Advanced SQL Queries

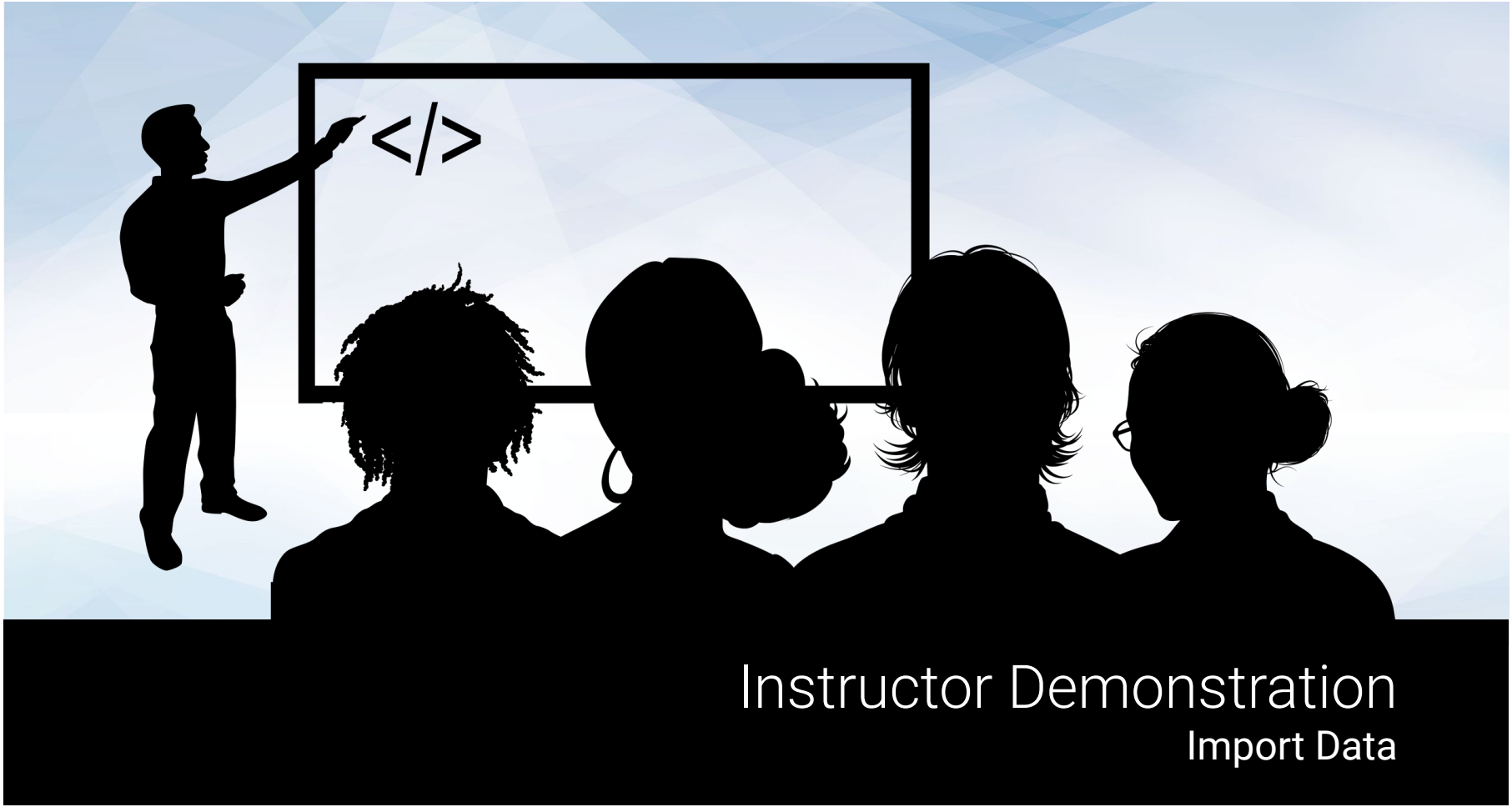
Data Boot Camp

Lesson 9.2

Class Objectives

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

- Create Aggregate queries.
- Create subqueries for further data exploration.
- Create views and run subqueries off of them.



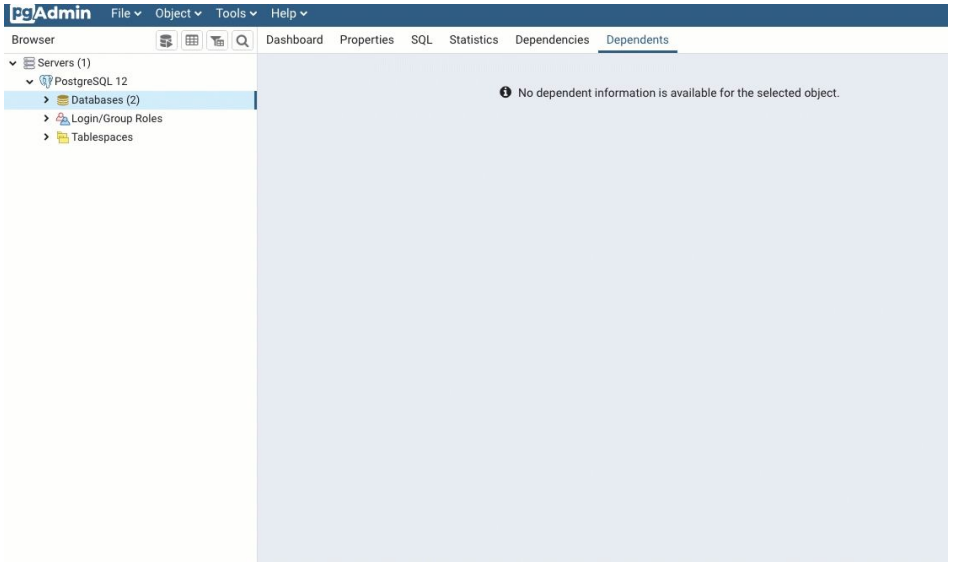
Instructor Demonstration

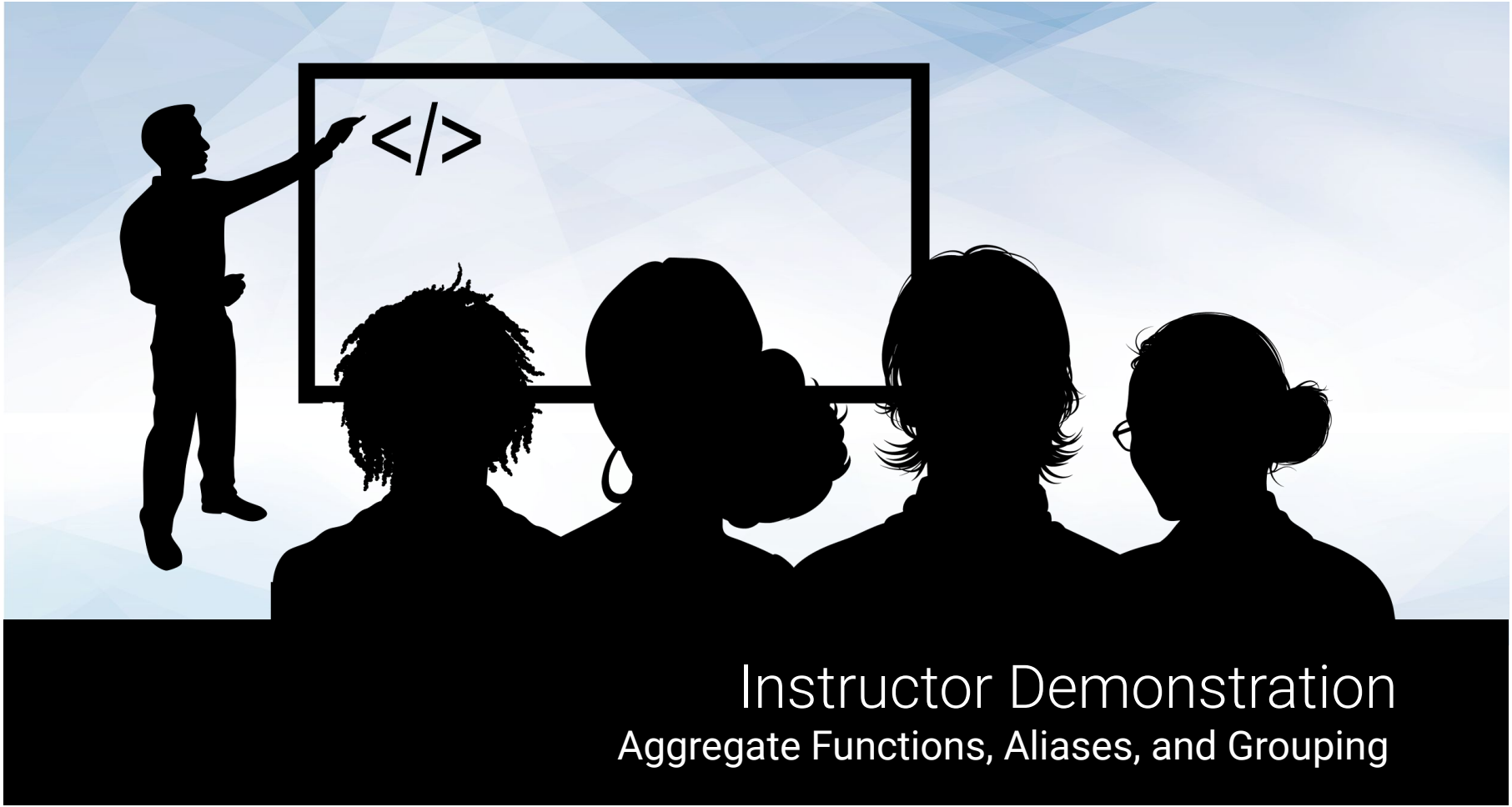
Import Data

Check your SLACK!!!

Import Data

- The process to import data to a table:
  - Create a database.
  - Open the query tool for the database created.
    - Write the code to create a table.
  - Right-click on the table then select Import/Export.
    - Import the data (usually in a csv file).
  - Confirm import was successful.





Instructor Demonstration

Aggregate Functions, Aliases, and Grouping

Aggregate Functions , Aliases, and Grouping

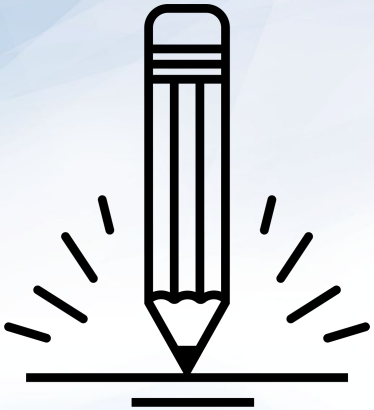
- Aggregate functions allow you to perform a calculation on a set of values to return a single value.

- 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 are often used with:
  - **GROUP BY**
  - **HAVING**
  - **SELECT**

Aggregate Functions , Aliases, and Grouping

<Time to code>



Activity: Gregarious Aggregates

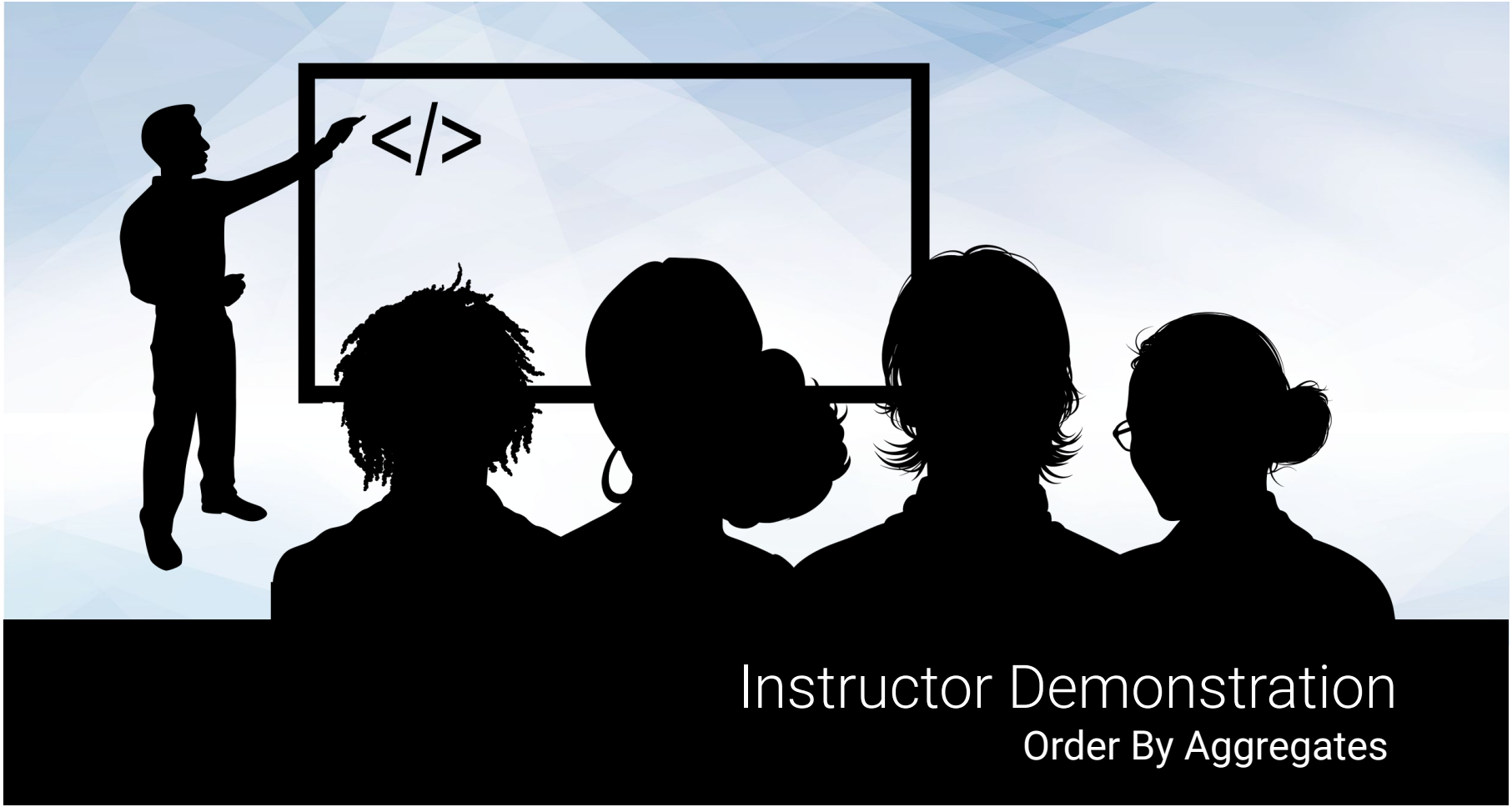
In this activity, you will practice queries with aggregate functions, with grouping, and with using aliases.

Suggested Time:
15 Minutes

Activity: Gregarious Aggregates

- Use aggregate functions as you run queries to answer the following questions. You will have to search the internet for some of them. Try to use 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 is the cheapest rating of films to rent? What 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 ratings category?
  - How long is the longest movie in the database? How long 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.

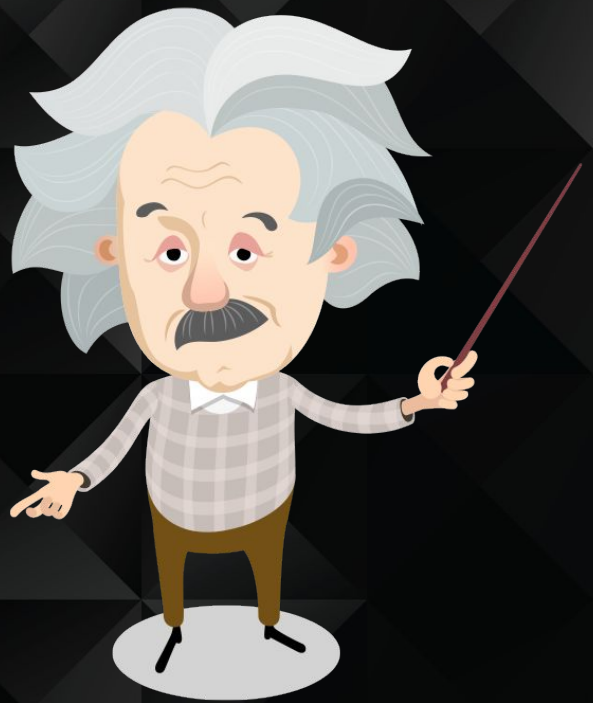


Instructor Demonstration

Order By Aggregates

One important point about **AGGREGATE FUNCTIONS** we all need to keep in mind;

It only returns in a random order!

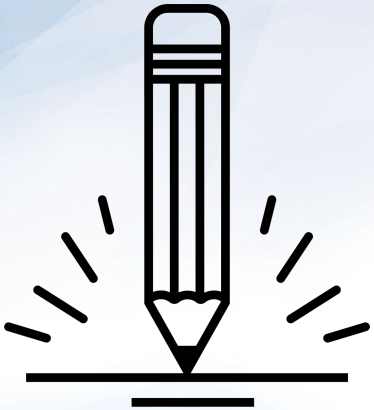


Order By Aggregates

<Time to Code>

- The `ORDER BY` function.
    - Is added towards the end of a query.
    - It returns in an ascending order by default.
    - It can also return in a descending order by adding `DESC`
    - It can limit the return by adding `LIMIT`

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



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

- Determine the count of actor first name ordered in descending order.
- Determine the average rental duration for each rating rounded to two decimals. Order these in ascending order.
- Determine the top 10 average replace costs for movies by their length.

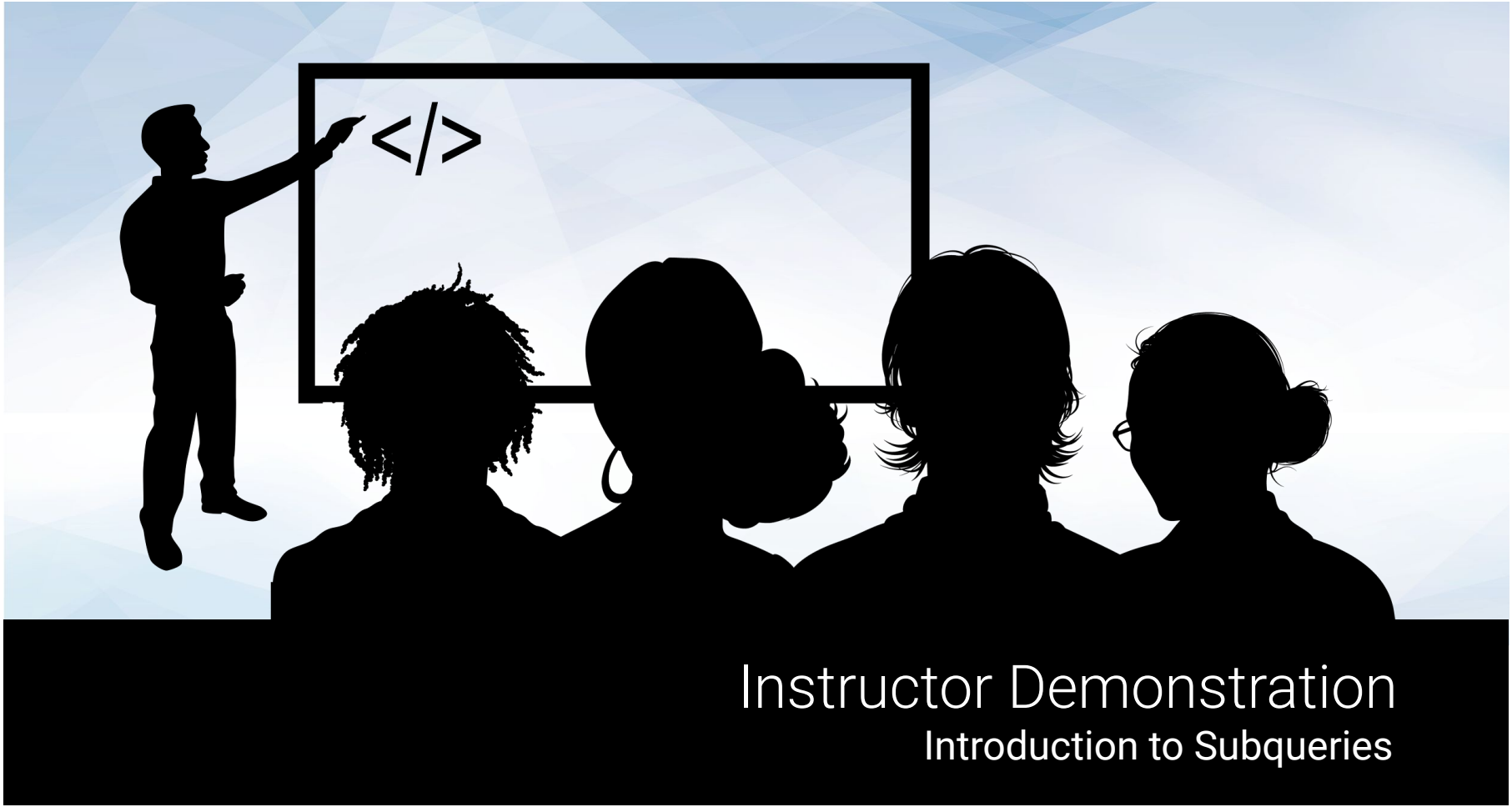
- **Bonus:**
  - Using the city and country tables, determine the count of countries in descending order.

Time’s Up! Let’s Review.

Countdown timer

15:00

(with alarm)



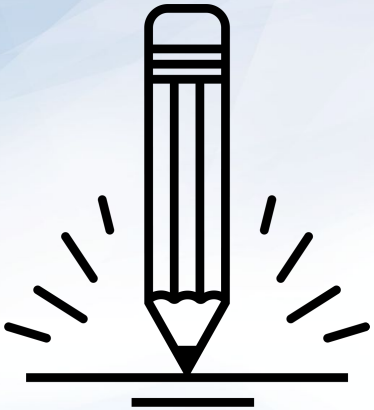
Instructor Demonstration

Introduction to Subqueries

Introduction to Subqueries

<Time to code>

- **Subqueries**
  - A subquery is nested inside a larger query.
  - Subqueries occur in:
    - The `SELECT` statement.
    - The `FROM` clause.
    - The `WHERE` clause.



Activity: Subqueries

In this activity, you will practice creating subqueries.

Suggested Time:
15 Minutes

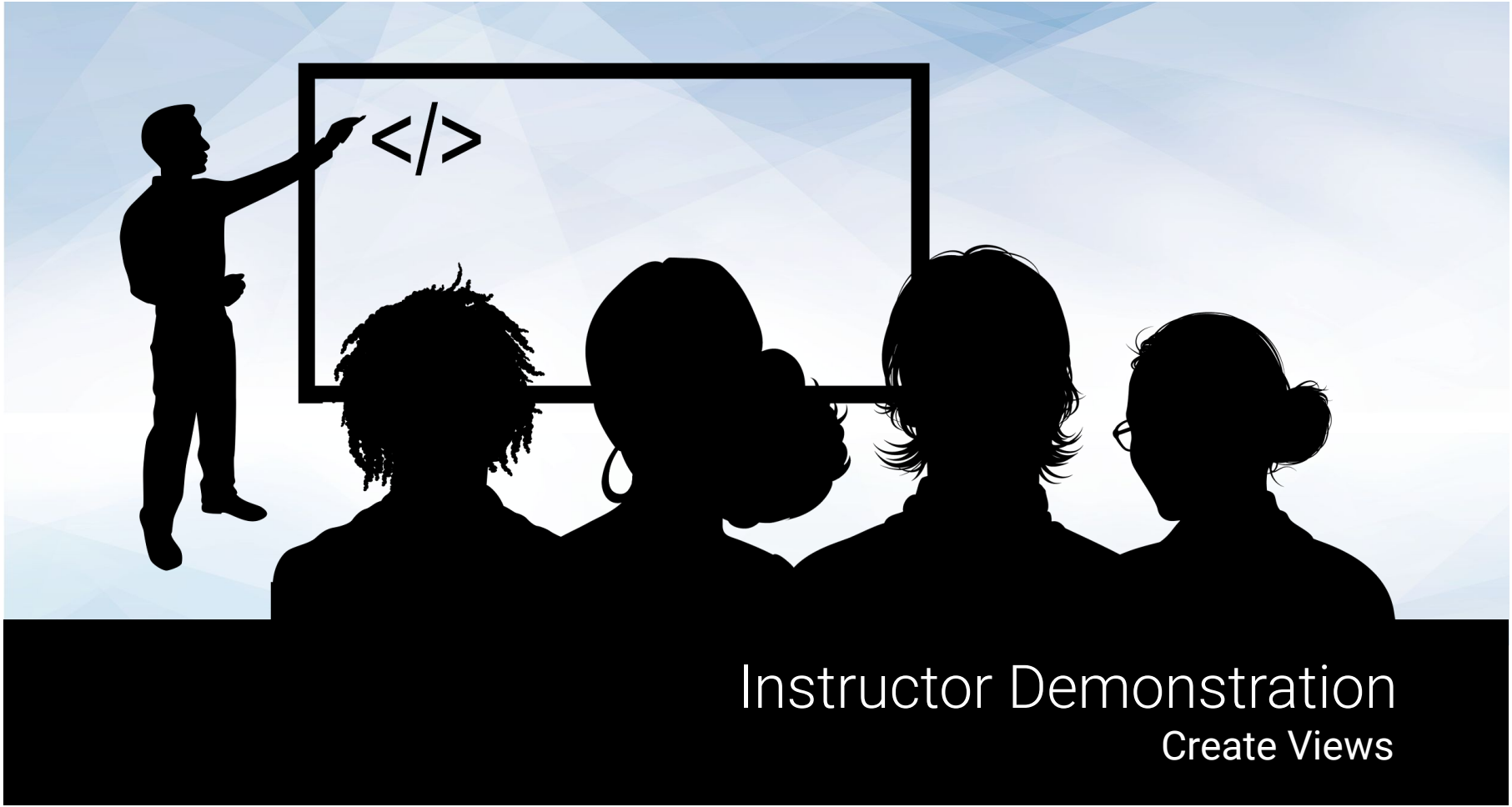
Activity: Subqueries

- 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.

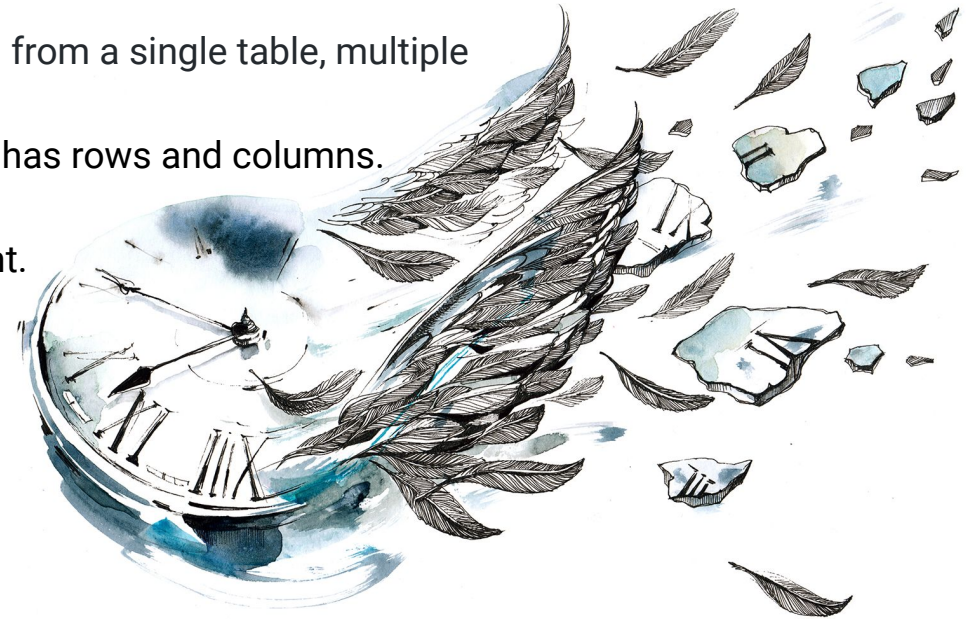


Instructor Demonstration

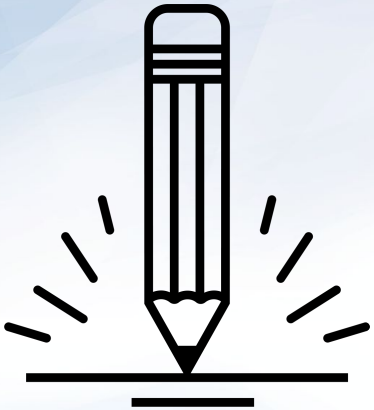
Create Views

Create Views <Time to code>

- **View**
  - A virtual table that can be created from a single table, multiple tables, or another view.
  - It is not part of the schema, but it has rows and columns.
  - **View** can be created using:
    - The `CREATE VIEW` statement.



NOTE**: Check your **SLACK.



Activity: A View with a Roomful of Queries

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

Suggested Time:
15 Minutes

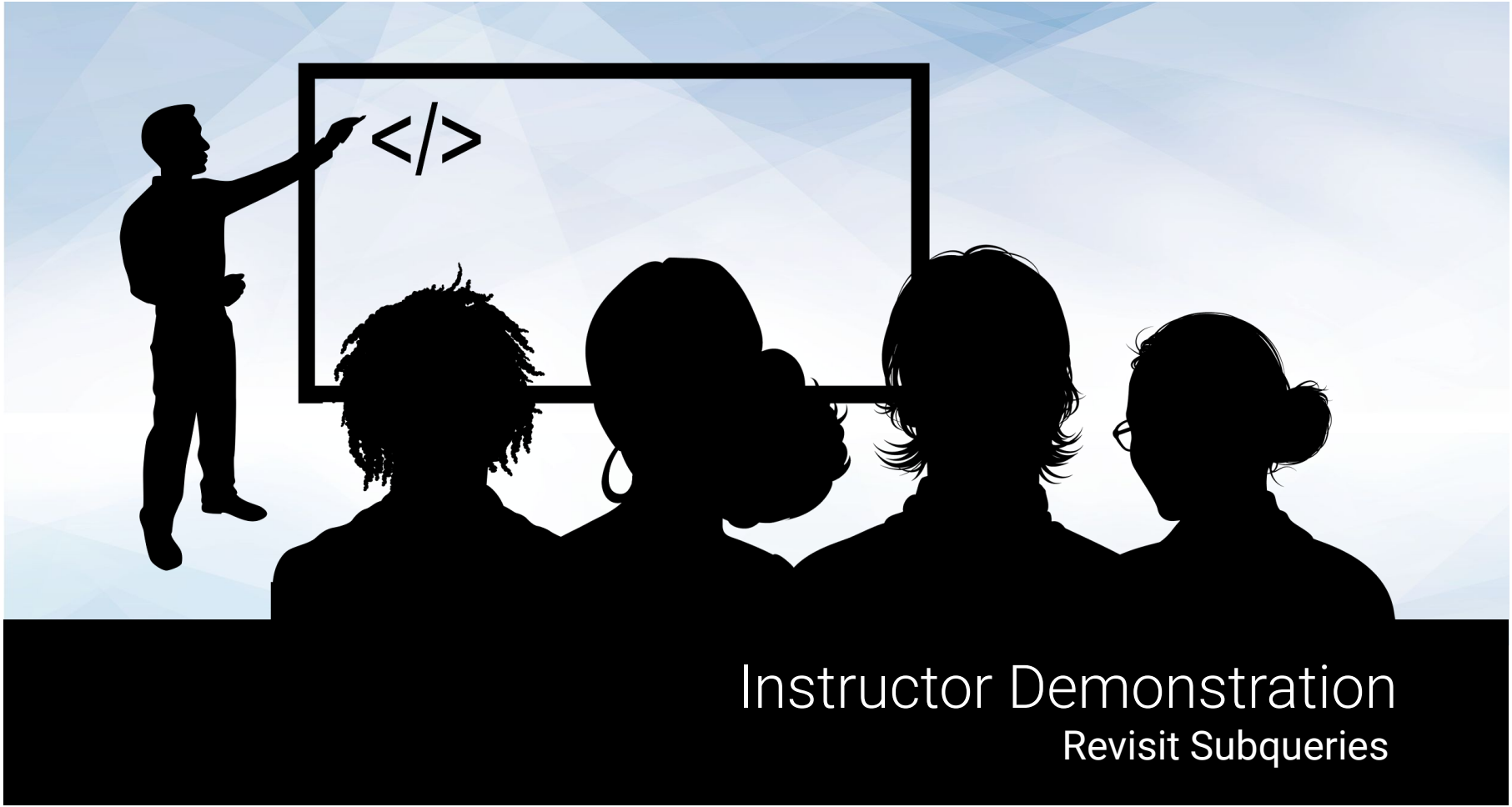
Activity: A View with a Roomful of Queries

- 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 7 copies.

	title character varying	number_of_copies bigint
1	AFAIR PREJUDICE	7
2	ALADDIN CALENDAR	7
3	ALAMO VIDEOTAPE	7
4	ALASKA PHANTON	7
5	AMISTAD MIDSUMMER	7
6	ARACHNOPHOBIA ROL...	7
7	ARIZONA BANG	7
8	ARMAGEDDON LOST	7

Time’s Up! Let’s Review.



Instructor Demonstration

Revisit Subqueries

Revisit Subqueries

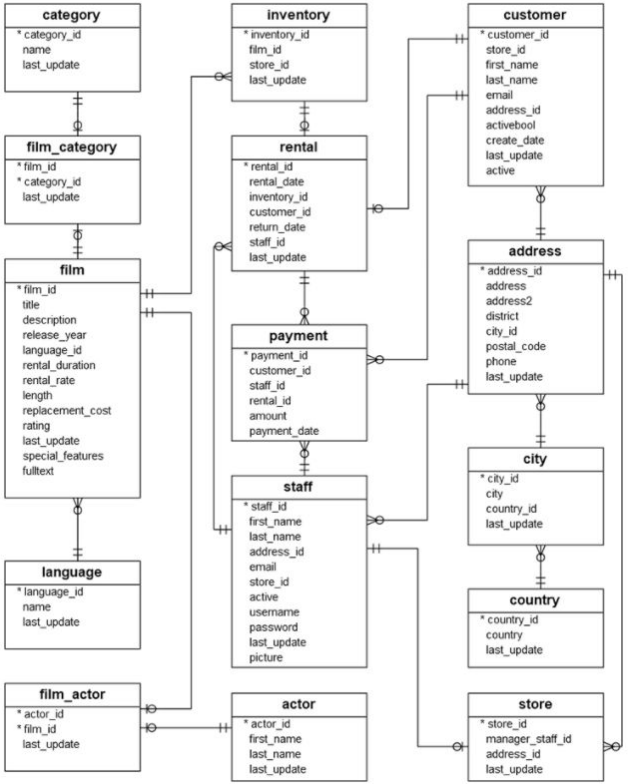
How many people have rented the film Blanket Beverly?

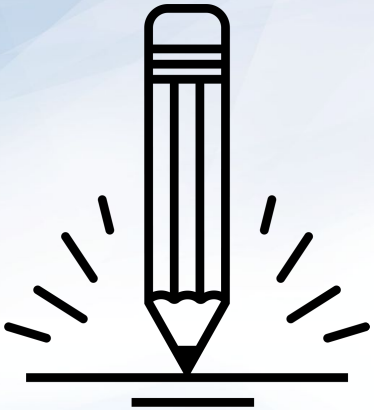
To answer this question systematically, we must use an entity relationship diagram (ERD) to identify the tables needed for our query.

- **ERD**
    - An ERD shows the connections between the tables.
    - The schema makes it easier to identify the tables we need as well as the keys we will use to link our subqueries.
    - We will dive deeper into these in the next lesson.

NOTE**: Check your **SLACK.

DVD Rental ER Model





Activity: Mine the Subquery

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

Suggested Time:
10 Minutes

Activity: Mine the Subqueries

- 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.

- **Note**: You can use ERD (Entity-Relationship Diagram) for help with queries.

Time’s Up! Let’s Review.


The End.