

# The ins and outs of **INNER JOIN**

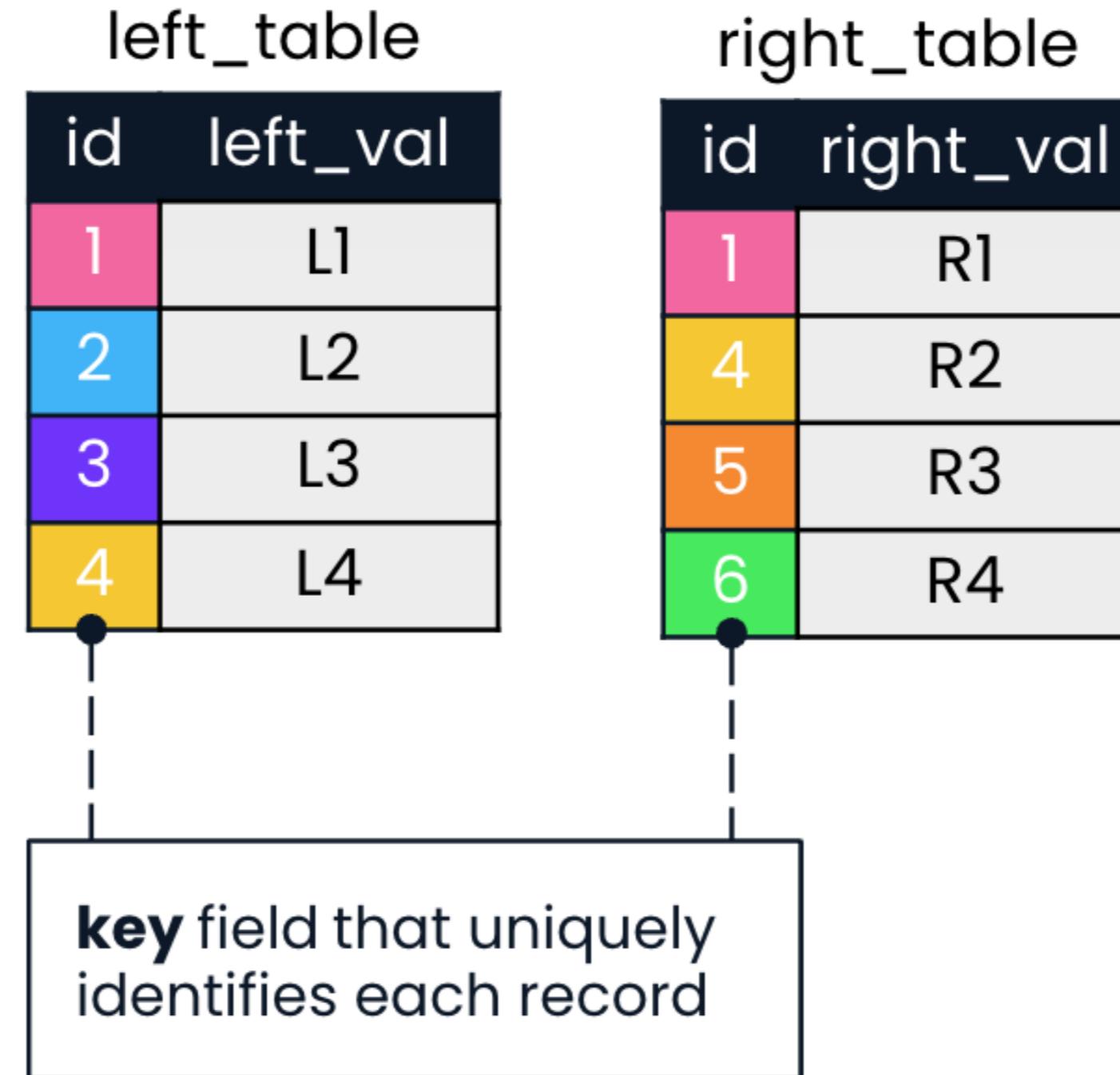
JOINING DATA IN SQL

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**Maham Faisal Khan**

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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

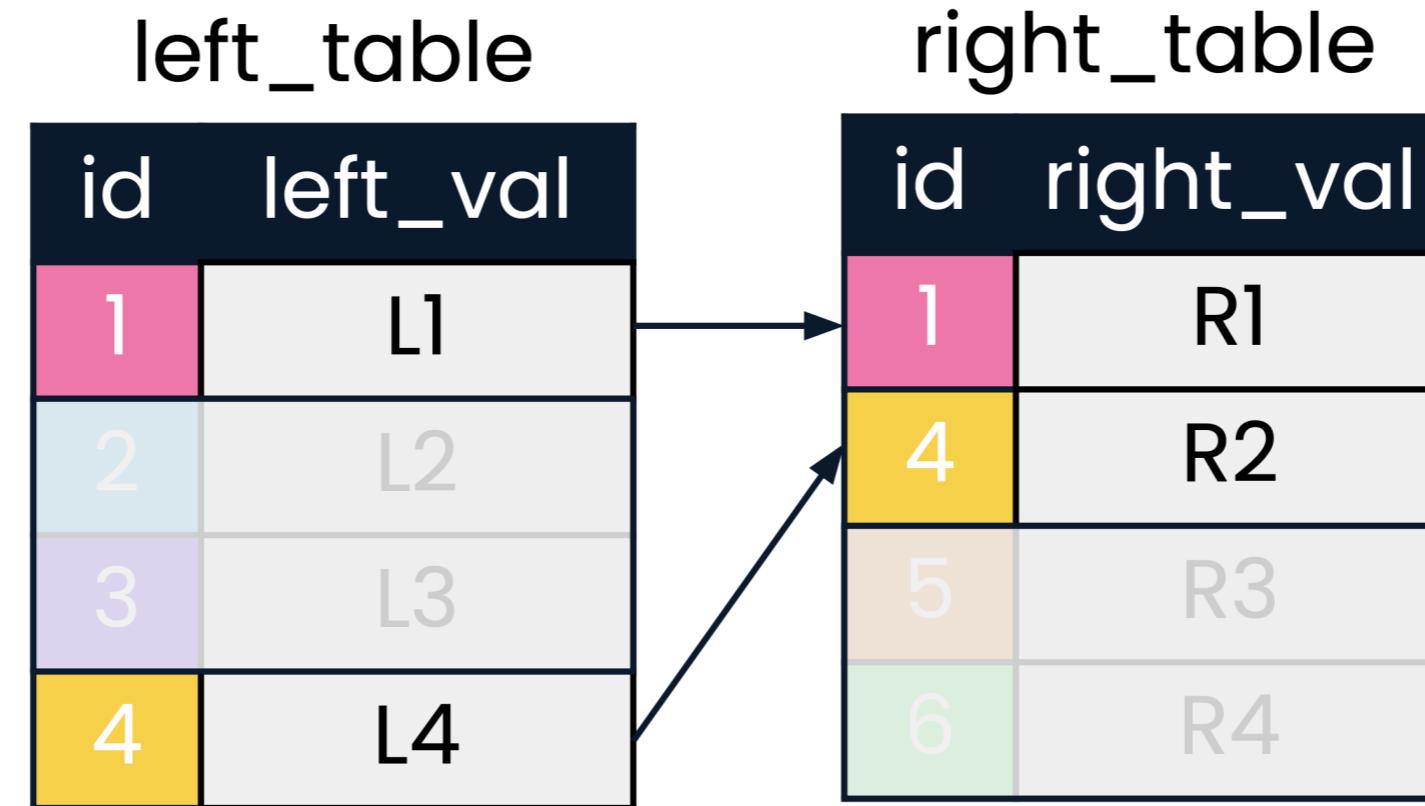
Diagram for an INNER JOIN on the `id` field

left_table		right_table	
id	left_val	id	right_val
1	L1	1	R1
2	L2	4	R2
3	L3	5	R3
4	L4	6	R4

The diagram illustrates an INNER JOIN operation between two tables, `left_table` and `right_table`, on the `id` field. The `left_table` has four rows with `id` values 1, 2, 3, and 4, and corresponding `left_val` values L1, L2, L3, and L4. The `right_table` has four rows with `id` values 1, 4, 5, and 6, and corresponding `right_val` values R1, R2, R3, and R4. Arrows point from the `id` column of the `left_table` to the `id` column of the `right_table`, specifically connecting row 1 of the left table to row 1 of the right table, and row 4 of the left table to row 4 of the right table. This indicates that only the rows where the `id` values match are selected.

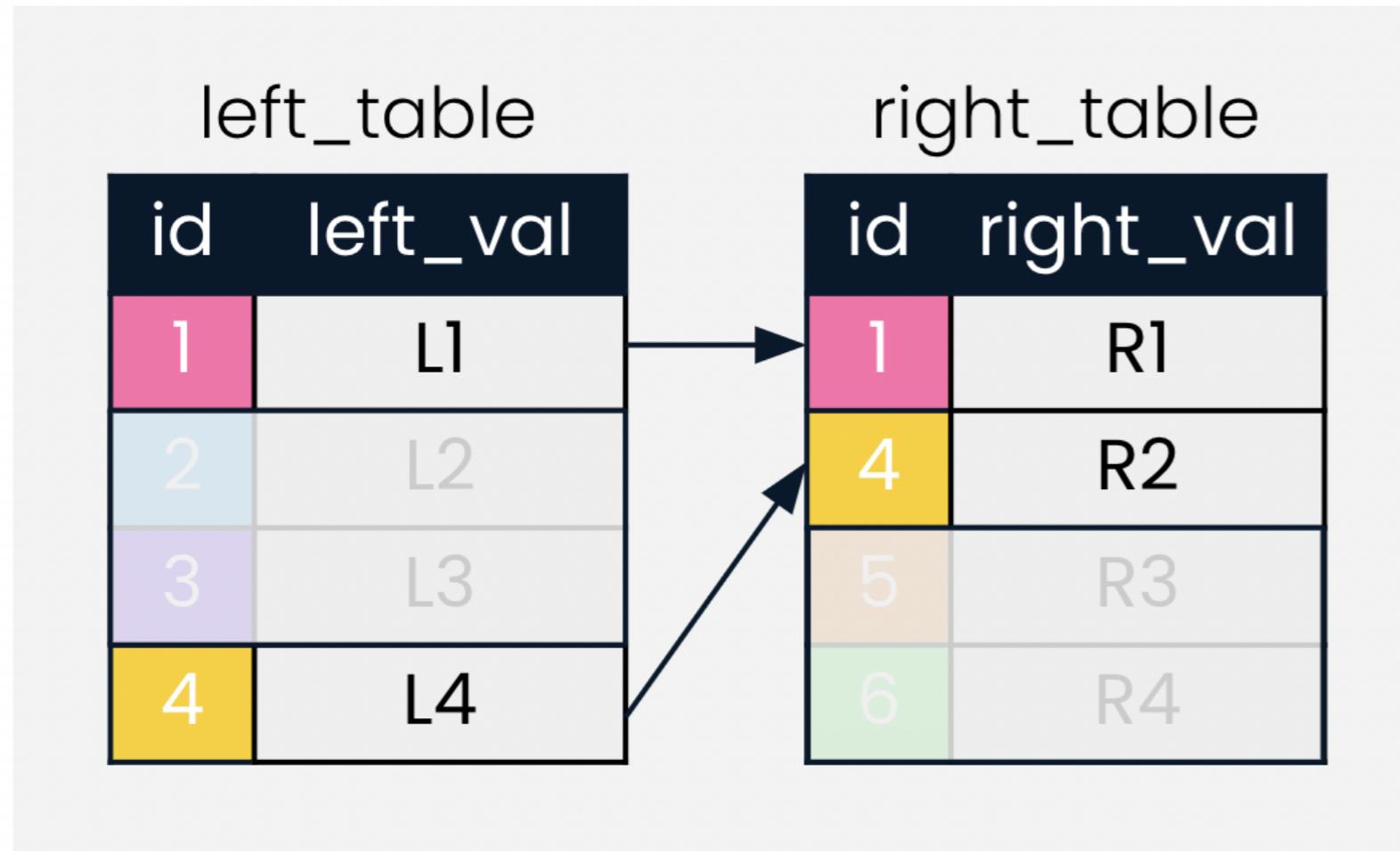
# The ins and outs of INNER JOINS

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



# The ins and outs of INNER JOINS

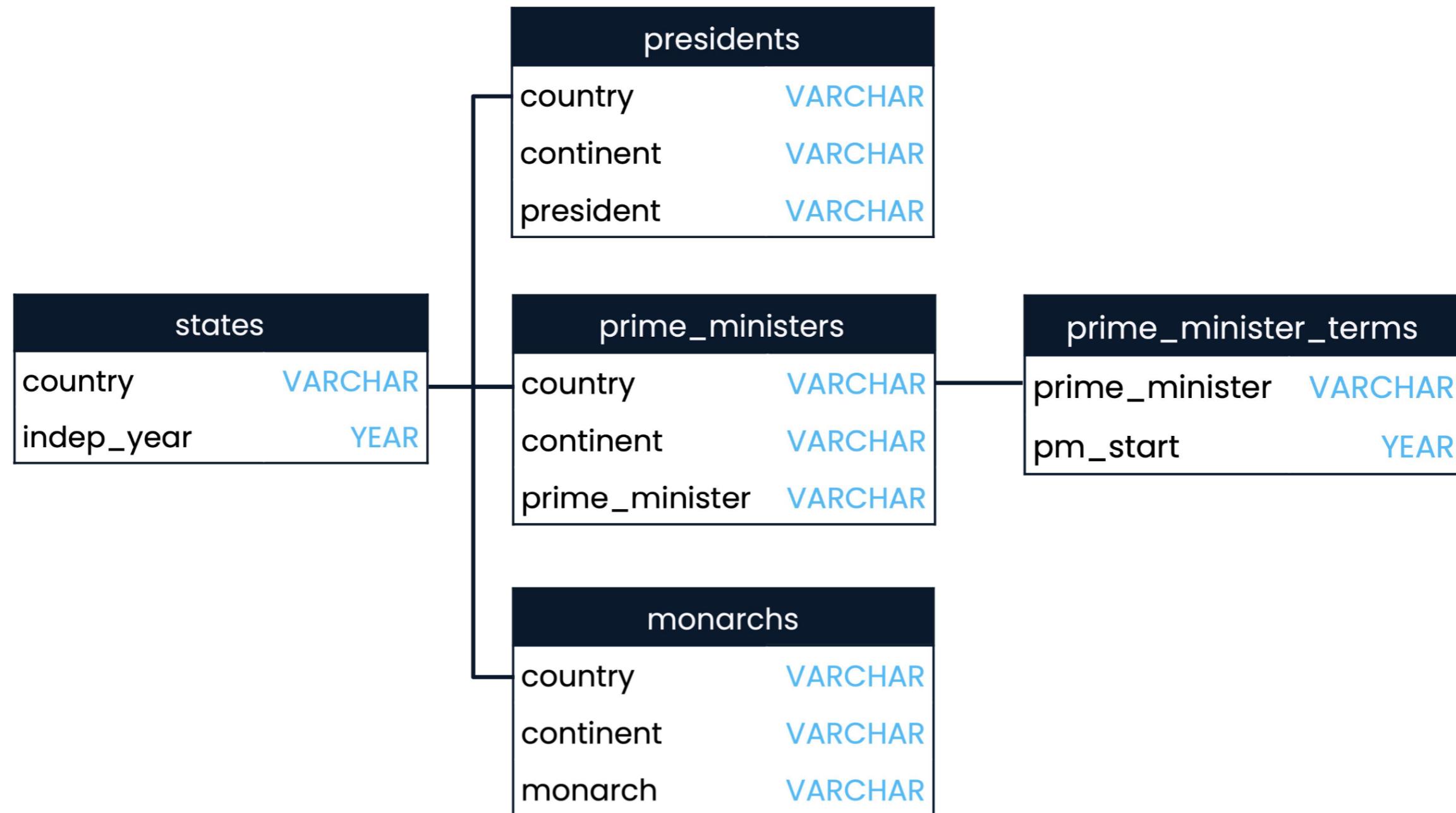
Diagram for an `INNER JOIN` on the `id` field



result after INNER JOIN

<code>id</code>	<code>left_val</code>	<code>right_val</code>
1	L1	R1
4	L4	R2

# 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!**

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# Defining relationships

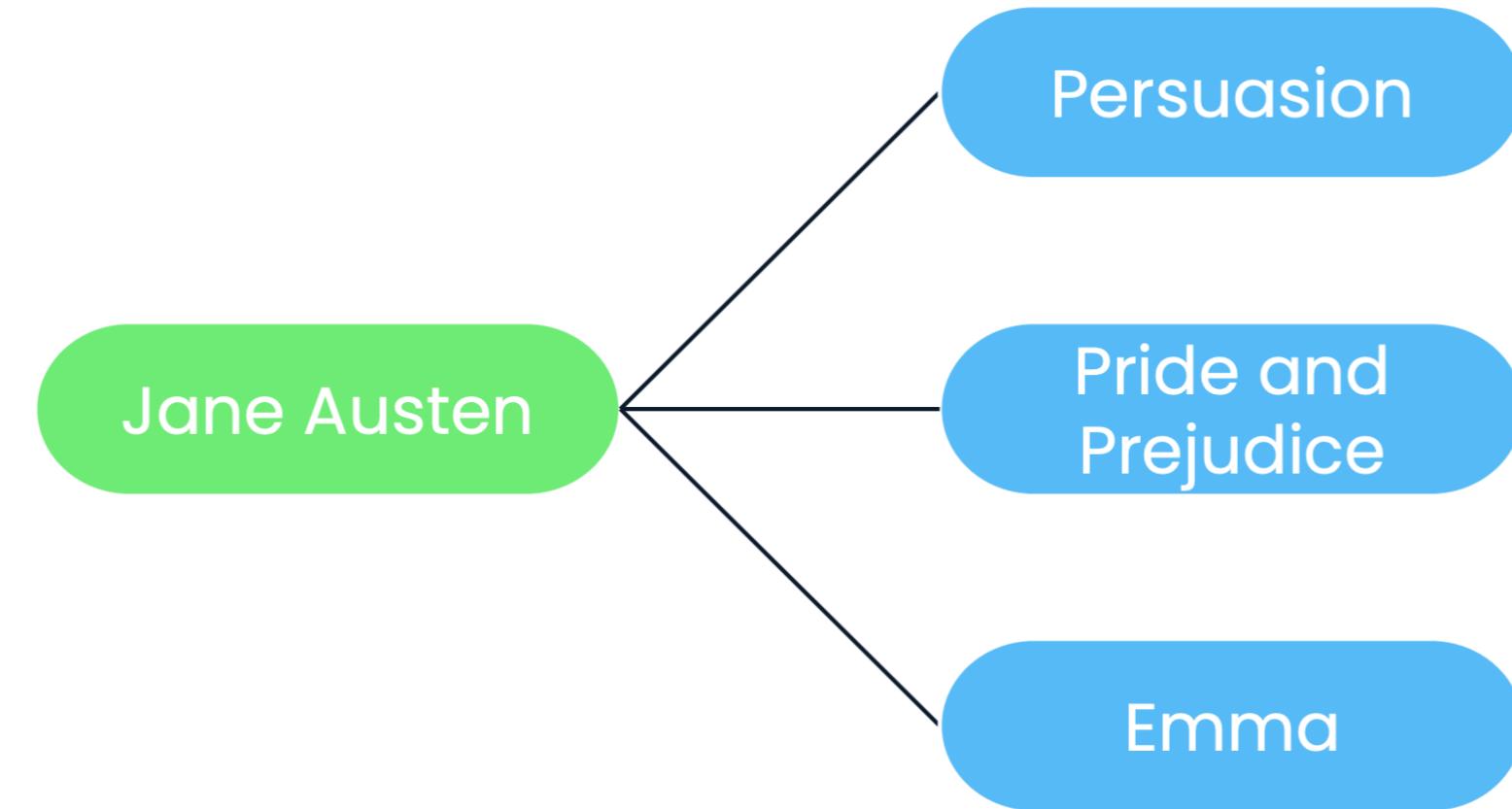
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SQL

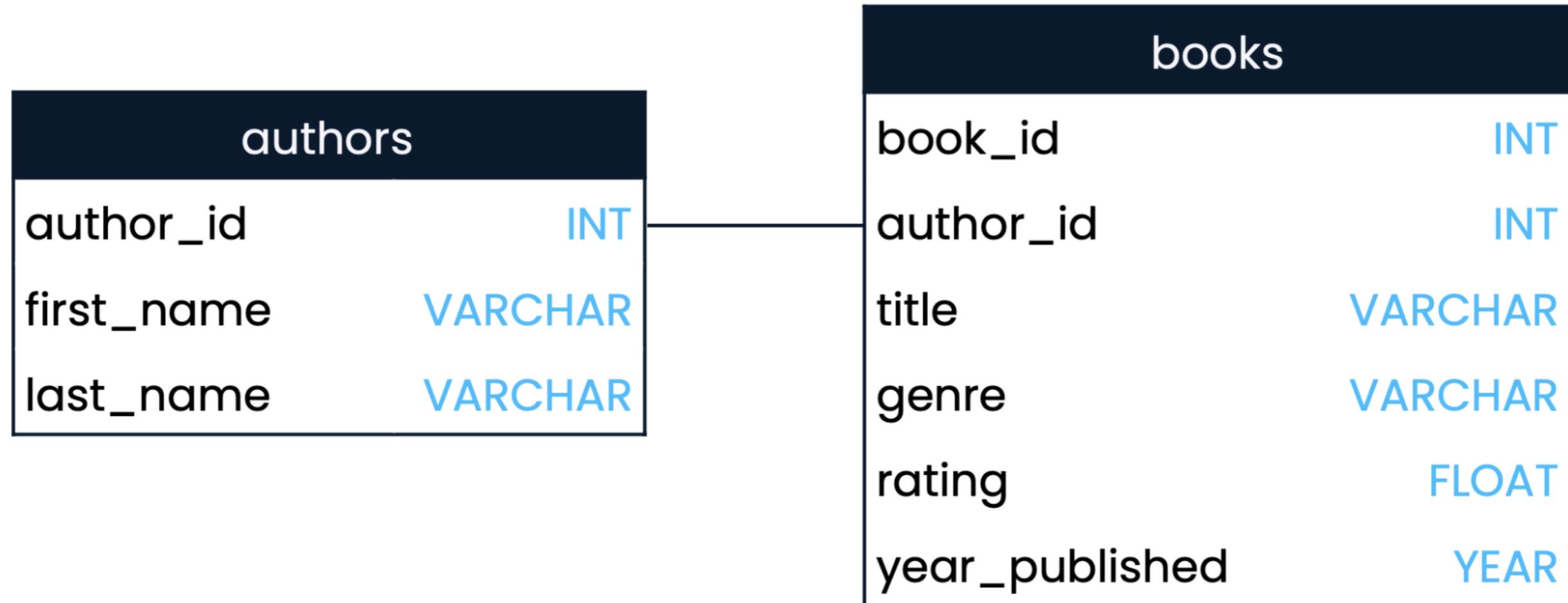
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# One-to-many relationships



# One-to-many relationships



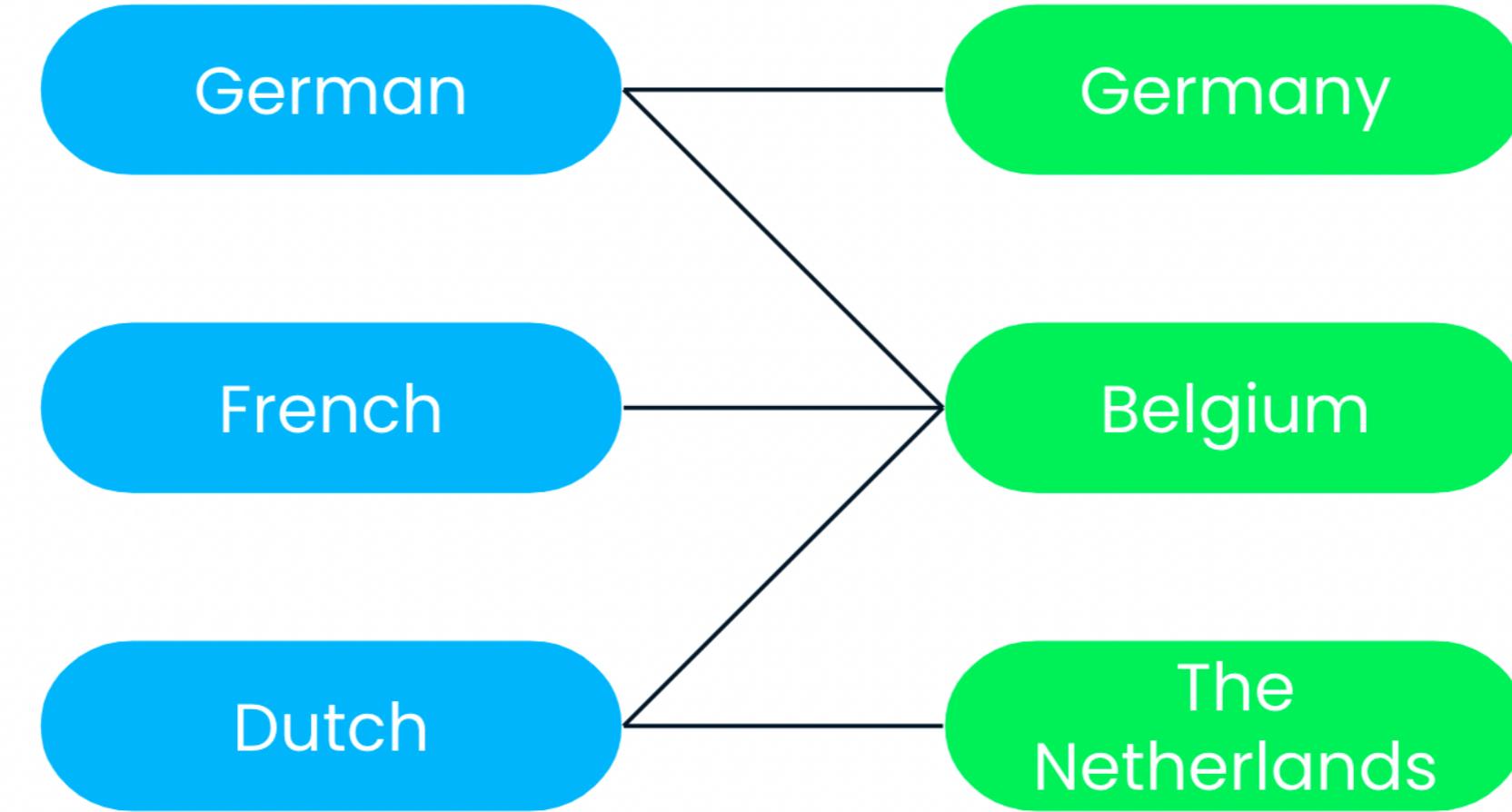
# One-to-one relationships



# One-to-one relationships

individuals		fingerprints	
passport_no	VARCHAR	passport_no	VARCHAR
nationality	VARCHAR	left_index	BINARY
date_of_birth	DATE	left_thumb	BINARY
first_name	VARCHAR	right_index	BINARY
last_name	VARCHAR	right_thumb	BINARY

# Many-to-many relationships



# **Let's practice!**

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# Multiple joins

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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

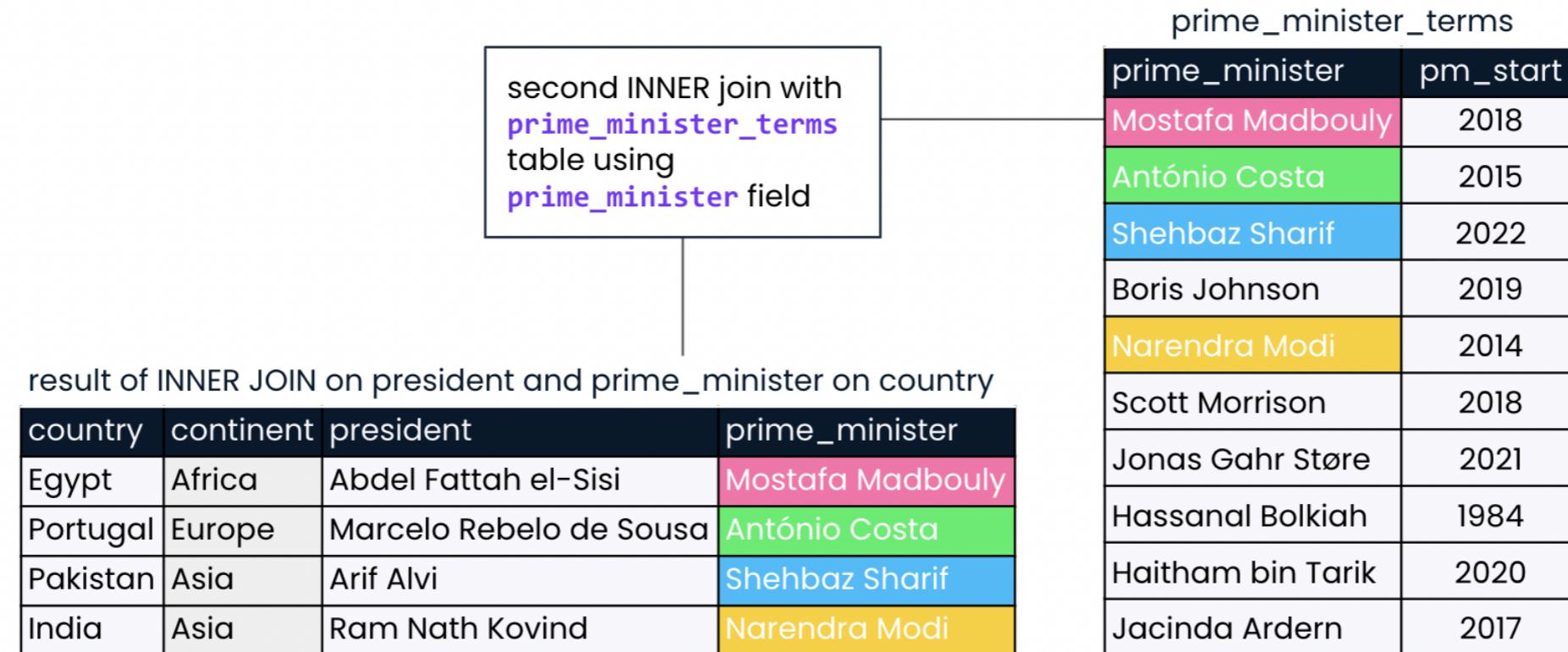
prime_minister	pm_start
Mostafa Madbouly	2018
António Costa	2015
Shehbaz Sharif	2022
Boris Johnson	2019
Narendra Modi	2014
Scott Morrison	2018
Jonas Gahr Støre	2021
Hassanal Bolkiah	1984
Haitham bin Tarik	2020
Jacinda Ardern	2017

# 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



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

left_table			right_table		
id	date	left_value	id	date	right_value
1	09/03/19	L1	1	09/03/19	R1
2	04/02/18	L2	1	12/12/20	R1.1
3	04/03/12	L3	4	06/12/22	R2
4	06/12/22	L4	4	11/08/19	R2.1
			5	08/09/12	R3
			6	02/01/09	R4

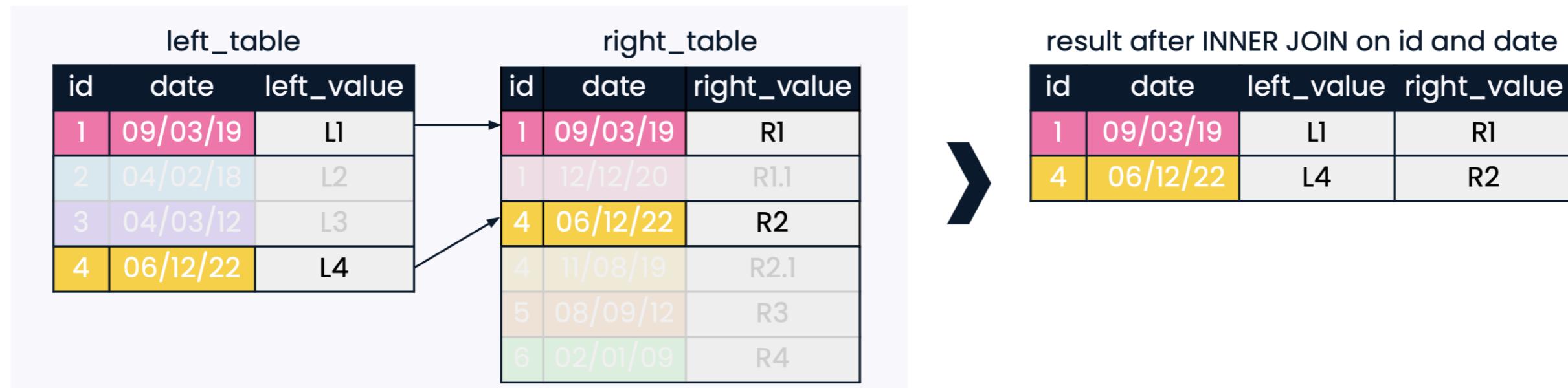
result after INNER JOIN on id

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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