

Why learn SQL?



What is SQL?

SQL = Structured Query Language

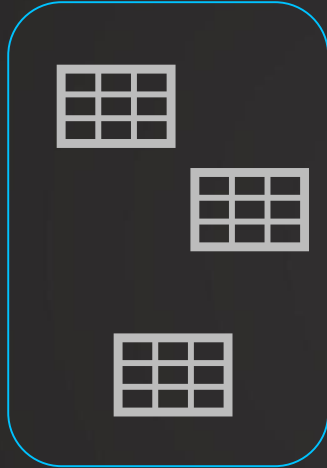
Interact with databases



Using SQL



Database



SQL

Departments

employee_id	entry_date	position_level
1	1/2/2022	HR
2	1/6/2022	IT
3	1/4/2022	IT
4	1/7/2022	UM
5	1/6/2022	PM

- Retrieve data
- Analyze data
- Define data
- Change data

employee_id	entry_date	position_level
1	1/2/2022	HR
2	1/6/2022	IT
3	1/4/2022	IT
4	1/7/2022	UM
5	1/6/2022	PM



+ a b | e a u

Qlik

Why learn SQL?

- ✓ Data is everywhere and mostly in databases
- ✓ Maybe the most important skill as
 - Data Analyst,
 - Data Scientist,
 - Business Analyst
- ✓ Learning SQL is easy & intuitive
- ✓ Mastering SQL is a Career Booster



What is a database?



What is a database?



Database



Tables



Tables

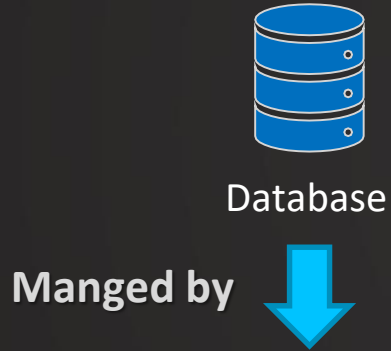


Tables

```
SELECT    <column1>,  
          <column2>, ...  
FROM      <table_name>
```

id	date	product	customer_id
1	1/2/2022	Fulltoss Tangy Tomato	2
2	1/2/2022	Chilli - Green, Organically Grown	2
3	1/2/2022	Masala Powder	5
4	1/2/2022	Cheese Cracker (McVities)	1
5	1/2/2022	Centre Filled Chocolate Cake	5

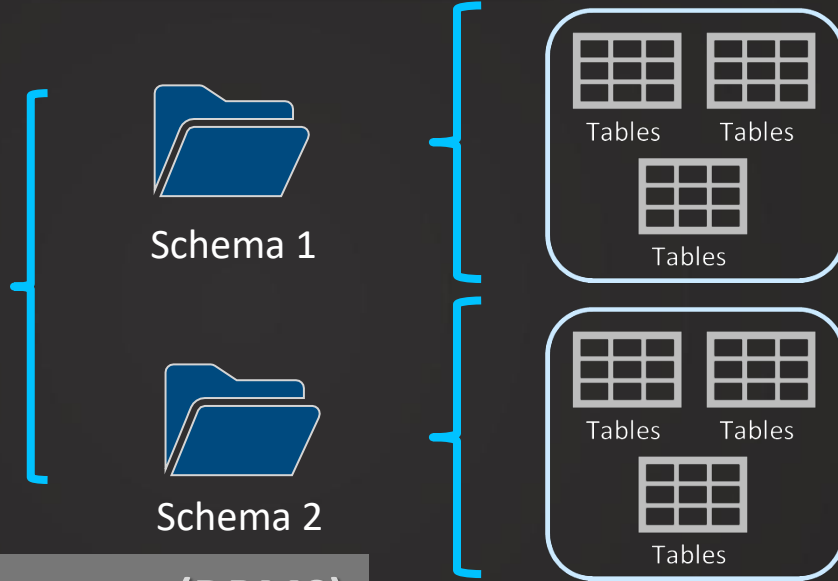
What is a database?



Database management system (DBMS)



PostgreSQL



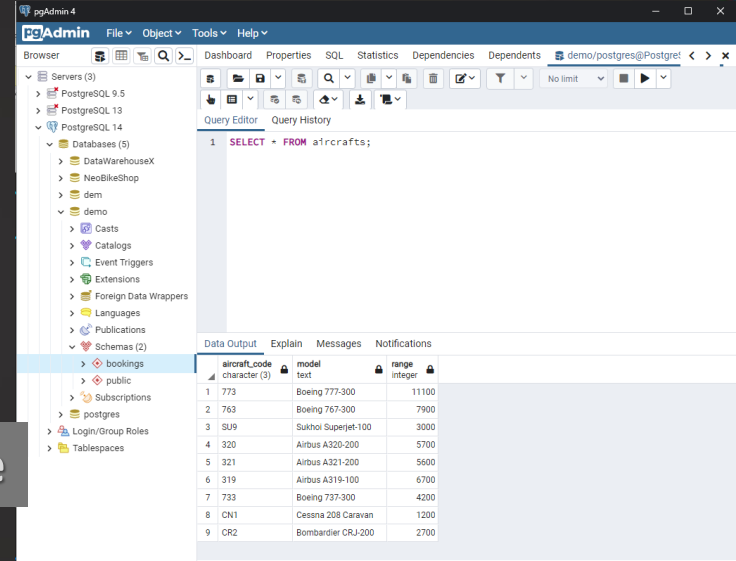
What is a database?

Database management system (DBMS)



PostgreSQL

Graphical Interface

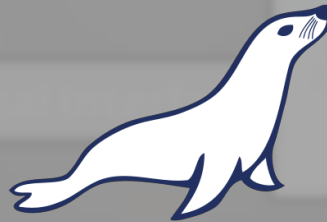


PgAdmin

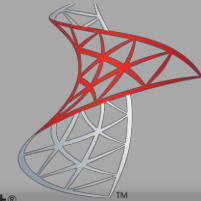
Different DBMS



PostgreSQL



MariaDB®



Microsoft®
SQL Server®



PostgreSQL

Different dialects

One language

All DBMS have slightly different dialects

The differences are small

PostgreSQL is the closest to the Standard SQL



PostgreSQL

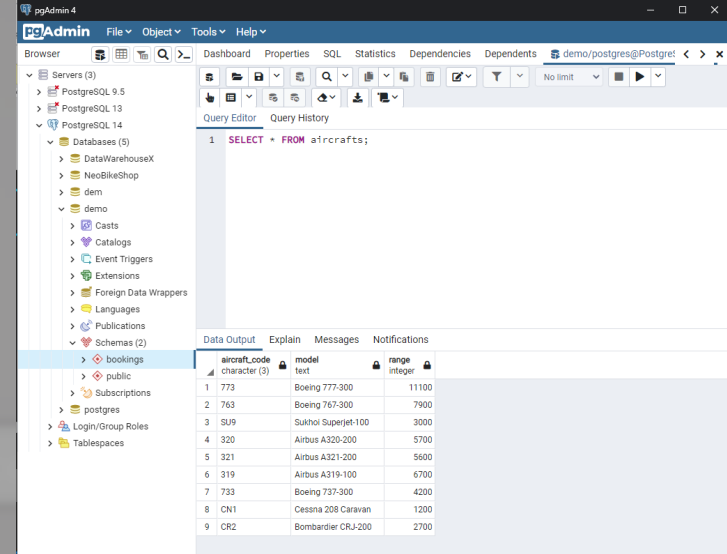
Why PostgreSQL?

- ✓ PostgreSQL is the closest to the Standard SQL
- ✓ Most flexible & transition will be easiest
- ✓ Free to download & use
- ✓ Very popular
- ✓ The most advanced DBMS in the world

Installation



PostgreSQL



PgAdmin

The Project



YOU:
Data Analyst



GreenCYCLES



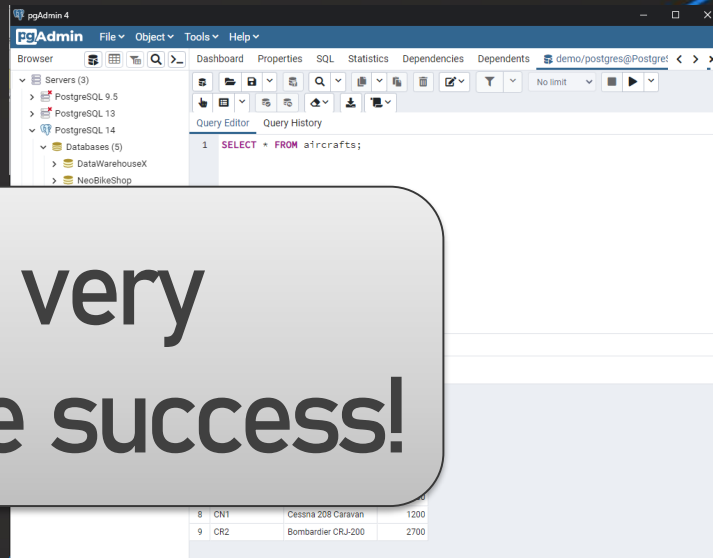
BUSINESS:
Online Movie Rental Shop

The Project



Data that is very
important for the success!

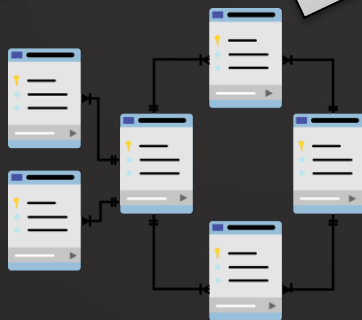
YOU:
Data Analyst



Your job

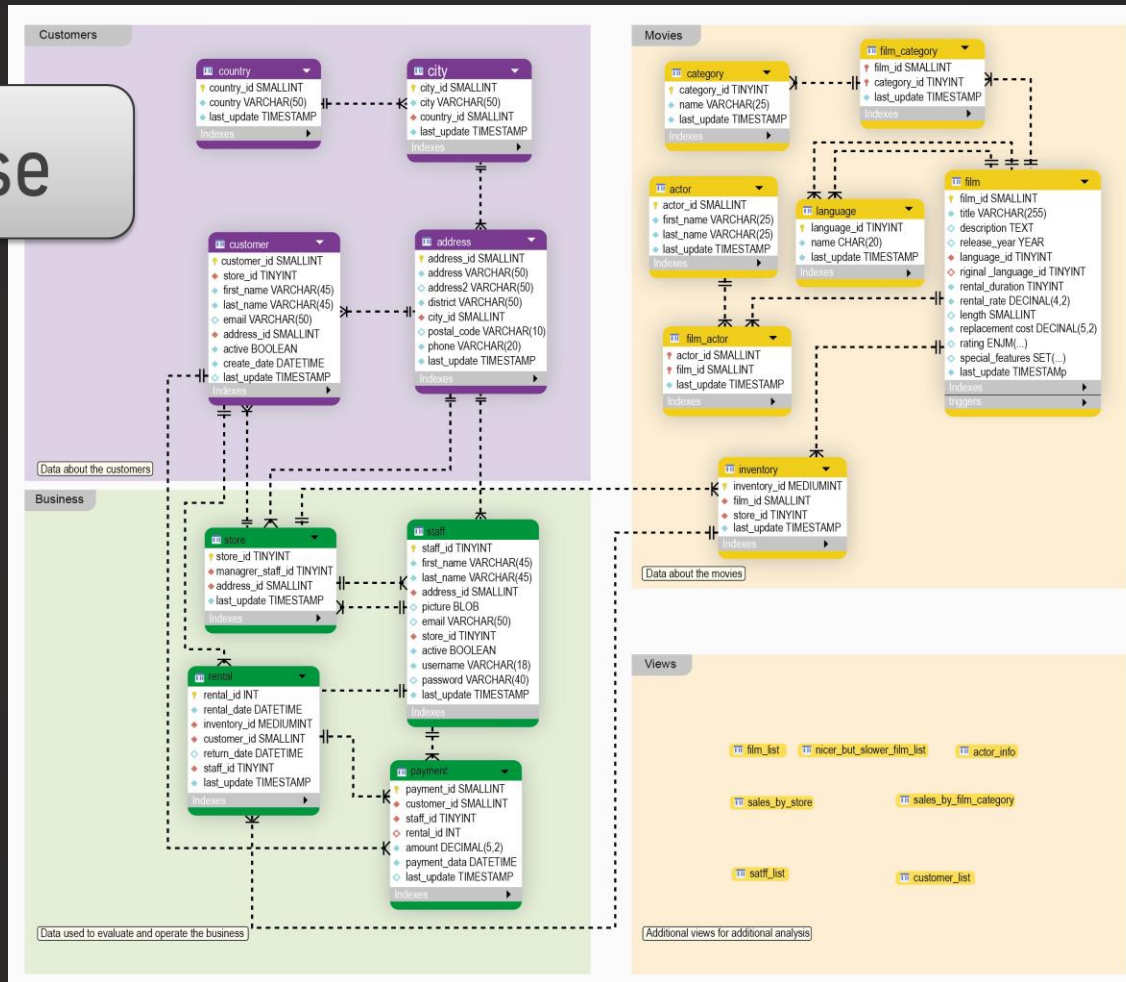


YOU:
Data Analyst

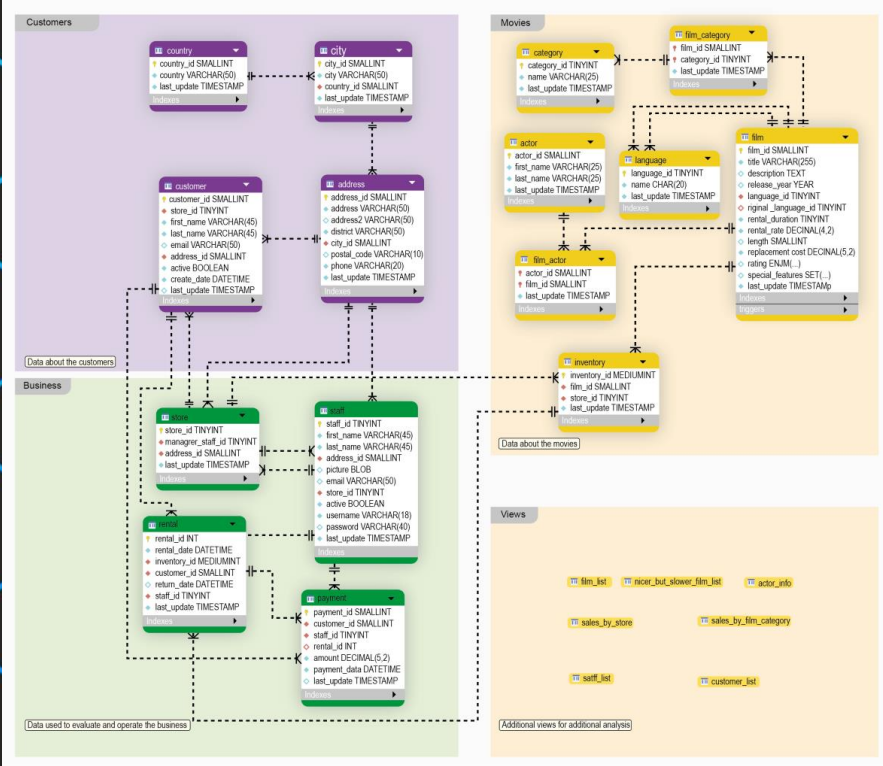


- ✓ Help the company operate
- ✓ Gain insights
- ✓ Solve problems

The database



Your challenges



- ✓ Explore meaningful data
- ✓ Get insights to make decisions
- ✓ Help to operate & navigate

**You are responsible
for the success!**

SELECT



- ✓ Most basic statement SQL
- ✓ Used to **select** and return data

SYNTAX

```
SELECT  
column_name  
FROM table_name
```

Example

```
SELECT  
first_name  
FROM actor
```

Data Output			Explain	Messages	Notifications
		first_name text			
1		PENELOPE			
2		NICK			
3		ED			
4		JENNIFER			
5		JOHNNY			

Multiple columns

```
SELECT  
first_name,  
last_name  
FROM actor
```






	Data Output	Explain	Messages	Notifications
	<div><div>first_name</div><div>text</div></div>	<div><div>last_name</div><div>text</div></div>		
1	PENELOPE	GUINESS		
2	NICK	WAHLBERG		
3	ED	CHASE		
4	JENNIFER	DAVIS		

All columns

SELECT

*

FROM actor

	Data Output	Explain	Messages	Notifications
	 actor_id [PK] integer 	first_name text 	last_name text 	last_update timestamp with time zone 
1	1	PENELOPE	GUINNESS	2020-02-15 10:34:33+01
2	2	NICK	WAHLBERG	2020-02-15 10:34:33+01
3	3	ED	CHASE	2020-02-15 10:34:33+01
4	4	JENNIFER	DAVIS	2020-02-15 10:34:33+01

Remarks!

1. Formatting doesn't matter!

```
SELECT  
first_name,  
last_name  
FROM actor
```

```
SELECT first_name,last_name  
FROM actor
```

```
SELECT first_name,last_name  
  
FROM actor
```

```
SELECT first_name,last_name FROM actor
```

The slide features a dark gray background. On the left and right edges, there are decorative vertical borders composed of light blue hexagonal outlines. These hexagons are arranged in a staggered, honeycomb-like pattern. In the center of the slide, there is a dark gray rectangular box containing the word "Challenge" in a white, cursive script font.

Challenge

Challenge

Your first day as a Data Analyst has started!

The Marketing Manager asks you for a **list of all customers**.

With **first name**, **last name** and the customer's **email address**.

Write a SQL query to get that list!

ORDER BY

✓ Used to **order** results based on a column

✓ Alphabetically, numerically, chronologically etc.

SYNTAX

SELECT

column_name1,




column_name2,

FROM table_name

ORDER BY column_name1



Example

```
SELECT  
first_name,  
last_name  
FROM actor  
ORDER BY first_name
```

	Data Output	Explain	Messages	No
	 first_name text		last_name text	
1	ADAM		HOPPER	
2	ADAM		GRANT	
3	AL		GARLAND	
4	ALAN		DREYFUSS	




DESC / ASC

```
SELECT  
first_name,  
last_name  
FROM actor  
ORDER BY first_name DESC
```

	Data Output	Explain	Messages	Notifications
	first_name text		last_name text	
1	ZERO		CAGE	
2	WOODY		HOFFMAN	
3	WOODY		JOLIE	



DESC / ASC

```
SELECT  
first_name,  
last_name  
FROM actor  
ORDER BY first_name ASC
```

	Data Output	Explain	Messages	Nc
	 first_name text		last_name text	
1	ADAM		HOPPER	
2	ADAM		GRANT	
3	AL		GARLAND	
4	ALAN		DREYFUSS	




Multiple columns

```
SELECT  
first_name,  
last_name  
FROM actor  
ORDER BY first_name, last_name
```

	Data Output	Explain	Messages	Notific
	first_name text		last_name text	
1	ADAM		GRANT	
2	ADAM		HOPPER	
3	AL		GARLAND	

DESC / ASC

```
SELECT  
first_name,  
last_name  
FROM actor  
ORDER BY first_name DESC, last_name
```

	Data Output	Explain	Messages	N
	 first_name text 		last_name text 	
1	ZERO		CAGE	
2	WOODY		HOFFMAN	
3	WOODY		JOLIE	



Challenge

SELECT DISTINCT


✓ Used to **SELECT** the **DISTINCT** values in a table

SYNTAX

```
SELECT DISTINCT  
column_name1  
FROM table_name
```

Example

```
SELECT DISTINCT  
first_name  
FROM actor
```

Data Output		Explain
	first_name text	
1	SIDNEY	
2	WOODY	
3	GOLDIE	
4	CHRIS	

Example

```
SELECT DISTINCT  
first_name  
FROM actor  
ORDER BY first_name
```




Data Output		Explain
	first_name text	
1	ADAM	
2	AL	
3	ALAN	
4	ALBERT	

Multiple columns

```
SELECT DISTINCT  
first_name,  
last_name  
FROM actor  
ORDER BY first_name
```



Note!

Distinct in terms of
all selected columns!

	Data Output	Explain	Messages	Not
	 first_name text		last_name text	
1	ADAM		GRANT	
2	ADAM		HOPPER	
3	AL		GARLAND	
4	ALAN		DREYFUSS	

Multiple columns

```
SELECT  
first_name,  
last_name  
FROM actor  
ORDER BY first_name, last_name
```

	Data Output	Explain	Messages	Notific
	first_name text		last_name text	
1	ADAM		GRANT	
2	ADAM		HOPPER	
3	AL		GARLAND	



Challenge

Challenge

A marketing team member asks you about the different prices that have been paid.

To make it easier for them order the prices from high to low.

Write a SQL query to get the different prices!

Result

Data Output		Explain
	amount numeric (5,2)	
1	11.99	
2	10.99	
3	9.99	
4	9.98	
5	8.99	
6	8.97	
7	7.99	
8	7.98	

LIMIT


- ✓ Used to **LIMIT** the number of rows in the output
- ✓ Always at the very end of your query
- ✓ Can help to get a quick idea about a table

SYNTAX

```
SELECT  
column_name1,  
column_name2  
FROM table_name  
LIMIT n
```

SYNTAX

```
SELECT  
first_name  
FROM actor  
LIMIT 4
```

Data Output		Explain
	first_name text 	
1	PENELOPE	
2	NICK	
3	ED	
4	JENNIFER	

Example

```
SELECT  
first_name  
FROM actor  
ORDER BY first_name  
LIMIT 4
```




Data Output		Explain
	first_name text	
1	ADAM	
2	ADAM	
3	AL	
4	ALAN	

Multiple columns

```
SELECT DISTINCT  
first_name,  
last_name  
FROM actor  
ORDER BY first_name
```

Note!

Distinct in terms of
all selected columns!

	Data Output	Explain	Messages	Not
	 first_name text		last_name text	
1	ADAM		GRANT	
2	ADAM		HOPPER	
3	AL		GARLAND	
4	ALAN		DREYFUSS	



Challenge

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	amount numeric (5,2)	
1	11.99	
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4	9.98	
5	8.99	
6	8.97	
7	7.99	
8	7.98	

COUNT

✓ Used to **COUNT** the number of rows in a output

✓ Used often in combination with grouping & filtering

SYNTAX

```
SELECT  
COUNT(*)  
FROM table_name
```

SYNTAX


```
SELECT  
COUNT(column_name)  
FROM table_name
```

Note!

Nulls will not be
counted in that case!


Example

```
SELECT  
COUNT(first_name)  
FROM actor
```

Data Output		Expla
	count bigint 	
1	200	


Example

```
SELECT  
COUNT(*)  
FROM actor
```

Data Output		Expla
	count bigint 	
1	200	

Example

```
SELECT  
COUNT(DISTINCT first_name)  
FROM actor
```




Data Output	
	count bigint 
1	128

Multiple columns

```
SELECT DISTINCT  
first_name,  
last_name  
FROM actor  
ORDER BY first_name
```

Note!

Distinct in terms of
all selected columns!

	Data Output	Explain	Messages	Not
	 first_name text		last_name text	
1	ADAM		GRANT	
2	ADAM		HOPPER	
3	AL		GARLAND	
4	ALAN		DREYFUSS	



Challenge

for today

Challenge for today

1. Create a list of all the **distinct districts** customers are from.
2. What is the **latest rental date**?
3. **How many films** does the company have?
4. **How many distinct last names** of the customers are there?



Results



Result 1

Data	Output	Explain	Me																		
	<table><tr><th>district</th><th>last</th></tr><tr><td>1</td><td>Aden</td></tr><tr><td>2</td><td>Eastern Visayas</td></tr><tr><td>3</td><td>Vaduz</td></tr><tr><td>4</td><td>Tokat</td></tr><tr><td>5</td><td>Anzotegui</td></tr><tr><td>6</td><td>Saint-Denis</td></tr><tr><td>7</td><td>Chollanam</td></tr><tr><td>8</td><td>Chihuahua</td></tr></table>	district	last	1	Aden	2	Eastern Visayas	3	Vaduz	4	Tokat	5	Anzotegui	6	Saint-Denis	7	Chollanam	8	Chihuahua		
district	last																				
1	Aden																				
2	Eastern Visayas																				
3	Vaduz																				
4	Tokat																				
5	Anzotegui																				
6	Saint-Denis																				
7	Chollanam																				
8	Chihuahua																				



Result 2

Data Output		Explain	M
	rental_date		
	timestamp with time zone		
1	2020-02-14 16:16:03+01		

Result 3

Data Output	
	count bigint 
1	1000

Result 4

Data Output	
	count bigint 
1	599



Solution 1

1. Create a list of all the **distinct districts** customers are from.

```
SELECT DISTINCT
district
FROM address
```

Solution 2

2. What is the **latest rental date**?

```
SELECT
rental_date
FROM rental
ORDER BY rental_date DESC
LIMIT 1
```

Challenge

for today

1. Create a list of all the **distinct districts** customers are from.
2. What is the **latest rental date**?
3. **How many films** does the company have?
4. **How many distinct last names** of the customers are there?

Results

Result 1

Data Output		Explain	Me
	district text		🔒
1	Aden		
2	Eastern Visayas		
3	Vaduz		
4	Tokat		
5	Anzotegui		
6	Saint-Denis		
7	Chollanam		
8	Chihuahua		

Result 2

Data Output		Explain	Me
	rental_date timestamp with time zone		🔒
1	2020-02-14 16:16:03+01		

Result 3

Data Output	
	count bigint
1	1000

Result 4

Data Output	
	count bigint
1	599

Solution 1

1. Create a list of all the [distinct districts](#) customers are from.

```
SELECT DISTINCT  
district  
FROM address
```

Solution 2

2. What is the latest rental date?

```
SELECT  
rental_date  
FROM rental  
ORDER BY rental_date DESC  
LIMIT 1
```

Solution 2

3. How many films does the company have?

```
SELECT  
COUNT (*)  
FROM film
```

Solution 2

4. How many distinct last names of the customers are there?

```
SELECT  
COUNT(DISTINCT last_name)  
FROM customer
```

Challenge

A marketing team member asks you about the different prices that have been paid.

To make it easier for them order the prices from high to low.

Write a SQL query to get the different prices!

Result

Data Output		Explain
	amount numeric (5,2)	
1	11.99	
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4	9.98	
5	8.99	
6	8.97	
7	7.99	
8	7.98	

Challenge

You need to help the Marketing team to work more easily.

The Marketing Manager asks you to order the customer list by the **last name**.

The want to start from "Z" and work towards "A".

In case of the same last name the order should be based on the first name – also from "Z" to "A".

Write a SQL query to get that list!