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Assignment 06

View in SQL and Comparison to Other SQL Concepts

What is View and when to use View

A SQL View is a virtual table derived from a SELECT query. It is used for purposes of enhancing efficiency, organization and security of database management. Some common use cases might be:

- Data simplification and abstraction: SQL views provide a way to simplify complex queries, encapsulating complex joins, aggregations and transformations within them. End users can interact with the database using straightforward queries with help of views.
- Security and data access control: Views help restrict access to certain columns or rows of tables. Users can be granted access to necessary information by creating a view with a subset of columns or filtered data, thus enforcing data security and compliance with data privacy requirements.
- Performance optimization: Views can be used to predefine complex & time-consuming operations which may be executed repeatedly. By storing such operations/aggregations in views, performance can be improved when accessing data by applications or users.
- Business logic encapsulation: Views allow database admins or developers to encapsulate business rules in the form of SELECT queries. This makes maintenance easier given the business logic changes are only on the view, instead of scattered across use cases or multiple SQL queries

Comparing to other common SQL concepts

Views, functions, and stored procedures are all objects in a relational database to help simplify database operations, but they serve different purposes and have different features. They can however overlap in some areas.

- Functions: A function is a set of SQL statements to take input parameters, perform an operation and return a single value or a table. They are used when logic needs to be encapsulated to return a scalar value result or a table, typically for mathematical, string or date manipulations, and can be reused across multiple queries
- SQL stored procedures: A stored procedure is a set of SQL statements to execute logic and perform operations like inserting, updating, deleting or querying data. They can be used to encapsulate business logic, modify data and automate repetitive tasks in the database.

Views, Functions and Stored Procedures all provide encapsulation of logic to simplify application development, offer reusability to be reused across multiple queries, allow

modular design by isolating specific operations, and are stored in the database schema and managed by the database management system. However, they do share a few differences:

- Only stored procedures can modify data by inserting, updating and deleting
- Stored procedures and functions can take parameters for use, but Views don't support parameters
- Usually stored procedures don't have return value, while Views return virtual tables and functions return single value or a table
- Views can be queries directly like tables, while functions can only be invoked as part of a SELECT statement, and stored procedures are executed explicitly using CALL
- Views is a pure data selection without control flow, while functions support simple logic like IF, CASE, etc, and stored procedures can support more complex control flows like loops and conditionals