Data Bhau

Class 3
Joins - I

What is a JOIN?

What is a JOIN?

Join is the most commonly used clause in SQL, and it is used to combine and retrieve data from two or more tables.

Data in a real-world relational database is structured in many tables, which requires the constant need to join these multiple tables based on logical relationships. The different types of Joins are:

- INNER JOIN;
- LEFT JOIN;
- RIGHT JOIN;
- FULL JOIN.

BASIC SYNTAX OF JOINS

- TABLE_1

JOIN

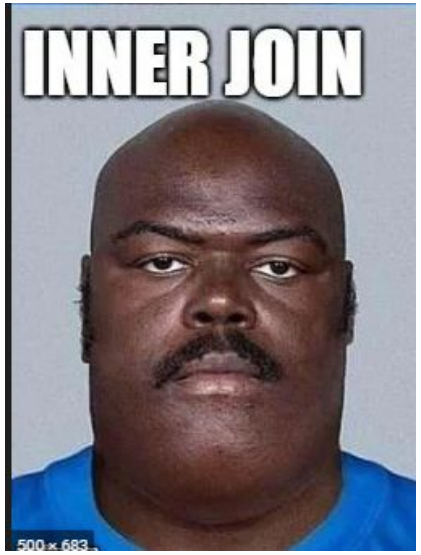
TABLE_2

ON (LINKING CONDITIONS)

INNER JOIN

In SQL Server, the Inner Join clause creates a new table (not physical) by combining rows with matching values from two or more tables.

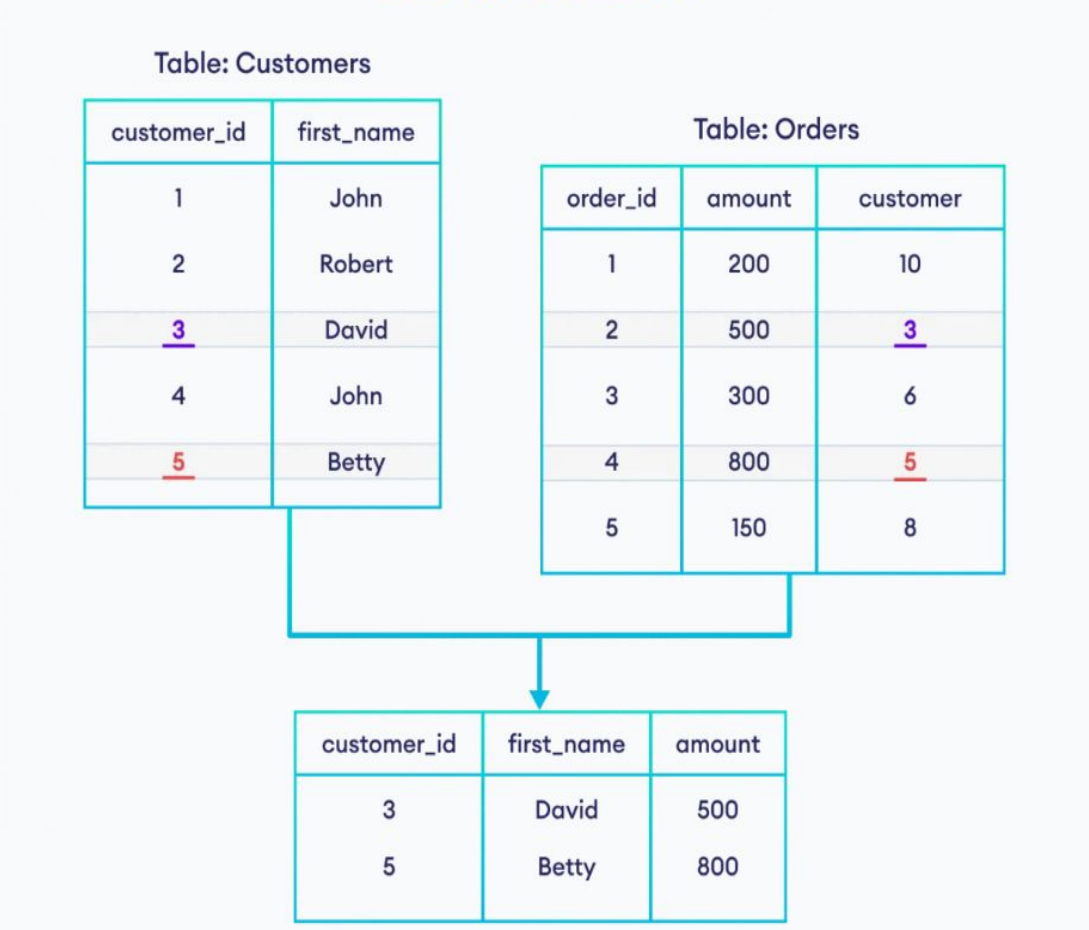
Assume we have two tables, A and B, that we want to join using SQL Inner Join. This join will produce a new result set with matching rows from both tables.



Basic Syntax of Inner Join

```
SELECT Column_list
FROM TABLE1
INNER JOIN TABLE2
ON Table1.Column_name = Table2.Column_name
```

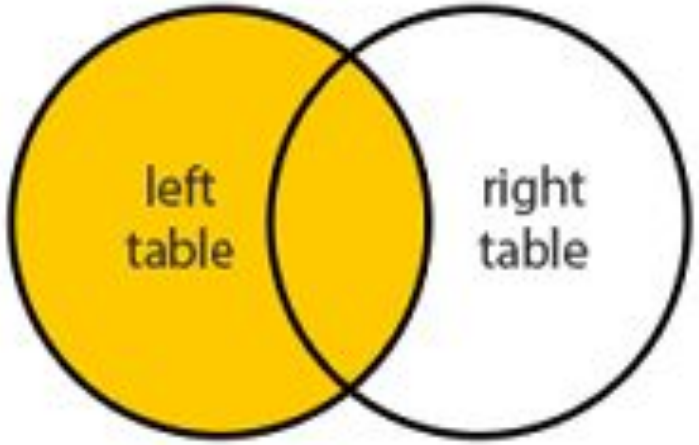
Example of Inner Join




```
Select a.customer_id, a.first_name,
b.amount
from
Customers as a
INNER JOIN
orders as b
on a.customer_id = b.customer
```

LEFT JOIN

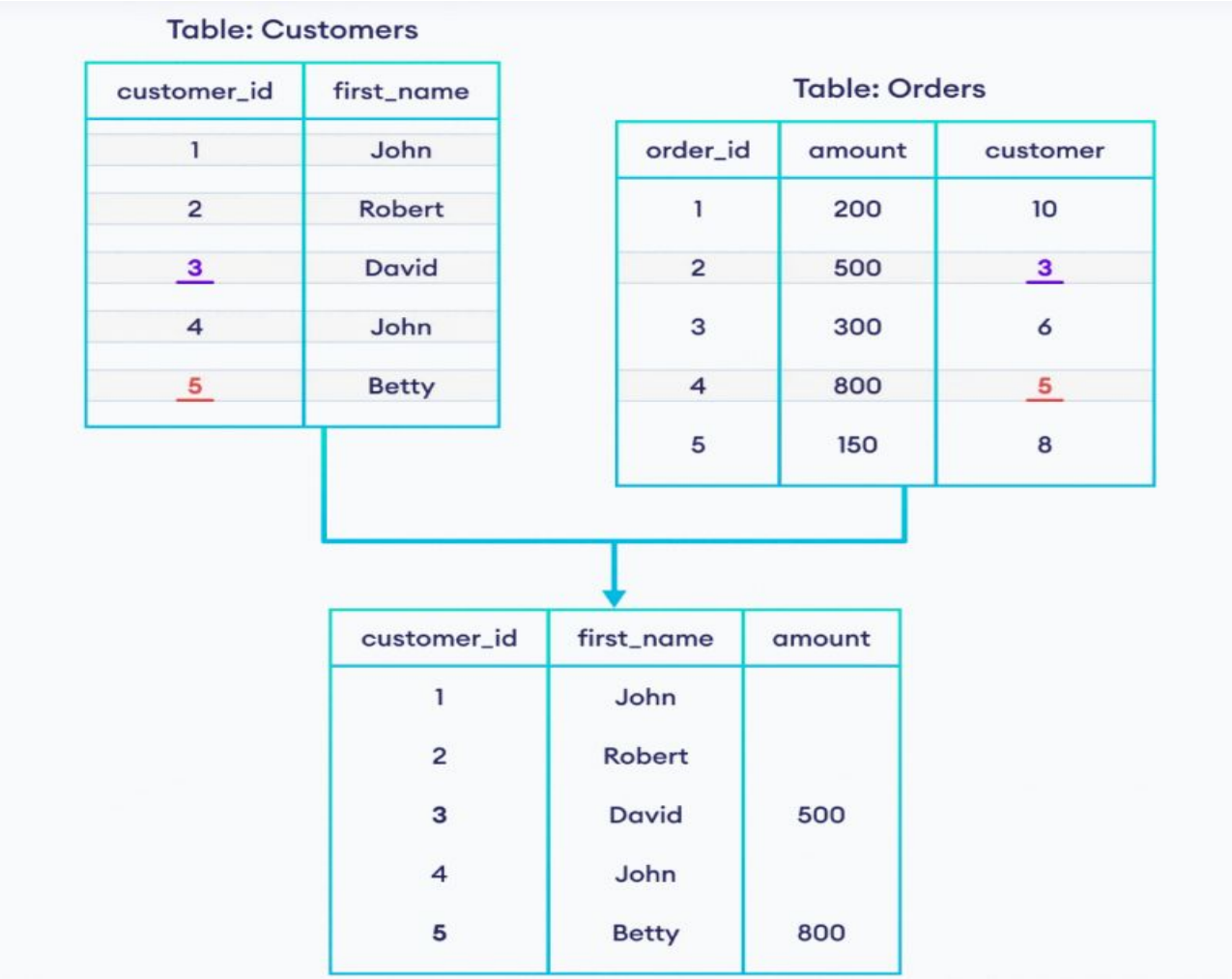
SQL Left Join returns all records from the left table in the join clause, regardless of whether there are any matching records in the right table. The left SQL outer join includes all rows from the table on the left where the condition is met and all rows from the table on the left where the condition is not met. Fields from the correct table that do not match will have null values.



Basic Syntax of Left Join

```
SELECT Column_list
FROM TABLE1
LEFT JOIN TABLE2
ON Table1.Column_name = Table2.Column_name
```

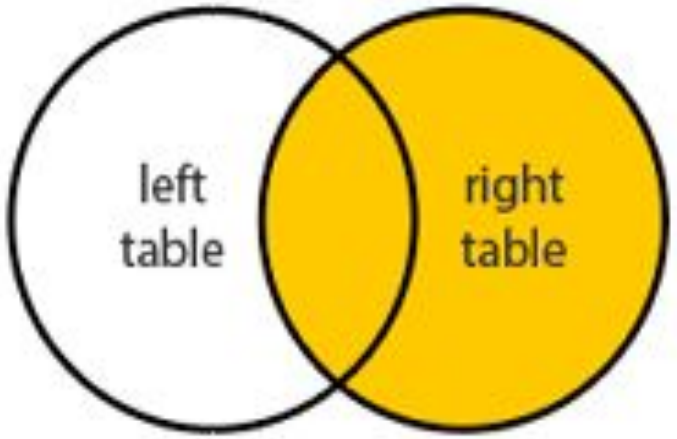
Example of Left Join

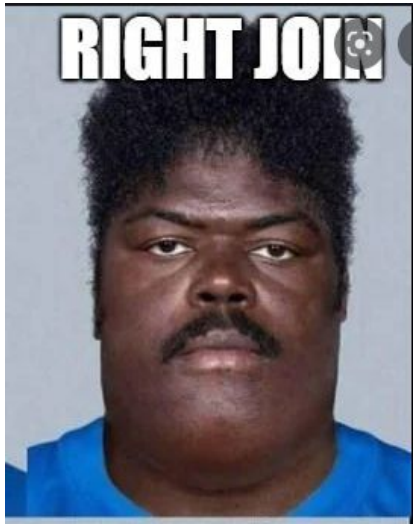



```
Select a.customer_id, a.first_name,
b.amount
from
Customers as a
LEFT JOIN
orders as b
on a.customer_id = b.customer
```

RIGHT JOIN

A right outer join will return all records in the join clauses' right table, regardless of matching records in the left table. The correct SQL outer join includes all of the rows from the right-hand table. The right SQL outer join is a special case, and many databases do not support right joins. A SQL right join can usually be rewritten as a SQL left join by simply changing the order of the tables in the query. Fields from the left table that do not match will display null values in this case.





Basic Syntax of Right Join

```
SELECT Column_list
FROM TABLE1
RIGHT JOIN TABLE2
ON Table1.Column_name = Table2.Column_name
```

Example of Right Join


```
Select a.customer_id, a.first_name,
b.amount
from
Customers as a
RIGHT JOIN
orders as b
on a.customer_id = b.customer
```

What is even the use of RIGHT JOIN?

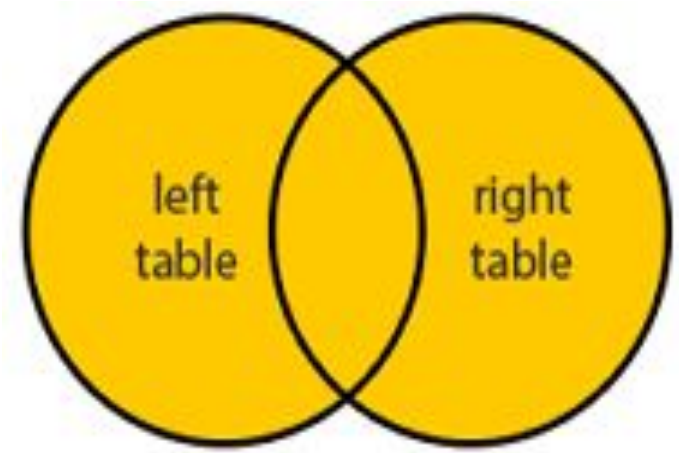
Will query performance increase? Nope

Any visible benefits? Hmm. Not really!

It's mostly a matter of perspective. All Right join Queries can be handled by Left Joins as well. Use what suits YOU....

FULL (OUTER) JOIN

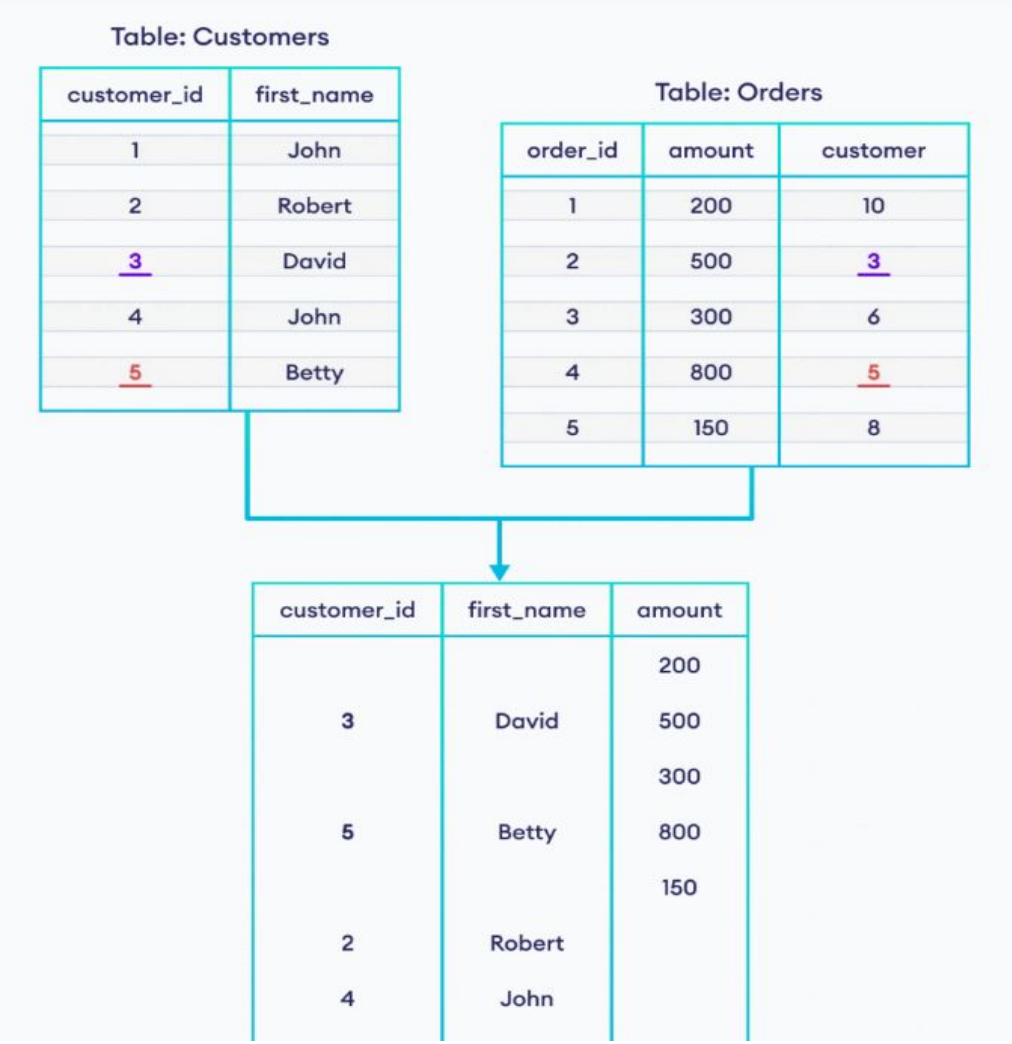
A full join will return all the rows in both tables. When rows don't match in one of the tables, the field will display a null value. A complete SQL outer join combines the effects of the SQL left joins and SQL right joins. Many databases do not support the implementation of full SQL outer joins.



Basic Syntax of Full Outer Join

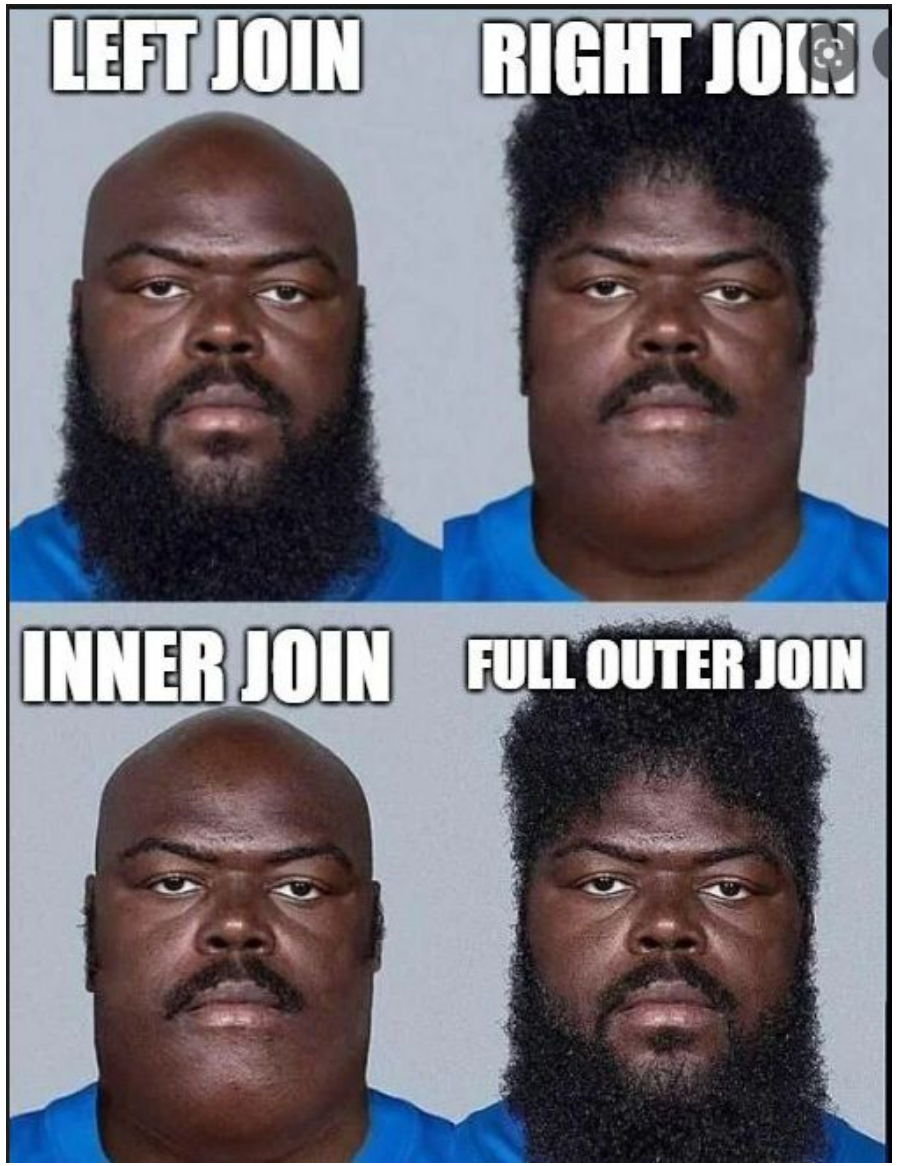
```
SELECT Column_list
FROM TABLE1
FULL (OUTER) JOIN TABLE2
ON Table1.Column_name = Table2.Column_name
```

Example of Full (Outer) Join




```
Select a.customer_id, a.first_name,
b.amount
from
Customers as a
FULL OUTER JOIN
orders as b
on a.customer_id = b.customer
```

PUTTING IT ALL TOGETHER



Join for more than two tables

- How to prioritize tables :

This can be done by determining which tables contain the data we need and include them

Thus start by writing the query for that table and also include all the tables that come along the way between this table that doesn't contain data but serve as a relation between tables that do

Join for more than two tables

TRICK

OUT OF THE TABLES YOU HAVE TO JOIN, THINK OF THE MOST IMPORTANT TABLE ,AS PER THE QUESTION, AS THE BASE AND THEN JOIN ALL TABLES TO IT

Join for more than two tables

Query to get students along with their marks and attendance

1) Student - Student_id, name

2) Marks - Student_id, Subject, Marks

3) Attendance - Student_id, Attendance%

What should be the base table?

Join for more than two tables

Query to get customers along with their country and city name

	id	city_name	lat	long	country_id
1	1	Berlin	52.520008	13.404954	1
2	2	Belgrade	44.787197	20.457273	2
3	3	Zagreb	45.815399	15.966568	3
4	4	New York	40.730610	-73.935242	4
5	5	Los Angeles	34.052235	-118.243683	4
6	6	Warsaw	52.237049	21.017532	5

	id	customer_name	city_id	customer_address	next_call_date	ts_inserted
1	1	Jewelry Store	4	Long Street 120	2020-01-21	2020-01-09 14:01:20.000
2	2	Bakery	1	Kurfürstendamm 25	2020-02-21	2020-01-09 17:52:15.000
3	3	Café	1	Tauentzienstraße 44	2020-01-21	2020-01-10 08:02:49.000
4	4	Restaurant	3	Ulica lipa 15	2020-01-21	2020-01-10 09:20:21.000

	id	country_name	country_name_eng	country_code
1	1	Deutschland	Germany	DEU
2	2	Srbija	Serbia	SRB
3	3	Hrvatska	Croatia	HRV
4	4	United States of America	United States of America	USA
5	5	Polska	Poland	POL
6	6	España	Spain	ESP
7	7	Rossiya	Russia	RUS

```
SELECT
customer.customer_name,
country.country_name_eng,
city.city_name
FROM customer
INNER JOIN city ON
customer.city_id = city.id
INNER JOIN country ON
country.id =
city.country_id
```

Practice Question - 1

https://www.hackerrank.com/challenges/african-cities/problem?isFullScreen=true

QUESTION

Given the CITY and COUNTRY tables, query the names of all cities where the CONTINENT is 'Africa'.

Note: CITY.CountryCode and COUNTRY.Code are matching key columns.

SOLUTION

```
select distinct a.name
from
city as a
inner join
country as b
on a.countrycode = b.code
where b.continent = 'Africa'
```

Practice Question - 2

https://www.hackerrank.com/challenges/average-population-of-each-continent/problem?isFullScreen=true

QUESTION

Given the CITY and COUNTRY tables, query the names of all the continents

(COUNTRY.Continent) and their respective average city populations

(CITY.Population) rounded down to the nearest integer.

Note: CITY.CountryCode and COUNTRY.Code are matching key columns.

SOLUTION

```
SELECT COUNTRY.Continent, FLOOR(AVG(CITY.Population)) AS avg_population
FROM city
INNER JOIN country
ON city.countrycode = country.code
GROUP BY COUNTRY.Continent
```

Practice Question - 3

https://leetcode.com/problems/combine-two-tables/submissions/

QUESTION

Write an SQL query to report the first name, last name, city, and state of each person in the `Person` table. If the address of a `personId` is not present in the `Address` table, report `null` instead.

Return the result table in any order.

SOLUTION

```
SELECT FirstName, LastName, City, State
FROM Person
LEFT JOIN address
ON Person.PersonId =Address.PersonId
```

Practice Question - 4

https://platform.stratascratch.com/coding/10061-popularity-of-hack?python=

QUESTION

find the average popularity of the Hack per office location.
Output the location along with the average popularity.

SOLUTION

```
SELECT location, AVG(popularity)
FROM facebook_employees a
JOIN facebook_hack_survey b
ON a.id = b.employee_id
 GROUP BY location
```

Practice Question - 5

https://platform.stratascratch.com/coding/9913-order-details?code_type=1

QUESTION

Find order details made by Jill and Eva.
Consider the Jill and Eva as first names of customers.
Output the order date, details and cost along with the first name.
Order records based on the customer id in ascending order.

SOLUTION

```
SELECT first_name, order_date, order_details, total_order_cost
FROM customers
JOIN orders
ON customers.id = orders.cust_id
WHERE first_name IN ('Jill', 'Eva')
ORDER BY cust_id
```

Thanks for attending

DataBhau communication platforms:

- **Whatsapp :** https://chat.whatsapp.com/BaP2CAajm9597J8LwzYE3j
- **Linkedin Handle:** https://www.linkedin.com/company/databhau/
- **Instructors Linkedin Handles:**
  - Shrey Jain : https://www.linkedin.com/in/shrey-jain-74a90b13b/
  - Harsh Katyayan : https://www.linkedin.com/in/harsh-katyayan-a2248316b/