SQL

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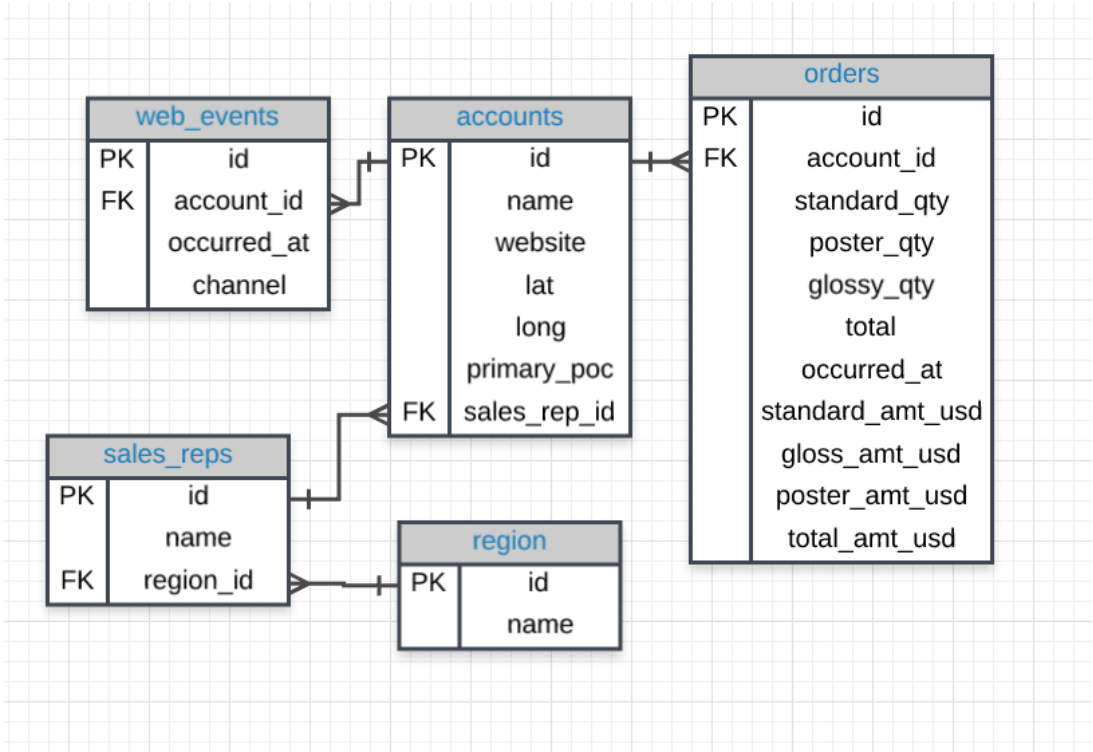
Entity Relationship Diagrams



Entity Relationship Diagrams

An **entity-relationship diagram** (ERD) is a common way to view data in a database.
Below is the ERD for the database we will use from Parch & Posey.
These diagrams help you visualize the data you are analyzing including:

1. The names of the tables.
2. The columns in each table.
3. The way the tables work together.

Select

The SELECT statement is used to select data from a database.

Example :

```
SELECT column1, column2, ...
FROM table_name;
```

Where

The WHERE clause is used to filter records.
It is used to extract only those records that fulfill a specified condition.

Example :

```
SELECT column1, column2, ...
FROM table_name
WHERE condition;
```

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AND, OR and NOT Operators

- The AND operator displays a record if all the conditions separated by AND are TRUE.
- The OR operator displays a record if any of the conditions separated by OR is TRUE.
- The NOT operator displays a record if the condition(s) is NOT TRUE.

Example AND:

```
SELECT column1, column2, ...
FROM table_name
WHERE condition1 AND condition2 AND
condition3 ...;
-----------------------------------
SELECT * FROM Customers
WHERE Country='Germany' AND City='
Berlin';
```

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Example OR :

```
SELECT column1, column2, ...
FROM table_name
WHERE condition1 OR condition2 OR
condition3 ...;
```

```
SELECT * FROM Customers
WHERE City='Berlin' OR City='Münch
en';
```

Example NOT :

```
SELECT column1, column2, ...
FROM table_name
WHERE NOT condition;
```

```
SELECT * FROM Customers
WHERE NOT Country='Germany';
```

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Examples:

```
SELECT * FROM Customers
WHERE Country='Germany' AND (City=
'Berlin' OR City='München');
```

```
SELECT * FROM Customers
WHERE NOT Country='Germany’
AND Not Country='USA';
```

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ORDER BY :

The ORDER BY keyword is used to sort the result-set in ascending or descending order.
The ORDER BY keyword sorts the records in ascending order by default.
To sort the records in descending order, use the DESC keyword.

Example :

```
SELECT column1, column2, ...
FROM table_name
ORDER BY column1, column2,
... ASC|DESC;
```

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Examples:

```
SELECT * FROM Customers
ORDER BY Country DESC;
```

```
SELECT * FROM Customers
ORDER BY Country, CustomerName;
```

```
SELECT * FROM Customers
ORDER BY Country ASC,
CustomerName DESC;
```

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INSERT INTO :

The INSERT INTO statement is used to insert new records in a table.

Example :

```
INSERT INTO table_name (column1, column2, column3, ...)
VALUES (value1, value2, value3, ...);
```

```
INSERT INTO Customers (CustomerName, ContactName, Address,
City, PostalCode, Country)
VALUES ('Cardinal', 'Tom B. Erichsen', 'Skagen
21', 'Stavanger', '4006', 'Norway');
```

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How to Test for NULL Values?

It is not possible to test for NULL values with comparison operators, such as =, <, or <>.
We will have to use the IS NULL and IS NOT NULL operators instead.

```
SELECT column_names
FROM table_name
WHERE column_name IS NULL;
```

```
SELECT CustomerName, ContactName,
Address
FROM Customers
WHERE Address IS NULL;
```

```
SELECT column_names
FROM table_name
WHERE column_name IS NOT NULL;
```

```
SELECT CustomerName, ContactName,
Address
FROM Customers
WHERE Address IS NOT NULL;
```

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UPDATE :

The UPDATE statement is used to modify the existing records in a table.

Example :

```
UPDATE table_name
SET column1 = value1, column2 = value2, ...
WHERE condition;
```

```
UPDATE Customers
SET ContactName = 'Alfred Schmidt', City= 'Frankfurt'
WHERE CustomerID = 1;
```

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```sql
UPDATE Customers
SET ContactName='Juan';

UPDATE Customers
SET ContactName='Juan'
WHERE Country='Mexico';
```

DELETE:

The DELETE statement is used to delete existing records in a table.

Example :

```
DELETE FROM table_name WHERE condition;
```

```
DELETE FROM Customers WHERE CustomerName='Alfreds Futterkiste';
```

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SELECT TOP :

The SELECT TOP clause is used to specify the number of records to return.

Example :

```
SELECT column_name(s)
FROM table_name
WHERE condition
LIMIT number;
```

```
SELECT * FROM Customers
WHERE Country='Germany'
LIMIT 3;
```

```
SELECT * FROM Customers
LIMIT 3;
```

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MIN() and MAX() Functions :

The MIN() function returns the smallest value of the selected column.
The MAX() function returns the largest value of the selected column.

Example :

```
SELECT MIN(column_name)
FROM table_name
WHERE condition;
```

```
SELECT MAX(column_name)
FROM table_name
WHERE condition;
```

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```sql
SELECT MIN(Price) AS SmallestPrice
FROM Products;
```

```sql
SELECT MAX(Price) AS LargestPrice
FROM Products;
```

COUNT(), AVG() and SUM() Functions:

The COUNT() function returns the number of rows that matches a specified criterion.

Example :

```
SELECT COUNT(column_name)
FROM table_name
WHERE condition;
```

```
SELECT SUM(column_name)
FROM table_name
WHERE condition;
```

```
SELECT AVG(column_name)
FROM table_name
WHERE condition;
```

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LIKE Operator:

The LIKE operator is used in a WHERE clause to search for a specified pattern in a column.

Example :

```
SELECT column1, column2, ...
FROM table_name
WHERE columnN LIKE pattern;
```

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The following SQL statement selects all customers with a CustomerName starting with "a":

```
SELECT * FROM Customers
WHERE CustomerName LIKE 'a%';
```

The following SQL statement selects all customers with a CustomerName ending with "a":

```
SELECT * FROM Customers
WHERE CustomerName LIKE '%a';
```

The following SQL statement selects all customers with a CustomerName that have "or" in any position:

```
SELECT * FROM Customers
WHERE CustomerName LIKE '%or%';
```

IN Operator :

The IN operator allows you to specify multiple values in a WHERE clause.

Example :

```
SELECT column_name(s)
FROM table_name
WHERE column_name IN (value1, value2, ...);
```

```
SELECT * FROM Customers
WHERE Country IN ('Germany', 'France', 'UK');
```

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```sql
SELECT * FROM Customers
WHERE Country NOT IN ('Germany', 'France', 'UK');

SELECT * FROM Customers
WHERE Country IN (SELECT Country FROM Suppliers);
```

BETWEEN Operator:

The BETWEEN operator selects values within a given range. The values can be numbers, text, or dates.

Example :

```
SELECT column_name(s)
FROM table_name
WHERE column_name BETWEEN value1 AND value2;
```

```
SELECT * FROM Products
WHERE Price BETWEEN 10 AND 20;
```

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```sql
SELECT * FROM Products
WHERE Price NOT BETWEEN 10 AND 20;
```

```sql
SELECT * FROM Products
WHERE Price BETWEEN 10 AND 20
AND CategoryID NOT IN (1,2,3)
```

```sql
SELECT * FROM Products
WHERE ProductName BETWEEN 'Carnarvon
Tigers' AND 'Mozzarella di Giovanni'
ORDER BY ProductName;
```

```sql
SELECT * FROM Products
WHERE ProductName BETWEEN "Carnarvon Tigers" AND "Chef Anton's
Cajun Seasoning"
ORDER BY ProductName;
```

```sql
SELECT * FROM Products
WHERE ProductName NOT BETWEEN 'Carnarvon Tigers' AND 'Mozzarella
di Giovanni'
ORDER BY ProductName;
```

```sql
SELECT * FROM Orders
WHERE OrderDate BETWEEN '1996-07-01' AND '1996-07-31';
```

Joins :

A JOIN clause is used to combine rows from two or more tables, based on a related column between them.

Example :

```
SELECT Orders.OrderID, Customers.CustomerName, Orders.OrderDate
FROM Orders
INNER JOIN Customers ON Orders.CustomerID=Customers.CustomerID;
```

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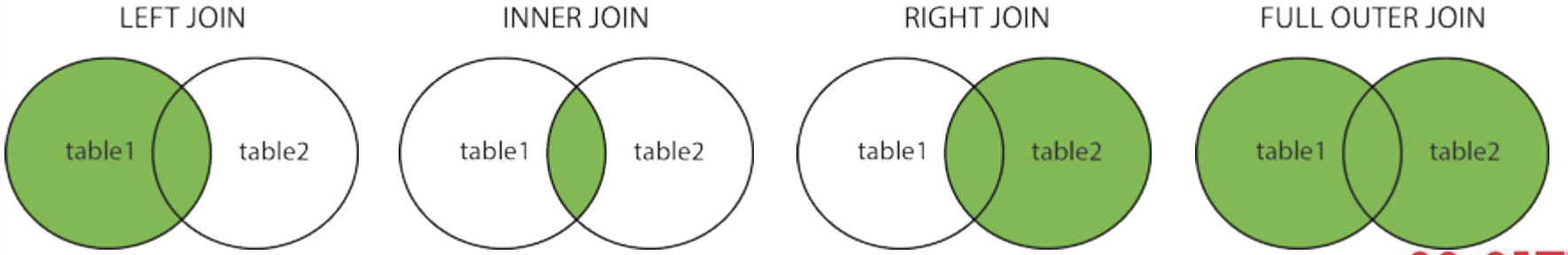
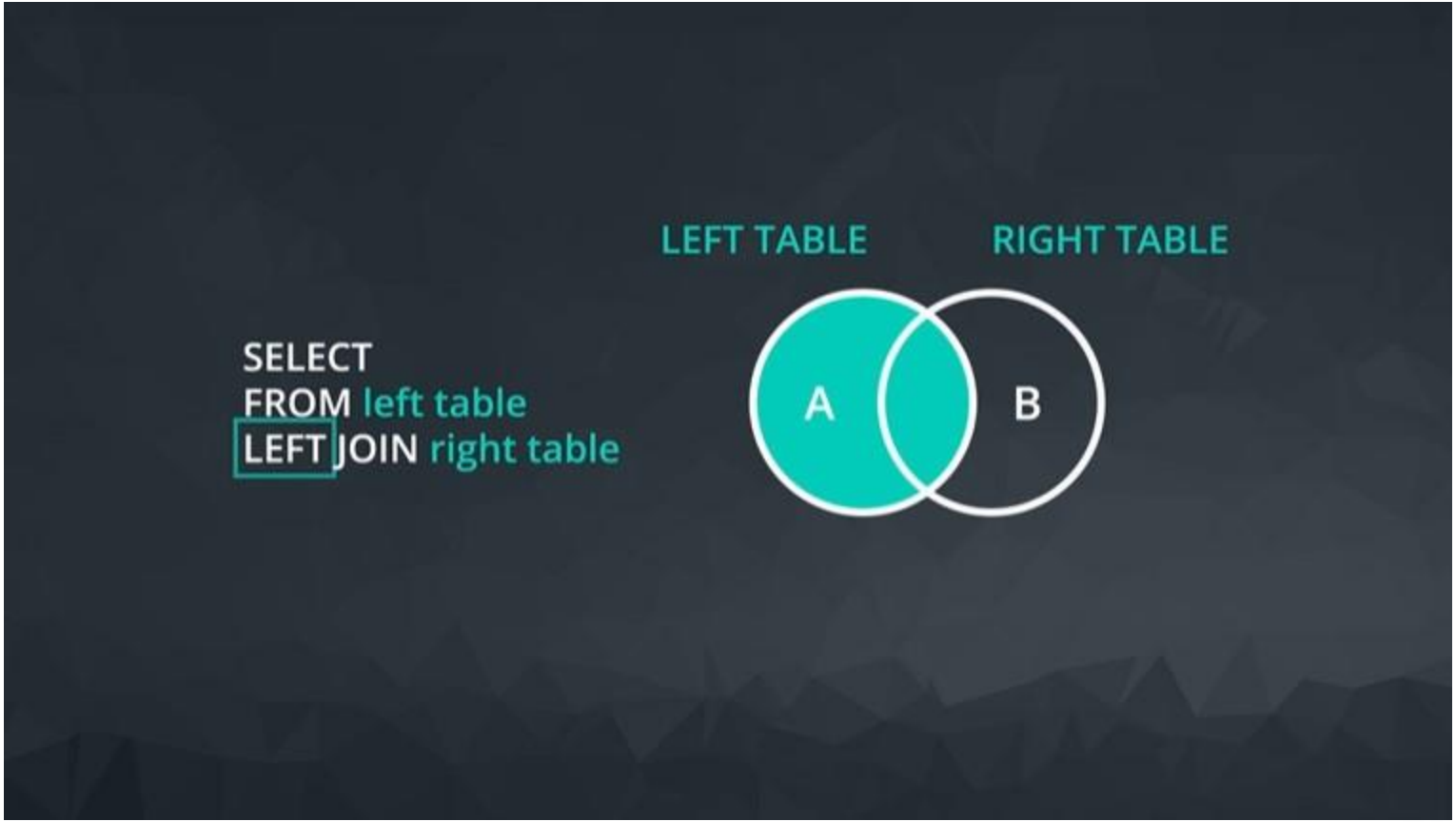
- (INNER) JOIN: Returns records that have matching values in both tables
- LEFT (OUTER) JOIN: Returns all records from the left table, and the matched records from the right table
- RIGHT (OUTER) JOIN: Returns all records from the right table, and the matched records from the left table
- FULL (OUTER) JOIN: Returns all records when there is a match in either left or right table




LEFT TABLE
RIGHT TABLE
SELECT
FROM left table
LEFT JOIN right table
A
B

ORDERS ACCOUNTS


```
SELECT a.id, a.name, o.total
FROM orders o
LEFT JOIN accounts a
ON o.account_id = a.id
```

ORDERS

id	account_id	total
1	1001	169
2	1001	288
17	1011	541
18	1021	539

ACCOUNTS

id	name
1001	Walmart
1011	Exxon Mobil
1021	Apple
1031	Berkshire Hathaway
1041	McKesson
1051	UnitedHealth Group
1061	CVS Health

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ORDERS ACCOUNTS


```
SELECT a.id, a.name, o.total
FROM orders o
RIGHT JOIN accounts a
ON o.account_id = a.id
```

ORDERS

id	account_id	total
1	1001	169
2	1001	288
17	1011	541
18	1021	539

ACCOUNTS

id	name
1001	Walmart
1011	Exxon Mobil
1021	Apple
1031	Berkshire Hathaway
1041	McKesson
1051	UnitedHealth Group
1061	CVS Health

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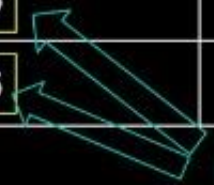
FROM Country

countryid	countryName
1	India
2	Nepal
3	United States
4	Canada
5	Sri Lanka
6	Brazil



Included In LEFT JOIN

LEFT JOIN State

stateid	countryid	stateName
1	1	Maharashtra
2	1	Punjab
3	2	Kathmandu
4	3	California
5	3	Texas
6	4	Alberta

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The resulting table will look like:

countryid	countryName	stateName
1	India	Maharashtra
1	India	Punjab
2	Nepal	Kathmandu
3	United States	California
3	United States	Texas
4	Canada	Alberta
5	Sri Lanka	NULL
6	Brazil	NULL

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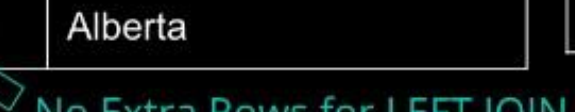
FROM State

stateid	countryid	stateName
1	1	Maharashtra
2	1	Punjab
3	2	Kathmandu
4	3	California
5	3	Texas
6	4	Alberta

LEFT JOIN Country

countryid	countryName
1	India
2	Nepal
3	United States
4	Canada
5	Sri Lanka
6	Brazil



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The resulting table will look like:

countryid	countryName	stateName
1	India	Maharashtra
1	India	Punjab
2	Nepal	Kathmandu
3	United States	California
3	United States	Texas
4	Canada	Alberta

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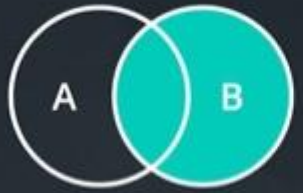
ORDERS ACCOUNTS




```
SELECT a.id, a.name, o.total
FROM orders o
RIGHT JOIN accounts a
ON o.account_id = a.id
```

NOT MATCHED →

RIGHT JOIN RESULT

id	account_id	total
1001	Walmart	169
1001	Walmart	288
1011	Exxon Mobil	541
1021	Apple	539
1031	Berkshire Hathaway	
1041	McKesson	
1051	UnitedHealth Group	
1061	CVS Health	

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ACCOUNTS

id	name
1001	Walmart
1011	Exxon Mobil
1021	Apple
1031	Berkshire Hathaway
1041	McKesson
1051	UnitedHealth Group
1061	CVS Health

```
SELECT a.id, a.name, o.total
FROM accounts a
LEFT JOIN orders o
ON o.account_id = a.id
```

ORDERS

id	account_id	total
1	1001	169
2	1001	288
17	1011	541
18	1021	539

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THESE GIVE THE SAME RESULTING TABLE

```
SELECT a.id, a.name, o.total
FROM orders o
RIGHT JOIN accounts a
ON o.account_id = a.id
```

```
SELECT a.id, a.name, o.total
FROM accounts a
LEFT JOIN orders o
ON o.account_id = a.id
```

RESULT

id	account_id	total
1001	Walmart	169
1001	Walmart	288
1011	Exxon Mobil	541
1021	Apple	539
1031	Berkshire Hathaway	
1041	McKesson	
1051	UnitedHealth Group	
1061	CVS Health	

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INNER JOIN

Country

countryid	countryName
1	India
2	Nepal
3	United States
4	Canada
5	Sri Lanka
6	Brazil

State

stateid	countryid	stateName
1	1	Maharashtra
2	1	Punjab
3	2	Kathmandu
4	3	California
5	3	Texas
6	4	Alberta

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LEFT JOIN :

The LEFT JOIN keyword returns all records from the left table (table1), and the matching records from the right table (table2). The result is 0 records from the right side, if there is no match.

Example :

```
SELECT column_name(s)
FROM table1
LEFT JOIN table2
ON table1.column_name = table2.column_name;
```

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```
SELECT a.id, a.name, o.total
FROM orders o
LEFT JOIN accounts a
ON o.account_id = a.id
```

```
SELECT c.countryid, c.countryName, s.stateName
FROM Country c
LEFT JOIN State s
ON c.countryid = s.countryid;
```

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```
SELECT orders.*, accounts.*
FROM orders
LEFT JOIN accounts
ON orders.account_id = accounts.id
WHERE accounts.sales_rep_id = 321500
```

INNER JOIN :

The INNER JOIN keyword selects records that have matching values in both tables.

Example :

```
SELECT column_name(s)
FROM table1
INNER JOIN table2
ON table1.column_name = table2.column_name;
```

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```
SELECT orders.* FROM orders JOIN accounts ON
orders.account_id = accounts.id;
```

```
SELECT accounts.name, orders.occurred_at FROM orders JOIN
accounts ON orders.account_id = accounts.id;
```

```
SELECT * FROM orders JOIN accounts ON orders.account_id =
accounts.id;
```

```
SELECT orders.* FROM orders JOIN accounts ON
orders.account_id = accounts.id;
```

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```sql
SELECT Orders.OrderID, Customers.CustomerName
FROM Orders
INNER JOIN Customers
ON Orders.CustomerID = Customers.CustomerID;
```

RIGHT JOIN:

The RIGHT JOIN keyword returns all records from the right table (table2), and the matching records from the left table (table1).
The result is 0 records from the left side, if there is no match.

Example :

```
SELECT column_name(s)
FROM table1
RIGHT JOIN table2
ON table1.column_name = table2.column_name;
```

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```
SELECT a.id, a.name, o.total
FROM orders o
JOIN accounts a
ON o.account_id = a.id
```

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```sql
SELECT Orders.OrderID, Employees.LastName, Employees.FirstName
FROM Orders
RIGHT JOIN Employees
ON Orders.EmployeeID = Employees.EmployeeID
ORDER BY Orders.OrderID;
```

OUTER JOIN:

The FULL OUTER JOIN keyword returns all records when there is a match in left (table1) or right (table2) table records.

Tip: FULL OUTER JOIN and FULL JOIN are the same.

Example :

```
SELECT Customers.CustomerName, Orders.OrderID
FROM Customers
FULL OUTER JOIN Orders
ON Customers.CustomerID=Orders.CustomerID
ORDER BY Customers.CustomerName;
```

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GROUP BY:

The GROUP BY statement groups rows that have the same values into summary rows, like "find the number of customers in each country".

Example :

```
SELECT column_name(s)
FROM table_name
WHERE condition
GROUP BY column_name(s)
ORDER BY column_name(s);
```

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```sql
SELECT COUNT(CustomerID), Country
FROM Customers
GROUP BY Country;
```

```sql
SELECT COUNT(CustomerID), Country
FROM Customers
GROUP BY Country
ORDER BY COUNT(CustomerID) DESC;
```

```sql
SELECT Shippers.ShipperName, COUNT(Orders.OrderID) AS NumberOfOrders
 FROM Orders
LEFT JOIN Shippers ON Orders.ShipperID = Shippers.ShipperID
GROUP BY ShipperName;
```

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HAVING Clause:

The HAVING clause was added to SQL because the WHERE keyword cannot be used with aggregate functions.

Example :

```
SELECT column_name(s)
FROM table_name
WHERE condition
GROUP BY column_name(s)
HAVING condition
ORDER BY column_name(s);
```

```
SELECT COUNT(CustomerID), Country
FROM Customers
GROUP BY Country
HAVING COUNT(CustomerID) > 5
ORDER BY COUNT(CustomerID) DESC;
```

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```
SELECT s.id, s.name, COUNT(*) num_accounts
FROM accounts a
JOIN sales_reps s
ON s.id = a.sales_rep_id
GROUP BY s.id, s.name
HAVING COUNT(*) > 5
ORDER BY num_accounts;
```

```
SELECT Employees.LastName, COUNT(Orders.OrderID) AS NumberOfOrders
FROM Orders
INNER JOIN Employees ON Orders.EmployeeID = Employees.EmployeeID
WHERE LastName = 'Davolio' OR LastName = 'Fuller'
GROUP BY LastName
HAVING COUNT(Orders.OrderID) > 25;
```

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Case:

```
SELECT CASE WHEN total >= 2000
THEN 'At Least 2000' WHEN total >= 1000 AND total < 2000
THEN 'Between 1000 and 2000' ELSE 'Less than 1000’
END AS order_category,
COUNT(*) AS order_count
FROM orders
GROUP BY 1;
```

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```
SELECT id, account_id, occurred_at, channel,
CASE WHEN channel = 'facebook' THEN 'yes’
END AS is_facebook FROM web_events
ORDER BY occurred_at
```

```
SELECT id, account_id, occurred_at, channel,
 CASE WHEN channel = 'facebook' THEN 'yes' ELSE 'no’
END AS is_facebook FROM web_events
ORDER BY occurred_at
```

```
SELECT id, account_id, occurred_at, channel,
CASE WHEN channel = 'facebook' OR channel = 'direct' THEN 'yes' ELSE 'no’
END AS is_facebook FROM web_events ORDER BY occurred_at
```

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```
SELECT account_id, occurred_at, total, CASE WHEN total > 500 THEN 'Over 500’
WHEN total > 300 THEN '301 - 500' WHEN total > 100
THEN '101 - 300' ELSE '100 or under’
 END AS total_group FROM orders
```

```
SELECT account_id, occurred_at, total, CASE WHEN total > 500 THEN 'Over 500’
WHEN total > 300 AND total <= 500 THEN '301 - 500’
WHEN total > 100 AND total <=300 THEN '101 - 300' ELSE '100 or under’
END AS total_group FROM orders
```

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```
SELECT a.name, SUM(total_amt_usd) total_spent,
CASE WHEN SUM(total_amt_usd) > 200000 THEN 'top’
WHEN SUM(total_amt_usd) > 100000
THEN 'middle' ELSE 'low' END AS customer_level
FROM orders o
JOIN accounts a
ON o.account_id = a.id
GROUP BY a.name
ORDER BY 2 DESC;
```

```
SELECT CASE WHEN total > 500 THEN 'OVer 500' ELSE '500 or under’
END AS total_group, COUNT(*) AS order_count FROM orders GROUP BY 1
```

```
SELECT a.name, SUM(total_amt_usd) total_spent,
CASE WHEN SUM(total_amt_usd) > 200000 THEN 'top'
 WHEN SUM(total_amt_usd) > 100000 THEN 'middle' ELSE 'low'
END AS customer_level
FROM orders o JOIN accounts a ON o.account_id = a.id
WHERE occurred_at > '2015-12-31'
GROUP BY 1
ORDER BY 2 DESC;
```

```
SELECT COUNT(1) AS orders_over_500_units
FROM orders WHERE total > 500
```

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comment:

```
--SELECT * FROM Customers;



/*SELECT * FROM Customers;
SELECT * FROM Products;
SELECT * FROM Orders;
SELECT * FROM Categories;*/
SELECT * FROM Suppliers;
```

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Save Query to CSV

1- Write your query
2-Run it from run all
3-Save Export to csv

Then you have a table csv file you can use it in EXCEL OR POWER BI

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THANK YOU!