**SQL stands** for the Structured Query Language. It is the standard language used to maintain the relational database and perform many different data manipulation operations on the dat

Usage

* To execute queries against a database
* To retrieve data from a database
* To inserts records in a database
* To updates records in a database
* To delete records from a database
* To create new databases
* To create new tables in a database
* To create views in a database
* To perform complex operations on the database

Does SQL support programming language features?

No

### What are the subsets of SQL?

* **Data definition language (DDL):** It defines the data structure that consists of commands like CREATE, ALTER, DROP, etc.
* **Data manipulation language (DML):** It is used to manipulate existing data in the database. The commands in this category are SELECT, UPDATE, INSERT, etc.
* **Data control language (DCL):** It controls access to the data stored in the database. The commands in this category include GRANT and REVOKE.
* **Transaction Control Language (TCL):** It is used to deal with the transaction operations in the database. The commands in this category are COMMIT, ROLLBACK, SET TRANSACTION, SAVEPOINT, etc

**Tables** are the fundamental level to store data in a relational database management system. It contains a header row at the top of the table which gives the list of column names, followed by rows that contain data.

**Fields** are basically columns in a table with specific information about the data.

## **Records and Fields in SQL**

Tables contain rows and columns, where the rows are known as records and the columns are known as fields.

### ****Records in SQL****

A record is basically an individual entry that exists in a table.

### What is a primary key?

A primary key is a field or the combination of fields that uniquely identify each record in the table. If the column contains a primary key, it cannot be null or empty. A table can have duplicate columns, but it cannot have more than one primary key. It always stores unique values into a column.

### What is a foreign key?

The foreign key is used to link one or more tables together. It is also known as the referencing key. A foreign key is related to the primary key of another table. It means a foreign key field in one table refers to the primary key field of the other table. It identifies each row of another table uniquely that maintains the referential integrity. The primary key-foreign key relationship is a very crucial relationship as it maintains the ACID properties of the database sometimes. It also prevents actions that would destroy links between the child and parent tables.

### What is a unique key?

A unique key is a single or combination of fields that ensure all values stores in the column will be unique. It means a column cannot stores duplicate values. This key provides uniqueness for the column or set of columns. **For example,**

|  |  |
| --- | --- |
| **Primary Key** | **Unique Key** |
| The primary key act as a unique identifier for each record in the table. | The unique key is also a unique identifier for records when the primary key is not present in the table. |
| We cannot store NULL values in the primary key column. | We can store NULL value in the unique key column, but only one NULL is allowed. |
| We cannot change or delete the primary key column values. | We can modify the unique key column values. |

The DBMS **manages incoming data, organizes it, and provides ways for the data to be modified or extracted by users or other programs**. Some DBMS examples include MySQL, PostgreSQL, Microsoft Access, SQL Server,

## **What is Data?**

## Data is a collection of information.

## **What is Database?**

A **database** is an organized collection of data, so that it can be easily accessed and managed.

What are the different types of database management systems?

The database management systems can be categorized into several types. Some of the important lists are given below:

* Hierarchical databases (DBMS)
* Network databases (IDMS)
* Relational databases (RDBMS
* Object-oriented databases
* Document databases (Document DB)
* Graph databases
* ER model databases
* NoSQL databases

### What is RDBMS?

RDBMS stands for Relational Database Management System. It is a database management system based on a relational model. It facilitates to manipulate the data stored in the tables by using relational operators. RDBMS stores the data into the collection of tables and links those tables using the relational operators easily whenever required. Examples of relational database management systems are Microsoft Access, MySQL, SQL Server, Oracle database, etc.

What is Normalization in a Database?

Normalization is used to minimize redundancy and dependency by organizing fields and table of a database.

There are some rules of database normalization, which is commonly known as Normal From, and they are:

* First normal form(1NF)
* Second normal form(2NF)
* Third normal form(3NF)
* Boyce-Codd normal form(BCNF)

### What is the primary use of Normalization?

Normalization is the process of organizing data in a database. This includes creating tables and establishing relationships between those tables according to rules designed both to protect the data and to make the database more flexible by eliminating redundancy and inconsistent dependency.

### What is Denormalization in a Database?

This method allows us to add redundant data into a normalized database to solve issues with database queries that merge data from several tables into a single table. It adds redundant terms into the tables to avoid complex joins and many other complex operations.

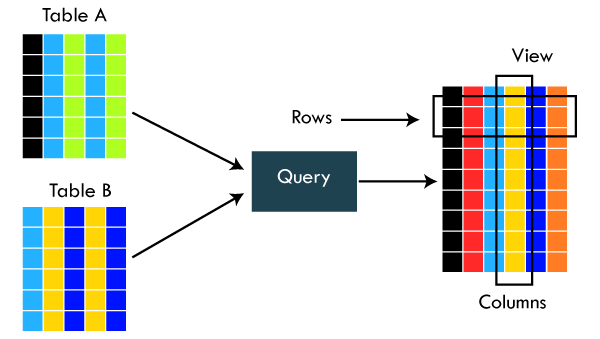
What are the different types of SQL operators?

Operators are the special keywords or special characters reserved for performing particular operations. They are also used in SQL queries. We can primarily use these operators within the WHERE clause of SQL commands. It's a part of the command to filters data based on the specified condition. The SQL operators can be categorized into the following types:

* **Arithmetic operators:** These operators are used to perform mathematical operations on numerical data. The categories of this operators are addition (+), subtraction (-), multiplication (\*), division (/), remainder/modulus (%), etc.
* **Logical operators:** These operators evaluate the expressions and return their results in True or False. This operator includes ALL, AND, ANY, ISNULL, EXISTS, BETWEEN, IN, LIKE, NOT, OR, UNIQUE.
* **Comparison operators:** These operators are used to perform comparisons of two values and check whether they are the same or not. It includes equal to (=), not equal to (!= or <>), less than (<), greater than (>), less than or equal to (<=), greater than or equal to (>=), not less than (!<), not greater than (!>), etc.
* **Bitwise operators:** It is used to do bit manipulations between two expressions of integer type. It first performs conversion of integers into binary bits and then applied operators such as AND (& symbol), OR (|, ^), NOT (~), etc.
* **Compound operators:** These operators perform operations on a variable before setting the variable's result to the operation's result. It includes Add equals (+=), subtract equals (-=), multiply equals (\*=), divide equals (/=), modulo equals (%=), etc.
* **String operators:** These operators are primarily used to perform concatenation and pattern matching of strings. It includes + (String concatenation), += (String concatenation assignment), % (Wildcard), [] (Character(s) matches), [^] (Character(s) not to match), \_ (Wildcard match one character), etc.

What is a view in SQL?

A view is a database object that has no values. It is a virtual table that contains a subset of data within a table. It looks like an actual table containing rows and columns, but it takes less space because it is not present physically. It is operated similarly to the base table but does not contain any data of its own. Its name is always unique. A view can have data from one or more tables. If any changes occur in the underlying table, the same changes reflected in the views also.



The primary use of a view is to implement the security mechanism. It is the searchable object where we can use a query to search the view as we use for the table. It only shows the data returned by the query that was declared when the view was created.

We can create a view by using the following syntax:

1. CREATE VIEW view\_name AS
2. SELECT column\_lists FROM table\_name
3. WHERE condition;

ACID

https://www.javatpoint.com/acid-properties-in-dbms