

Write the difference for the following

Left Join vs Right Join

On clause Vs using clause

Natural Join vs Inner Join

Inner Join vs Left Join

1. Left Join vs. Right Join

Criteria	Left Join	Right Join
Definition	Returns all records from the left table and matched records from the right table. If no match, NULL values are returned for columns from the right table.	Returns all records from the right table and matched records from the left table. If no match, NULL values are returned for columns from the left table.
Order of Tables	Left table is prioritized; all its records appear in the result.	Right table is prioritized; all its records appear in the result.
Syntax	SELECT columns FROM table1 LEFT	SELECT columns FROM table1

	JOIN table2 ON condition;	RIGHT JOIN table2 ON condition;
Usage Example	Often used when you want to ensure all data from the first table is included.	Often used when you want to ensure all data from the second table is included.

2. ON Clause vs. USING Clause

Criteria	ON Clause	USING Clause
Definition	Specifies the condition for the join using any arbitrary condition, which can involve columns with different names.	Specifies the columns to join on when the columns have the same name in both tables.
Syntax	SELECT columns FROM table1 JOIN table2 ON table1.columnA = table2.columnB;	SELECT columns FROM table1 JOIN table2 USING (columnName);
Column Names	Allows joining on columns with different names or complex conditions.	Only allows joining on columns with the same

		name in both tables.
Result	Result set will have both columns used in the join, even if they have different names.	Result set will only show the joined column once if the names are the same.

3. Natural Join vs. Inner Join

Criteria	Natural Join	Inner Join
Definition	Automatically joins tables based on all columns with the same name and compatible data types in both tables.	Joins tables based on a specified condition provided using the ON or USING clause.
Columns Used	Only columns with the same names and compatible data types are considered.	Any column(s) can be used in the join condition.
Result	The resulting table has columns from both tables but excludes	The resulting table includes all columns from both tables,

	duplicate columns with the same name.	based on the condition.
Control	Less control over the join conditions, as it automatically matches columns.	Full control over which columns and conditions are used for the join.

4. Inner Join vs. Left Join

Criteria	Inner Join	Left Join
Definition	Returns only the rows that have matching values in both tables.	Returns all rows from the left table, and matched rows from the right table. If no match, NULL values for columns from the right table.
Result	Only matching rows from both tables are included in the result.	All rows from the left table are included, with NULLs for non-matching rows from the right table.
Use Case	When you only want to see the	When you need all records from the left

	rows where there is data in both tables.	table, regardless of whether they have a match in the right table.
NULL Handling	No NULLs in the result for unmatched rows.	NULLs appear for columns from the right table where no match is found.
Performance	Generally faster as it only retrieves matching rows.	May be slower due to retrieval of all rows from the left table and handling NULLs.

The screenshot shows the MySQL Workbench interface. The SQL Editor contains the following queries:

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168 SELECT * FROM A INNER JOIN B ON A.PK = B.PK;
169 SELECT * FROM A, B WHERE A.PK = B.PK;
170 SELECT * FROM A Natural Join B;
171 SELECT * FROM A Left Outer Join B ON A.PK = B.PK;
172 SELECT * FROM A Right Outer Join B ON A.PK = B.PK;
173 Select * from A Full Join B on A.PK = B.PK; -----(It is not work in MySQL)-----
174 (SELECT * FROM A Left Outer Join B ON A.PK = B.PK) Union (SELECT * FROM A Right Outer Join B ON A.PK = B.PK);
175 SELECT * FROM A CROSS JOIN B;
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```

The Results tab shows the output of the first query (Result 1):

#	PK	value4	PK	value
1	FOR	3	TOOT	
2	COF	2	CAR	
3	TAG	1	CAR	
4	WASHINGTON	4	HOPLAND	
5	ORL	7	PC	
6	ARIZONA	1	MICROSOFT	
7	LONDON	4	APPLE	
8	WOMT	10	SCOTCH	

The Action Output tab shows the execution details of the queries:

#	Time	Action	Message	Duration / Rows
1	15:07:31	SELECT * FROM A INNER JOIN B ON A.PK = B.PK (LIMIT 0, 1000)	Rows returned:	0:000 sec / 0:000 sec
2	15:07:31	SELECT * FROM A, B WHERE A.PK = B.PK (LIMIT 0, 1000)	Rows returned:	0:000 sec / 0:000 sec
3	15:07:31	SELECT * FROM A Natural Join B (LIMIT 0, 1000)	Rows returned:	0:000 sec / 0:000 sec
4	15:07:31	SELECT * FROM A Left Outer Join B ON A.PK = B.PK (LIMIT 0, 1000)	Rows returned:	0:000 sec / 0:000 sec

