The ins and outs of INNER JOIN

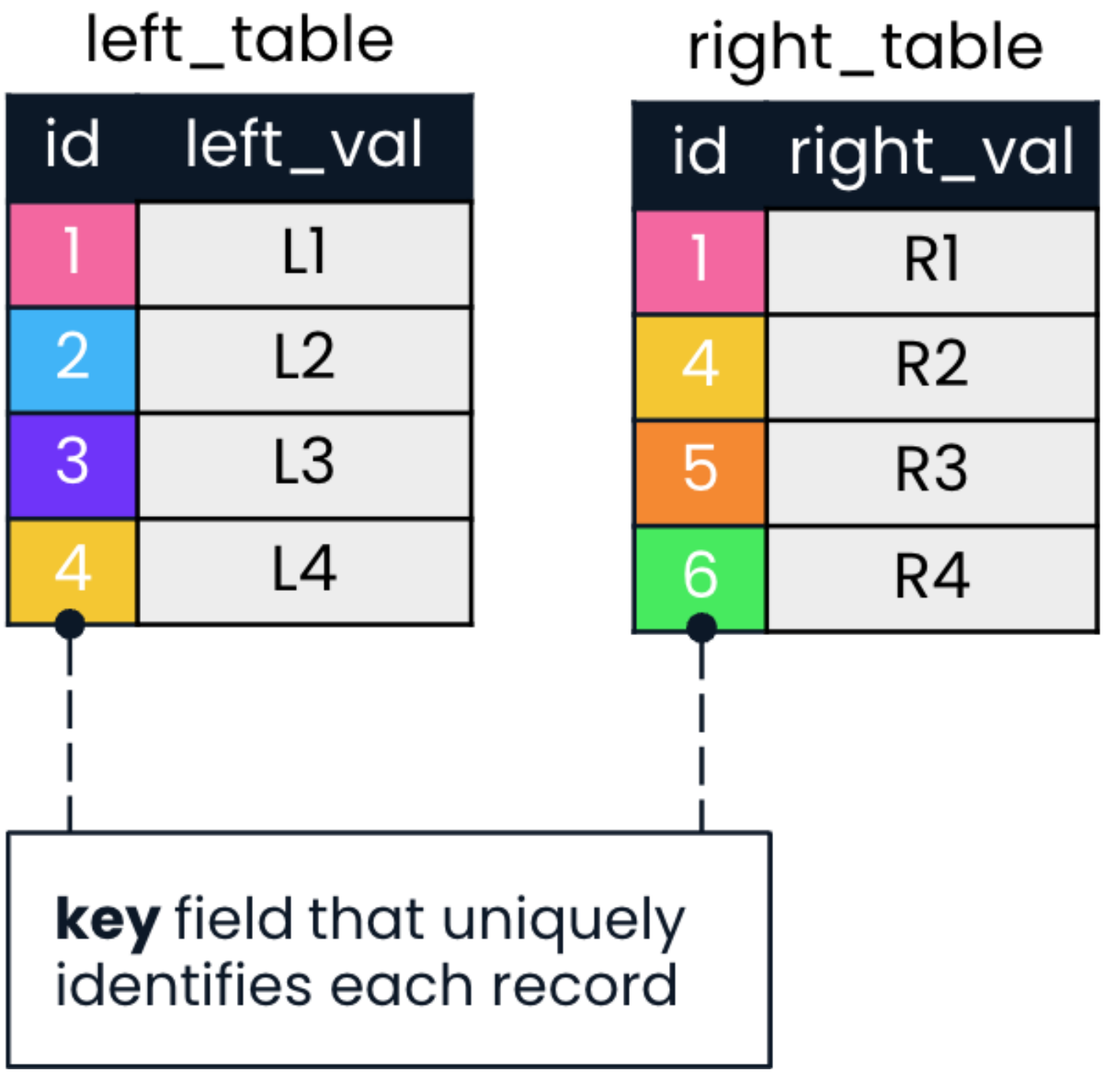
JOINING DATA IN SQL



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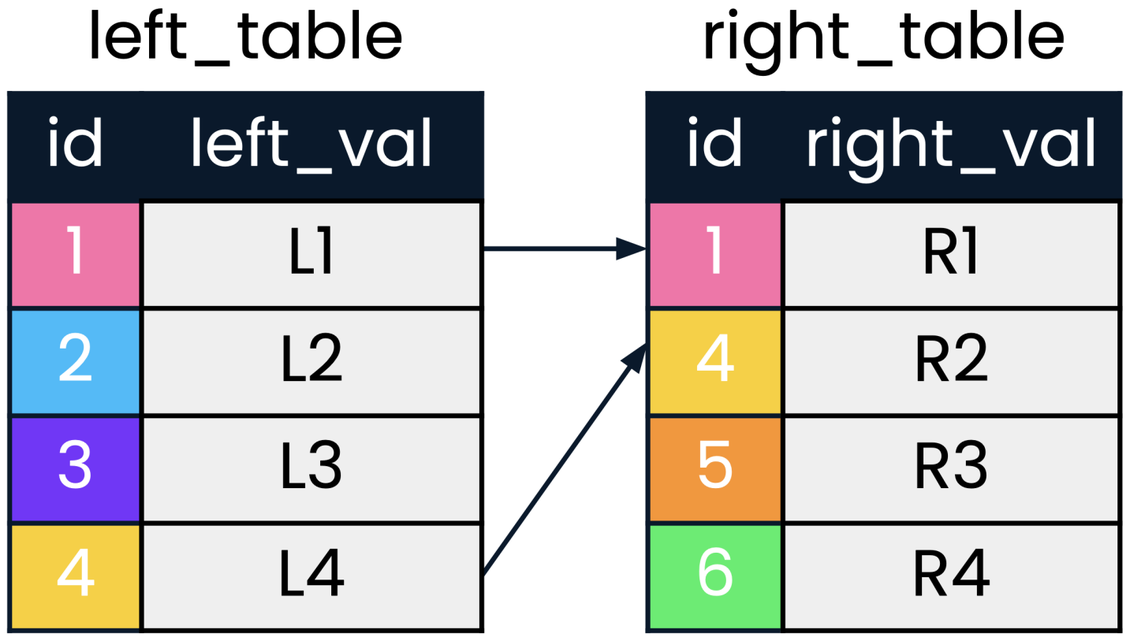
The ins and outs of INNER JOINs



The ins and outs of INNER JOINs

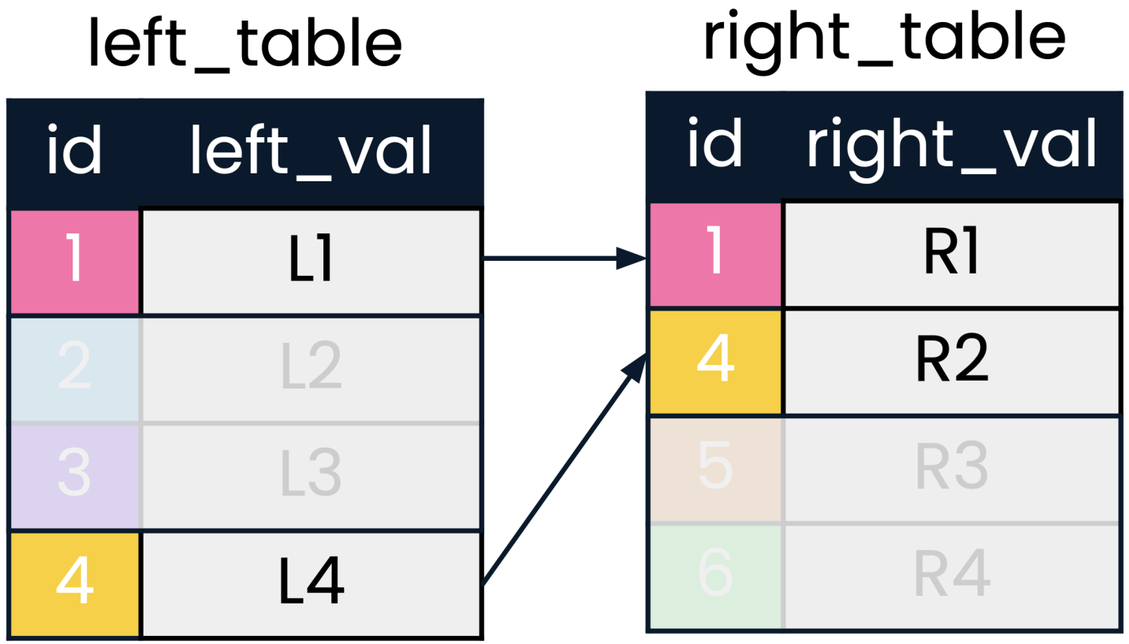
- `INNER JOIN` looks for records in both tables which match on a given field

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



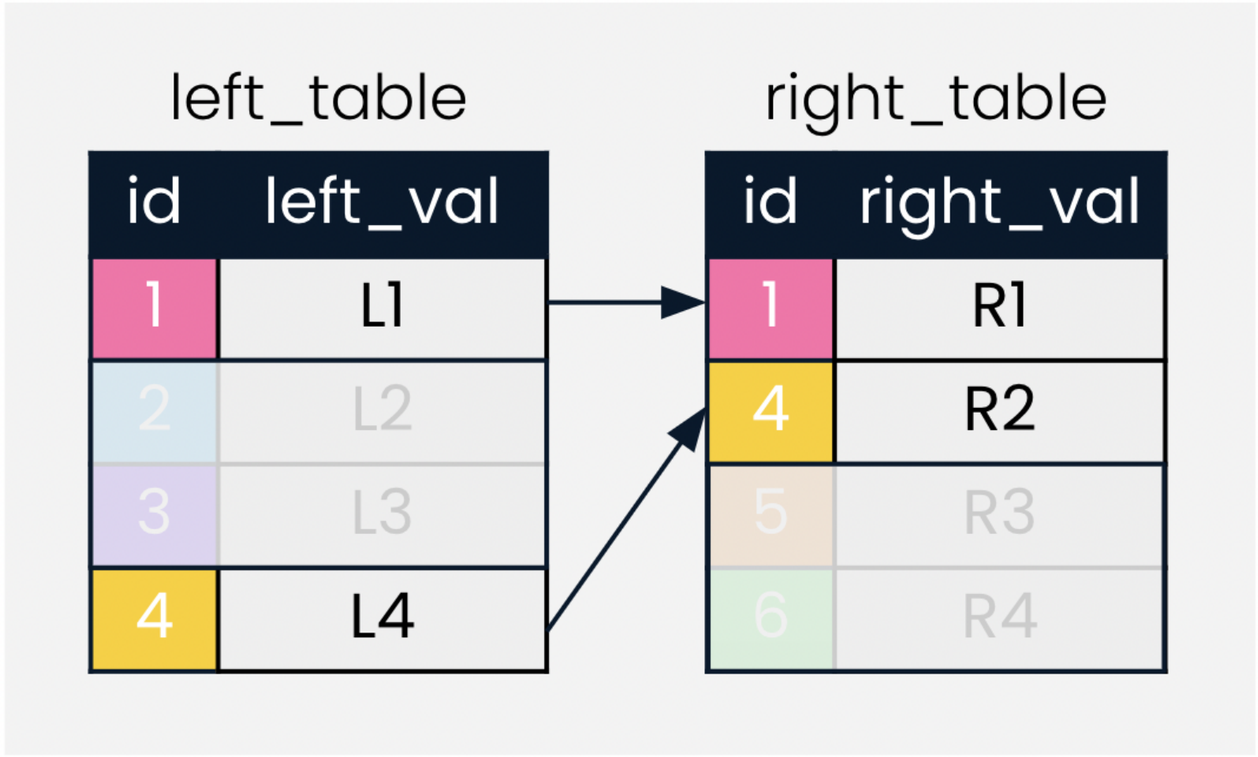
The ins and outs of INNER JOINs

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

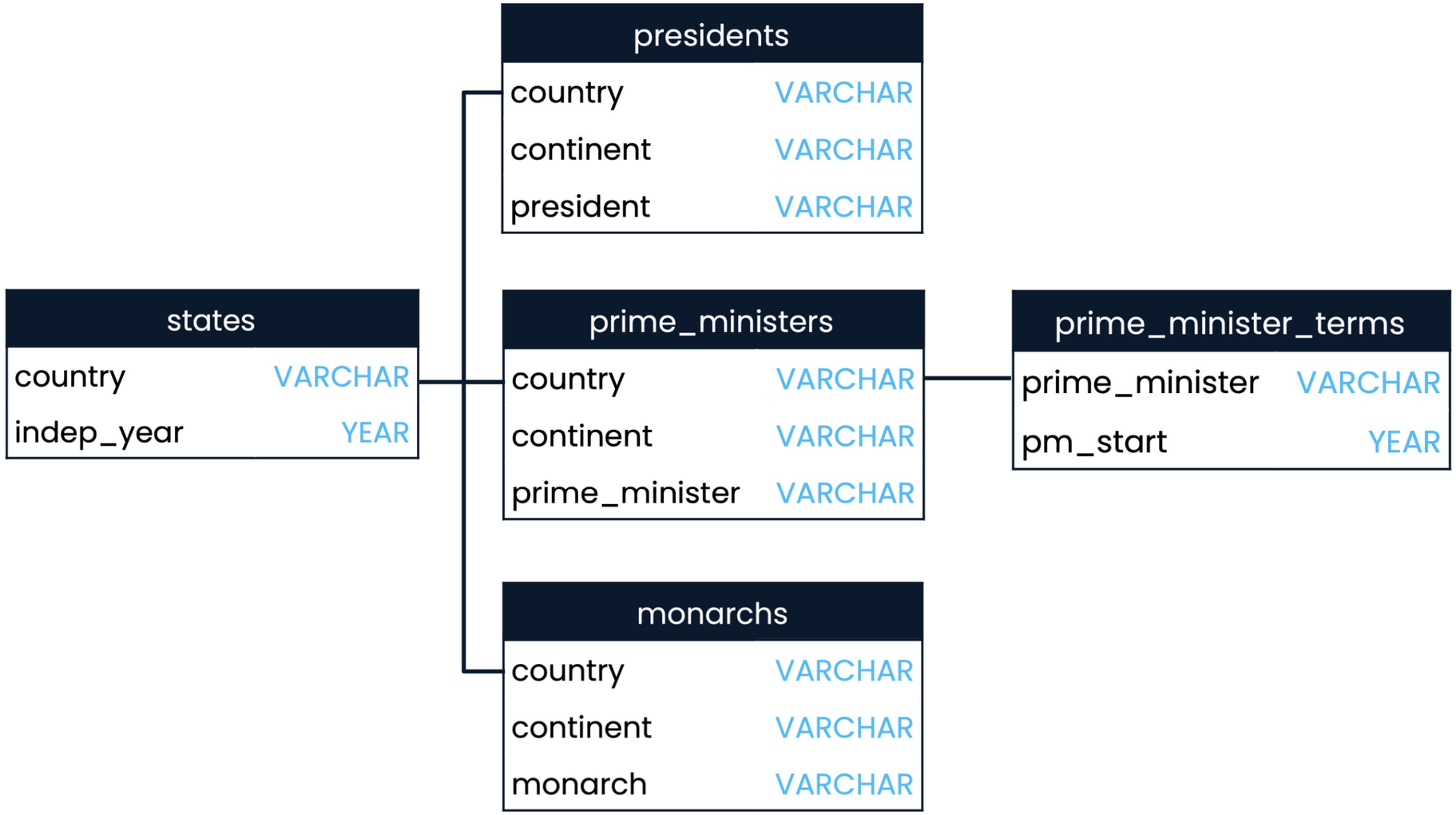


The ins and outs of INNER JOINs

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



The leadership database schema



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          | Arif Alvi                |
| Chile     | South America | Gabriel Boric            |
| India     | Asia          | Ram Nath Kovind          |
```

Meet the prime ministers

The `prime_ministers` table

country	continent	prime_minister
Egypt	Africa	Mostafa Madbouly
Portugal	Europe	António Costa
Pakistan	Asia	Shehbaz Sharif
United Kingdom	Europe	Boris Johnson
India	Asia	Narendra Modi
Australia	Oceania	Scott Morrison
Norway	Europe	Jonas Gahr Støre
Brunei	Asia	Hassanal Bolkiah
Oman	Asia	Haitham bin Tarik
New Zealand	Oceania	Jacinda Ardern

Prime ministers, meet the presidents

The `presidents` table

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	Arif Alvi
Chile	South America	Gabriel Boric
India	Asia	Ram Nath Kovind

The `prime_ministers` table

country	continent	prime_minister
Egypt	Africa	Mostafa Madbouly
Portugal	Europe	António Costa
Pakistan	Asia	Shehbaz Sharif
United Kingdom	Europe	Boris Johnson
India	Asia	Narendra Modi
Australia	Oceania	Scott Morrison
Norway	Europe	Jonas Gahr Støre
Brunei	Asia	Hassanal Bolkiah
Oman	Asia	Haitham bin Tarik
New Zealand	Oceania	Jacinda Ardern

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 prime_ministers
INNER JOIN presidents
ON prime_ministers.country = presidents.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    | António Costa    | Marcelo Rebelo de Sousa |
| Pakistan       | Asia      | Shehbaz Sharif   | Arif Alvi               |
| India          | Asia      | Narendra Modi    | Ram Nath Kovind         |
```

Aliasing tables

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

```
| country        | continent | prime_minister   | president                |
|----------------|-----------|------------------|--------------------------|
| Egypt          | Africa    | Mostafa Madbouly | Abdel Fattah el-Sisi     |
| Portugal       | Europe    | António Costa    | Marcelo Rebelo de Sousa  |
| Pakistan       | Asia      | Shehbaz Sharif   | Arif Alvi                |
| 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 p1.country, p1.continent, prime_minister, president
FROM prime_ministers AS p1
INNER JOIN presidents AS p2
USING(country);
```

country	continent	prime_minister	president
Egypt	Africa	Mostafa Madbouly	Abdel Fattah el-Sisi
Portugal	Europe	António Costa	Marcelo Rebelo de Sousa
Pakistan	Asia	Shehbaz Sharif	Arif Alvi
India	Asia	Narendra Modi	Ram Nath Kovind

Let's practice!

JOINING DATA IN SQL

Defining relationships

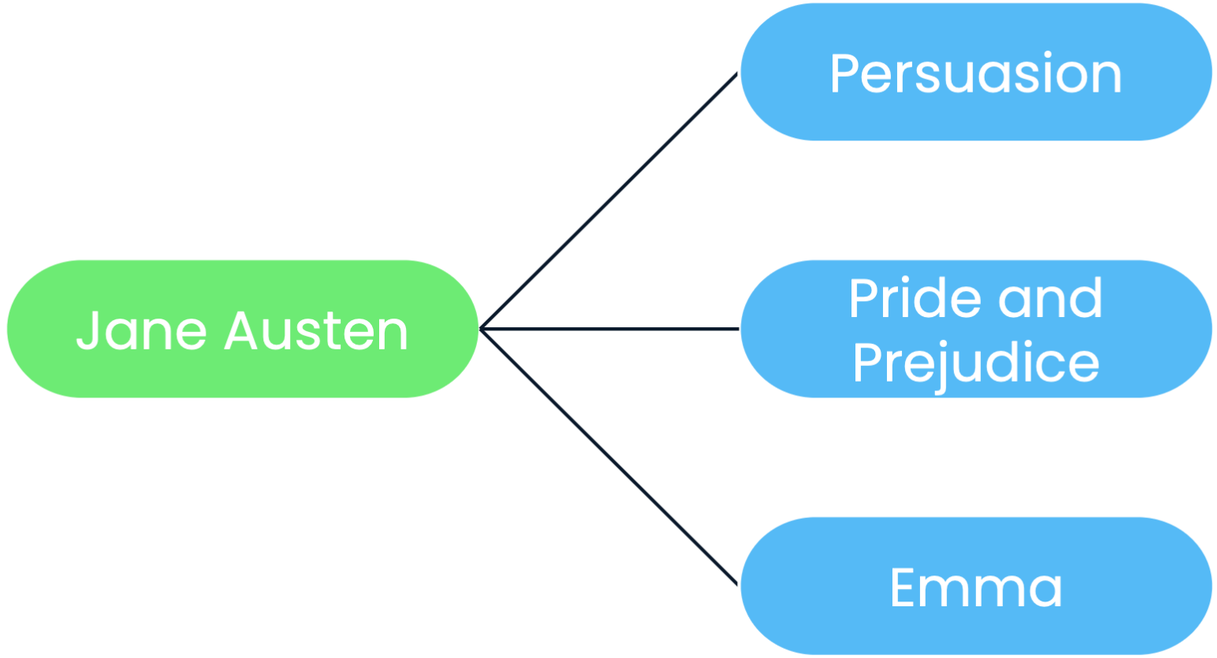
JOINING DATA IN SQL



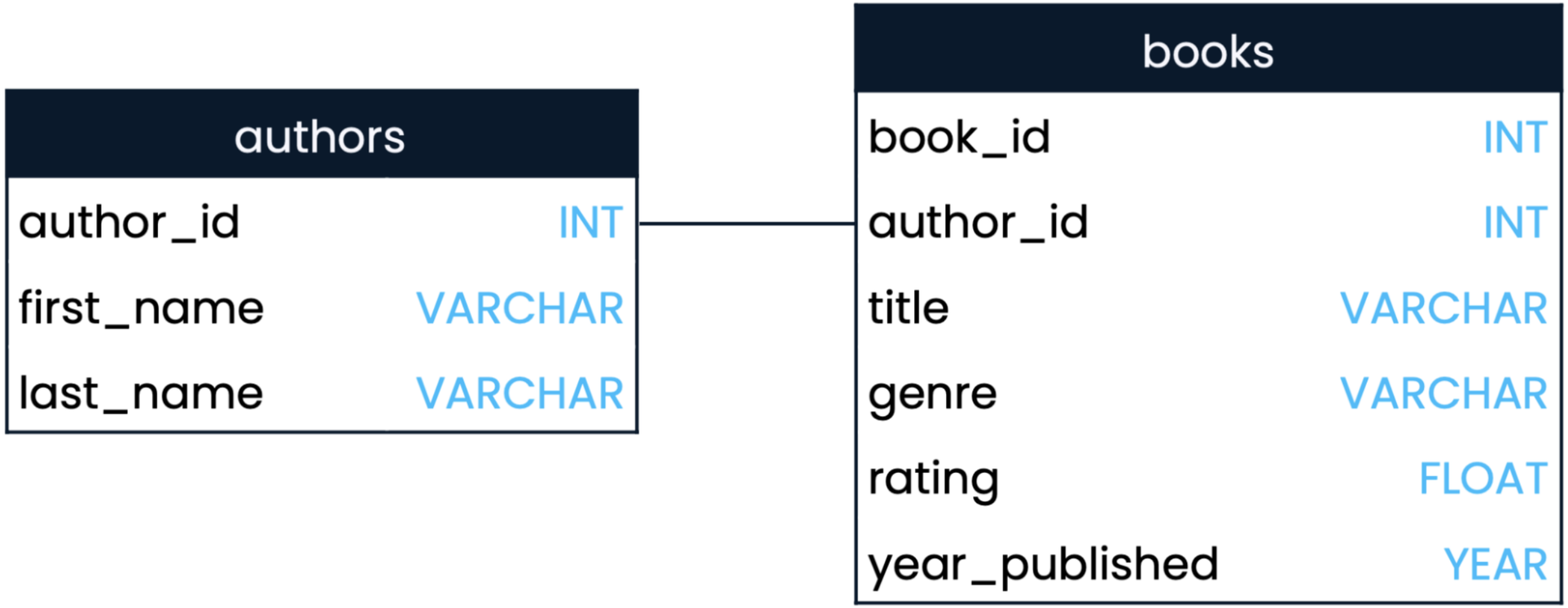
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One-to-many relationships



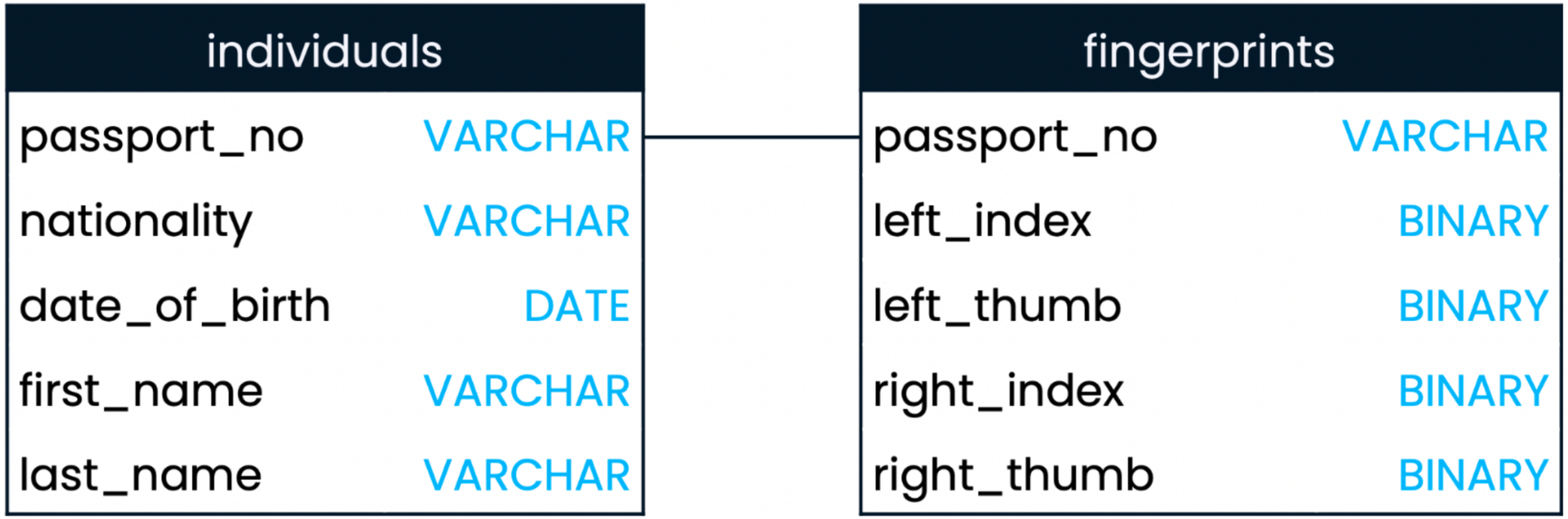
One-to-many relationships



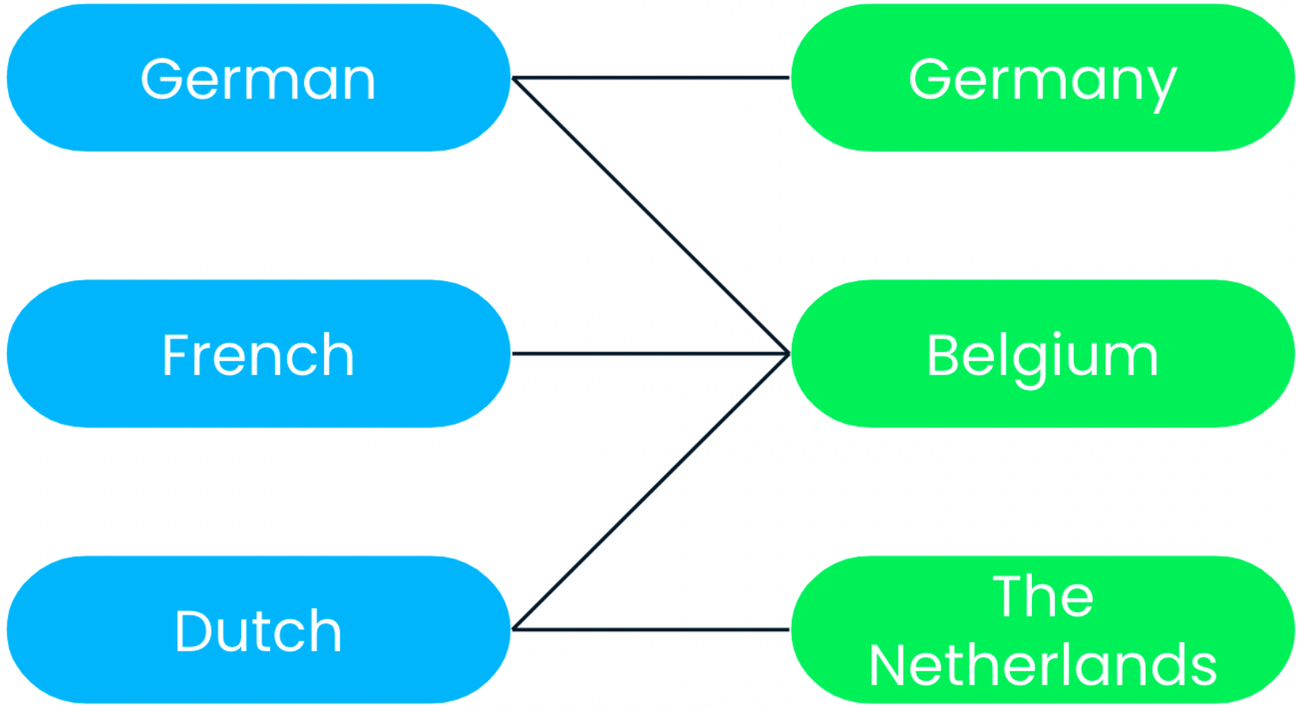
One-to-one relationships



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
António Costa	2015
Shehbaz Sharif	2022
Boris Johnson	2019
Narendra Modi	2014
Scott Morrison	2018
Jonas Gahr Støre	2021
Hassanal Bolkiah	1984
Haitham bin Tarik	2020
Jacinda Ardern	2017

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  | António Costa    |
| Pakistan | Asia          | Arif Alvi                | Shehbaz Sharif   |
| India    | Asia          | Ram Nath Kovind          | Narendra Modi    |
```

Chaining joins

second INNER join with `prime_minister_terms` table using `prime_minister` field

prime_minister_terms

prime_minister	pm_start
Mostafa Madbouly	2018
António Costa	2015
Shehbaz Sharif	2022
Boris Johnson	2019
Narendra Modi	2014
Scott Morrison	2018
Jonas Gahr Støre	2021
Hassanal Bolkiah	1984
Haitham bin Tarik	2020
Jacinda Ardern	2017

result of INNER JOIN on president and prime_minister on country

country	continent	president	prime_minister
Egypt	Africa	Abdel Fattah el-Sisi	Mostafa Madbouly
Portugal	Europe	Marcelo Rebelo de Sousa	António Costa
Pakistan	Asia	Arif Alvi	Shehbaz Sharif
India	Asia	Ram Nath Kovind	Narendra Modi

country	continent	president	prime_minister	pm_start
Egypt	Africa	Abdel Fattah el-Sisi	Mostafa Madbouly	2018
Portugal	Europe	Marcelo Rebelo de Sousa	António Costa	2015
Pakistan	Asia	Arif Alvi	Shehbaz Sharif	2022
India	Asia	Ram Nath Kovind	Narendra Modi	2014

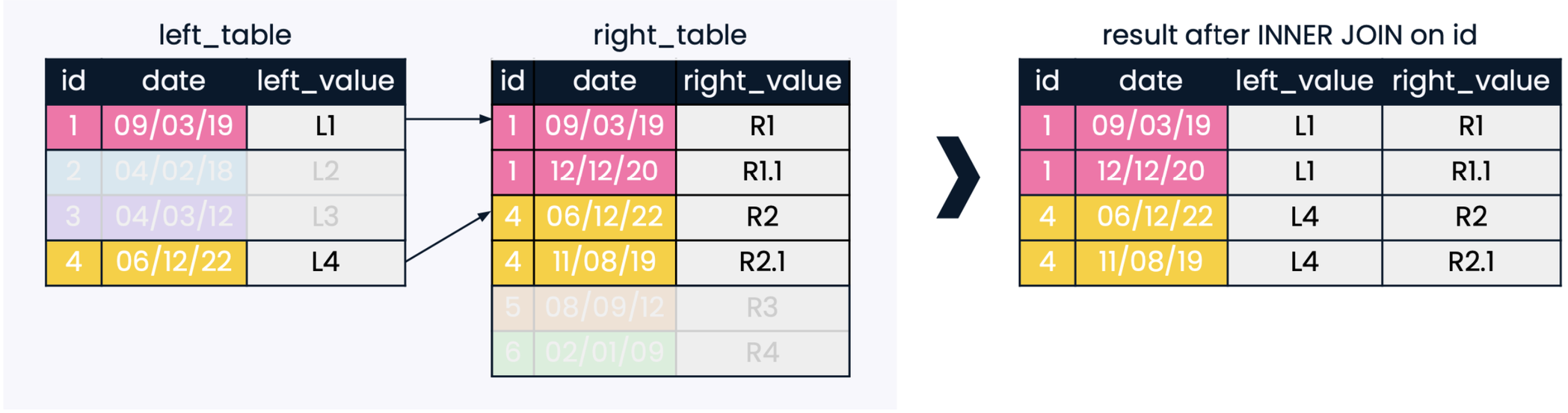
Chaining joins

```
-- 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;
```

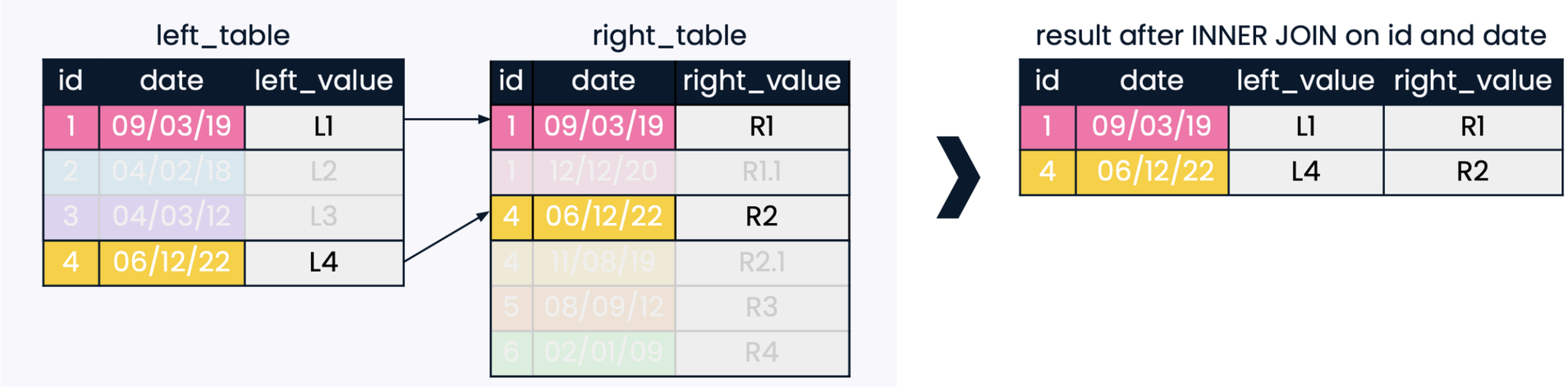
Diagram for an `INNER JOIN` `ON` the `id` field



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!

JOINING DATA IN SQL