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**Course:** Foundations of Databases & SQL Programming

**GitHub link:** <https://github.com/i-zuzu/DBFoundationsSQL>

## Assignment 06 – Views

### Introduction

In this document we'll cover the following topics:

- 1. Explain when you would use a SQL View.***
- 2. Explain the differences and similarities between a View, Function, and Stored Procedure.***

We'll start with the first item and discuss the situations when you would use a SQL View

### **1. Explain when you would use a SQL View.**

A view is a virtual table in SQL that is based on the result set of an SQL statement.

Views are used to save the Select statements within a database's file. Views are generally used to focus, simplify, and customize the interaction with the database for users. Views can be used as security mechanisms by denying or granting users access data through the view.

Views are commonly used to query multiple tables at the same time, abstract logic from the underlying tables, or provide a security layer by limiting access to a predetermined set of rows and columns. Views can also be used to improve data integrity and simplify complex calculations down to a single SELECT statement.

A view is created with the CREATE VIEW statement.

Below is an example of how to create the view:

```
CREATE VIEW [Brazil Customers] AS
SELECT CustomerName, ContactName
FROM Customers
WHERE Country = 'Brazil';
```

We can run the saved code for View using only a simple Select statement, which makes complex SQL code much easier to use:

```
SELECT * FROM [Brazil Customers];
```

Each table in a database should have a "Base" or "Basic" view to show data from that table. When you make a table, you create a base view and then restrict access to the table while allowing access to the View. Base views allow people to use your data in the "Abstract." You can also create the Reporting views for the needs of different types of users.

Views are abstraction layer objects, they make changes to a table design easier. They help to maintain the way applications access the data.

## 2. Explain are the differences and similarities between a View, Function, and Stored Procedure.

A view is a virtual table, a logical table based on an existing table or tables. It can be used to hide complex data from the user and retrieve only the required data on demand basis. Views can also contain joins and functions, making them a powerful tool for simplifying complex queries. Views can be used to combine data from multiple tables that might not have been related in the original design of the database.

Example of a View creation:

```
Create View vProducts
AS
Select ProductID, ProductName, CurrentPrice = UnitPrice, CategoryID, Discontinued
From Northwind.dbo.Products;
go
Select * from vProducts; -- 77rows
Go
```

A function is a set of statements that take input, process it, and return a single value. Functions are used to encapsulate complex calculations or processes and can be used in SELECT, INSERT, UPDATE or DELETE statements. Functions can take parameters, making them more flexible and easier to read compared to complex SQL statements.

Example of a Function creation:

```
Create Function dbo.fProducts() # Using the dbo prefix is common in Microsoft SQL Server
Returns Table
AS
Return(
Select ProductID, ProductName, CategoryId, Discontinued
From Northwind.dbo.Products
);
go
Select * from dbo.fProducts(); -- 77rows
Go
```

A stored procedure is an encapsulated set of multiple SQL statements that perform an operation and return a value. Stored procedures are usually used to perform data manipulation tasks, such as inserting data into the database or updating existing data. Stored procedures can accept parameters, making them more powerful and efficient compared to views and functions. Similarities: All three allow the user to execute complex tasks and queries.

Example of a Stored Procedure creation:

```
Create Procedure pProducts()
AS
Select ProductID, ProductName, CategoryId, Discontinued
From Northwind.dbo.Products;
go
Execute pProducts(); -- 77rows
Go
```

Views and User-Defined Functions almost serve the same purpose. But the major difference is that User-Defined Function can accept parameters, and Views cannot. And also, the output of the User Defined Function can be directly used in the SELECT clause, whereas you cannot do it with a View. The function must return a value but in Stored Procedure it is optional. Even a procedure can return zero or n values. Functions can have only input parameters for it whereas Procedures can have input or output parameters. Functions can be called from Procedure whereas Procedures cannot be called from a Function.

## **Summary**

In this document we discussed SQL Views, Functions and Stored Procedures. We looked at the differences and similarities between them, discussed when you would want to use Views, Functions or Stored procedures and showed a few examples.

## **Sources:**

1. UW Foundations of Databases & SQL Programming, Moule06 Notes
2. OpenAI ChatGPT, Mar. 2023, chat.openai.com/chat: Aspects of this assignment were generated by ChatGPT as a starting point.
3. Comparing SQL Views and Stored Procedures by Rachel Soderberg, Aug 5, 2019  
<https://dev.to/rachelsoderberg/comparing-sql-views-and-stored-procedures-4pfb#:~:text=Views%20should%20be%20used%20to,to%20automate%20large%20SQL%20workflows.>