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Assignment 06
https://github.com/ZachLarmer/DBFoundations/tree/main

SQL Views, Functions & Stored Procedures

Introduction

SQL views, functions, and stored procedures are all ways to create levels of abstraction within a database, as well as store complex code for easy use by users in the future. Specifically views are used to save select statements for later use, and quickly show the resulting table. Functions are similar as they are able to also return a table, however they are also able to return specific values. Stored procedures are the most complex as they can execute many statements of all types at the same time.

Using SQL Views

SQL Views in their simplest sense are stored select statements in a database, that once created can be viewed by simply running a select statement of the view. This provides a helpful abstraction layer to the database. It both keeps the database user from directly touching the data in the database, and allows for complex queries to be saved and easily called for analyzing data.

Views are used in two major ways. Basic views are used as an abstraction layer on a database. These views are essentially one to one copies of the underlying tables (even though the views are not actually tables). By only granting select permissions to users on the view, the underlying data is protected from accidental corruption by altering or deleting data. Reporting views alternatively, are views created to show data from underlying tables in useful ways. These views are often complex select statements, that would be a hassle to rewrite every time the specific data was needed. By creating a view of it, it can quickly be accessed as needed.

Views, Functions, & Stored Procedures

Views as discussed above are simply stored select statements that can then be used by writing a select statement with the view name in the from clause. They show results of the underlying select statement. Views can then be used just like a table.

Although similar views, functions provide some different functionality. Functions are able to return both a table or a single value. They can be used in concert with other select statements to return the specific value in all rows of the results.

Stored procedures are the most complex. Stored procedures run specific batches of code as a single executable. They can contain a wide variety of statements such as selects, inserts, updates, deletes, etc. Once created the procedure can be executed easily without having to rewrite all of the underlying code each time. With stored procedures many database operations can be automated to a point.

Summary

All three of these features help provide the databases they exist in with user friendly functionality, and layers of abstraction to protect the underlying data. Creating useful vies functions and stored procedures reduces friction when working with complex queries and large unwieldy databases with many tables and lots of data.