

Welcome to the course!

JOINING DATA IN SQL



Chester Ismay

Data Science Evangelist, DataRobot

left_table

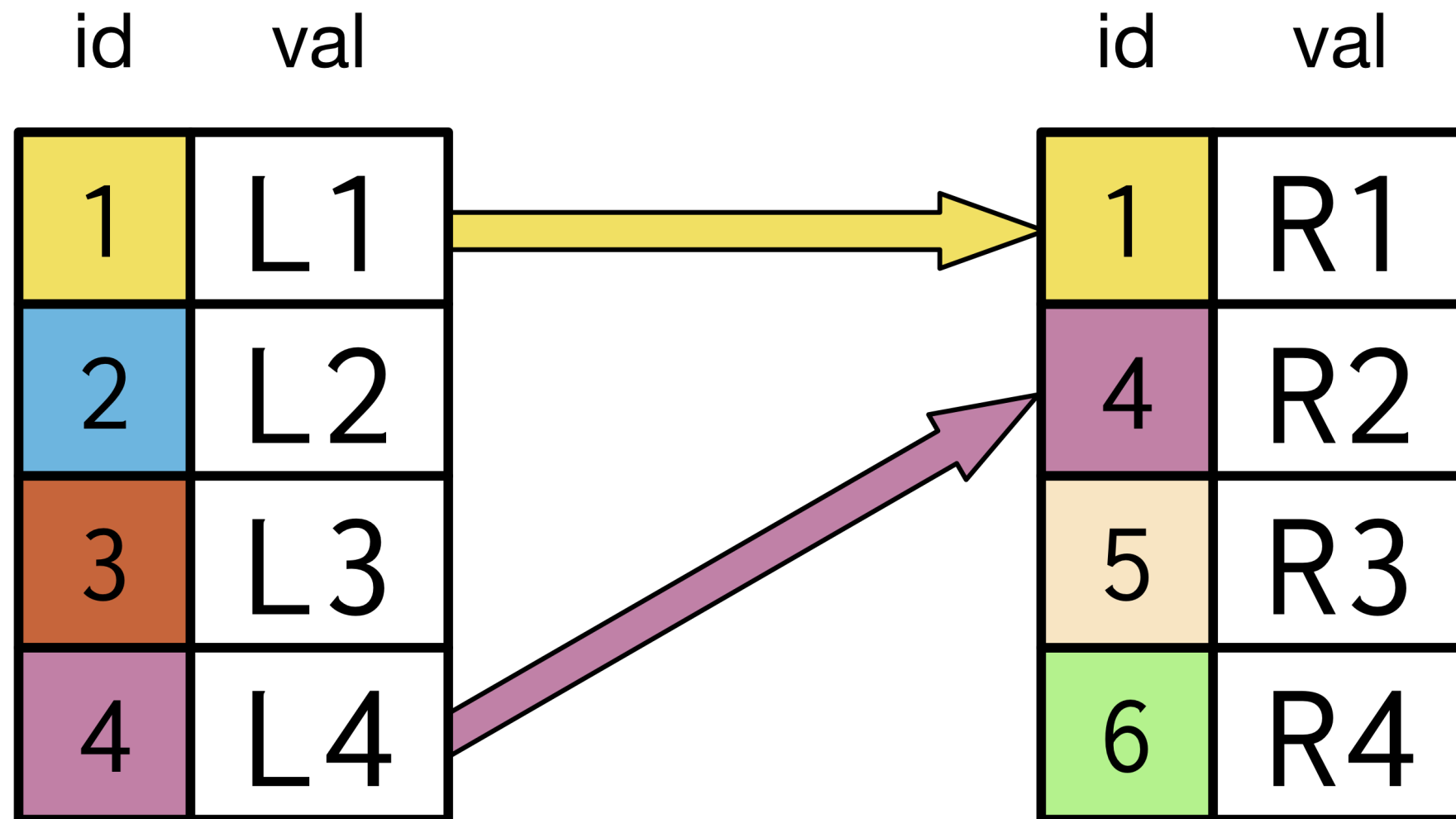
id	val
1	L1
2	L2
3	L3
4	L4

right_table

id	val
1	R1
4	R2
5	R3
6	R4

left_table

right_table



left_table

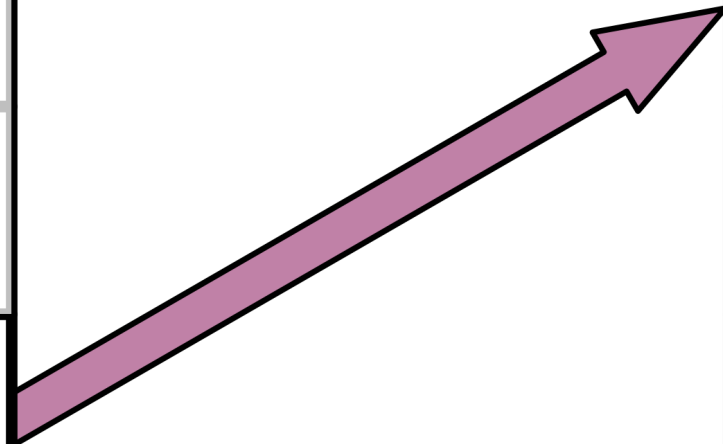
id val

1	L1
2	L2
3	L3
4	L4

right_table

id val

1	R1
4	R2
5	R3
6	R4



left_table

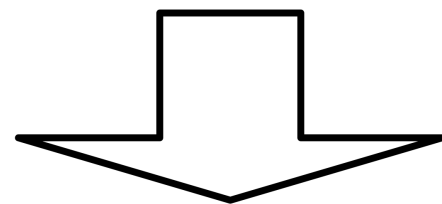
id val

1	L1
2	L2
3	L3
4	L4

right_table

id val

1	R1
4	R2
5	R3
6	R4



INNER JOIN

L_id	L_val	R_val
1	L1	R1
4	L4	R2

prime_ministers table

```
+-----+-----+-----+
| country | continent | prime_minister |
+-----+-----+-----+
| Egypt   | Africa    | Sherif Ismail   |
| Portugal| Europe    | Antonio Costa   |
| Vietnam | Asia       | Nguyen Xuan Phuc|
| Haiti    | North America | Jack Guy Lafontant |
| India    | Asia       | Narendra Modi   |
| Australia| Oceania    | Malcolm Turnbull|
| Norway   | Europe     | Erna Solberg    |
| Brunei   | Asia       | Hassanal Bolkiah|
| Oman     | Asia       | Qaboos bin Said al Said |
| Spain    | Europe     | Mariano Rajoy   |
+-----+-----+-----+
```

presidents table

```
SELECT *  
FROM presidents;
```

```
+-----+-----+-----+  
| country | continent | president |  
+-----+-----+-----+  
| Egypt   | Africa    | Abdel Fattah el-Sisi |  
| Portugal | Europe    | Marcelo Rebelo de Sousa |  
| Haiti    | North America | Jovenel Moise |  
| Uruguay  | South America | Jose Mujica |  
| Liberia  | Africa     | Ellen Johnson Sirleaf |  
| Chile    | South America | Michelle Bachelet |  
| Vietnam  | Asia       | Tran Dai Quang |  
+-----+-----+-----+
```

INNER JOIN in SQL

```
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	Sherif Ismail	Abdel Fattah el-Sisi
Portugal	Europe	Antonio Costa	Marcelo Rebelo de Sousa
Vietnam	Asia	Nguyen Xuan Phuc	Tran Dai Quang
Haiti	North America	Jack Guy Lafontant	Jovenel Moise

Let's practice!

JOINING DATA IN SQL

INNER JOIN via USING

JOINING DATA IN SQL



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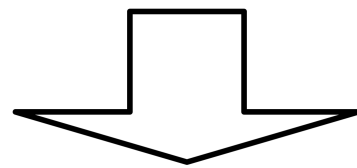
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The INNER JOIN diagram again

left_table right_table

id	val		id	val
----	-----	--	----	-----

1	L1	→	1	R1
2	L2		4	R2
3	L3		5	R3
4	L4	↗	6	R4

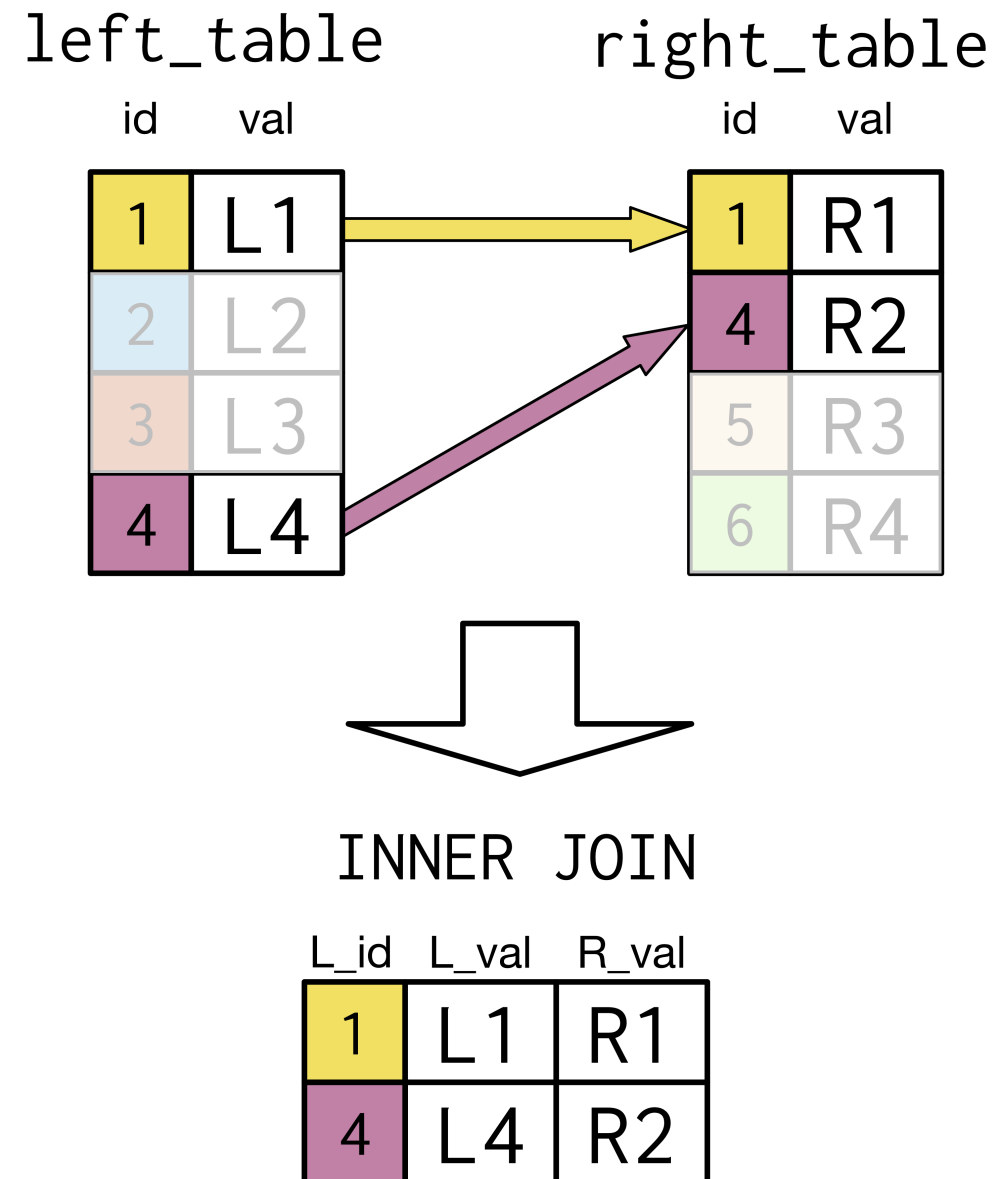


INNER JOIN

L_id	L_val	R_val
1	L1	R1
4	L4	R2

```
SELECT left_table.id AS L_id  
       left_table.val AS L_val  
       right_table.val AS R_val  
FROM left_table  
INNER JOIN right_table  
ON left_table.id = right_table.id
```

The INNER JOIN diagram with USING



```
SELECT left_table.id AS L_id  
       left_table.val AS L_val  
       right_table.val AS R_val  
FROM left_table  
INNER JOIN right_table  
USING (id);
```

Countries with prime ministers and presidents

```
SELECT p1.country, p1.continent, prime_minister, president
FROM ___ AS p1
INNER JOIN ___ AS p2
___ (___);
```

One answer:

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

```
+-----+-----+-----+-----+
| country | continent | prime_minister | president |
+-----+-----+-----+-----+
| Egypt   | Africa    | Sherif Ismail   | Abdel Fattah el-Sisi |
| Portugal | Europe    | Antonio Costa   | Marcelo Rebelo de Sousa |
| Vietnam | Asia      | Nguyen Xuan Phuc | Tran Dai Quang |
| Haiti    | North America | Jack Guy Lafontant | Jovenel Moise |
+-----+-----+-----+-----+
```

Let's practice!

JOINING DATA IN SQL

Self-ish joins, just in CASE

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Join a table to itself?

```
+-----+-----+-----+
| country | continent | prime_minister |
+-----+-----+-----+
| Egypt   | Africa    | Sherif Ismail   |
| Portugal| Europe     | Antonio Costa   |
| Vietnam | Asia       | Nguyen Xuan Phuc|
| Haiti    | North America | Jack Guy Lafontant |
| India    | Asia       | Narendra Modi   |
| Australia| Oceania    | Malcolm Turnbull|
| Norway   | Europe     | Erna Solberg    |
| Brunei   | Asia       | Hassanal Bolkiah|
| Oman     | Asia       | Qaboos bin Said al Said |
| Spain    | Europe     | Mariano Rajoy   |
+-----+-----+-----+
```


Join prime_ministers to itself?

```
SELECT p1.country AS country1, p2.country AS country2, p1.continent
FROM prime_ministers AS p1
INNER JOIN prime_ministers AS p2
ON p1.continent = p2.continent
LIMIT 14;
```

country1	country2	continent
Egypt	Egypt	Africa
Portugal	Spain	Europe
Portugal	Norway	Europe
Portugal	Portugal	Europe
Vietnam	Oman	Asia
Vietnam	Brunei	Asia
Vietnam	India	Asia
Vietnam	Vietnam	Asia
Haiti	Haiti	North America
India	Oman	Asia
India	Brunei	Asia
India	India	Asia
India	Vietnam	Asia
Australia	Australia	Oceania

Finishing off the self-join on prime_ministers

```
SELECT p1.country AS country1, p2.country AS country2, p1.continent
FROM prime_ministers AS p1
INNER JOIN prime_ministers AS p2
ON p1.continent = p2.continent AND p1.country <> p2.country
LIMIT 13;
```

country1	country2	continent
Portugal	Spain	Europe
Portugal	Norway	Europe
Vietnam	Oman	Asia
Vietnam	Brunei	Asia
Vietnam	India	Asia
India	Oman	Asia
India	Brunei	Asia
India	Vietnam	Asia
Norway	Spain	Europe
Norway	Portugal	Europe
Brunei	Oman	Asia
Brunei	India	Asia
Brunei	Vietnam	Asia

CASE WHEN and THEN

```
+-----+-----+-----+
| name   | continent | indep_year |
+-----+-----+-----+
| Australia | Oceania   | 1901      |
| Brunei    | Asia      | 1984      |
| Chile     | South America | 1810      |
| Egypt     | Africa    | 1922      |
| Haiti     | North America | 1804      |
| India     | Asia      | 1947      |
| Liberia   | Africa    | 1847      |
| Norway    | Europe    | 1905      |
| Oman      | Asia      | 1951      |
| Portugal  | Europe    | 1143      |
| Spain     | Europe    | 1492      |
| Uruguay   | South America | 1828      |
| Vietnam   | Asia      | 1945      |
+-----+-----+-----+
```

Preparing indep_year_group in states

```
SELECT name, continent, indep_year,  
       CASE WHEN ___ < ___ THEN 'before 1900'  
            WHEN indep_year <= 1930 THEN '___'  
            ELSE '___' END  
       AS indep_year_group  
FROM states  
ORDER BY indep_year_group;
```

Creating indep_year_group in states

```
SELECT name, continent, indep_year,  
       CASE WHEN indep_year < 1900 THEN 'before 1900'  
            WHEN indep_year <= 1930 THEN 'between 1900 and 1930'  
            ELSE 'after 1930' END  
       AS indep_year_group  
FROM states  
ORDER BY indep_year_group;
```

name	continent	indep_year	indep_year_group
Brunei	Asia	1984	after 1930
India	Asia	1947	after 1930
Oman	Asia	1951	after 1930
Vietnam	Asia	1945	after 1930
Liberia	Africa	1847	before 1900
Chile	South America	1810	before 1900
Haiti	North America	1804	before 1900
Portugal	Europe	1143	before 1900
Spain	Europe	1492	before 1900
Uruguay	South America	1828	before 1900
Norway	Europe	1905	between 1900 and 1930
Australia	Oceania	1901	between 1900 and 1930
Egypt	Africa	1922	between 1900 and 1930

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