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10/19/2025  
BIDD 310  
Assignment 03

# Reports!

## Intro

This week I learned about some ways to share data and analysis with end users who may not have permissions to query the database directly, but who need to perform their own analyses on business data. The catchall term we affectionately use to refer to these deliverables is: reports! Reports come in all shapes and sizes, but at their simplest, they are both the deliverable and the data model that drives them. These data models are often made of some type of complex query that may be generated by a *subquery* or a *window function*. We'll explore both reports and complex SQL queries below!

## How do you write complex SQL queries?

What are complex queries? There are a handful of approaches that allow a developer to achieve advanced results in a limited amount of code. For starters there are subqueries. These allow us to create a temporary result set that we can query against. This can be helpful for filtering results before calculating aggregated values. A similar approach is to use window functions. Here too you can calculate aggregated values OVER a filtered result set. CTEs or Common Table Expressions are *another* way to create a filtered set of results that you can then select against or load into a new table. Finally, there are Temporary Tables and Views. These are tables that have varying levels of persistence allowing you to use your filtered result set in multiple operations, not just a single session or connection. The best way to utilize these approaches is to build up your query layer by layer. First just query for the inner result set. Then wrap that into an inner query and query against it. Keep working in this fashion until you are producing the final result set that you are looking for.

## What are report objects?

Reports are used to print or display information from a database. *Report object* is just a funny way to say report. Or more precisely, it is a way to refer to the deliverable artifacts that allow an end user to read information from the database. Creating a report requires building a data model to provide the basis of the report, usually answering some business question, and then creating the presentation layer using any number of tools: Tableau, Power BI, Excel, SQL Server Reporting Service, or a web application, to name a few.

## Summary

This week's assignments took a leap forward in complexity. The SQL queries became more complex utilizing various Temporary Data structures like views and temporary tables, and using subqueries and CTEs to build up more advanced results. This week's assignments also added reporting and connecting Excel to SQL Server for generating report objects. These provide a solid foundation for answering business questions for your end users. And this leap forward will only create the basis for next weeks assignments to be even more complex!