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Assignment 06

**Assignment 06 Writeup**

Introduction

A successful database structure can grow and change over time, as the needs of the organization change. To minimize the visible changes for the users of the database, abstraction layers can be put in place to maintain a consistent viewable structure to the end users. In this way, if an underlying table structure is changed, the view can be updated to look the same. Views, Functions, and Stored Procedures can be used to create a more secure database, by removing the ability for certain users to access specific data or alter the data itself, as well as save certain queries in the database for future use. Each can also be used to write code once, and use the code repeatedly to run queries again, but receiving different results if the data has been updated.

SQL View Use

SQL Views can be used to save a SQL Statement within the database itself, so they can be referred to later, or have further queries run on them. Data can be combined from more than one table and can be used to prevent certain users from seeing specific data within the database by using permissions, as shown below and by removing certain columns from the public views. Views can also be used to maintain the structure of a table that users see, structure data in a way that is intuitive to users and combine data from multiple tables into one easy to use view for reporting purposes.

A screenshot of a computer

Description automatically generated

Figure 1 - Views are saved within the database and can be seen in the SQL Server Object Explorer just like tables

It is best practice to create basic views of every table in a database, which contain all data, but create a layer between the table itself and users. The below statement creates a new view with 3 columns of data from the basic views of vCategories and vProducts.

CREATE VIEW vProductsByCategories

WITH SCHEMABINDING

AS

SELECT TOP 10000000

dbo.vCategories.CategoryName

, dbo.vProducts.ProductName

, dbo.vProducts.UnitPrice

FROM dbo.vCategories

LEFT JOIN dbo.vProducts

ON dbo.vCategories.CategoryID = dbo.vProducts.CategoryID

ORDER BY vCategories.CategoryName

, dbo.vProducts.ProductName

;

GO

DENY SELECT ON Categories TO PUBLIC

GRANT SELECT ON dbo.vCategories TO PUBLIC

;

GO

SQL Views, Functions, and Stored Procedures

Views, User Defined Functions, and Stored Procedures have a lot of similarities, but also important differences that can help define when to use each of them.

User Defined Functions (UDFs) can use parameters and return a single value using an expression such as multiplication. Although views cannot use parameters, WHERE statements can be used to achieve the same result, therefore views should typically be used, since they are less complex. UDFs should be used when calculations need to be performed, such as multiplying a quantity by a price for each record in a sales table.

A Stored Procedure is a written and executable SQL code that can be saved and used repeatedly, similarly to Views and UDFS. Stored Procedures can have multiple parameters and include more than select statements, so can be more complex than views or UDFs.

Summary

Basic SQL views can be used to add an abstraction layer between the database and users, which can be used to increase the security of the data or maintain views for the user, even if the structure of a table or tables change.

More complex views, Functions, or Stored Procedures can be used to save the code within the database for future use. These stored items can be used by other users to generate reports or combine data from multiple tables but also decrease the need to rewrite code each time the query is run.