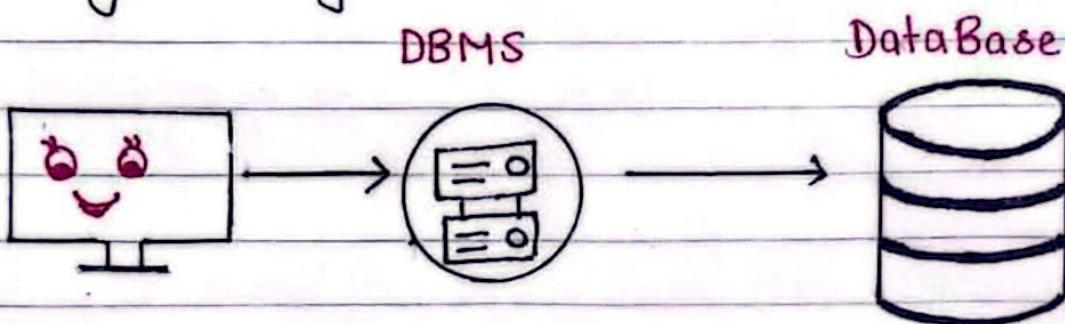


SQL Introduction

DataBase :- It is an organized collection of data so that it can be easily accessed.

To manage these databases, DBMS (DataBase Management System) are used.



Types of DBMS :-

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- Relational DBMS
- Non-Relational DBMS

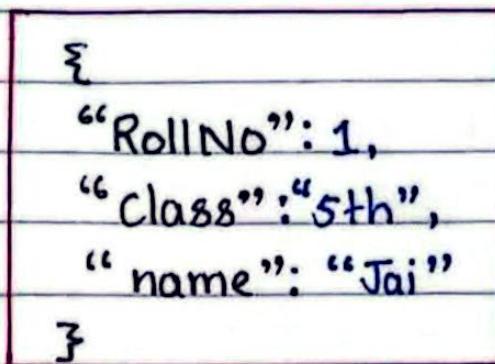
Relational DBMS :- In this DBMS, data stored in table Format.

ROLLNO	Name	Class
1	Jai	5th
2	Amar	7th
3	Anuj	5th
4	Ram	8th

(Relational DBMS)

For Example :- MySQL, Oracle.

Non-Relational DBMS :- In this DBMS data is stored in key-value pairs.

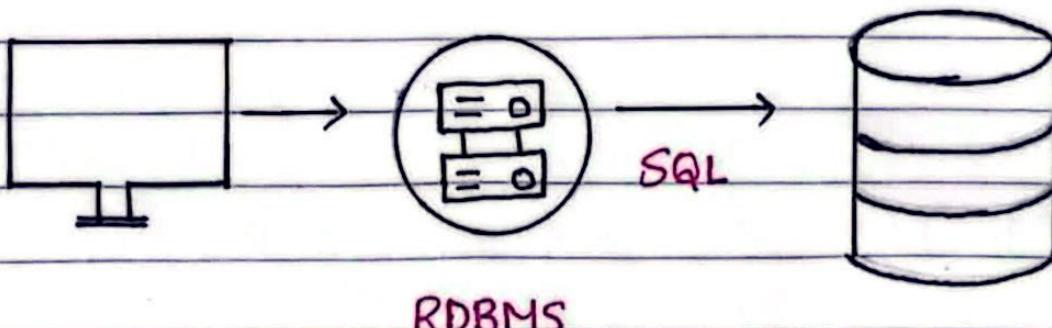


(Non-Relational DBMS)

For Example :- MongoDB, Redis

SQL :- It stand for Structured Query language.

SQL is used for update, delete, insert data in table or Relational DataBase.



Relational
DataBase

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SQL CREATE Command :-

It is used for creating Tables.

Syntax :-

```
CREATE TABLE tableName (  
    column1 datatype,  
    column2 datatype,  
    ...  
)
```

SQL Keywords are **case-insensitive**.

In MySQL, case-insensitive is an option you can turn on and off.

For Example :-

```
CREATE TABLE user (  
    FirstName varchar,  
    LastName varchar,  
    Email_id varchar,  
    password varchar  
)
```

FirstName LastName Email_id password

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SQL INSERT INTO Command :-

It is used to insert ^{data} into tables.

Syntax:-

```
INSERT INTO tableName (column1,  
                      column2 .... )  
VALUES (value1,value2 ... );
```

- A row of database table is known as record or a tuple.
- A column of database table is known as an attribute.

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For Example :-

```
INSERT INTO USER (FirstName,  
                  LastName, Email-id, Password)  
VALUES (Jai, Sharma, abc@gmail.com,  
        abc#123);
```

FirstName	LastName	Email-id	Password
Jai	Sharma	abc@gmail.com	abc#123

How to Insert Multiple Record (row, tuple):-

```
VALUES (Jai, Sharma, abc@gmail.com, 123),  
       (Jaya, Sharma, xyz@gmail.com, abc);
```

SQL SELECT Command :-

It is used to retrieves data from the table.

Syntax :-

```
SELECT Column1, Column2  
From tableName;
```

- To Select complete table, use * (Star)

```
SELECT *
```

```
From tableName;
```

Example :-

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	FirstName	LastName	Password
	Jai	Kumar	123
	Jaya	Singh	abc
	Amit	Sharma	xyz

Table :- USER

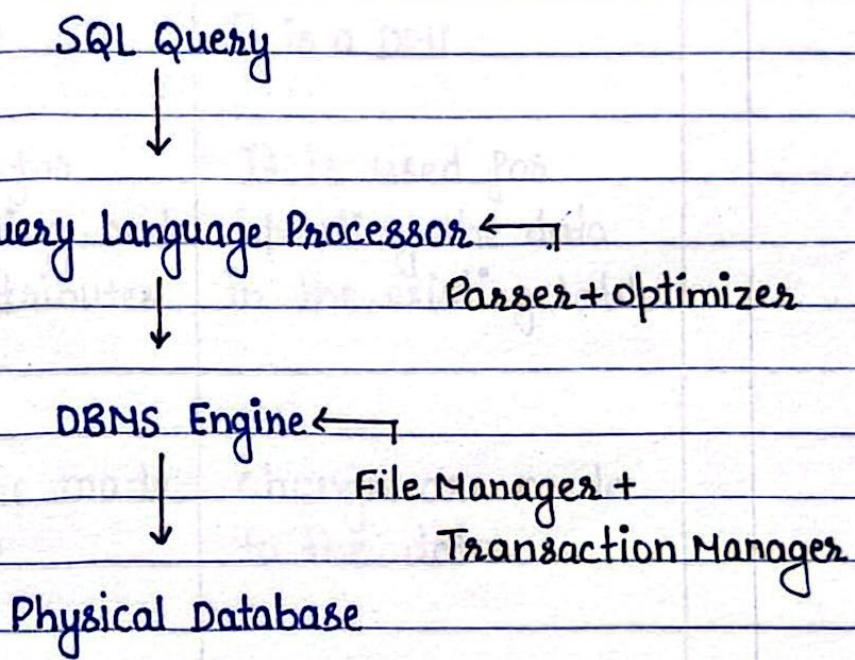
Command :-

```
SELECT FirstName  
From USER;
```

Output :-

FirstName
Jai
Jaya
Amit

How Does SQL WORK



Parsing :- In this process, Query statement is tokenized.

Optimising :- It optimize the best algorithm for the byte code.

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FROM :- It is used to specify the tables from which data fetched.

WHERE :- It is used to filter records based on the given condition.

JOIN :- It is used to combine data from tables based on a common field.

GROUP BY :- It is used to group records based on our requirement.

HAVING :- It is used to filter groups.

ORDER BY :- It is used to sort the data in ascending or descending order.

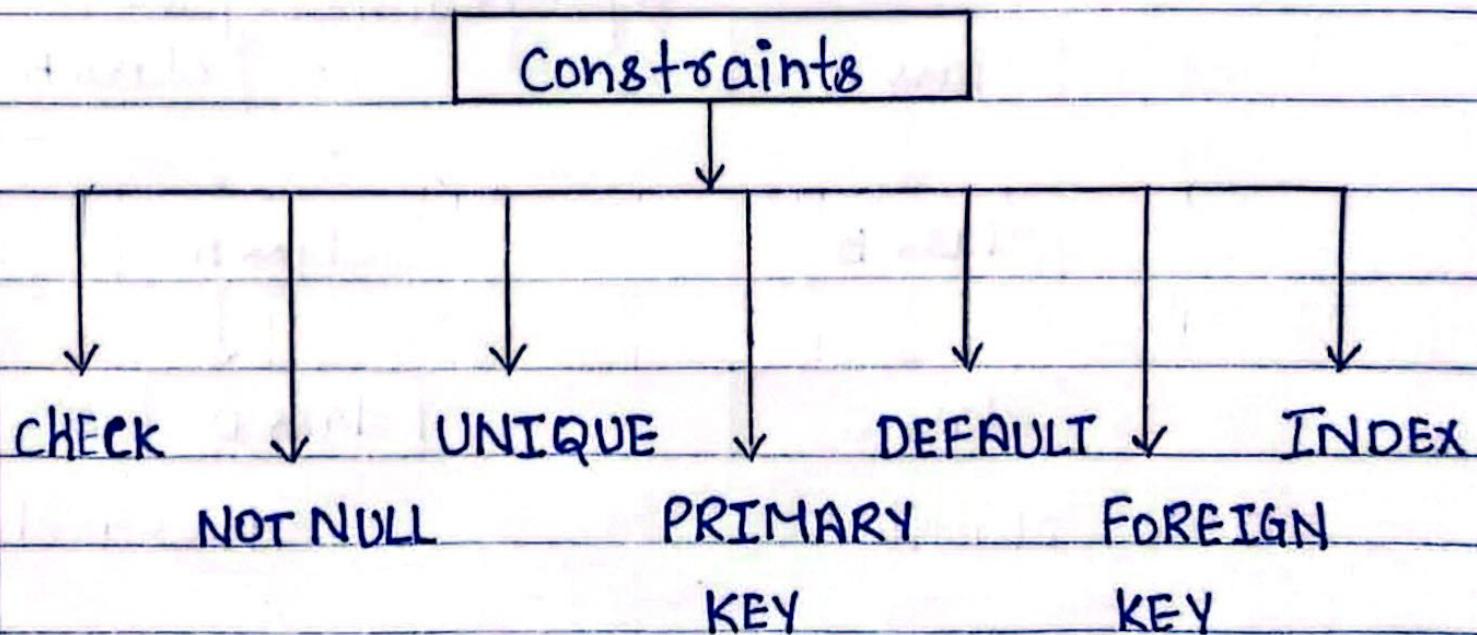
SELECT :- It is used to retrieves data from the table.

LIMIT :- It is used to specify how many rows are returned.

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SQL

Constraints



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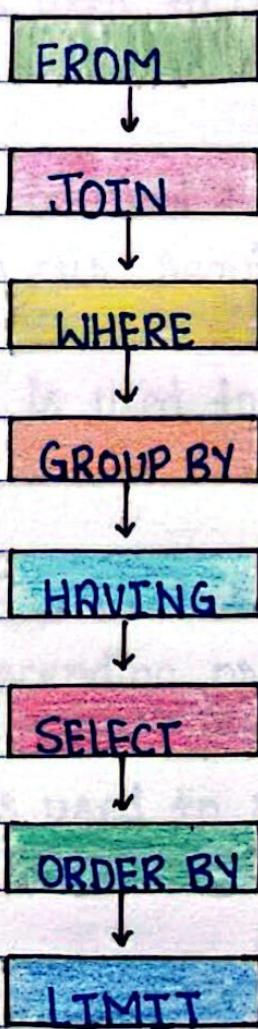
These constraints also known as Integrity constraints.

- SQL Constraints:- Constraints are the rules and restrictions applied on the data in a table.
- NOT NULL:- Value cannot be Null in a column.
- UNIQUE:- Value cannot be same in a column.
- PRIMARY KEY:- Used to uniquely identify a row.
- FOREIGN KEY:- References a row in another table.
- CHECK:- Satisfies a specific condition
- DEFAULT:- Set default value
- CREATE INDEX:- Used to speedup the read process.

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SQL Query Execution

Order →



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Difference Between ALTER And UPDATE

ALTER	UPDATE
It is a DDL.	It is a DML.
It is used for adding, deleting, and modifying attributes of the table.	It is used for updating the data in the existing table.
Changes are made to the table structure.	Changes are made to the data.
By default, all the values in the tuple are initialized as null if the ALTER command is used.	It sets the specified value to the tuple if Update Command is used.

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SQL SELECT DISTINCT :-

It is used to return only unique values from a specified column in a table.

Syntax :-

```
SELECT DISTINCT column-name  
FROM table-name;
```

Example :-

	FirstName	LastName	Password
	Jai	Kumar	123
	Jaya	Singh	123
	Amit	Sharma	xyz

Table :- USER

Command :-

```
SELECT Distinct Password  
FROM USER;
```

Output:-

Password
123
xyz

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SQL WHERE CLAUSE :-

It is used to filter rows in a table based on a specified condition.

Syntax :-

```
SELECT column-name  
FROM table-name  
WHERE condition;
```

Example :-

FirstName	LastName	Age
Jai	Kumar	19
Jaya	Singh	20
Amit	Sharma	21

Table :- USER

Command :-

```
SELECT FirstName, LastName  
FROM USER  
WHERE Age > 20;
```

Output :-

FirstName	LastName
Amit	Sharma

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SQL AND :-

The AND operator returns true if both conditions are true, and false otherwise.

Syntax :- WHERE condition1 AND condition2;

SQL OR :-

It returns true if either condition is true, and false if both conditions are false.

Syntax :- WHERE condition1 OR condition2;

SQL NOT :-

It returns the opposite of a condition.

Syntax :- WHERE NOT condition;

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AND, OR, NOT operators are used to combine conditions in a where clause to create more complex filtering conditions.

SQL ORDER BY :-

It is used to sort the result of a query in ascending or descending order.

Syntax :-

```
SELECT column1, column2, ...
FROM table-name
ORDER By column1 [ASC][DESC], column2
[ASC][DESC], ...
```

ASC :- It is used to sort the result in ascending order

DESC :- It is used to sort the result in descending order.

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Example :-

FirstName	LastName	Age
Jai	Kumar	49
Jaya	Singh	20
Amit	Sharma	21

Table :- user

Command :-

```
SELECT * FROM user
ORDER BY Age;
```

Output :-

FirstName	LastName	Age
Jaya	Singh	20
Amit	Sharma	21
Jai	Kumar	49

INSERT INTO :-

It is used to insert data into a table.

Syntax:-

Insert into tablename (column1, column2,..)
values (value1, value2,..);

Note:- There must be the same number of values
as the same number of columns specified.

Example:-

	FirstName	LastName	Age
	Jai	Kumar	10
	Jaya	Singh	15
	Amit	Sharma	20

Table:- user

Command:-

Insert into user (FirstName, LastName, Age)
values (abc, xyz, 25);

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Output:-

	FirstName	LastName	Age
	Jai	Kumar	10
	Jaya	Singh	15
	Amit	Sharma	20
	abc	xyz	25

SQL NULL Values :-

It is used to represent missing or unknown data.

Note:- Null is different from zero or empty string.

Insert Null value :-

```
INSERT INTO tablename(column1,column2,...)  
VALUES (value1,NULL,..);
```

To Check for Null values :-

```
IS NULL :-  
SELECT column1,column2,...  
From table-name  
WHERE column2 IS NULL;
```

IS NOT NULL :-

```
SELECT column1,column2 , .. .  
FROM table-name  
WHERE column1 IS NOT NULL;
```

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SQL UPDATE :-

It is used to modify existing data in table.

Syntax :-

```
UPDATE table-name
SET column1 = Value1, column2 = Value2, ...
WHERE some-column = Some-value;
```

SET :- It is used to specify the column and values to update.

Example :-

FirstName	LastName	Age
Jai	Kumar	10
Jaya	Singh	15
Amit	Sharma	20

Table:- Users

Command :-

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UPDATE USERS

SET age = age+1;

Output :-

FirstName	LastName	Age
Jai	Kumar	11
Jaya	Singh	16
Amit	Sharma	21

SQL DELETE :-

It is used to remove existing record from a table in a SQL Database.

Syntax:-

DELETE FROM tablename WHERE condition;

Note:- This operation is not reversible, So be careful when using DELETE statements!

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SQL Wildcards :-

Wildcards are special characters used in SQL 'LIKE' operator to search for a specific pattern in a column of a table.

- The percent sign (%) represents zero, one or multiple characters.
- The underscore sign (-) represents one, single character.

SQL LIKE :-

It is used to search for a specific pattern in a column of a table.

Syntax :-

```
SELECT column1, column2, ...
FROM table-name
WHERE column-name LIKE pattern;
```

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