

The ins and outs of INNER JOIN

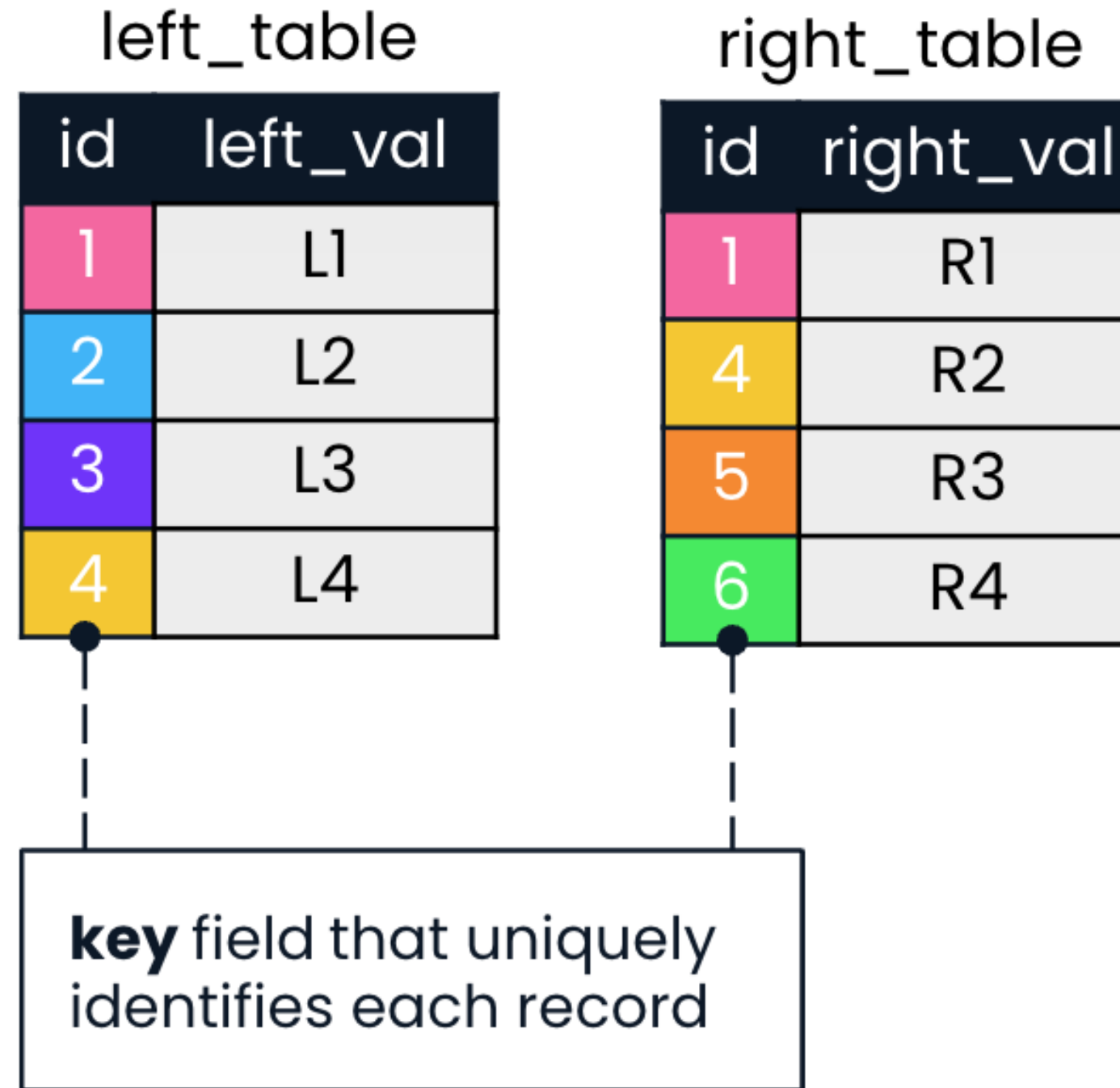
JOINING DATA IN SQL



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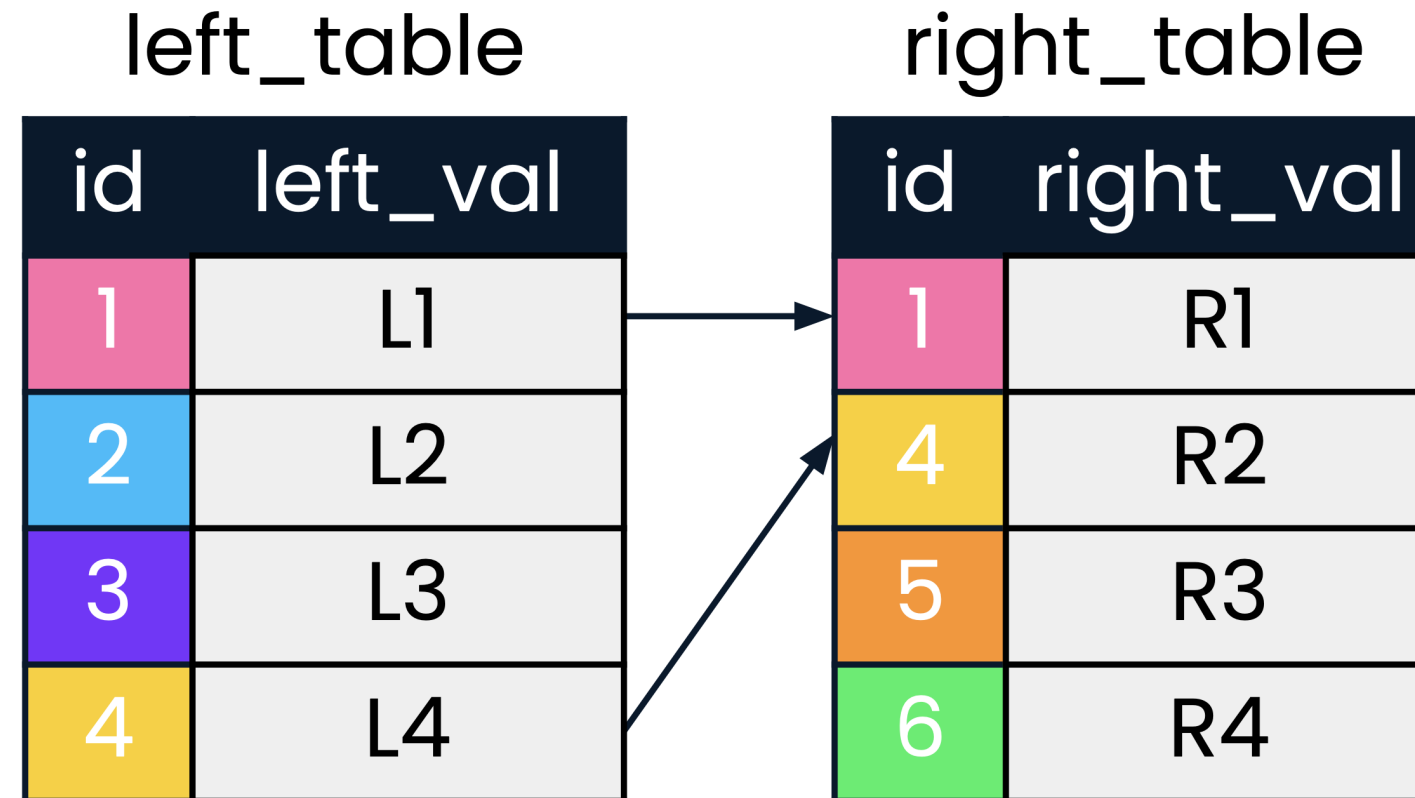
The ins and outs of INNER JOINS



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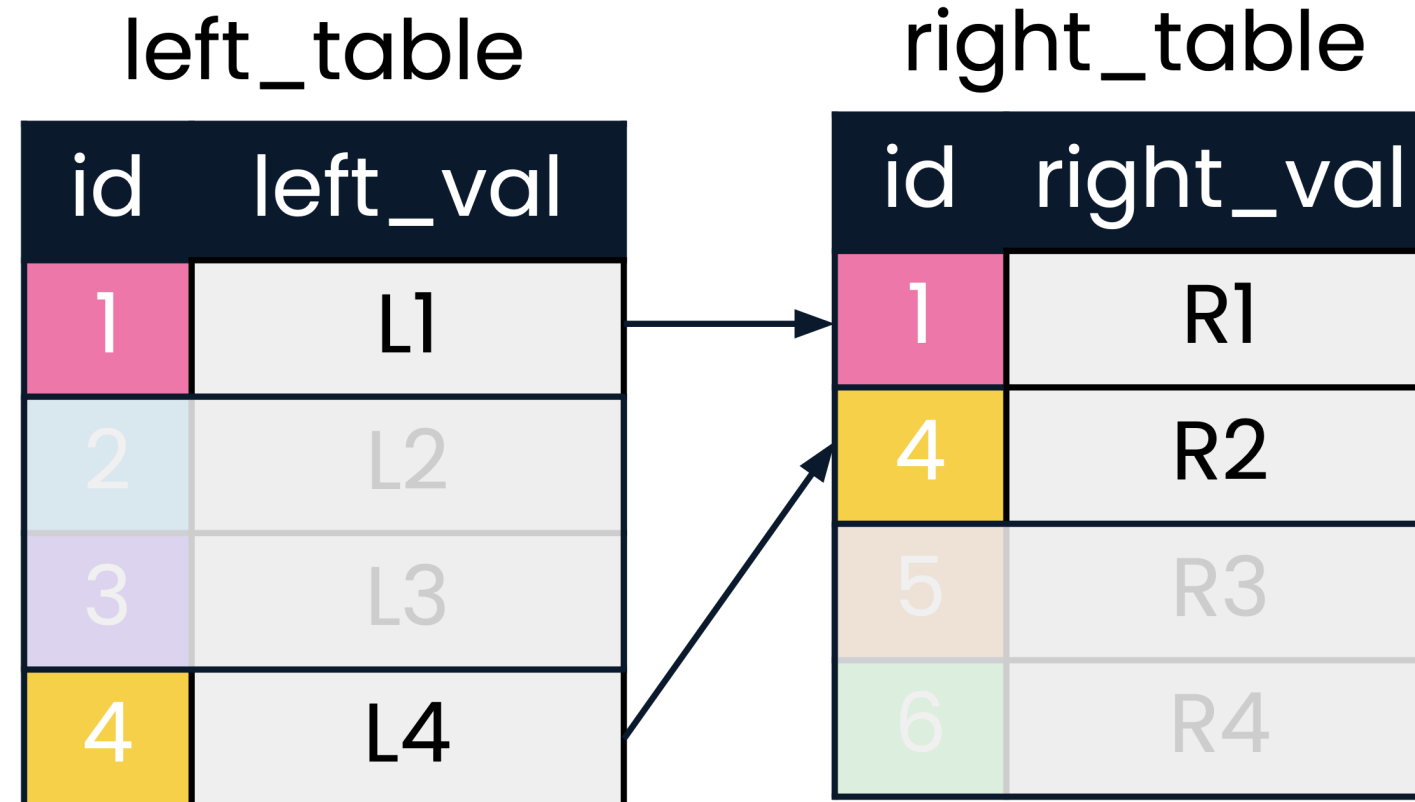
- `INNER JOIN` looks for records in both tables which match on a given field

Diagram for an `INNER JOIN` on the `id` field



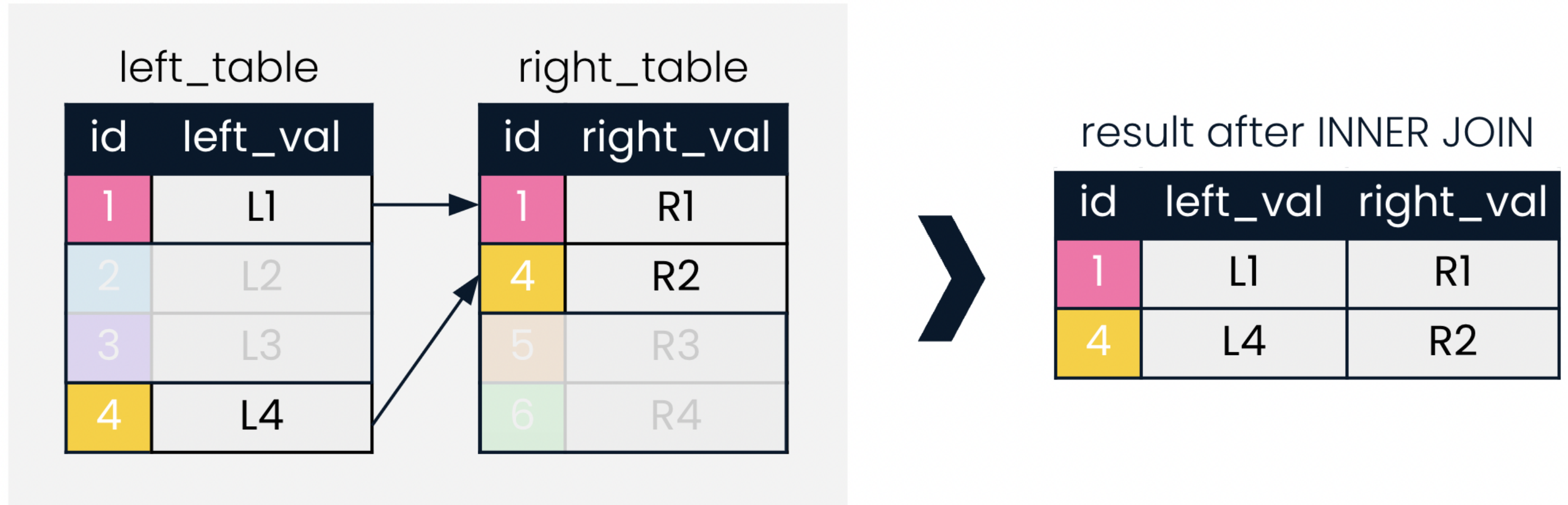
The ins and outs of INNER JOINS

Diagram for an **INNER JOIN** **ON** the **id** field



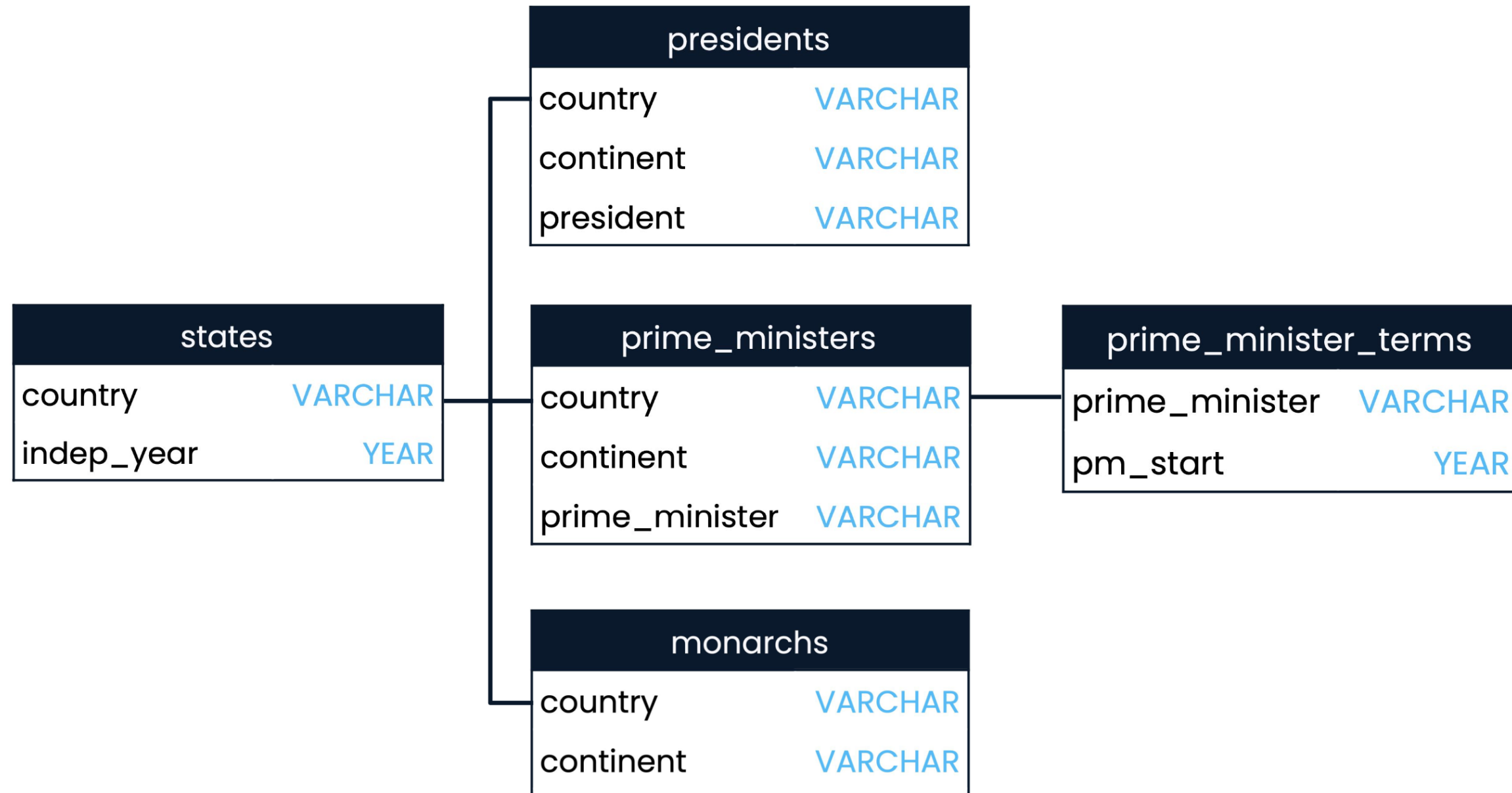
The ins and outs of INNER JOINS

Diagram for an **INNER JOIN** **ON** the **id** field



The leadership database schema

World leaders up to 2024:



At the presidents table

```
SELECT *  
FROM presidents;
```

| country | continent | president |
|----------|---------------|-------------------------|
| ----- | ----- | ----- |
| Egypt | Africa | Abdel Fattah el-Sisi |
| Portugal | Europe | Marcelo Rebelo de Sousa |
| USA | North America | Joe Biden |
| Uruguay | South America | Luis Lacalle Pou |
| Pakistan | Asia | Asif Ali Zardari |
| Chile | South America | Gabriel Boric |
| India | Asia | Droupadi Murmu |

Meet the prime ministers

The `prime_ministers` table

| country | continent | prime_minister |
|----------------|-----------|-------------------|
| Egypt | Africa | Mostafa Madbouly |
| Portugal | Europe | Luís Montenegro |
| Pakistan | Asia | Shehbaz Sharif |
| United Kingdom | Europe | Keir Starmer |
| India | Asia | Narendra Modi |
| Australia | Oceania | Anthony Albanese |
| Norway | Europe | Jonas Gahr Støre |
| Brunei | Asia | Hassanal Bolkiah |
| Oman | Asia | Haitham bin Tarik |
| New Zealand | Oceania | Christopher Luxon |

Prime ministers, meet the presidents

The `presidents` table

| country | continent | president |
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| Egypt | Africa | Abdel Fattah el-Sisi |
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| Brunei | Asia | Hassanal Bolkiah |
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Our first INNER JOIN

```
--Inner join of presidents and prime_ministers, joining on country
SELECT prime_ministers.country, prime_ministers.continent, prime_minister, president
FROM presidents
INNER JOIN prime_ministers
ON presidents.country = prime_ministers.country;
```

Note. The `table.column_name` format must be used when selecting columns that exist in both tables to avoid a SQL error.

| country | continent | prime_minister | president |
|----------|-----------|------------------|-------------------------|
| Egypt | Africa | Mostafa Madbouly | Abdel Fattah el-Sisi |
| Portugal | Europe | Luís Montenegro | Marcelo Rebelo de Sousa |
| Pakistan | Asia | Shehbaz Sharif | Asif Ali Zardari |
| India | Asia | Narendra Modi | Ram Nath Kovind |

Aliasing tables

```
--Inner join of presidents and prime_ministers, joining on country
SELECT p2.country, p2.continent, prime_minister, president
FROM presidents AS p1
INNER JOIN prime_ministers AS p2
ON p1.country = p2.country;
```

| country | continent | prime_minister | president |
|----------|-----------|------------------|-------------------------|
| Egypt | Africa | Mostafa Madbouly | Abdel Fattah el-Sisi |
| Portugal | Europe | Luís Montenegro | Marcelo Rebelo de Sousa |
| Pakistan | Asia | Shehbaz Sharif | Asif Ali Zardari |
| India | Asia | Narendra Modi | Ram Nath Kovind |

Aliases can be used in the `table.column_name` syntax in `SELECT` and `ON` clauses.

Using USING

```
--Inner join of presidents and prime_ministers, joining on country
SELECT p2.country, p2.continent, prime_minister, president
FROM presidents AS p1
INNER JOIN prime_ministers AS p2
USING(country);
```

| country | continent | prime_minister | president |
|----------|-----------|------------------|-------------------------|
| Egypt | Africa | Mostafa Madbouly | Abdel Fattah el-Sisi |
| Portugal | Europe | Luís Montenegro | Marcelo Rebelo de Sousa |
| Pakistan | Asia | Shehbaz Sharif | Asif Ali Zardari |
| India | Asia | Narendra Modi | Ram Nath Kovind |

Let's practice!

JOINING DATA IN SQL

Defining relationships

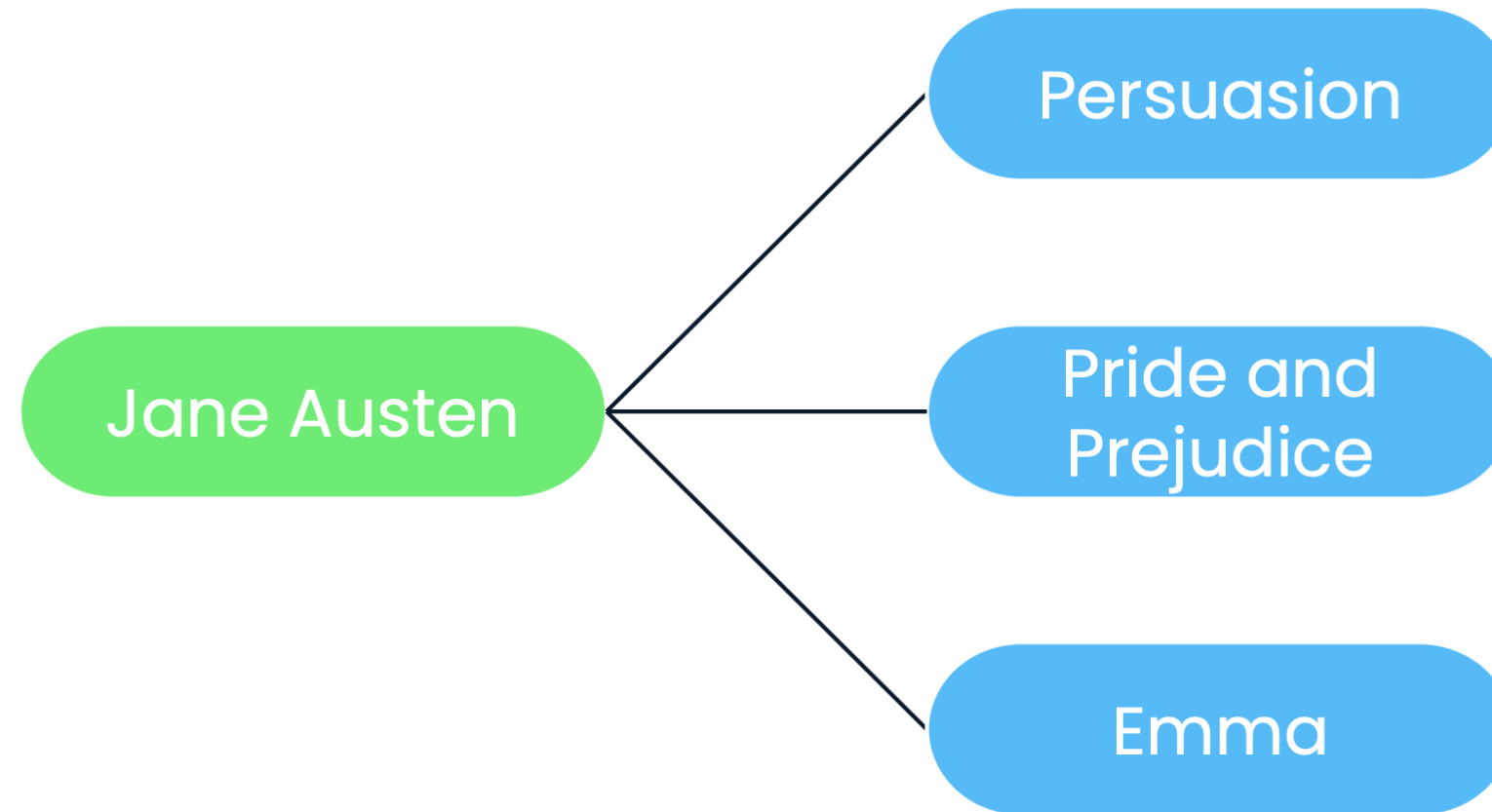
JOINING DATA IN SQL

SQL

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One-to-many relationships



One-to-many relationships

| authors | |
|------------|---------|
| author_id | INT |
| first_name | VARCHAR |
| last_name | VARCHAR |

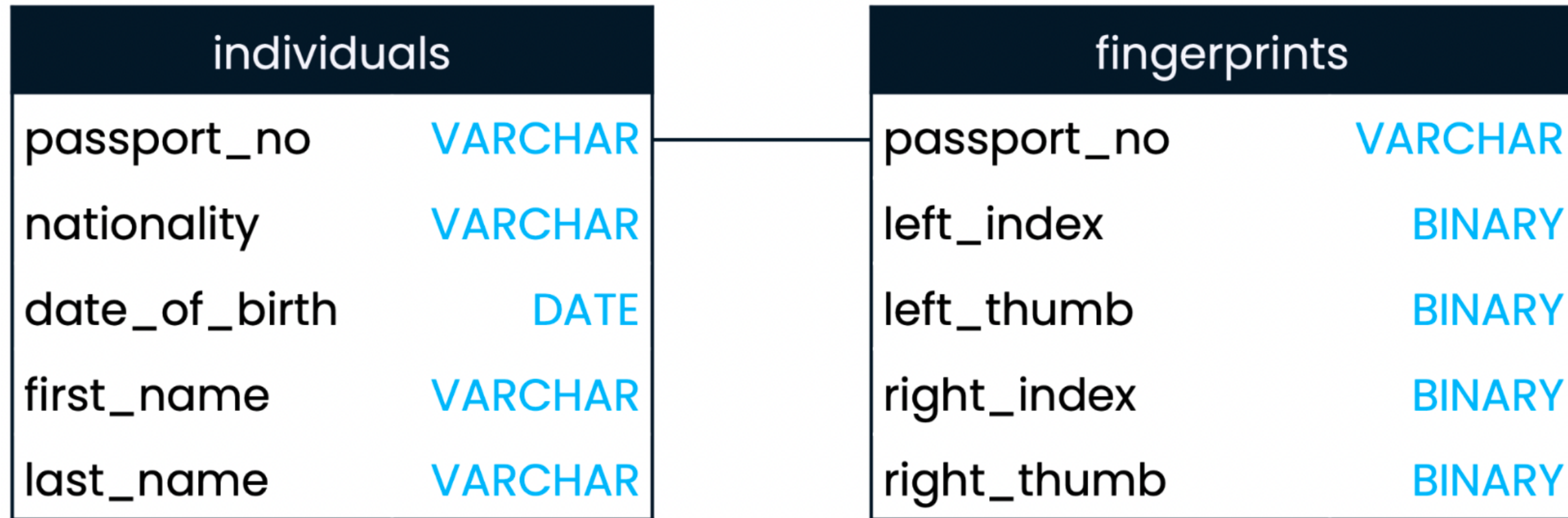


| books | |
|----------------|---------|
| book_id | INT |
| author_id | INT |
| title | VARCHAR |
| genre | VARCHAR |
| rating | FLOAT |
| year_published | YEAR |

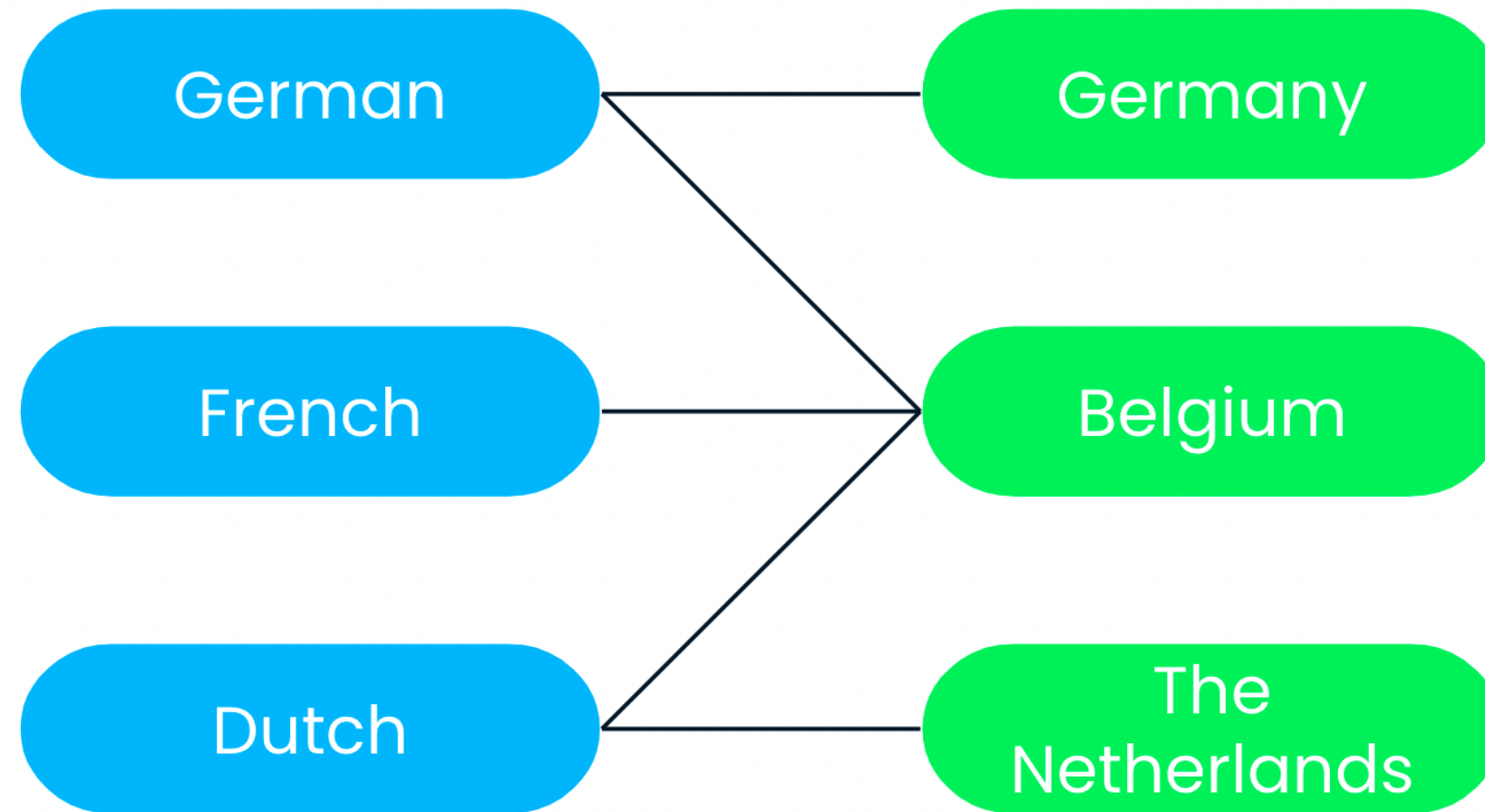
One-to-one relationships



One-to-one relationships



Many-to-many relationships



Let's practice!

JOINING DATA IN SQL

Multiple joins

JOINING DATA IN SQL



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Joins on joins

```
SELECT *  
FROM left_table  
INNER JOIN right_table  
ON left_table.id = right_table.id  
INNER JOIN another_table  
ON left_table.id = another_table.id;
```

Note. Depending on the use case, `left_table` or `right_table` can be used in the `ON` clause.

Joins on joins

The `prime_minister_terms` table from our database of world leaders

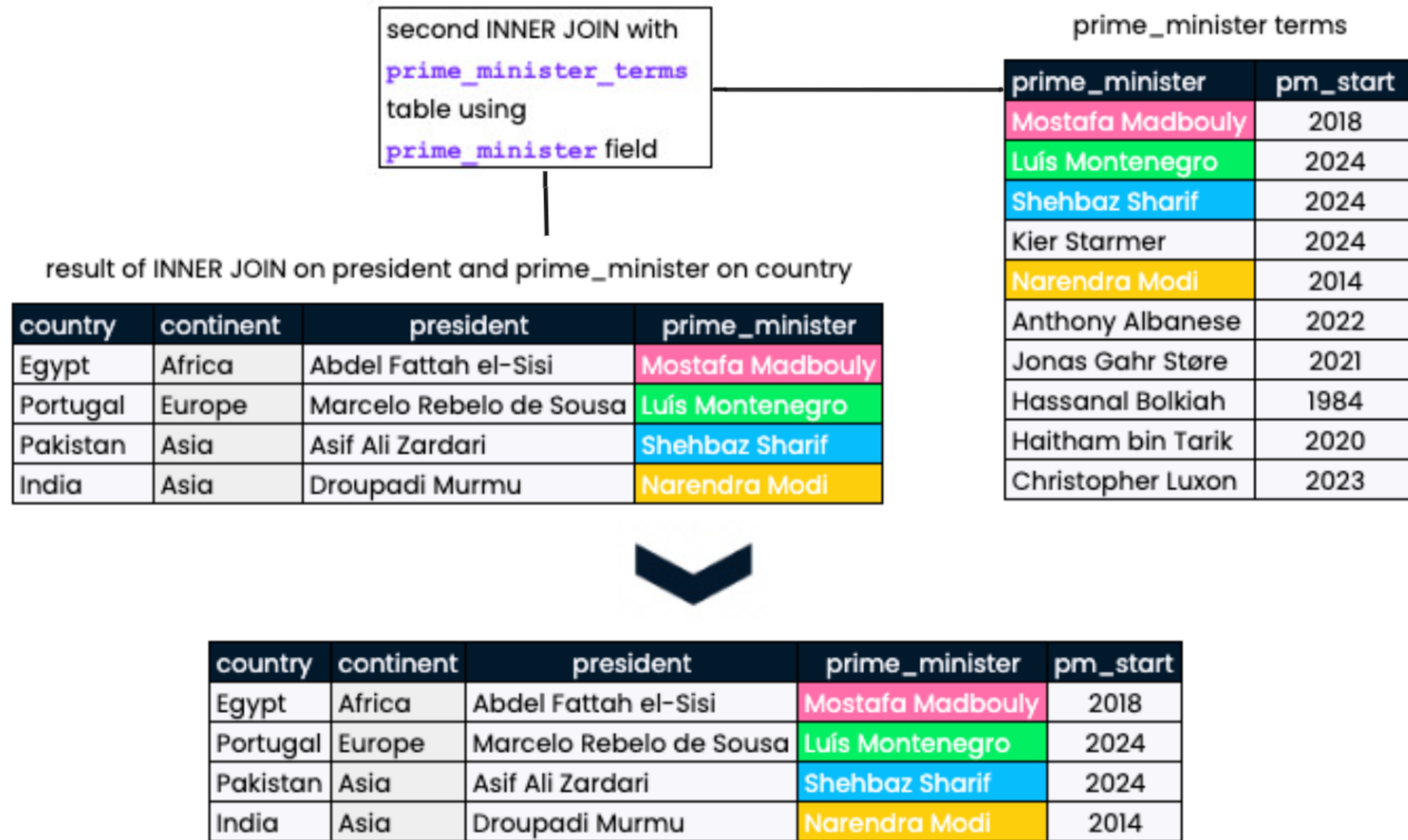
| prime_minister | pm_start |
|-------------------|----------|
| Mostafa Madbouly | 2018 |
| Luís Montenegro | 2024 |
| Shehbaz Sharif | 2024 |
| Kier Starmer | 2024 |
| Narendra Modi | 2014 |
| Anthony Albanese | 2022 |
| Jonas Gahr Støre | 2021 |
| Hassanal Bolkiah | 1984 |
| Haitham bin Tarik | 2020 |
| Christopher Luxon | 2023 |

What to join first?

```
SELECT p1.country, p1.continent,  
       president, prime_minister  
FROM prime_ministers as p1  
INNER JOIN presidents as p2  
USING(country);
```

| country | continent | president | prime_minister |
|----------|-----------|-------------------------|------------------|
| ----- | ----- | ----- | ----- |
| Egypt | Africa | Abdel Fattah el-Sisi | Mostafa Madbouly |
| Portugal | Europe | Marcelo Rebelo de Sousa | Luís Montenegro |
| Pakistan | Asia | Asif Ali Zardari | Shehbaz Sharif |
| India | Asia | Droupadi Murmu | Narendra Modi |

Chaining joins



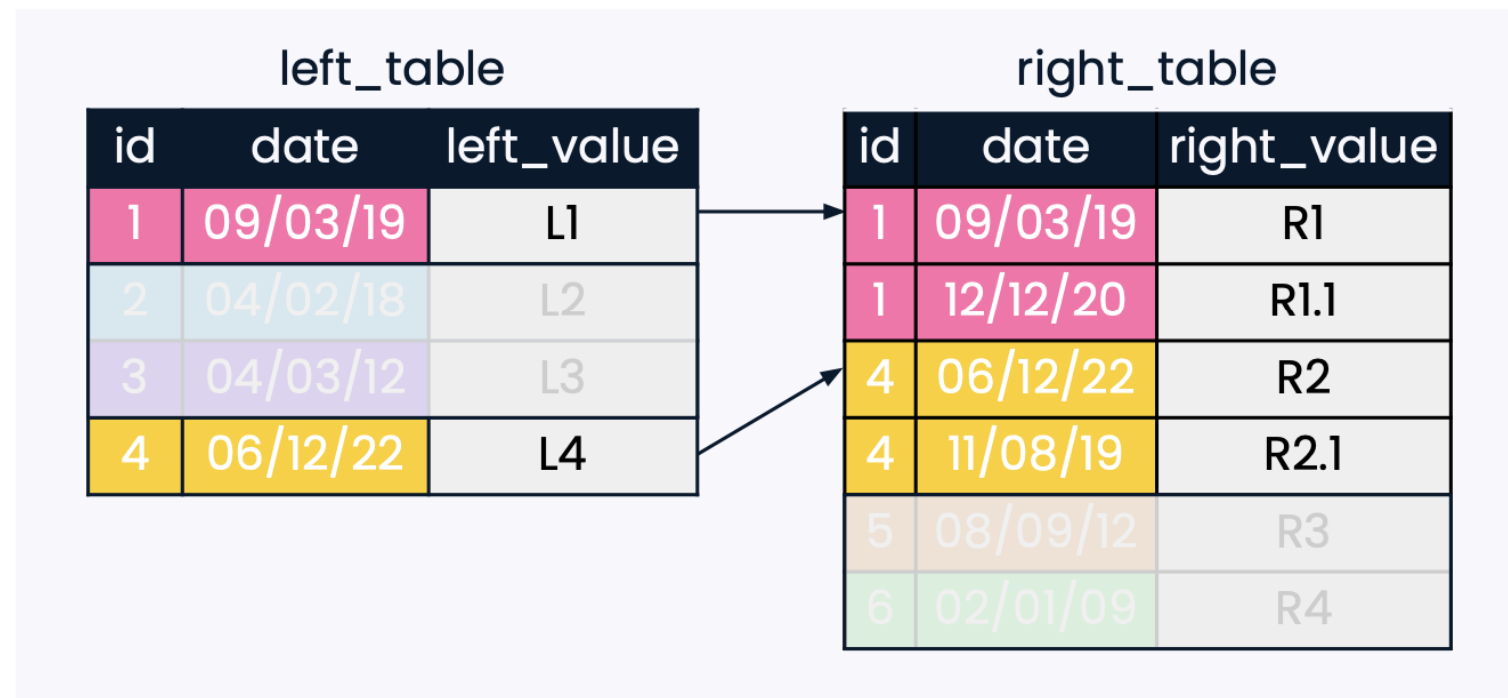
Chaining joins

```
-- SQL query for chaining inner joins
SELECT
    p1.country,
    p1.continent,
    president,
    prime_minister,
    pm_start
FROM prime_ministers as p1
INNER JOIN presidents as p2
    USING(country)
INNER JOIN prime_minister_terms as p3
    USING(prime_minister);
```

What are we joining ON?

```
SELECT *  
FROM left_table  
INNER JOIN right_table  
ON left_table.id = right_table.id;
```

Diagram for an **INNER JOIN** **ON** the **id** field

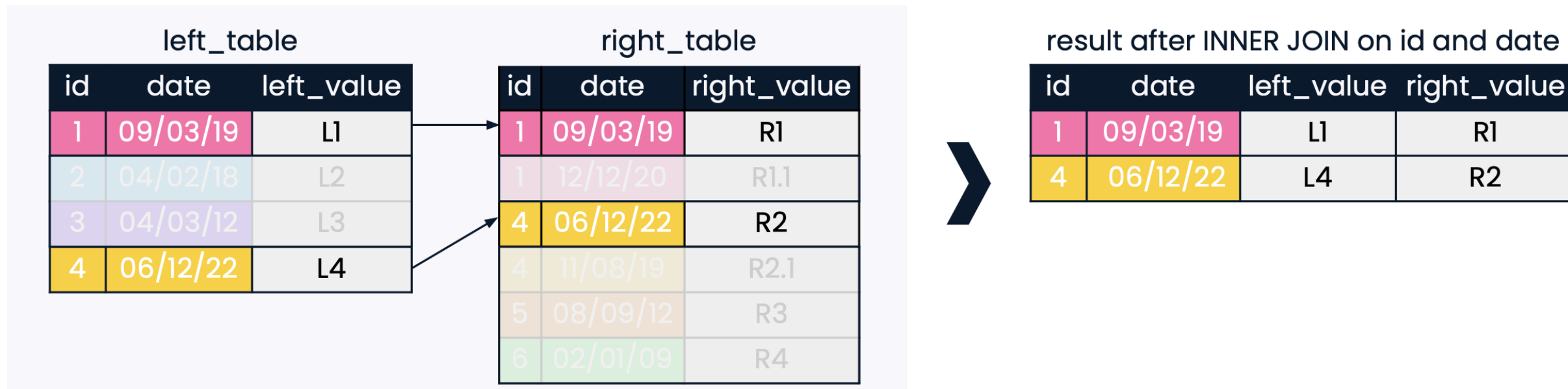


| result after INNER JOIN on id | | | |
|-------------------------------|----------|------------|-------------|
| id | date | left_value | right_value |
| 1 | 09/03/19 | L1 | R1 |
| 1 | 12/12/20 | L1 | R1.1 |
| 4 | 06/12/22 | L4 | R2 |
| 4 | 11/08/19 | L4 | R2.1 |

Joining on multiple keys

```
SELECT *  
FROM left_table  
INNER JOIN right_table  
ON left_table.id = right_table.id  
   AND left_table.date = right_table.date;
```

Diagram for an **INNER JOIN** **ON** the **id** **AND** **date** field



Let's practice!

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