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**1️ Connect to MySQL**

mysql -u username -p

**Enter password when prompted.**

**2️ Databases**

|  |
| --- |
|  |
| **Action** | **SQL Command** |
| Show all databases | SHOW DATABASES; |
| Create a new database | CREATE DATABASE db\_name; |
| Use a specific database | USE db\_name; |

**3️ Tables**

|  |  |
| --- | --- |
| **Action** | **SQL Command** |
| Show all tables | SHOW TABLES; |
| Create a table | CREATE TABLE table\_name (...); |
| Describe table structure | DESCRIBE table\_name; |

**Example:**

CREATE TABLE users (  
    id INT PRIMARY KEY AUTO\_INCREMENT,  
    name VARCHAR(50) NOT NULL,  
    email VARCHAR(100) UNIQUE  
);

**4️ CRUD Operations**

|  |  |
| --- | --- |
| **Operation** | **SQL Syntax** |
| Create | INSERT INTO table (...) VALUES (...); |
| Read | SELECT \* FROM table WHERE ...; |
| Update | UPDATE table SET col = val WHERE ...; |
| Delete | DELETE FROM table WHERE ...; |

**Examples:**

**Insert:**

INSERT INTO users (name, email)  
VALUES ('Alice', 'alice@example.com');

**Select:**

SELECT name, email FROM users;

**Update:**

UPDATE users  
SET email = 'newemail@example.com'  
WHERE id = 1;

**Delete:**

DELETE FROM users WHERE id = 1;

**⚠️ Always use WHERE with UPDATE or DELETE.**

**5️ WHERE Clause – Filtering Data**

Used in SELECT, UPDATE, and DELETE to filter rows.

|  |  |
| --- | --- |
| **Operator** | **Meaning** |
| = | Equal |
| != or <> | Not equal |
| > | Greater than |
| < | Less than |
| >= | Greater than or equal |
| <= | Less than or equal |
| LIKE | Pattern match |
| IN | Matches any value in list |
| BETWEEN | Between a range |
| IS NULL | Is null |

**Examples:**

SELECT \* FROM users WHERE name LIKE 'A%';  
SELECT \* FROM users WHERE id IN (1, 3);  
SELECT \* FROM users WHERE id BETWEEN 1 AND 5;

**6️ Constraints – Rules for Your Data**

**Constraints help keep your data correct and consistent.**

|  |  |
| --- | --- |
| **Constraint** | **Purpose** |
| PRIMARY KEY | Unique ID for each row. Can’t be null. |
| AUTO\_INCREMENT | Auto-increases number for new rows. |
| NOT NULL | Column must have a value. |
| UNIQUE | All values must be different. |
| DEFAULT | Default value if none is given. |
| FOREIGN KEY | Links one table to another. |

**Example:**

CREATE TABLE users (  
    id INT PRIMARY KEY AUTO\_INCREMENT,  
    name VARCHAR(50) NOT NULL,  
    email VARCHAR(100) UNIQUE,  
    city VARCHAR(50) DEFAULT 'Unknown'  
);

**7️ Literals – Fixed Values You Write in SQL**

**These are actual values like numbers, text, dates, etc., written directly in SQL.**

|  |  |  |
| --- | --- | --- |
| **Type** | **Example** | **Description** |
| String | 'John', '2023-01-01' | Text or characters in single quotes. |
| Number | 123, 3.14 | Whole numbers or decimals without quotes. |
| Date/Time | '2023-12-31', '10:30:00' | Written as strings but used for dates/times. |
| Boolean | TRUE, FALSE | Represented by 1 or 0 internally. |
| NULL | NULL | Represents "no value" or "unknown". |

**Examples:**

INSERT INTO users (name, age) VALUES ('Alice', 25);  
SELECT \* FROM users WHERE city = 'New York';

**8️ Summary Table**

|  |  |
| --- | --- |
| **Concept** | **What It Is** |
| Constraints | Rules applied to columns to ensure valid data |
| Literals | Fixed values written directly in SQL |
| CRUD | Create, Read, Update, Delete operations |
| WHERE Clause | Filters rows based on conditions |