**📘 DCL Statements in MySQL**

**🔹 What is DCL?**

* **DCL (Data Control Language)** statements are used to **control access to the database**.
* They manage **user permissions, privileges, and roles** in MySQL.
* Example tasks:
  + Grant a user permission to read/write data.
  + Revoke a user’s access.
  + Ensure security by restricting sensitive tables.

👉 In short: **DCL controls “WHO can do WHAT” in the database.**

**🔹 Why are DCL Statements Used?**

1. To **assign permissions** to database users.
2. To **revoke permissions** when not needed.
3. To **secure data** by restricting unauthorized access.
4. To allow **multi-user database management** safely.

**🔹 Main DCL Statements in MySQL**

**1. GRANT**

* **Definition**: Gives a user specific permissions on a database/table.
* **Syntax**:

GRANT privilege\_type [(column\_list)]

ON database\_name.table\_name

TO 'username'@'host'

[WITH GRANT OPTION];

* **Example**:

-- Grant SELECT and INSERT on employees table to user 'lucky' (from localhost)

GRANT SELECT, INSERT

ON company\_db.employees

TO 'lucky'@'localhost';

-- Grant ALL privileges on a database

GRANT ALL PRIVILEGES

ON company\_db.\*

TO 'admin'@'localhost'

WITH GRANT OPTION;

👉 The WITH GRANT OPTION allows the user to grant permissions to others.

**2. REVOKE**

* **Definition**: Removes (takes back) previously granted permissions.
* **Syntax**:

REVOKE privilege\_type [(column\_list)]

ON database\_name.table\_name

FROM 'username'@'host';

* **Example**:

-- Remove INSERT permission from user 'lucky'

REVOKE INSERT

ON company\_db.employees

FROM 'lucky'@'localhost';

-- Remove ALL privileges

REVOKE ALL PRIVILEGES

ON company\_db.\*

FROM 'admin'@'localhost';

**3. SET PASSWORD (Older MySQL versions, now replaced with ALTER USER)**

* **Definition**: Used to change a user’s password.
* **Syntax (legacy)**:

SET PASSWORD FOR 'username'@'host' = PASSWORD('newpassword');

* **Example**:

SET PASSWORD FOR 'lucky'@'localhost' = PASSWORD('Lucky@123');

👉 But in modern MySQL, use:

ALTER USER 'lucky'@'localhost' IDENTIFIED BY 'Lucky@123';

**4. SHOW GRANTS**

* **Definition**: Displays the privileges assigned to a user.
* **Syntax**:

SHOW GRANTS FOR 'username'@'host';

* **Example**:

SHOW GRANTS FOR 'lucky'@'localhost';

**5. FLUSH PRIVILEGES**

* **Definition**: Reloads the grant tables in MySQL after changes (needed when privileges are edited manually).
* **Syntax**:

FLUSH PRIVILEGES;

**✅ Summary**

| **Command** | **Purpose** |
| --- | --- |
| GRANT | Give privileges to users |
| REVOKE | Remove privileges from users |
| SET PASSWORD | (Old) Change user password |
| ALTER USER | (New) Change user password |
| SHOW GRANTS | Show user’s current privileges |
| FLUSH PRIVILEGES | Refresh privileges after manual edits |

👉 Example Workflow:

1. Create a new user:

CREATE USER 'testuser'@'localhost' IDENTIFIED BY 'Test@123';

1. Grant permission:

GRANT SELECT, INSERT ON company\_db.employees TO 'testuser'@'localhost';

1. Show permissions:

SHOW GRANTS FOR 'testuser'@'localhost';

1. Revoke permission:

REVOKE INSERT ON company\_db.employees FROM 'testuser'@'localhost';