Ginevra Brannigan
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IT Foundations of Database Management

GitHub Link: https://github.com/GBrannigan13/DBFoundations

Assignment 06 –Views

Introduction:

Explain when you would use a SQL View

A View is used when you want to present a customized subset of data from one or more tables in a database, essentially creating a "virtual table." It essentially provides the user with a simplified view of the data instead of raw data while also being able to restrict access to sensitive information. It also allows the user to grant different permissions to different user groups and provide specific data for those users.

Basically, it allows for a reusable query logic that can be referenced multiple times and present consolidated data from multiple sources as well as ensures data consistency.

Explain the differences and similarities between View, Function and Stored Procedure

Views, Functions, and Stored Procedures are all database objects in SQL, but they serve different purposes and have distinct characteristics.

Let's first summarize each one:

Views:

The purpose of the view is to present a virtual table based on the result of a SELECT query and is automatically executed when referenced in a query. View is generally read-only and primarily used for data retrieval and security.

Functions:

Perform calculations and return a single value or a table. Functions are called within SQL statements or other routines. They generally do not modify data and often used for calculations, data transformation, and complex logic.

Stored Procedures:

Stored procedures perform a series of operations, can include business logic. They are explicitly called using EXEC or CALL statement. Data within can be modified using INSERT, UPDATE, DELETE and are used primarily for complex operations, transactions, and application logic.

The key similarities are:

1. Database Objects: All are database objects stored in the database.
2. Reusability: All promote code reuse and maintainability.

3. Security: Can be used to implement security measures.
4. Performance: Can improve performance by reducing network traffic.

Key differences are:

1. Syntax:
    - Views: Created using CREATE VIEW
    - Functions: Created using CREATE FUNCTION
    - Stored Procedures: Created using CREATE PROCEDURE
2. Calling Mechanism:
    - Views: Used in FROM clause like tables
    - Functions: Called within SQL statements
    - Stored Procedures: Executed using EXEC or CALL
3. Transaction Control:
    - Views: No direct transaction control
    - Functions: Limited transaction control
    - Stored Procedures: Full transaction control
4. Complexity:
    - Views: Simplest, based on SELECT statements
    - Functions: More complex, can include logic
    - Stored Procedures: Most complex, can include extensive logic and flow control

Summary:

Views are powerful tools for database management, but should be used carefully as they can add complexity to database maintenance if overused.

In summary, while these database objects share some similarities in terms of reusability and being stored in the database, they serve different purposes and have distinct characteristics in terms of execution, parameters, and data modification capabilities.