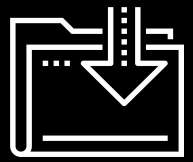
Advanced SQL Queries

Data Boot Camp

Lesson 9.2



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Class Objectives

By the end of today's class, you will be able to:

Create aggregate queries.

Create subqueries to explore data further.

Create views and run subqueries off of them.

Instructor Demonstration

Import Data

Import Data

After creating a database and table, we import data into a table by doing the following:

Instructions	
	Right-click the table, then select **Import/Export.**
	In the Import/Export options: ● Select the file to import. ● Select the type of file (usually CSV file). ● Set “Header” to “**Yes**”. ● Set the delimiter based on how the data is separated (usually a comma). ● Click **OK**.
	Confirm the import was successful.

Gregarious Aggregates

Aggregate functions allow you to perform a calculation on a set of values to return a single value.

Aggregate Functions

The most commonly used aggregate functions are:

AVG	Calculates the average of a set of values
COUNT	Counts the rows in a specific table or view
MIN	Returns the minimum value in a set of values
MAX	Returns the maximum value in a set of values
SUM	Calculates the sum of a set of values

Aggregate Functions

Aggregate functions are often used with:

01 The `GROUP BY` clause

02 The `HAVING` clause

03 The `SELECT` statement

Instructor Demonstration

Aggregate Functions, Aliases, and Grouping

Questions?

Activity: Gregarious Aggregates

In this activity, you will practice queries with aggregate functions, with grouping, and with using aliases.

Suggested Time:

15 minutes

Activity: Gregarious Aggregates

Instructions

Use aggregate functions as you run queries to answer the following questions.
You will have to search the internet for some of these functions.
Try using aliases for more informative column headings.

- What is the average cost to rent a film in the stores?
- What is the average rental cost of films by rating? On average, what film rating is the cheapest to rent? What rating is the most expensive?
- How much would it cost to replace all films in the database?
- How much would it cost to replace all films in each rating category?
- How long is the longest movie in the database? How short is the shortest movie?

Hint

Consult the Postgres documentation on the "**Aggregate Functions**" section for a summary of the available functions.

Time's Up! Let's Review.

Instructor Demonstration

Order By Aggregates

Order By Aggregates

The `ORDER BY` function:

Is added towards the end of a query.

Returns in an ascending order by default.

Can also return in a descending order by adding `DESC`.

Can limit the return by adding `LIMIT`.

NOTE: Use the `ROUND` function to round up the number after the the decimal.

Pro Tip:

One important point about AGGREGATE FUNCTIONS:

The returned data is in random order!

Activity: Movies Ordered By

In this activity, you will use `ORDER BY` in combination with other SQL methods to query and order the tables.

Suggested Time:

15 minutes

Activity: Movies Ordered By

Instructions	Determine the Top 10 count of actor first names with the names ordered in descending order of count.
	Determine the average rental duration for each rating, rounded to two decimals. Order these in ascending order.
	Determine the average replacement costs and length of movie for each rating, rounded to two decimals. Order these by movie length in descending order.
Bonus	Using the city and country tables, determine the count of countries in descending order.

Time's Up! Let's Review.

Break

Introduction to Subqueries

Subqueries

A subquery is nested inside a larger query. Subqueries occur in:

01 The `SELECT` statement

02 The `FROM` clause

03 The `WHERE` clause

Instructor Demonstration

Introduction to Subqueries

Activity: Subqueries

In this activity, you will practice creating subqueries.

Suggested Time:

15 minutes

Activity: Subqueries

Instructions	List the names and ID numbers of cities that are in the following list: `Qalyub`, `Qinhuangdao`, `Qomsheh`, `Quilmes`.
	Display the districts in the above list of cities.
Hint	Use the `address` and `city` tables.
Bonus	Using subqueries, find the first and last names of customers who reside in cities that begin with the letter Q.
Hint	You will need to use three tables and more than one subquery.

Time's Up! Let's Review.

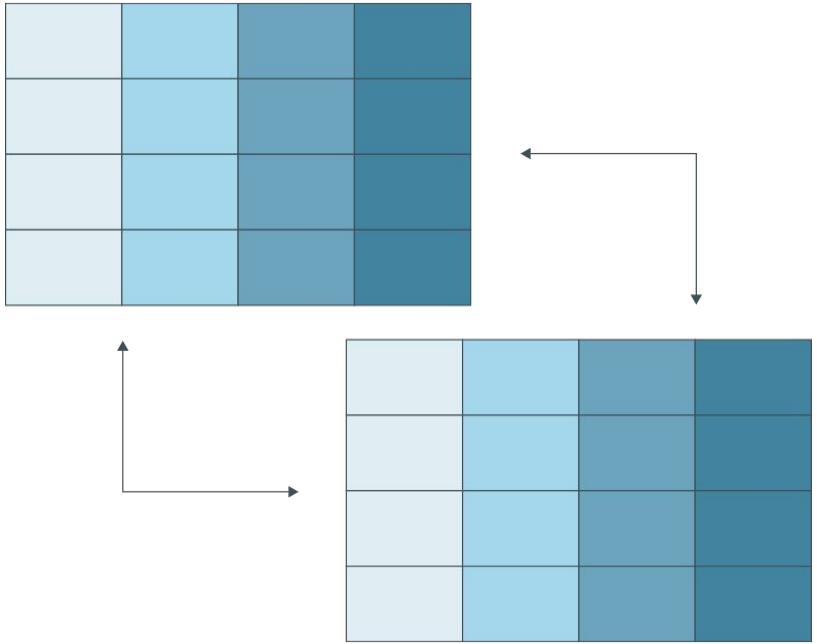
SQL Views

A **view** is a virtual table that can be created from a single table, multiple tables, or another view.

SQL Views

Views are created by using the `CREATE VIEW` statement.

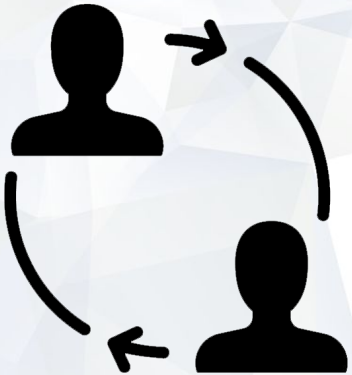
Views are created from a single table, multiple tables, or another view.



Instructor Demonstration

Create Views

Questions?



Partner Activity:
A View with a Roomful of Queries

In this activity, you will practice your join and subquery skills, as well as build out a view.

Suggested Time:

15 minutes

Partner Activity: A View with a Roomful of Queries

Instructions	
	Write a query to get the number of copies of a film title that exist in the inventory. The results should look like those shown in the following table. Your challenge is to use a subquery (a query embedded within another query) instead of a join.
	Create a view named `title_count` from the above query.
	Query the newly created view to find all the titles that have seven copies.

Time's Up! Let's Review.

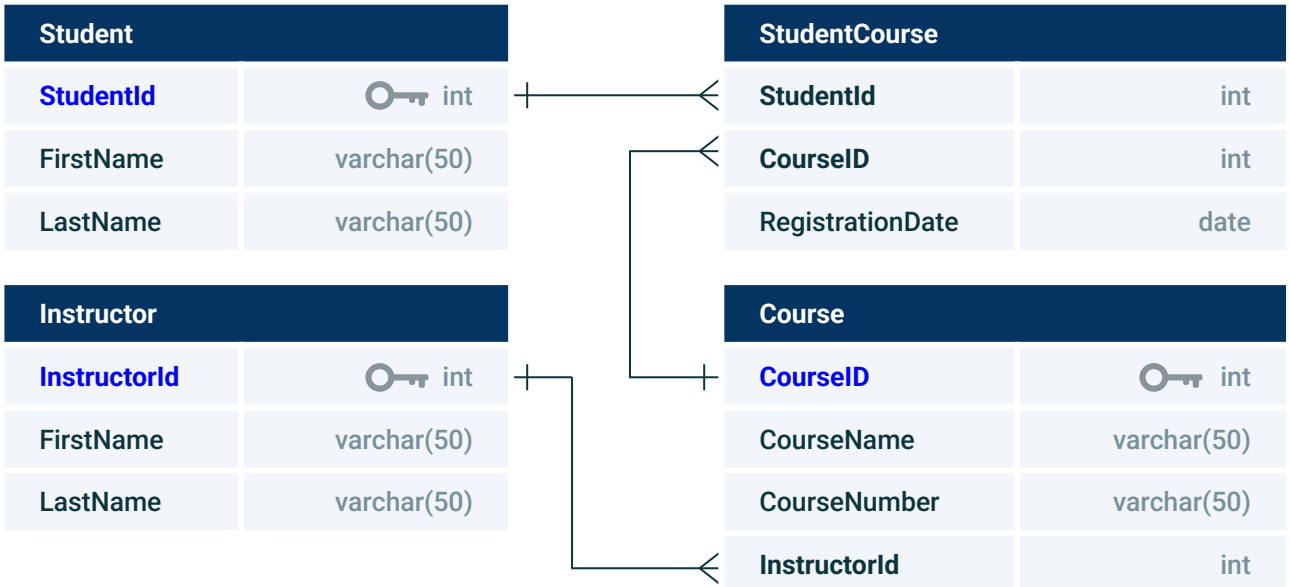
How many people have rented the film Blanket Beverly?

An **ERD** (Entity Relationship Diagram) shows the connections between the tables.

Entity Relationship Diagram

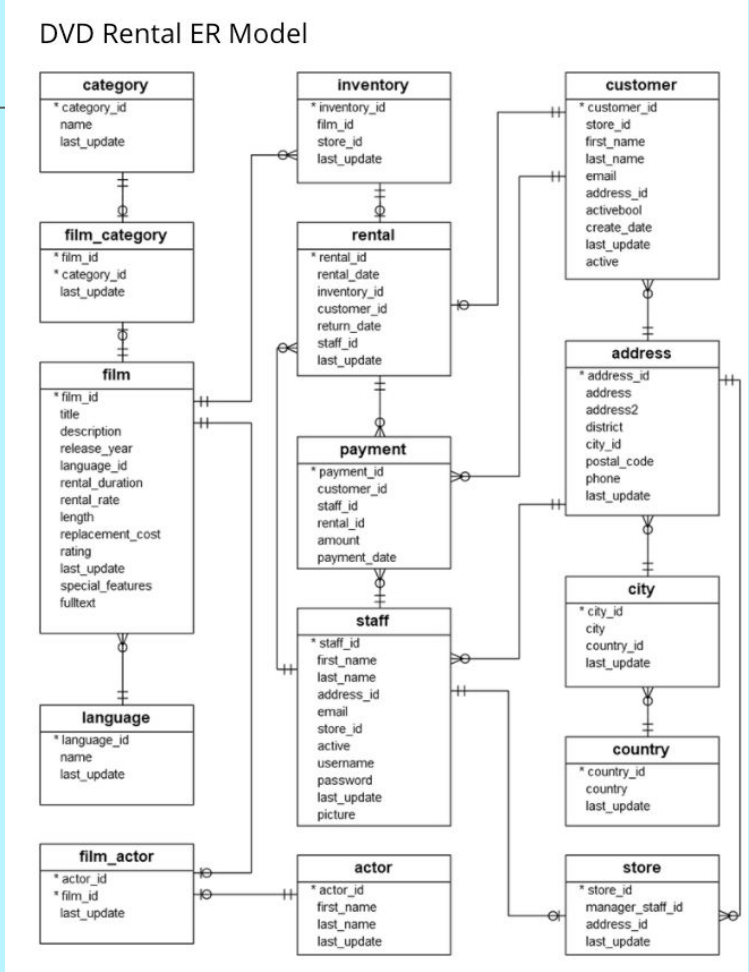
It's called an Entity Relationship Diagram because it shows:

- The entities in your data model
- The relationship between entities



Entity Relationship Diagram

The schema makes it easier to identify the tables we need as well as the keys we will use to link our subqueries.



Instructor Demonstration

Revisit Subqueries

Questions?

Activity: Mine the Subquery

In this activity, you will continue to practice subqueries. You can work individually or with partners.

Suggested Time:

10 minutes

Partner Activity: A View with a Roomful of Queries

Instructions	Using subqueries, identify all actors who appear in the film `'ALTER VICTORY'` in `pagila` database.
	Using subqueries, display the titles of films that the employee **Jon Stephens** rented to customers.
Hint	You can use an ERD for help with queries.

Time's Up! Let's Review.