

Subquerying with semi joins and anti joins

JOINING DATA IN SQL

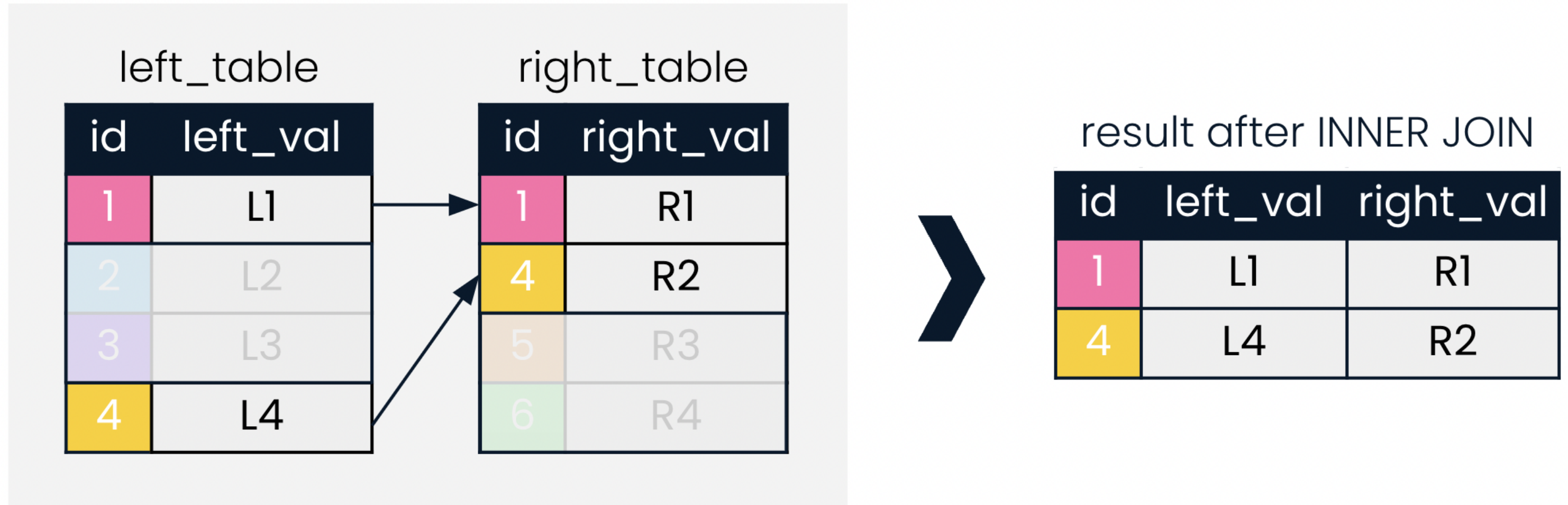
SQL

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Calling all joins

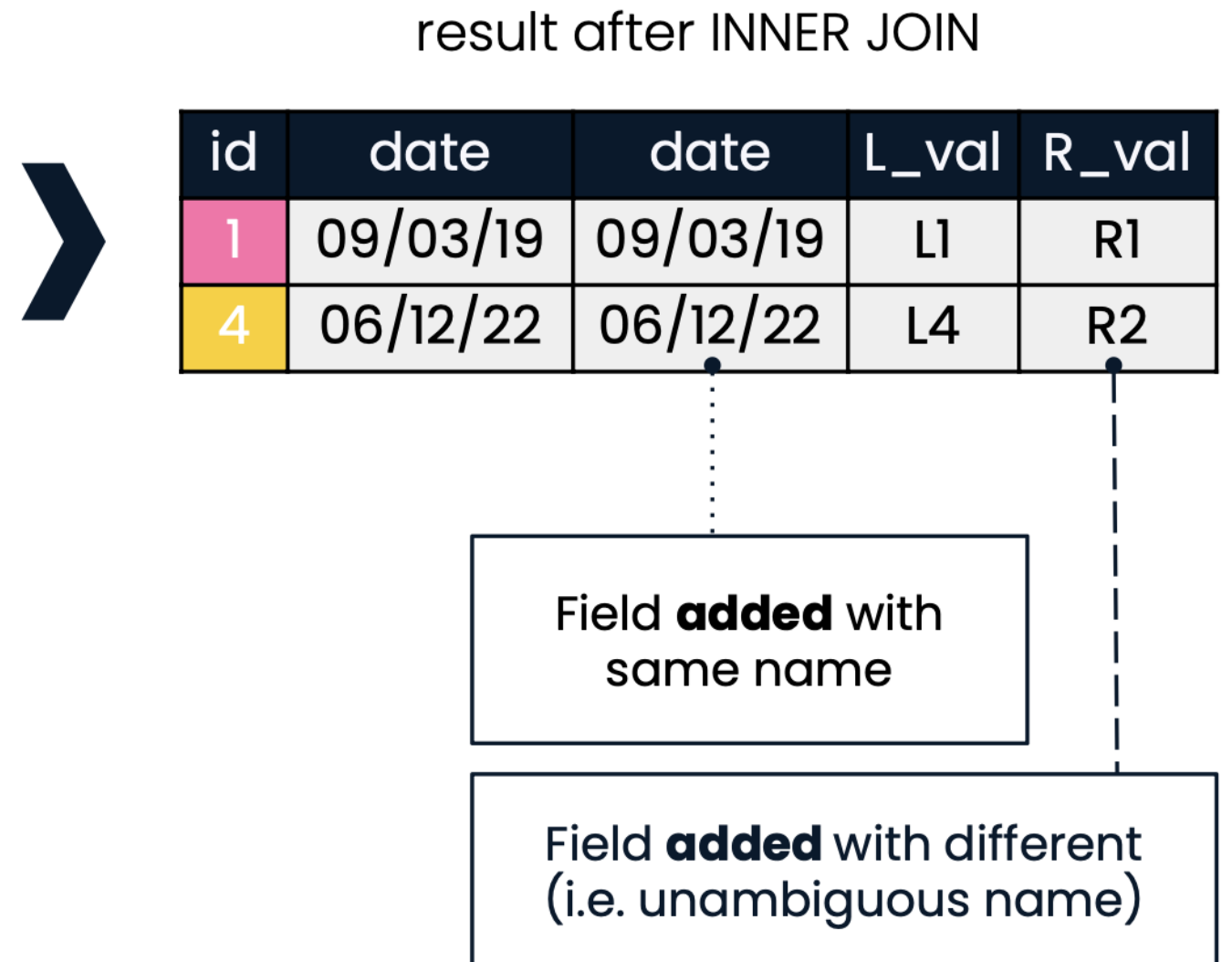
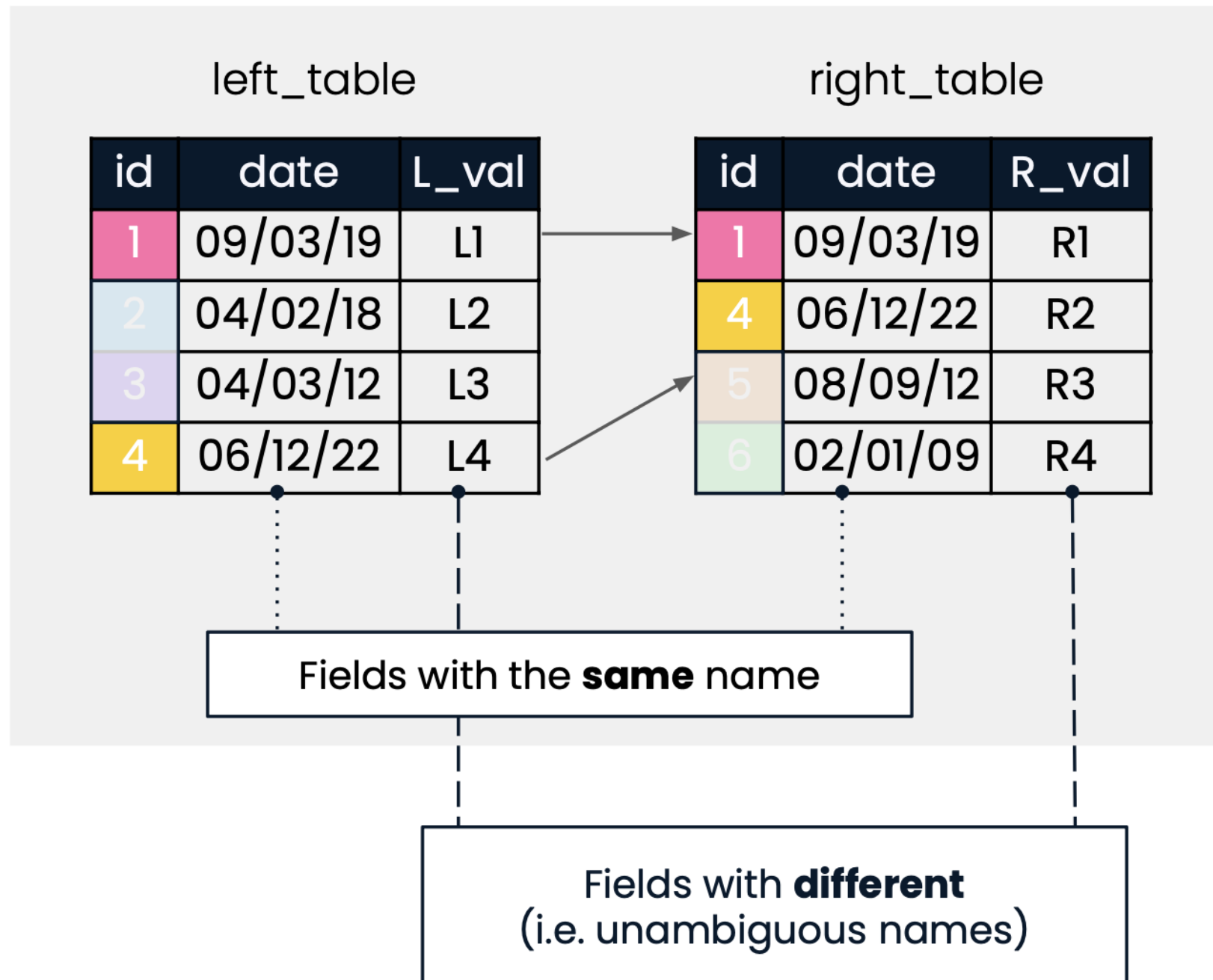
Diagram for an **INNER JOIN** on the **id** field



Additive joins

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

Additive joins

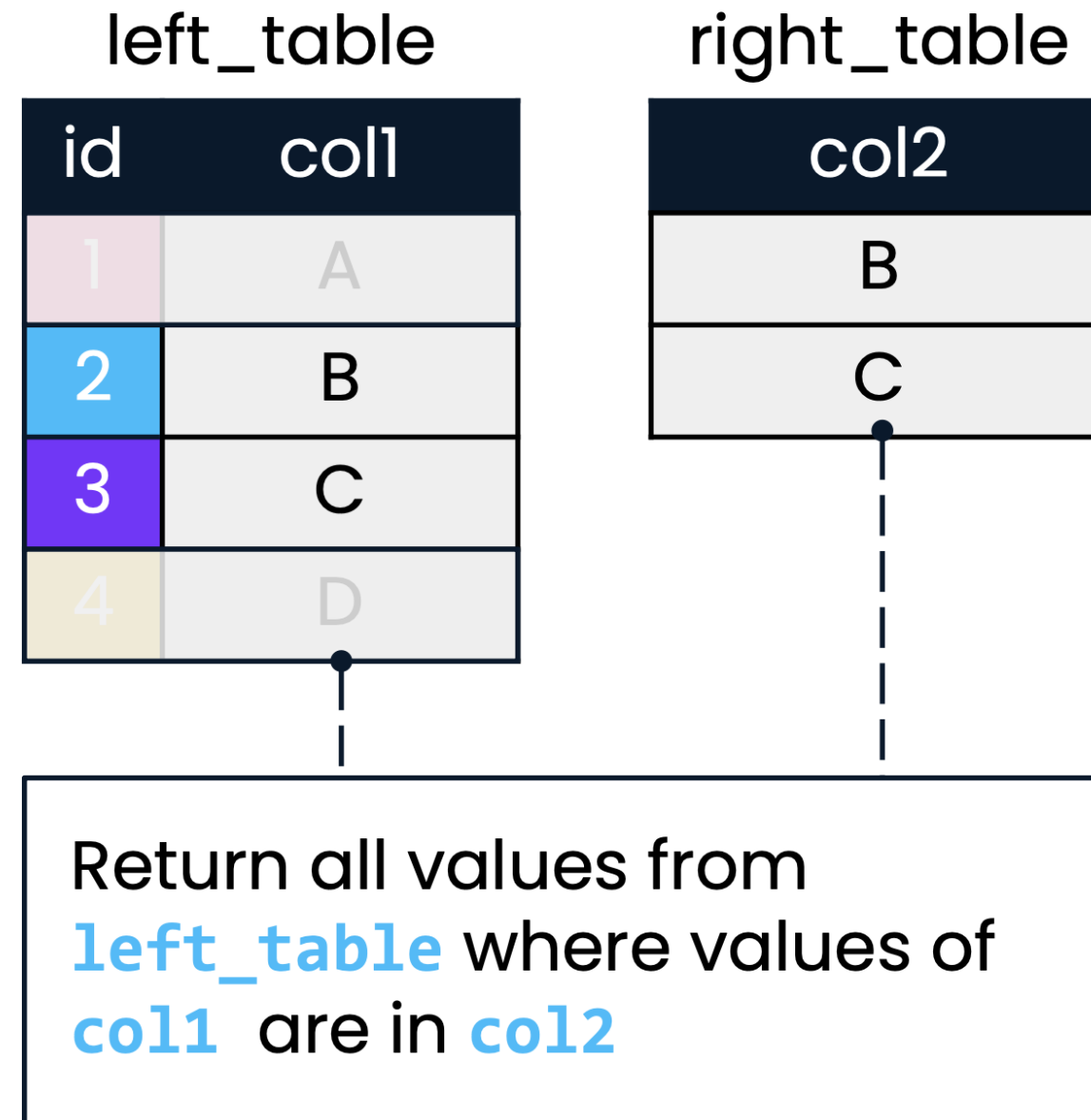


Semi join

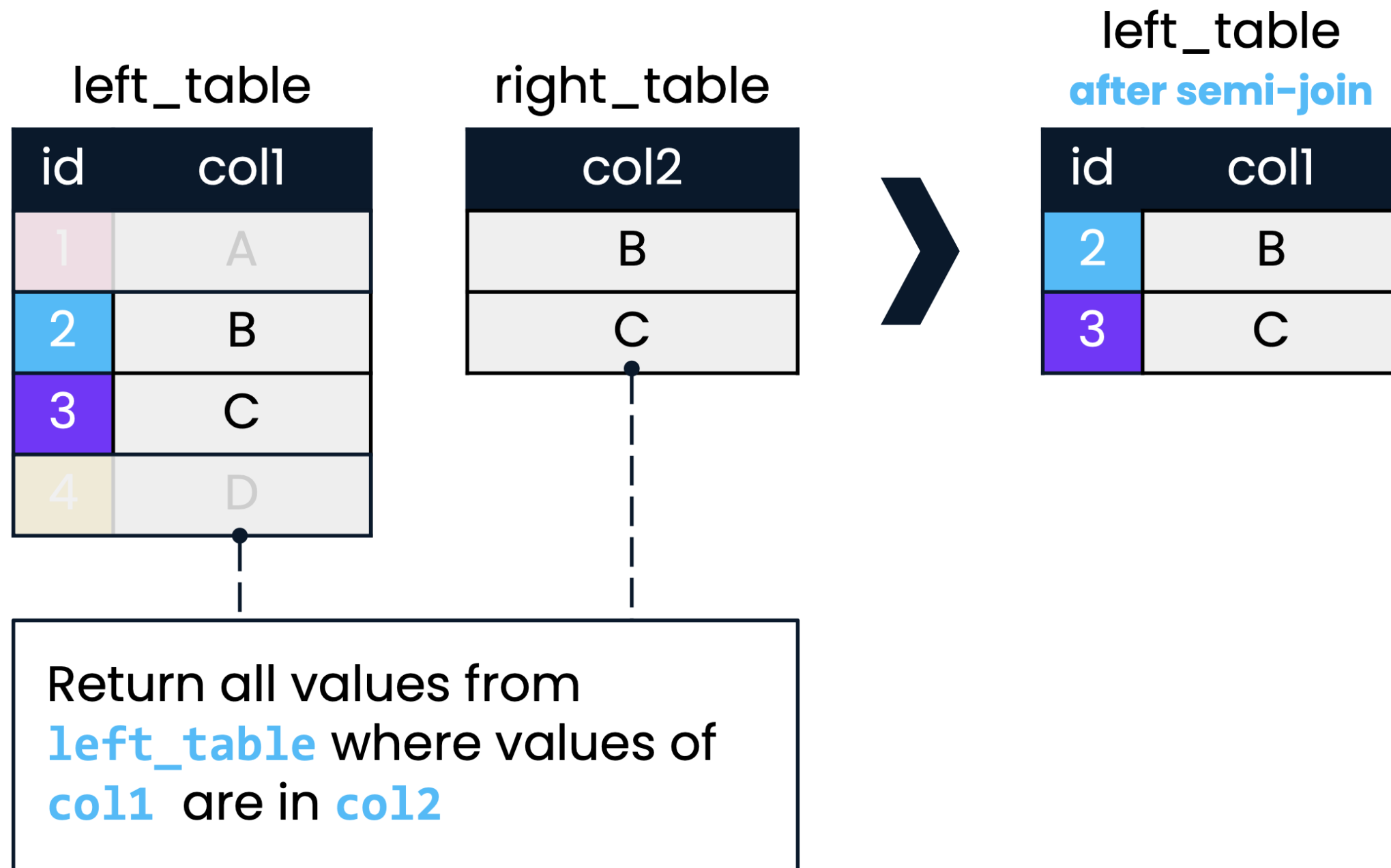
A **semi join** chooses records in the first table where a condition is met in the second table.

left_table		right_table	
id	col1	col2	
1	A	B	
2	B	C	
3	C		
4	D		

Semi join



Semi join



Kicking off our semi join

```
SELECT country, continent, president
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

Building on our semi join

```
SELECT country
FROM states
WHERE indep_year < 1800;
```

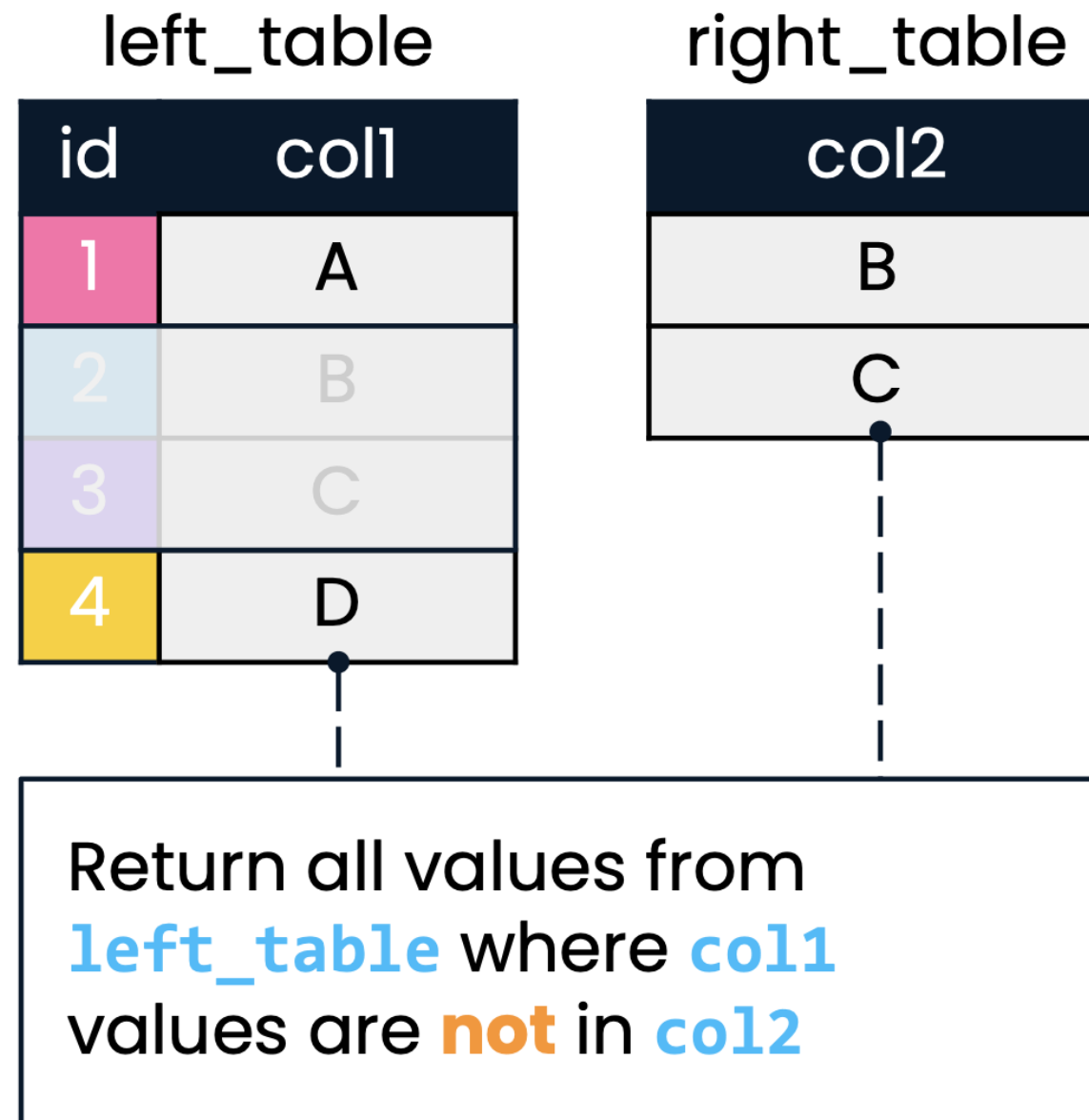
```
|-----|
| country |
|-----|
| Portugal|
| Spain   |
|-----|
```

Finish the semi join (an intro to subqueries)

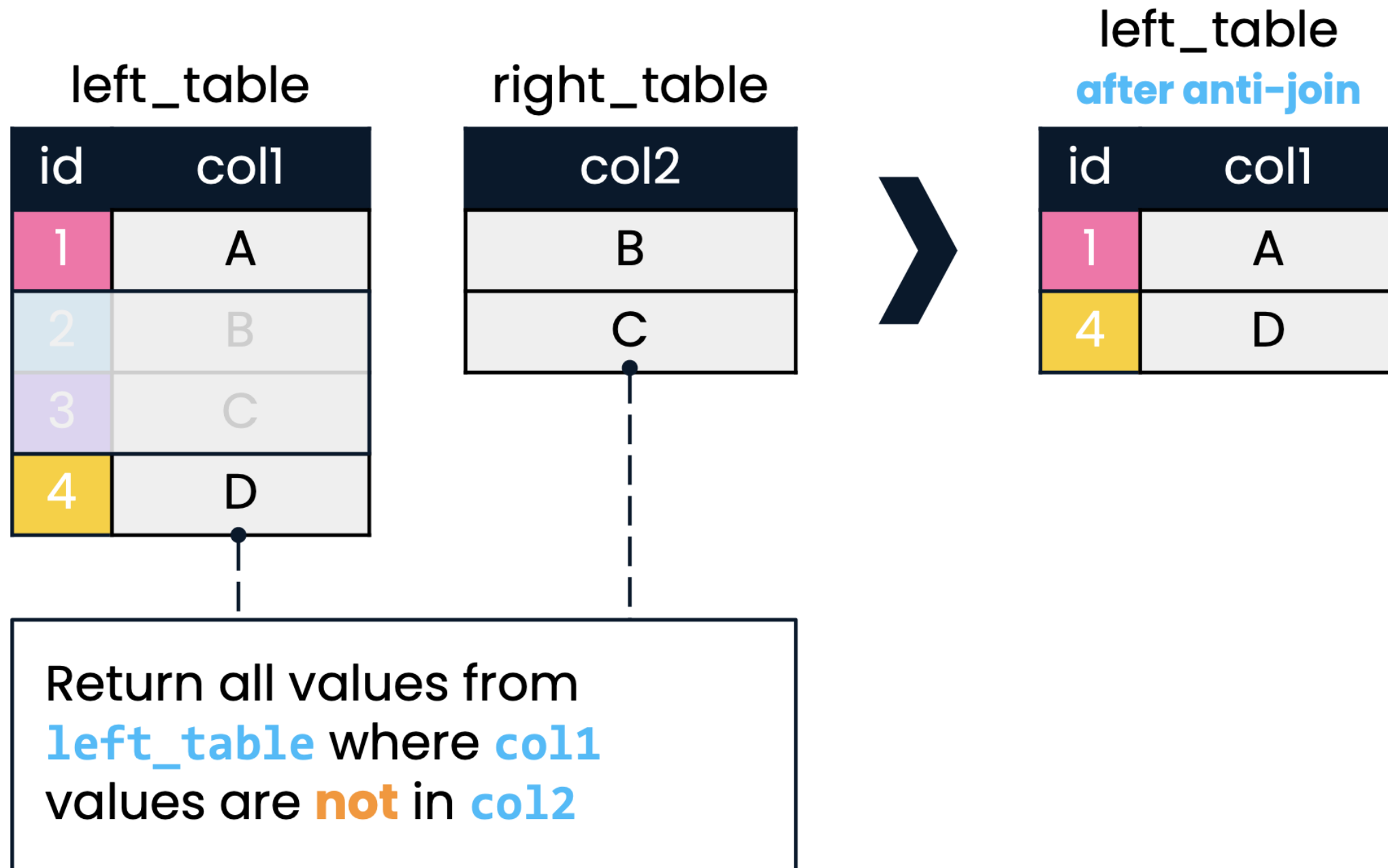
```
SELECT president, country, continent
FROM presidents
WHERE country IN
    (SELECT country
     FROM states
     WHERE indep_year < 1800);
```

-----	-----	-----
president	country	continent
-----	-----	-----
Marcelo Rebelo de Sousa	Portugal	Europe
-----	-----	-----

Anti join



Anti join



An anti join with the presidents

```
SELECT country, president
FROM presidents
WHERE continent LIKE '%America'
      AND country NOT IN
      (SELECT country
       FROM states
       WHERE indep_year < 1800);
```

	country		president	
	-----		-----	
	Uruguay		Luis Lacalle Pou	
	Chile		Gabriel Boric	

Let's practice!

JOINING DATA IN SQL

Subqueries inside WHERE and SELECT

JOINING DATA IN SQL



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Syntax for subqueries inside WHERE

- All semi joins and anti joins we have seen included a subquery in `WHERE`
- `WHERE` is the most common place for subqueries

Syntax for query using `WHERE IN` statement

```
SELECT *  
FROM some_table  
WHERE some_numeric_field IN (4, 8, 12);
```


Syntax for subqueries inside WHERE

```
SELECT *  
FROM some_table  
WHERE some_field IN  
    (include subquery here);
```

Syntax for subqueries inside WHERE

```
SELECT *  
FROM some_table  
WHERE some_field IN  
    (SELECT some_numeric_field  
     FROM another_table  
     WHERE field2 = some_condition);
```

Subqueries inside SELECT

```
SELECT DISTINCT continent  
FROM states;
```

```
|-----|  
| continent |  
|-----|  
| Africa    |  
| Asia      |  
| Europe    |  
| North America |  
| Oceania   |  
|-----|
```

Subqueries inside SELECT

```
SELECT DISTINCT continent,  
  (SELECT COUNT(*)  
   FROM monarchs  
   WHERE states.continent = monarch.continent) AS monarch_count  
FROM states;
```

continent	monarch_count
Africa	0
Asia	2
Europe	2
North America	0
Oceania	0

Let's practice!

JOINING DATA IN SQL

Subqueries inside FROM

JOINING DATA IN SQL



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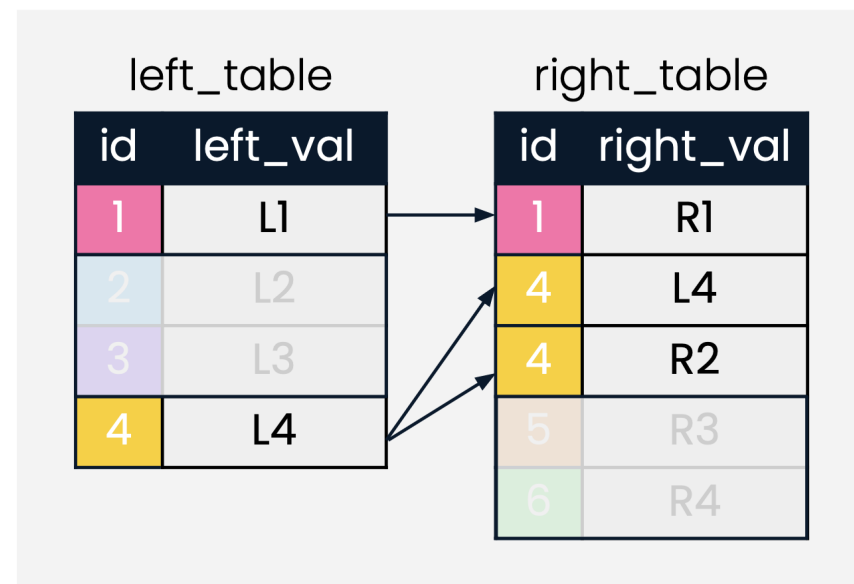
Subqueries inside FROM

```
SELECT continent, MAX(indep_year) AS most_recent
FROM states
GROUP BY continent;
```

continent	most_recent
-----	-----
Asia	1984
Europe	1814
Oceania	1901
North America	1776
South America	1818

Focusing on records inside monarchs

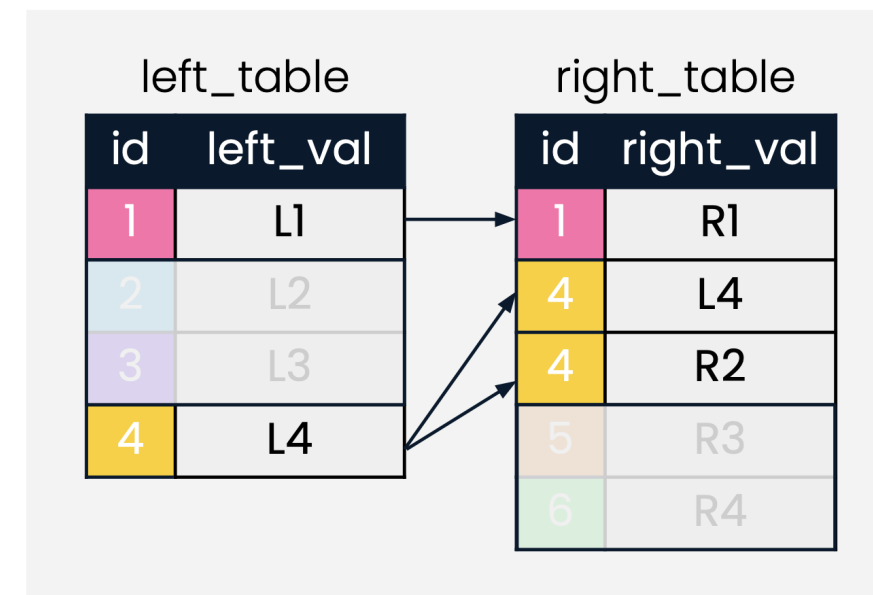
```
SELECT left_table.id, left_val  
FROM left_table, right_table  
WHERE left_table.id = right_table.id
```



result after query

id	left_val
1	L1
4	L4
4	L4

```
SELECT DISTINCT left_table.id, left_val  
FROM left_table, right_table  
WHERE left_table.id = right_table.id
```



result after query

id	left_val
1	L1
4	L4

Finishing off the subquery

```
-- Query to return continents with monarchs and the year the most recent country gained independence
SELECT DISTINCT monarchs.continent, sub.most_recent
FROM monarchs,
    (SELECT
        continent,
        MAX(indep_year) AS most_recent
    FROM states
    GROUP BY continent) AS sub
WHERE monarchs.continent = sub.continent
ORDER BY continent;
```

continent	most_recent	
-----	-----	
Asia	1984	
Europe	1814	

Let's practice!

JOINING DATA IN SQL

The finish line

JOINING DATA IN SQL



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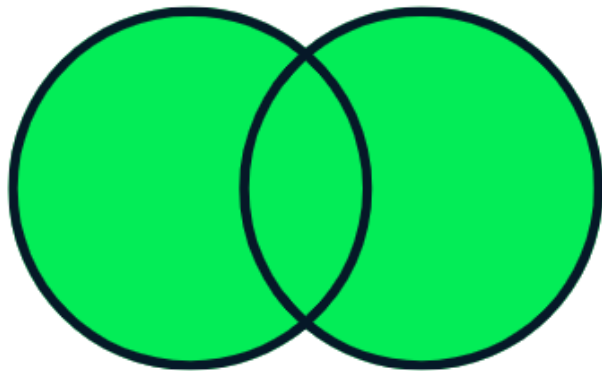
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Types of joins

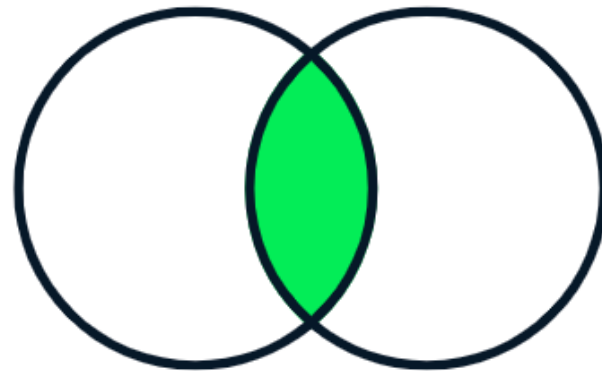
1. `INNER JOIN` , or just `JOIN`
2. Outer join
 - `LEFT JOIN`
 - `RIGHT JOIN`
 - `FULL JOIN`
3. `CROSS JOIN`
4. Semi join / anti join
5. Self join

Set operations

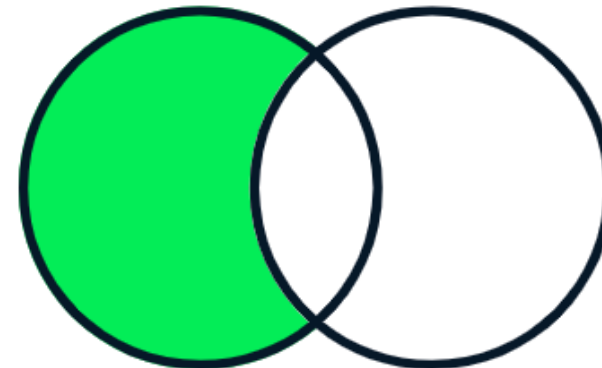
UNION
UNION ALL



INTERSECT



EXCEPT



Types of basic subqueries

- Subqueries inside `SELECT` clauses
- Subqueries inside `WHERE` clauses
- Subqueries inside `FROM` clauses

WHERE to from here?

- DataCamp's Intermediate SQL course
- Projects, practice exercises and competitions
- Workspace

The finish line!

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