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

## Assignment 06

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

## Introduction

“As your SQL Select statements become complex, you may decide to save them in a text file for repeated use. (A text file with SQL code in it is called a SQL Script!) Alternatively, you can save your Select statements within a database's file as a SQL View, Function, or Stored Procedure. SQL Views and Functions are "Named" Select statements whose code is stored in a database. Stored Procedures are similar, but they are not restricted to just Select statements.”  
(*Module06Notes 2023*). Views, functions, and stored procedures are essential database objects that contribute to better organization, security, and maintainability of database systems. They each serve specific purposes and can be used in combination to achieve more complex and efficient database operations.

## SQL VIEW

“Any view that is used to extract data for reporting purposes is called a "Reporting View." They can save simple or complex Select statements, but more complex ones are typical”  
(*Module06Notes 2023*). In SQL, a view is a virtual table based on the result of a SELECT query. Unlike a table, a view does not store the data itself; instead, it represents the data from one or more underlying tables or views. Views are used to simplify complex queries, provide a layer of security, and organize database schema.

A view is nothing more than a SQL statement that is stored in the database with an associated name. A view is actually a composition of a table in the form of a predefined SQL query. A view can contain all rows of a table or select rows from a table. A view can be created from one or many tables which depends on the written SQL query to create a view. Views, which are a type of virtual tables allow users to do the following:

(<https://www.tutorialspoint.com/sql/sql-using-views.htm>)

- Structure data in a way that users or classes of users find natural or intuitive.
- Restrict access to the data in such a way that a user can see and (sometimes) modify exactly what they need and no more.
- Summarize data from various tables which can be used to generate reports.

## Differences & Similarities between a View, Function, and Stored Procedure

While views, functions, and stored procedures serve different purposes, they share similarities in terms of encapsulation, code reusability, abstraction, and their ability to contribute to organized and secure database designs. Choosing between them depends on the specific requirements of the task at hand. Views are primarily for querying, functions for reusable calculations, and stored procedures for encapsulating complex tasks.

Purpose and Usage:

**View:** Primarily used for simplifying complex queries and providing a virtual table based on a SELECT statement. Represents a saved query that can be referenced in other queries.

**Function:** Used to encapsulate a piece of logic that performs a specific task and returns a value or a table. Designed for reuse in queries or expressions.

**Stored Procedure:** Contains a set of SQL statements that can perform multiple tasks, including modifying data. Can return values using output parameters but may not necessarily return a result set.

## Summary

SQL views are virtual tables for simplifying queries, functions encapsulate reusable logic for calculations, and stored procedures are sets of SQL statements for complex tasks and data modification. Each serves a specific role in database development, contributing to code organization, security, and modularity.