—> **MySQL** is an open-source **relational database** **management system (RDBMS)** that uses **Structured Query Language (SQL)** to **manage, store, and retrieve data** in a **database**.

—> It is one of the **most widely used databases** due to its **reliability, scalability, and ease of use**, especially for **web-based applications**.

**Key Features of MySQL:**

**1. Relational Database:** **MySQL** organises **data into tables**, which can be related to each other using **keys**.

—>This makes it easier to manage **structured data**.

2. **SQL (Structured Query Language)**: **MySQL** uses **SQ**L for **querying, updating, and managing** the database.

**3. Open-Source**: MySQL is **free to use and can be modified and distributed** under the terms of the **GNU General Public License (GPL)**.

However, there are also **commercial versions with additional features**.

**4. Scalability:** **MySQL** can handle **small applications** as well as **large-scale enterprise** solutions with **millions of records**.

**5. Cross-Platform:** It is compatible with various **operating systems**, such as **Windows, Linux, and macOS**.

**6. High Performance**: **MySQL** is optimised for **fast read and write operations**, making it suitable for **high-traffic websites and applications**.

**7. Security:** It provides **strong security features**, such as **data encryption, user authentication, and access controls.**

**8. Community Support:** As an **open-source database,** **MySQL** has a **large and active** community that contributes to its continuous **development and support**.

**Use Cases for MySQL:**

**- Web Applications:** Popular content management systems like **WordPress, Joomla, and Drupal use MySQL.**

**- E-Commerce Platforms: MySQL** is widely used in e-commerce platforms like **Magneto and WooCommerce** to manage **product catalogs and user data**.

**- Data Warehousing:** **MySQL** can be used for **data storage and processing** in **data warehousing applications**.

**- Enterprise Applications:** Businesses use **MySQL** to handle their **customer, financial, and operational data.**

**MySQL Structure:**

**- Database:** A collection of tables.

**- Table:** A collection of rows and columns, where data is stored.

**- Row:** A single record in a table.

**- Column:** A specific attribute or field for each record.

**MySQL Common Commands:**

**- SELECT:** Retrieves data from a database.

**- INSERT:** Adds new records to a table.

**- UPDATE:** Modifies existing data.

**- DELETE:** Removes records from a table.

**- CREATE:** Creates databases or tables.

**- ALTER:** Modifies the structure of an existing table.

**- DROP:** Deletes a database or table.

**Example of a basic query:**

```sql

SELECT \* FROM employees WHERE salary > 50000;

```

MySQL is highly favoured for its **speed, reliability, and ease of integration** with **web applications**, especially in LAMP **(Linux, Apache, MySQL, PHP/Perl/Python)** stacks.

Here is a list of commonly used **DDL (Data Definition Language)** commands in **MySQ**L:

**1. CREATE**:

Used to create new database objects such as databases, tables, indexes, and views.s

**- CREATE DATABASE:** Creates a new database.

**- CREATE TABLE:** Creates a new table.

**- CREATE INDEX:** Creates a new index on a table column(s).

**- CREATE VIEW:** Creates a virtual table (view) based on a query.

**Example:**

```sql

CREATE DATABASE my\_database;

CREATE TABLE employees (

id INT AUTO\_INCREMENT PRIMARY KEY,

name VARCHAR(100),

salary DECIMAL(10,2)

);

CREATE INDEX idx\_name ON employees(name);

CREATE VIEW high\_salary\_employees AS SELECT name, salary FROM employees WHERE salary > 50000;

```

**2. ALTER:**

Used to modify an existing database object (like a table or column).

**- ALTER TABLE:** Adds, deletes, or modifies columns in a table.

**- ALTER DATABASE:** Modifies a database.

**- ALTER VIEW:** Modifies an existing view.

**Example:**

```sql

ALTER TABLE employees ADD department VARCHAR(50);

ALTER TABLE employees DROP COLUMN department;

ALTER TABLE employees MODIFY salary DECIMAL(12,2);

```

**3. DROP:**

Used to delete existing database objects like **databases, tables, indexes, or views.**

**- DROP DATABASE:** Deletes a database and all its tables.

**- DROP TABLE:** Deletes a table and all of its data.

**- DROP INDEX:** Deletes an index.

**- DROP VIEW:** Deletes a view.

**Example:**

```sql

DROP DATABASE my\_database;

DROP TABLE employees;

DROP INDEX idx\_name ON employees;

DROP VIEW high\_salary\_employees;

```

**4. TRUNCATE:**

Used to remove all rows from a table, but it preserves the structure of the table.

**- TRUNCATE TABLE:** Removes all data from a table.

**Example:**

```sql

TRUNCATE TABLE employees;

```

**5. RENAME:**

Used to rename existing database objects like tables.

**- RENAME TABLE:** Renames an existing table.

**Example:**

```sql

RENAME TABLE employees TO staff;

```

These are the key **DDL** commands in **MySQL** that define and manipulate the structure of **database objects**.