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May 17, 2024

Foundations Of Databases & SQL Programming

Assignment 07

SQL User Defined Function (UDF)

Introduction

The objective of this report is to define SQL User Defined Function (UDF) and explain the use cases. In addition, the differences between Scalar, Inline, and Multi-Statement Functions are also explored.

Concepts

User Defined Function (UDF)

User defined Functions (UDF) is a custom function that a user or developer creates that perform specific tasks or logic within the database. The UDF is classified into three types, which are scalar function, inline function, and multi-statement function.

Scalar Function

Scalar function is one of three main type of UDF that returns a single value. It is often used to perform simple calculation and logics to produce a final single result.

```
Create Function dbo.MultiplyValues(@Value1 Float, @Value2 Float)
Returns Float
As
Begin
    Return (Select @Value1 * @Value2);
End
go
```

Figure 2: Example of Scalar Function

Inline Function

Inline function is a UDF that returns a table variable and is composed of a single SELECT statement. It is useful for filtering logic or joining tables.

```
Create Function dbo.GetItem(@ItemId Int)
Returns Table
As Return
(
Select FruitId,
From Produce
Where ItemId = @ItemId
);
```

Figure 3: Example of Inline Function

Multi-Statement Function

Multi-Statement Function is a UDF that also returns a table variable but it is different than inline function because it allows more complex logics and structure than Inline Functions. The multi-statement function are defined by using begin and end block, allows control flow using if and else, and also allows statements such as Insert, Update, or Delete statements

```
Create Function dbo.GetItem(@ItemId Int)
Returns @Fruit Table
{
  FruitId Int,
  FruitName VARCHAR(255)
}
As Begin
    Insert Into @Fruit (FruitId, FruitName)
    Select FruitId, FruitName
    From Fruit
    Where ItemListId = @ItemId
    Return;
End;
```

Figure 3: Example of Multi-line Function

Summary

This report describes the SQL UDF and its three main components, which are scalar function, inline function, and multi-statement function. In summary, the UDF is used if there are no pre-existing functions available to use. The scalar function returns a single value and is used for simple operations. The inline function and multi-statement function returns a table. The main difference between inline function and multi-statement function is that multi-statement function allows complex statements and operation and it must have begin and end statement.