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August 17, 2022
Foundations Of Databases & SQL Programming
Assignment 06
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# Views, Functions, and Stored Procedures

## Introduction

Views, functions, and stored procedures are abstraction layer objects. They can be used to protect fundamental data and developer-level code, and to show available data in less-complex ways. They are stored within the database so they can be used without re-writing their code every time they are called.

## When to Use a View

Views are queries that are used to display a data table in a user-friendly way, without showing too much complex code. Views allow data to be accessed indirectly and can be queried and joined like any table.

A view can be used to generate a table that shows only data that is relevant to a department or project. Views can also be used to show or hide private data based on permissions granted to a user. A view should be created for every table in a database to maintain integrity of the underlying data source.

## Differences and Similarities

Functions can return a single value: a table or a scalar value. Unlike views, they can include parameters to change query results depending on the parameter value entered when the function is called. Functions can only contain SELECT statements; data cannot be changed using a function. Functions can also be called from a SELECT statement.

A stored procedure is a process that is saved in the database. It can contain functions (but functions cannot contain procedures) and ALTER, UPDATE, and DELETE statements. It can include parameters and return multiple values. Stored procedures must be executed; they cannot be called from a SELECT statement.

## Summary

Layers of abstraction in databases are important for managing ease of use, access control, and process speed. Views, functions, and stored procedures are tools that offer increasing complexity for returning data in a useful way.