

STRUCTURED QUERY LANGUAGE (SQL)

SQL is a standard language used for managing and manipulating relational databases. It allows us to store, retrieve, update and delete data in a structured manner.

Why do we use SQL?

We use SQL because -

(1) Data Retrieval

SQL allows us to fetch specific data using queries.

(2) Data Management

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SQL helps to manipulate

and manage large amount of data stored in relational databases.

(3) Data Manipulation

SQL enables users to insert, update, delete records in databases.

(4) Data Security

SQL provides features like user authentication and access control to protect data.

What are the benefits of SQL?

- (1) SQL is easy to learn and use.
The statements comprise descriptive English words and are not case sensitive.
- (2) SQL allows quick data retrieval techniques.

NOTE:

1. SQL is case-sensitive insensitive.
2. SQL statements always ends with semicolon.
3. To enter multiline SQL statements we don't write ; after the first line.

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What is data type of attribute?

Data type of an attribute is the type of data that an attribute can have. Additionally, it determines the operation that can be performed on the data of that attribute.

Commonly used data types in MySQL

Numeric Data Types

1. INT = used for whole numbers

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2. FLOAT = Used for decimal numbers
(eg: 3.14, 9.81)

3.

3. DECIMAL = Used for precise decimal numbers (eg. 99.99, 123.456)

4. BIGINT = Used for very large numbers (eg. population count).

String (Character) Data Types.

1. CHAR(n) : Fixed length texts.

2. VARCHAR(n): Variable length text.

3. TEXT : Large text data
eg: paragraph, comments.

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Date and Time Data Types

- 1) DATE - Stores only the date.
(eg: '2024-03-06').
- 2) TIME - Stores only the time
(eg. '12:30:00').
- 3) DATETIME - Stores both date and
time.
(eg: '2024-03-06 12:30:00')

Constraints

Constraints are rules applied to columns in a table to maintain data integrity and ensure valid data is entered.

(1) PRIMARY KEY

→ ensure each record in a table is unique and not null.

eg: create table student (

StudentID INT PRIMARY KEY,

Name Varchar (50)

);

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(2) FOREIGN KEY.

- Establishes a relationship between two tables.
- Ensure the value in a column must exist in another column.

eg:

```
Create Table Orders (  
    OrderID INT PRIMARY KEY,  
    CustomerID INT,  
    FOREIGN KEY (CustomerID)  
    References Customers (CustomerID)  
);
```

(3) NOT NULL

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→ Ensures a column cannot have null values.

eg: Create Table Employees (
EmpID INT PRIMARY KEY,
Name Varchar(50) Not Null
);

(4) UNIQUE

→ Ensures all values are distinct
eg:

Create Table Users (
UserID INT Primary Key,
Email Varchar(100) Unique
);

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(5) ~~Check~~ CHECK

Ensures values meet a specific condition

eg: Create Table Products (
ProductID INT PRIMARY KEY,
Price DECIMAL(10,2)
CHECK (Price > 0)
);

(6) DEFAULT

Assigns a default value if no value is provided

eg: Create Table Employees (
EmpID INT PRIMARY KEY,
Salary DECIMAL(10,2)
DEFAULT 30000
);

Types of SQL commands. —

1. DDL (Data Definition Language)

These commands are used to create, modify or delete database objects like tables, schemas and indexes.

eg:

(a) Create : Creates a new table, database or object.

eg: Create Table Students (ID INT
PRIMARY KEY, Name Varchar(50));

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(b) Alter: Modifies an existing table

(e.g. add or remove columns)

eg: Alter Table Students Add Column
Age Int;

(c) Drop: Deletes a table or

database permanently.

eg: Drop Table Students

(d) Truncate: Removes all records
from a table but keeps the structure

eg: Truncate Table Students;

2. DML (Data Manipulation Language)

Handles data inside the tables.

Used for inserting, updating, deleting and retrieving data in tables.

eg:

(1) Insert → adds new records into a table.

(2) Update → Modifies existing records

(3) Delete → Removes record from table

(4) Select → Retrieves data from table