Damon Leichman

Foundation of SQL Programming

02/28/2023

Assignment 07

https://github.com/DataDLL/DBFoundations

SQL FUNCTIONS

INTRODUCTION

For this assignment we will be examining Functions. In SQL there are built in Functions, and then there are custom Functions which are often referred to as User Defined Functions (UDFs). These can be Scalar Functions which return a single value, or Table Valued Functions (TVFs) which return a table of values. TVFs can be Inline or Multi-Statement. To start we will discuss when to use a SQL UDF, and then move into an explanation of the differences between Scalar, Inline, and Multi-Statement Functions.

WHEN TO USE UDFs

Often when you are writing code in SQL you can simply use a built in Function to accomplish what you need, but there are other times when you need to create your own Function, a UDF. These UDFs allow you to create new data types, and help you encapsulate and reuse functionality in your code. You can create the Function once, store it in the database, and then have it available to be used whenever it is needed. You can cache and reuse often complex statements for repeated execution, and make things run more efficiently. Another reason to use a UDF is to reduce network traffic. Instead of using an operation that filters data based on a complex constraint, you can use a UDF in the WHERE clause to reduce the number of rows needed to be used.

DIFFERENCES BETWEEN SCALAR, INLINE AND MULTI-STATEMENT FUNCTION

In SQL, there are two main types of Functions, Scalar and Table Valued Functions (TVFs) which can be either Inline or Multi-Statement. Scalar Functions are the most basic, accept any number of parameters, and only return a single data point. Inline TVFs (ILTVFs) return a result set, much like a View, but unlike Views can accept parameters. An ILTVF will have the function body contain only one line of select statement. You simply state Returns Table, and the return table's definition will be based on the Functions select statement. ILTVFs do not use the Begin/ End syntax, and generally perform faster than a Multi-Statement TVF (MSTVF). In a MSTVF, your Returns wording explicitly specifies the structure of the return table. You must declare a table variable that will be used to store and accumulate the rows that are returned as the value of the function. MSTVFs must use the Begin/End wording, and are generally slower than an ILTVF.

CONCLUSION

To summarize, User Defined Functions (UDFs) are used when the programmer needs to create a Function that does not already exist as a built in Function. UDFs can be either Scalar Functions, Inline Table Valued Functions (ILTVFs), or Multi-Statement Table Valued Functions (MSTVFs). They can make things work more efficiently by caching often complex groupings of code, and allowing them to be reused repeatedly. When looking at Scalar Functions, ILTVFs, and MSTVFs, there are certain differences to be aware of. Scalar are the most basic to write, accept parameters and return only a single value. ILTVFs only contain one line of select statement in the Functions body, do not use the Begin/End syntax, and run quite quickly, while MSTVFs contain an entire table in the Functions body, must use the Begin/End wording, and generally run slower than an ILTVF.