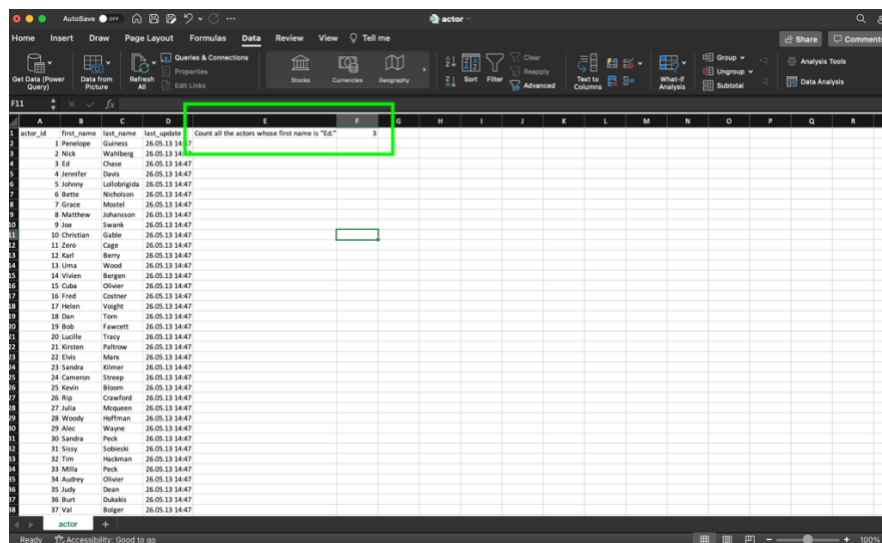


3.1: Intro to Relational Databases

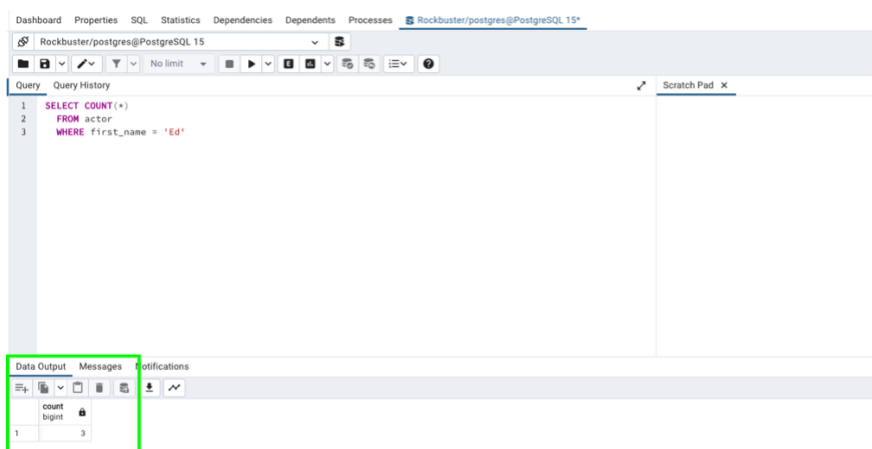
1. install PostgreSQL and load the Rockbuster database using the instructions in the Exercise
2. Compare and contrast spreadsheets and databases by following the steps below:
 - use the appropriate functions in Excel to count all the actors whose first name is “Ed.” Write down the result in a text document.



The screenshot shows a Microsoft Excel spreadsheet with a table of actors. The table has columns for actor_id, first_name, last_name, and last_update. A formula is entered in cell E2: =COUNTIF(A2:A37, "Ed"). The result of the formula is 3, displayed in cell F2.

actor_id	first_name	last_name	last_update
1	Penelope	Guinness	26.05.13 14:47
2	Neck	Wahlberg	26.05.13 14:47
3	Ed	Chase	26.05.13 14:47
4	Jeffrey	Davis	26.05.13 14:47
5	Johnny	Lutheganga	26.05.13 14:47
6	Bette	Nicholson	26.05.13 14:47
7	Gracie	Mouset	26.05.13 14:47
8	Matthew	Johansson	26.05.13 14:47
9	Joe	Swank	26.05.13 14:47
10	Christian	Galbo	26.05.13 14:47
11	Zero	Cage	26.05.13 14:47
12	Karl	Berry	26.05.13 14:47
13	Uma	Wood	26.05.13 14:47
14	Vivian	Bergan	26.05.13 14:47
15	Cuba	Oliver	26.05.13 14:47
16	Fred	Cosner	26.05.13 14:47
17	Helen	Vaught	26.05.13 14:47
18	Dan	Torn	26.05.13 14:47
19	Bob	Fawcett	26.05.13 14:47
20	Lucille	Tracy	26.05.13 14:47
21	Kristen	Palmer	26.05.13 14:47
22	Elvis	Mars	26.05.13 14:47
23	Sandra	Klimer	26.05.13 14:47
24	Cameron	Strong	26.05.13 14:47
25	Kevin	Bloom	26.05.13 14:47
26	Rip	Crowford	26.05.13 14:47
27	Julia	McQueen	26.05.13 14:47
28	Woody	Hoffman	26.05.13 14:47
29	Alor	Wayne	26.05.13 14:47
30	Sandra	Peck	26.05.13 14:47
31	Sissy	Sobieski	26.05.13 14:47
32	Tina	Hickman	26.05.13 14:47
33	Milla	Peck	26.05.13 14:47
34	Audrey	Oliver	26.05.13 14:47
35	Judy	Dean	26.05.13 14:47
36	Burt	Dukakis	26.05.13 14:47
37	Vai	Kalger	26.05.13 14:47

- Launch pgAdmin 4, open the Query Tool, copy-paste the SQL statement below into the Query Editor, and execute it.



The screenshot shows the pgAdmin 4 Query Tool interface. The SQL query is: `SELECT COUNT(*) FROM actor WHERE first_name = 'Ed'`. The result is displayed in the Data Output tab, showing a single row with the count 3.

count
3

Was it easier to use Excel or the SQL statement and database to count the number of “Eds”?

It isn't easy to compare this task using these two tools. They were both pretty fast. In SQL, more commands were needed than in excel (=COUNTIF(B1:D201;"Ed")) So, I guess with Excel was easier to count the number of Eds.

Step 3

- Execute the following query and list the names of the columns in the payment table.

SELECT * FROM payment LIMIT 10;

Payment Id (Integer) Customer Id (Smallint) Staff Id (Smallint) Rental Id (Integer) Amount (Numeric) Payment date (Timestamp without time zone)

	payment_id [PK] integer	customer_id smallint	staff_id smallint	rental_id integer	amount numeric (5,2)	payment_date timestamp without time zone
1	17503	341	2	1520	7.99	2007-02-15 22:25:46.996577
2	17504	341	1	1778	1.99	2007-02-16 17:23:14.996577
3	17505	341	1	1849	7.99	2007-02-16 22:41:45.996577
4	17506	341	2	2829	2.99	2007-02-19 19:39:56.996577
5	17507	341	2	3130	7.99	2007-02-20 17:31:48.996577
6	17508	341	1	3382	5.99	2007-02-21 12:33:49.996577
7	17509	342	2	2190	5.99	2007-02-17 23:58:17.996577
8	17510	342	1	2914	5.99	2007-02-20 02:11:44.996577
9	17511	342	1	3081	2.99	2007-02-20 13:57:39.996577
10	17512	343	2	1547	4.99	2007-02-16 00:10:50.996577

- Under the “table_name” column, what are the names of the tables that are available in the Rockbuster database? (List all names.)

	table_catalog name	table_schema name	table_name name	table_type character varying	self_referencing_column_name name	reference_generation character varying	user_defined_type_catalog name	user_defined_type_schema name	user_defined_type_name name	is_insert character
1	Rockbuster	public	actor	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
2	Rockbuster	public	store	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
3	Rockbuster	public	address	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
4	Rockbuster	public	category	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
5	Rockbuster	public	city	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
6	Rockbuster	public	country	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
7	Rockbuster	public	customer	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
8	Rockbuster	public	film_actor	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
9	Rockbuster	public	film_category	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
10	Rockbuster	public	inventory	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
11	Rockbuster	public	language	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
12	Rockbuster	public	rental	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
13	Rockbuster	public	staff	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
14	Rockbuster	public	payment	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES
15	Rockbuster	public	film	BASE TABLE	[null]	[null]	[null]	[null]	[null]	YES

- Within the pgAdmin 4 console, can you think of another way to list all the table names in the database instead of the SQL statement above?

Yes, through the browser menu on the left side: Rockbuster > Schemas > Tables (15)



- Analyze the rental duration distribution. How many days are most films rented for?

	rented for (in days) smallint	number of films bigint
1	7	191
2	5	191
3	4	203
4	3	203
5	6	212

Step 4

Think about who in Rockbuster Stealth might want to use an OLAP or OLTP system for their data needs; for example, the sales department, which is interested in sales trends, would likely use an OLAP system. Describe at least 2 situations for each type of system.

OLAP – would be suitable for a Marketing or Sales team that wants to prepare a Budget and forecast.

OLTP- would be suitable for Acquisition teams that records and updates interactions, e.g., storing new clients, order details, or shipment status.

Step 5

Rockbuster Stealth has received an invoice for the licenses for its new video collection.

- Does the invoice contain structured or unstructured data? Write an explanation for your answer.
- I will say it is unstructured. We could manipulate it, but it would involve manual intervention. Even though we could quickly put this information in a table, I don't see the data in a tabular form.
- Organize and store the information on the invoice in a database. Step one will be to create a table in the text document you've started (you can insert a table if you're using MS Word or Google Docs, for example). Make sure your table contains columns with the appropriate labels, as well as the values from the invoice in each column. You're focusing, here, on a high-level structuring of your data.

Invoice number	Item	Quantity	Description	Price	Currency	Retailer Name	Account holder name
2019001	1	1	New Video Collection Licensing	730	\$	Oaklanders Sound Studio	Miko Santo

Account Number	Adress	Ctity	State	First name	Last name	Gender	Adress	City	State
49293310005754	4826 Norma Avenue	Anderson	TX (Texas)	Timothy	Walkers	Male	40 Sheila La	Sparks	NV (Nevada)