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Course: IT FDN 130 A Su 22: Foundations of Databases & SQL Programming

GitHub Repository Link: [wizardoboz/DBFoundations (github.com)](github.com)

Assignment 6: SQL Views, Functions, and Stored Procedures

Introduction

In this paper, I will briefly explain when to use a SQL View, and the differences and similarities between a View, Function, and Stored Procedure. In addition, I will provide some examples of code (taken from this week's lab assignment) for each.

SQL Views

SQL Views offer a layer of abstraction so that a user can extract data for a reporting view without touching the underlying base table. As a best practice, you'll want to force users to use the view rather than interact directly with the bale. Therefore, you should always create a base view for each table that you have, and then restrict access to the base table while granting access to the view. Views can be simple, or they can be complex. In a complex view, you might often want to use an Order By clause. In SQL Server, this is disallowed unless you use a Top statement. If you do not include a Top statement, you will get an error message. You can either use Select Top 100 percent (thought this sometimes doesn't work as intended), or you can use Select Top int, where you set a value for the integer that is greater than what your results will return (see Code Example 1).

```
Go
Create View vNumberOfCustomerOrdersByLocationAndYears
 As
   Select
    CustomerName = CompanyName
    ,City
    ,Region = IsNull(Region, Country)
    ,Country
    ,NumberOfOrders = Count(OrderID)
    ,OrderYear = Year(OrderDate)
   From Northwind.dbo.Customers as c
   Join Northwind.dbo.Orders as o
     On c.CustomerID = o.CustomerID
   Group By
    CompanyName
    ,City
    ,Region
    ,Country
    ,Year(OrderDate);
Go
```

Differences between Views, Functions, and Stored Procedures

SQL Server allows you to build views, custom functions, and stored procedures. Functions and Stored Procedures are similar to views in that they all return the data written in a select statement. However, functions use parameters to alter a query where a view would use a Where statement to alter a query. In Code Example 1, (above), we see the code for creating a view. In Code Example 2 (below), we see the code for creating a similar function.

```sql
Go
Create Function dbo.fNumberOfCustomerOrdersByLocationAndYears()
Returns Table
 As
 Return(
   Select
    CustomerName = CompanyName
   ,City
   ,Region = IsNull(Region, Country)
   ,Country
   ,NumberOfOrders = Count(OrderID)
   ,OrderYear = Year(OrderDate)
   From Northwind.dbo.Customers as c
   Join Northwind.dbo.Orders as o
     On c.CustomerID = o.CustomerID
   Group By
    CompanyName
   ,City
   ,Region
   ,Country
   ,Year(OrderDate));
Go
```
Code Example 2

It's important to note that a function should use the namespace (dbo prefix) in SQL Server. In addition, the parentheses are required after the name of the function. A Stored Procedure can also return similar results. One of the main differences between a Function and a Stored Procedure is that you can evaluate into a function, and you cannot evaluate into a Stored Procedure. See Code Example 3 (below) for an example of a Stored Procedure.

```sql
Go
Create Procedure pNumberOfCustomerOrdersByLocationAndYears
 As
 Begin
    Select
    CustomerName = CompanyName
   ,City
   ,Region = IsNull(Region, Country)
   ,Country
   ,NumberOfOrders = Count(OrderID)
```

```
    ,OrderYear = Year(OrderDate)
    From Northwind.dbo.Customers as c
    Join Northwind.dbo.Orders as o
      On c.CustomerID = o.CustomerID
    Group By
     CompanyName
    ,City
    ,Region
    ,Country
    ,Year(OrderDate)
    Order By CustomerName;
End
Go


Exec pNumberOfCustomerOrdersByLocationAndYears
```

Code Example 3

Please note that the statement to call up the Stored Procedures uses EXEC or EXECUTE rather than SELECT (see Code Example 3, above).

Summary

This paper has discussed SQL Views, as well as the differences and similarities between Views, Functions, and Stored Procedures. It has also highlighted some code from Lab 6 as an example of each.