INTRODUCTION TO SQL

FOR DATA SCIENTISTS

DAY-5

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SQL JOINs

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Purpose

SQL JOINs is used to combine the records from two or more tables based on some related common columns.

For example - We want to join Order table with product table to find out which order belongs to which product category.

Types of JOINs

Below are different types of JOINS based on the kind of output that we are expecting.

- Inner Join
- Full Outer or Full Join.
- Left Outer or Left Join.
- Right Outer or Right Join.
- Cross Join
- Self join

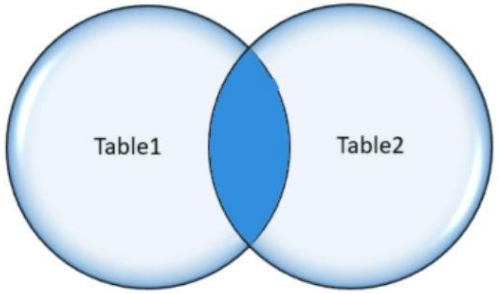
Inner Join

Purpose

The Inner Join is the most common join in SQL. It gives a new result set of combining columns from both tables based on the join condition. If the condition is met, it will return all the rows present in both the Left table and right table otherwise, it will returns zero records.

Syntax

```
SELECT table1.column1, table2.column2...
FROM table1
INNER JOIN table2
ON table1.common_field = table2.common_field;
```



It will return all the matching rows from Table1 and Table2. All the records which are present in Table1 but not in Table2 or All the records which are present in Table2 but not in Table1 will not be returned in the output.

Inner Join

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Example

Let's learn inner join using the below two sample tables

FactSales

ProductID	OrderDate	OrderQuantity	Sales
1	01-02-2022	45	3578.27
2	01-05-2022	33	3399.99
4	01-04-2022	41	699.09
5	01-01-2022	47	3578.27
7	01-01-2022	46	3374.99
8	01-02-2022	16	3399.99

DimProduct

ProcductID	ProductName	Size
1	Headset Ball Bearings	M
2	Adjustable Race	M
3	Down Tube	S
4	Chain Stays	L
5	Touring End Caps	M
6	LL Grip Tape	S

The below query will return all the products which have names in DimProduct table.

```
SELECT A.[ProductID], A.[OrderDate], A.[OrderQuantity], A.[Sales], B.[ProdcutName], B.[Size]
FROM  [SuperStore].[dbo].[FactSales] A
INNER JOIN  [SuperStore].[dbo].[DimProducts] B
ON A.ProductID = B.ProductID
```

ProductID	OrderDate	OrderQuantity	Sales	ProductName	Size
1	01-02-2022	45	3578.27	Headset Ball Bearings	M
2	01-05-2022	33	3399.99	Adjustable Race	M
4	01-04-2022	41	699.09	Chain Stays	L
5	01-01-2022	47	3578.27	Touring End Caps	M

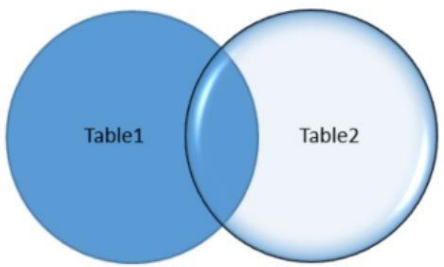
Left Join

Purpose

The Left Join returns all the records from left table even if there are no matches in the right table.

Syntax

```
SELECT table1.column1, table2.column2...
FROM table1
LEFT JOIN table2
ON table1.common_field = table2.common_field;
```



It will return all the rows from Table1, plus matching records from both tables or NULL in case of not matching records

Left Join

Example

Let's learn left join using the below two sample tables

FactSales

ProductID	OrderDate	OrderQuantity	Sales
1	01-02-2022	45	3578.27
2	01-05-2022	33	3399.99
4	01-04-2022	41	699.09
5	01-01-2022	47	3578.27
7	01-01-2022	46	3374.99
8	01-02-2022	16	3399.99

DimProduct

ProcductID	ProductName	Size
1	Headset Ball Bearings	M
2	Adjustable Race	M
3	Down Tube	S
4	Chain Stays	L
5	Touring End Caps	M
6	LL Grip Tape	S

The below query will return all the products/records from FactSales table even if they are not present in DimProduct table.

```
SELECT A.[ProductID], A.[OrderDate], A.[OrderQuantity], A.[Sales], B.[ProdcutName], B.[Size]
FROM [SuperStore].[dbo].[FactSales] A
LEFT JOIN [SuperStore].[dbo].[DimProducts] B
ON A.ProductID = B.ProductID
```

ProductID	OrderDate	OrderQuantity	Sales	ProductName	Size
1	01-02-2022	45	3578.27	Headset Ball Bearings	M
2	01-05-2022	33	3399.99	Adjustable Race	M
4	01-04-2022	41	699.09	Chain Stays	L
5	01-01-2022	47	3578.27	Touring End Caps	M
7	01-01-2022	46	3374.99	NULL	NULL
8	01-02-2022	16	3399.99	NULL	NULL

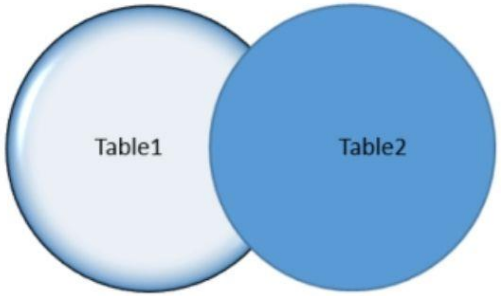
Right Join

Purpose

The Right Join returns all the records from right table even if there are no matches in the left table.

Syntax

```
SELECT table1.column1, table2.column2...
FROM table1
RIGHT JOIN table2
ON table1.common_field = table2.common_field;
```



It will return all the rows from Table2, plus matching records from both tables or NULL in case of not matching records

Right Join

Example

Let's learn right join using the below two sample tables

FactSales

ProductID	OrderDate	OrderQuantity	Sales
1	01-02-2022	45	3578.27
2	01-05-2022	33	3399.99
4	01-04-2022	41	699.09
5	01-01-2022	47	3578.27
7	01-01-2022	46	3374.99
8	01-02-2022	16	3399.99

DimProduct

ProcductID	ProductName	Size
1	Headset Ball Bearings	M
2	Adjustable Race	M
3	Down Tube	S
4	Chain Stays	L
5	Touring End Caps	M
6	LL Grip Tape	S

The below query will return all the products/records from DimProduct table even if they are not present in FactSales table.

```
SELECT B.[ProductID],B.[ProdcutName], B.[Size], A.[OrderDate], A.[OrderQuantity], A.[Sales]
FROM [SuperStore].[dbo].[FactSales] A
RIGHT JOIN [SuperStore].[dbo].[DimProducts] B
ON A.ProductID = B.ProductID
```

ProcductID	ProductName	Size	OrderDate	OrderQuantity	Sales
1	Headset Ball Bearings	M	01-02-2022	45	3578.27
2	Adjustable Race	M	01-05-2022	33	3399.99
3	Down Tube	S	NULL	NULL	NULL
4	Chain Stays	L	01-04-2022	41	699.09
5	Touring End Caps	M	01-01-2022	47	3578.27
6	LL Grip Tape	S	NULL	NULL	NULL

Question

Let's use the below two tables for the question

DimProduct

ProcductID	ProductName	Size
1	Headset Ball Bearings	M
2	Adjustable Race	M
3	Down Tube	S
4	Chain Stays	L

FactSales

ProductID	OrderDate	OrderQuantity	Sales
1	01-02-2022	45	3578.27
2	01-05-2022	33	3399.99
4	01-04-2022	41	699.09
4	01-01-2022	47	3578.27

Since we have studied INNER JOIN, Can you tell me what would be the output of below query?

```
SELECT A.[ProductID],
        B.[Sales]
FROM
       [SuperStore].[dbo].[DimProducts] A
INNER JOIN
       [SuperStore].[dbo].[FactSales] B
ON A.ProductID = B.ProductID
```