that it returns a table as its result. Inline Functions are versatile because its result set can be used with the FROM clause in a query, just like actual tables. Scalar functions do not have this ability. Inline Function result sets are determined by one or more user defined parameters, and they rely on a RETURN statement to define the table structure of the result.

**Multi-Statement Functions**

Similar to Inline Functions, Multi-Statement Functions return a table results set based on user-defined parameters. However, they differ in the fact that the table structure of the results set must be defined when creating the function. They differ from Scalar functions in the sense that they return more than a single result. Their syntax also requires the code to be contained within BEGIN and END blocks.

**Summary**

In conclusion, User Defined Functions can be created and stored within a database and called upon at any time. They can return results as a single value or as a results table, and those results are based on user-defined parameters. UDF’s offer benefits such as lower execution times and bandwidth usage.

Scaler functions are UDF’s that perform a calculation or operation and return only a single result value. The result can also be used as a column value in a later query. Inline Functions are yet another type of UDF however, they return a table as a result. Their results can be used as a table in a FROM clause and they rely on a RETURN clause to define the structure. Multi-Statement functions are similar to Inline Functions, but their structure must be defined upon creation. These functions also but be contained within BEGIN and END blocks.

**Citations**

https://www.geeksforgeeks.org/multi-statement-table-valued-function-in-sql-server/

https://www.geeksforgeeks.org/inline-table-valued-function-in-sql-server/

https://www.geeksforgeeks.org/scalar-function-in-sql-server/

https://learn.microsoft.com/en-us/sql/relational-databases/user-defined-functions/user-defined-functions?view=sql-server-ver16

**GitHub Link**

https://github.com/SBNEIFFER/DBFoundations.git