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Foundations Of Databases & SQL Programming

Explanation of SQL User-Defined Functions (UDFs)

When to Use a SQL UDF

SQL User-Defined Functions (UDFs) are useful in scenarios where we want to condense reusable pieces of logic or computations that can be applied to data sets across different queries. By creating a UDF, we can avoid repetitive code and increase query readability, especially when performing calculations, transformations, or conditional logic that would otherwise clutter a query. For example, a UDF might be used to calculate tax based on specific rules or to format data into a particular display format, such as currency. UDFs are also beneficial when there is a need for complex calculations that require a combination of multiple SQL statements and need to be consistently applied across queries. This encapsulation simplifies updates; when the logic within a UDF changes, updating it in one place will reflect across all queries that use it.

Differences Between Scalar, Inline, and Multi-Statement Functions

SQL offers three types of UDFs: Scalar, Inline, and Multi-Statement, each with different capabilities and limitations. A Scalar function returns a single value (e.g., a calculated number or formatted string) and is often used for simple computations or transformations. Inline functions, in contrast, are Table-Valued Functions (TVFs) that return a table rather than a single value. Inline functions are efficient and typically used in joins or as data sources within queries, making them a powerful choice for complex data manipulations. Multi-Statement functions are also TVFs that return a table, but they allow multiple SQL statements within the function body, such as variable assignments and conditional logic. This flexibility is valuable for complex operations but can come with a performance cost compared to Inline functions, as each statement in a Multi-Statement function is processed individually. Understanding these differences helps in choosing the appropriate UDF type for each use case based on performance requirements and desired output.