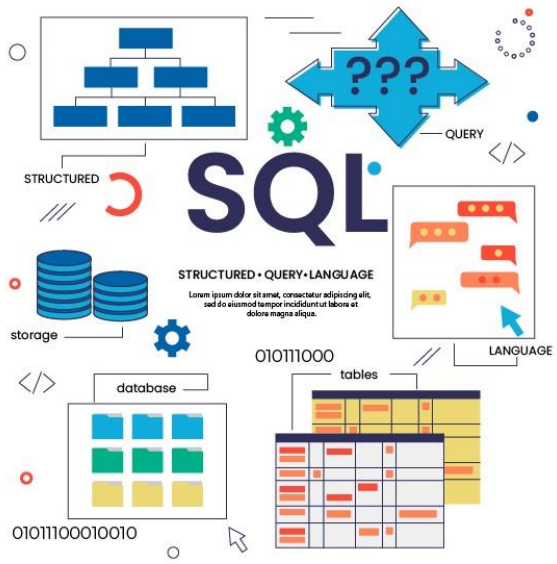
SQL Data Types



A Comprehensive Guide to SQL Data Types

SQL data types define the kind of data that can be stored in a database column while creating a table. They determine the nature of the data, such as whether it's a number, a string, a date, or a boolean value. Using the correct data type helps ensure data integrity, efficient storage, and correct handling of operations.

1. **String Data Types:** String data types are used to store text or a sequence of characters, such as letters, numbers, and symbols. Examples include CHAR, which stores fixed-length text, and VARCHAR, which stores variable-length text. These data types help handle textual information in a database.

CHAR	A fixed-length string is a type of data that can store letters, numbers, and special characters. The size parameter defines how many characters the string can hold, ranging from 0 to 255. The default length is 1 character.
VARCHAR	A variable-length string can store letters, numbers, and special characters. The size parameter sets the maximum number of characters the string can hold, ranging from 0 to 65,535. This means the string can be shorter or up to the maximum length specified.
TEXT	It stores a string that can be up to 65,535 bytes long.

2. **Numerical Data types:** Numerical data types are used to store numbers in a database. They can represent whole numbers (integers) or decimal numbers (floats). Common examples include INT for integers, FLOAT for floating-point numbers, and DECIMAL for precise decimal values. These data types help store and perform calculations on numerical data.

INT	In SQL, the INT data type is used to store whole numbers (integers) without decimals. It can store both positive and negative numbers, as well as zero. The range of values that an INT can store depends on the system but typically ranges from -2,147,483,648 to 2,147,483,647.
FLOAT	In SQL, the FLOAT data type is used to store numbers that have decimal points (floating-point numbers). It allows for the representation of approximate numeric values, useful for calculations that require decimals, like measurements or financial data.
BIGINT	In SQL, the BIGINT data type is used to store very large whole numbers (integers). It can hold values that are larger than the standard INT data type. (greater than 8 digit number)

3. **Date and Time Data Types:** Date and Time data types in SQL are used to store date, time, or both. These types help manage information like dates of events, timestamps, or durations. Common examples include DATE (for storing dates), TIME (for storing times), and DATETIME (for storing both date and time together). They help track and manipulate time-related data in databases.

DATE	In SQL, the DATE data type is used to store date values, typically in the format YYYY-MM-DD. It represents a specific day, including the year, month, and day, but does not store time information. This is useful for tracking dates like birthdays, events, or transaction dates.
TIME	In SQL, the TIME data type is used to store time values, typically in the format HH:MM:SS. It represents a specific time of day, including hours, minutes, and seconds, but does not include any date information. This is useful for storing times like opening hours or timestamps for events.
DATETIME	In SQL, the Datetime data type is used to store both date and time values together, typically in the format YYYY-MM-DD HH:MM:SS. It includes information about the year, month, day, hour, minute, and second. This is useful for tracking events that happen at specific moments in time, such as transaction timestamps or logs.

4. **Boolean Data Types:** In SQL, the `BOOLEAN` data type is used to store values that represent true or false. It helps store binary choices, such as whether a condition is met or if something is true or false. In some systems, it may be stored as `1` for true and `0` for false.