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SQL User Defined Functions

Introduction

This paper will discuss the use case for SQL User Defined Functions (UDFs), and explore the most common types of functions: Scalar, Inline, and Multi-Statement functions.

When to Use a UDF

In writing code, it is widely considered a best practice to avoid redundancy by replicating a block of code multiple times. Therefore, when the same set of functions need to be performed multiple times within a query, the developer can utilize UDFs to avoid this redundant code. UDFs achieve this by storing a desired set of functions, then passing an input (or a set of inputs) through it multiple times, when called throughout the query.

Types of Functions

The three most common types of UDFs are Scalar, Inline, and Multi-Statement functions, which differ in their inputs, outputs, and method of processing data.

Beginning with the simplest of the three, a Scalar function can accept any number of inputs (including zero), but will always return a single value. As a result of these limitations, Scalar functions are typically used to perform computations, or look up specific values from tables.

Next, an Inline function can accept any number of inputs, and will returns a data table derived from a single SELECT statement. While input variables are optional, they can be used to make the function more dynamic, and is a common reason why an Inline function may be selected over creating a view.

Finally, Multi-Statement functions can be thought of as extended versions of Inline functions. In addition to returning a table, these functions can utilize Transact SQL (T-SQL) statements to perform operations like inserting rows, retrieving multiple rows of data, etc. Multi-Statement functions are used whenever developers need to store more complex operations in a function.[1]

Conclusion

To conclude, this paper has explored what UDFs are able to accomplish within SQL queries, and the three most common function types: Scalar, Inline, and Multi-Statement functions. While these functions share a similarity in that they all take inputs, process data, and return outputs, they vary significantly in how they do so: the types of inputs, what type of data they commonly process, and what they return.

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[1] External Source. T P Reddy, "*How to Create Scalar, Inline and Multi-Statement Table Valued User Defined Functions in SQL Server*," Microsoft Power BI Kingdom. 2021-01-12, 2021-11-30, https://excelkingdom.blogspot.com/2018/01/how-to-create-scalar-inline-and-multi.html