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Foundations Of Databases & SQL Programming
Assignment 07
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Functions in SQL

Introduction

Functions are pieces of code that are stored in a database so they can be easily recalled. Storing code as a function makes it quick and easy to re-use, saving time and memory. Functions make database code more readable and efficient.

When to Use a User Defined Function

System functions are built into SQL. They are pre-defined functions that perform common actions, such as formatting, basic aggregation of numbers in a column, returning a maximum value, or changing a data type.

User-defined functions, or UDFs, are custom code that is written by a user and saved in a database, and can be run as needed. UDFs are useful when a table or calculation needs to be called often from data that is regularly updated. UDFs can have multiple parameters, and the output will change depending on the argument(s) entered. For example, a function can be written to return a table that lists orders that match a specified customer ID.

UDFs are also useful in writing calculations that take multiple inputs. Instead of writing out a formula every time it is used in a query, the code can be saved to a function, and the function can be called in a query. This results in fewer errors, as the function code lives in one place.

Scalar, Inline, and Multi-Statement Functions

A scalar function takes in one or more arguments and returns a single value. Scalar functions are useful for calculations that take multiple inputs and return a single number. They can be called in a statement in place of writing out code every time the calculation is needed.

An inline function is similar to a view, as it can contain only a single SELECT statement, and it will return a table that includes the columns listed in the SELECT statement. Unlike a view, an inline function includes one or more parameters.

A multi-statement function, also called a multi-statement table-valued function or MSTVF, can include, as its name implies, more than one statement. Like an inline function, it returns a table as output, but the MSTVF defines the structure of the output table as part of the function.

Summary

Functions make database code more efficient, readable, and easy to use. System functions come built into SQL and perform common operations. User-defined functions are written by users and saved in a database. UDFs can be scalar, returning a single value; inline, returning a table object; or multi-statement, returning a table whose structure is defined within the function. Functions can be simple or complex.

Using functions saves time, as they allow code to be re-used, and reduces the potential for errors and time spent de-bugging, as the function code is centralized. Understanding how to use functions is an important part of creating a useful and efficient database.