

Querying a database

INTERMEDIATE SQL

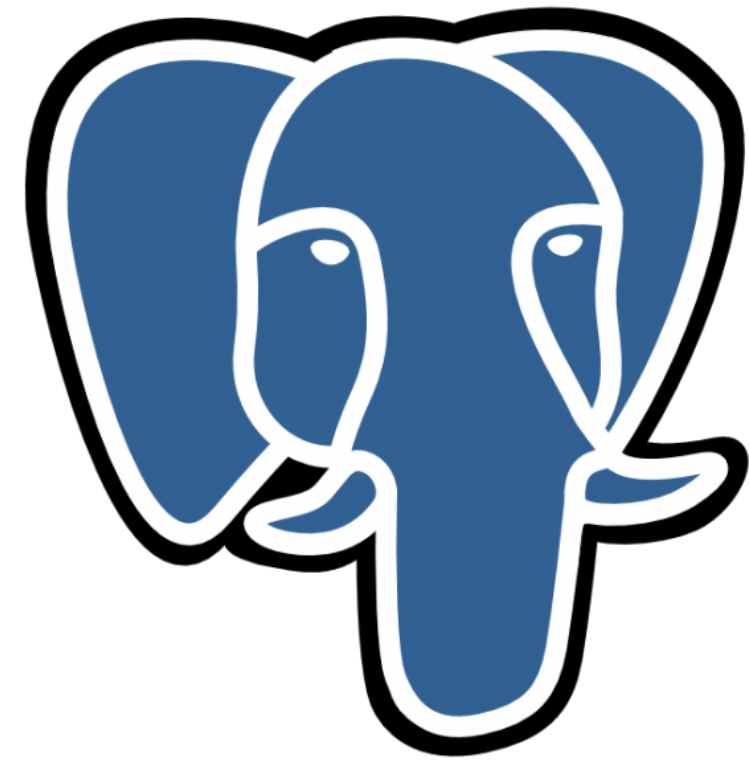
SQL

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Course roadmap

- Querying databases
- Count and view specified records
- Understand query execution and style
- Filtering
- Aggregate functions
- Sorting and grouping



PostgreSQL

Our films database

| films | |
|---------------|---------|
| id | INT4 |
| title | VARCHAR |
| release_year | INT4 |
| country | VARCHAR |
| duration | INT4 |
| language | VARCHAR |
| certification | VARCHAR |
| gross | INT8 |
| budget | INT8 |

| people | |
|-----------|---------|
| id | INT4 |
| name | VARCHAR |
| birthdate | DATE |
| deathdate | DATE |

| reviews | |
|----------------|--------|
| id | INT4 |
| film_id | INT4 |
| num_user | INT4 |
| num_critic | INT4 |
| imdb_score | FLOAT4 |
| num_votes | INT4 |
| facebook_likes | INT4 |

| roles | |
|-----------|---------|
| id | INT4 |
| film_id | INT4 |
| person_id | INT4 |
| role | VARCHAR |

COUNT()

- `COUNT()`
- Counts the number of records with a value in a field
- Use an alias for clarity

```
SELECT COUNT(birthdate) AS count_birthdates  
FROM people;
```

```
|count_birthdates|  
|-----|  
|6152           |
```

COUNT() multiple fields

```
SELECT COUNT(name) AS count_names, COUNT(birthdate) AS count_birthdates  
FROM people;
```

```
|count_names|count_birthdates|  
|-----|-----|  
|6397      |6152      |
```

Using * with COUNT()

- `COUNT(field_name)` counts values in a field
- `COUNT(*)` counts records in a table
- `*` represents all fields

```
SELECT COUNT(*) AS total_records  
FROM people;
```

```
|total_records|  
|-----|  
|8397        |
```

DISTINCT

- `DISTINCT` removes duplicates to return only unique values

```
SELECT language  
FROM films;
```

```
| language |  
|-----|  
| Danish  |  
| Danish  |  
| Greek   |  
| Greek   |  
| Greek   |
```

- Which languages are in our `films` table?

```
SELECT DISTINCT language  
FROM films;
```

```
| language |  
|-----|  
| Danish   |  
| Greek    |
```

COUNT() with DISTINCT

- Combine `COUNT()` with `DISTINCT` to count unique values

```
SELECT COUNT(DISTINCT birthdate) AS count_distinct_birthdates
FROM people;
```

```
|count_distinct_birthdates|
|-----|
|5398|
```

- `COUNT()` includes duplicates
- `DISTINCT` excludes duplicates

Let's practice!
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Query execution

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Order of execution

- SQL is not processed in its written order

```
-- Order of execution  
SELECT name  
FROM people  
LIMIT 10;
```

- `LIMIT` limits how many results we return
- Good to know processing order for debugging and aliasing
- Aliases are declared in the `SELECT` statement

Debugging SQL

```
SELECT nme  
FROM people;
```

```
field "nme" does not exist  
LINE 1: SELECT nme  
              ^  
HINT:  Perhaps you meant to reference the field "people.name".
```

- Misspelling
- Incorrect capitalization
- Incorrect or missing punctuation

Comma errors

- Look out for comma errors!

```
SELECT title, country duration  
FROM films;
```

```
syntax error at or near "duration"  
LINE 1: SELECT title, country duration  
                        ^
```

Keyword errors

```
SELECT title, country, duration  
FROM films;
```

```
syntax error at or near "SELECT"  
LINE 1: SELECT title, country, duration  
          ^
```

Final note on errors

Most common errors:

- Misspelling
- Incorrect capitalization
- Incorrect or missing punctuation, especially commas

Learn by making mistakes



Let's practice!
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SQL style

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SQL formatting

- Formatting is not required
- But lack of formatting can cause issues

```
select title, release_year, country from films limit 3
```

```
|title|release_year|country|
|-----|-----|-----|
|Intolerance: Love's Struggle Throughout the Ages|1916|USA|
|Over the Hill to the Poorhouse|1920|USA|
|The Big Parade|1925|USA|
```

Best practices

```
SELECT title, release_year, country
FROM films
LIMIT 3;
```

| title | release_year | country |
|--|--------------|---------|
| ----- | ----- | ----- |
| Intolerance: Love's Struggle Throughout the Ages | 1916 | USA |
| Over the Hill to the Poorhouse | 1920 | USA |
| The Big Parade | 1925 | USA |

- Capitalize keywords
- Add new lines

Style guides

```
SELECT
```

```
    title,  
    release_year,  
    country
```

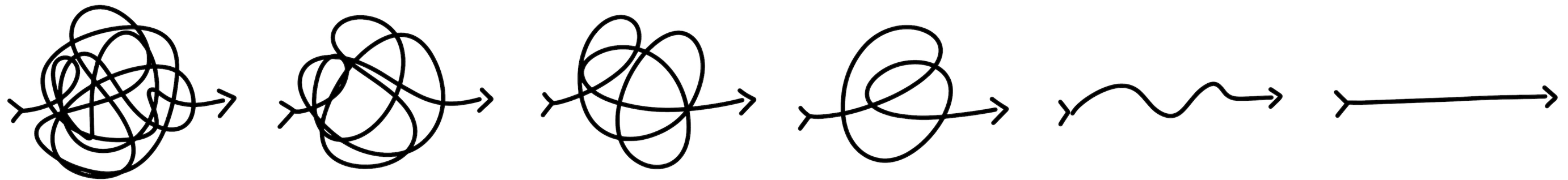
```
FROM films
```

```
LIMIT 3;
```

```
|title                                     |release_year|country|  
|-----|-----|-----|  
|Intolerance: Love's Struggle Throughout the Ages|1916        |USA    |  
|Over the Hill to the Poorhouse           |1920        |USA    |  
|The Big Parade                           |1925        |USA    |
```

Style guides

Holywell's style guide: <https://www.sqlstyle.guide/>



Write clear and readable code

Semicolon

```
SELECT title, release_year, country  
FROM films  
LIMIT 3;
```

- Best practice
- Easier to translate between SQL flavors
- Indicates the end of a query

Dealing with non-standard field names

- `release year` instead of `release_year`
- Put non-standard field names in double-quotes

```
SELECT title, "release year", country  
FROM films  
LIMIT 3;
```

Why do we format?

- Easier collaboration
- Clean and readable
- Looks professional
- Easier to understand
- Easier to debug

Let's practice!
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