

# Data Science



# Grouping

# Group BY

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- Used to group rows that have the same values.
- It summarizes data from the database.
- The GROUP BY clause returns one row for each group.

# Group BY

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- Can be used with -
  - Sum
  - Count
  - Min
  - Max
  - Avg

# Grouping with multiple columns

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- Syntax -
  - *SELECT \* FROM table GROUP BY col1, col2*
- This will display the total records in each group and sub group.

Having

# Having

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- WHERE keyword can not be used with group functions.
- We have to use HAVING clause in SELECT statement to specify filter conditions for grouped results.
- If the GROUP BY clause is omitted, the HAVING clause behaves like the WHERE clause.

# Order By

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- used to sort the result-set in ascending or descending order.
- Sorts the records in ascending order by default.
- To sort the records in descending order, use DESC keyword.



In and not In

- The IN operator is a shorthand for multiple OR conditions.
- The IN operator allows you to determine if a specified value matches any value from a list or from a subquery.

- Syntax -

```
SELECT column1,column2,...FROM table_name  
WHERE (expr|column_1) IN ('value1','value2',...);
```

- The values in the list must be separated by a comma (,).

# Not IN

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- You can combine the IN operator with the NOT operator to determine if a value does not match any value in a list or a subquery.

Between

- We can use BETWEEN clause to replace a combination of "greater than equal AND less than equal" conditions.
- Syntax -
  - `SELECT column_name(s) FROM table_name WHERE column_name BETWEEN value1 AND value2;`
- It will return the records where *expression* is within the range of *value1* and *value2* (inclusive).
- Values can be numbers, text or dates.

# Between

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- Can be used with different commands
  - Select
  - Update
  - Delete
  - IN

# Not Between

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- It will return all rows where value does not lie in the given range.

Like



- The LIKE operator is used in a WHERE clause to search for a specified pattern in a column.
- There are two wildcards used in conjunction with the LIKE operator:
  - % : The percent sign represents zero, one, or multiple characters
  - \_ : The underscore represents a single character
- Syntax -
  - *SELECT column1, column2, ...FROM table\_name WHERE column LIKE pattern;*

# Examples



Statements	Description
LIKE 'S%'	It finds any value which starts with 'S'.
LIKE '%S%'	It finds any value which have 'S' in any position.
LIKE '_SS%'	It finds any value which have 'SS' in the second and third positions.
LIKE 'S_%_ %'	It finds any value which starts with 'S' and have at least three characters in length.
LIKE '%S'	It finds any value which ends with 'S'.
LIKE '_S%P'	It finds any value which have 'S' in the second position and ends with 'P'.
LIKE 'S___P'	It finds any value in a five digit numbers which start with 'S' and ends with 'P'.

# Escape Characters

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- Let's say you wanted to search for a % or a \_ character in the MySQL LIKE condition. You can do this using an Escape character.
  - *SELECT \* FROM table\_name WHERE column\_name LIKE 'G\%';*
- We can override the default escape character in MySQL by providing the ESCAPE modifier as follows:
  - *SELECT \* FROM table\_name WHERE column\_name LIKE 'G!%' ESCAPE '!';*

# Joins

- With join, we can query data from two (or multiple) tables based on a related column which is present in both the tables.
- While performing a join, we need to specify the shared column and the condition on which we want to join tables
- You can use JOINS in the SELECT, UPDATE and DELETE statements to join multiple tables.

# Types of Joins

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- Inner Join or Simple Join
- Left Outer Join or Left Join
- Right outer join or Right Join
- Full outer join or Full Join

# Example Database

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- ClassDetails -
  - It stores which class is assigned to which teacher like class id and teacher id
- TeacherDetails -
  - It stores the details of each teacher like ID of teacher, teacher's name and the subject id which is taught by the teacher
- SubjectDetails -
  - This table stores the details of each subject like subject id, name of subject and total number of students which are admitted in individual subject.

# Types of Joins

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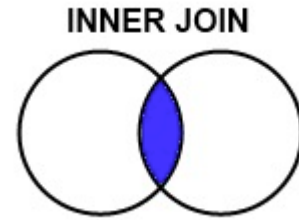


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# Inner Join

- This will only return rows when there is at least one row in both tables that match the specified join condition.
- Syntax -
  - *SELECT table1.col1, table2.col2, ....*  
*FROM table\_name1*  
*INNER JOIN table\_name2*  
*ON*  
*table1.column\_name = table2.column\_name;*



# Inner Join

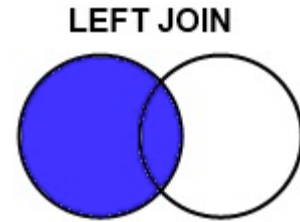
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- Syntax -  
*( SELECT table\_1.col1, table\_2.col2, ....  
FROM table\_1  
INNER JOIN table\_2  
ON  
table\_1.column\_name = table\_2.column\_name )  
INNER JOIN table\_3  
ON  
table\_2.column\_name = table\_3.column\_name*

# Left Outer Join

# Left Outer Join (Left Join)

- It returns all rows from the left table specified and only those rows from the other table where the join condition is matched.
- Syntax -
  - *SELECT table\_1.col1, table\_2.col2, ....*  
*FROM table\_1*  
*LEFT JOIN table\_2*  
*ON*  
*table\_1.column\_name = table\_2.column\_name;*



# Right Outer Join (Right Join)



- It returns all rows from the right table specified and only those rows from the left table where the join condition is matched.
- Syntax -
  - *SELECT table\_1.col1, table\_2.col2, ....*  
*FROM table\_1*  
*RIGHT JOIN table\_2*  
*ON*  
*table\_1.column\_name = table\_2.column\_name;*

