**Creating tables in SQL, DDL, DML**

**1. Creating Tables in MySQL**

In MySQL, you use the CREATE TABLE command to define a new table.

**Example:**

CREATE TABLE Employees (

EmployeeID INT AUTO\_INCREMENT PRIMARY KEY,

FirstName VARCHAR(50),

LastName VARCHAR(50),

Email VARCHAR(100) UNIQUE,

HireDate DATE,

Salary DECIMAL(10, 2)

);

**Explanation:**

* EmployeeID: An integer that auto-increments and serves as the primary key.
* VARCHAR(50): Stores variable-length text (up to 50 characters).
* DATE: Stores date values in YYYY-MM-DD format.
* DECIMAL(10,2): Stores up to 10 digits, with 2 after the decimal (e.g., 50000.00).
* UNIQUE: Ensures that the email is not duplicated.

**2. Importance of Data Types in MySQL**

Choosing the correct **data type** is important for:

* **Data integrity**: Prevents invalid entries (e.g., text in a number column).
* **Storage efficiency**: Saves disk space by using appropriate types.
* **Query performance**: Enables faster searches and indexing.
* **Functionality**: Some operations require specific types (e.g., date comparisons).

**Common MySQL Data Types:**

| **Data Type** | **Purpose** |
| --- | --- |
| INT | Whole numbers |
| VARCHAR(n) | Variable-length strings (up to n chars) |
| TEXT | Long text fields |
| DATE | Date values |
| DATETIME | Date and time values |
| DECIMAL(m,d) | Fixed-point numbers (money, prices) |
| FLOAT, DOUBLE | Floating-point numbers |
| BOOLEAN / TINYINT(1) | True/false values |

**3. DDL (Data Definition Language) Commands in MySQL**

These commands are used to define or modify the structure of database objects like tables, columns, indexes, etc.

**Common DDL Commands:**

1. **CREATE** – To create new tables or databases

CREATE TABLE Departments (

DeptID INT PRIMARY KEY,

DeptName VARCHAR(100)

);

1. **ALTER** – To modify an existing table
   * Add a column:

ALTER TABLE Employees ADD COLUMN Gender VARCHAR(10);

* + Modify a column:

ALTER TABLE Employees MODIFY Salary DECIMAL(12,2);

* + Drop a column:

ALTER TABLE Employees DROP COLUMN Gender;

1. **DROP** – To delete a table or database
   * Drop a table:

DROP TABLE Employees;

* + Drop a database:

DROP DATABASE CompanyDB;

1. **TRUNCATE** – To delete all data from a table (structure remains)

TRUNCATE TABLE Employees;

1. **RENAME** – To rename a table

RENAME TABLE Employees TO Staff;

**DML (Data Manipulation Language)**

**DML (Data Manipulation Language)** consists of SQL commands used to **manipulate data** within database tables. Unlike DDL (which defines structure), DML deals with **actual records** — inserting, updating, deleting, and retrieving data.

**Common DML Commands in MySQL**

| **Command** | **Description** |
| --- | --- |
| INSERT | Adds new records into a table |
| UPDATE | Modifies existing records |
| DELETE | Removes records from a table |
| SELECT | Retrieves data from one or more tables |

**1. INSERT – Add New Records**

INSERT INTO Employees (FirstName, LastName, Email, HireDate, Salary)

VALUES ('Alice', 'Johnson', 'alice@example.com', '2023-01-10', 50000.00);

**2. UPDATE – Modify Existing Records**

UPDATE Employees

SET Salary = 55000.00

WHERE EmployeeID = 1;

*Note: Always use a WHERE clause to avoid updating all rows.*

**3. DELETE – Remove Records**

DELETE FROM Employees

WHERE EmployeeID = 1;

*Note: Without a WHERE clause,* ***all records*** *in the table will be deleted.*

**4. SELECT – Retrieve Records**

SELECT \* FROM Employees;

SELECT FirstName, Salary

FROM Employees

WHERE Salary > 40000;