13 SQL - DCL

Data Control Language (DCL)

- DCL is a subset of SQL used to control access to data in a database
- DCL commands are primarily used to grant and revoke privileges on database objects like tables, views, and procedures

DCL Commands

1. **GRANT**: Gives specific privileges to users or roles
2. **REVOKE**: Removes previously granted privileges from users or roles

- Given the `DEMO` database and the `employees` table

Step 1: Create a New User

```
CREATE USER 'jishnu'@'localhost' IDENTIFIED BY 'jishnusmysql';
```

Step 2: Grant Privileges

- Let's grant `jishnu` permission to view the data in the `employees` table

```
GRANT SELECT ON DEMO.employees TO 'jishnu'@'localhost';
```

- Now, `jishnu` can execute the following command to view the data

```
SELECT * FROM DEMO.employees;
```

```
deadpool@daredevil:~$ mysql -u jishnu -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ;
Your MySQL connection id is 9
Server version: 8.0.37-0ubuntu0.22.04.3 (Ubuntu)

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Type 'help;' or '\h' for help. Type '\c' to clear t

mysql> SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| DEMO               |
| information_schema |
| performance_schema |
+--------------------+
3 rows in set (0.00 sec)

mysql> USE DEMO;
Reading table information for completion of table a
You can turn off this feature to get a quicker star

Database changed
mysql> SELECT * FROM employees;
+--------+---------------+------------+----------+
| emp_id | name          | department | salary   |
+--------+---------------+------------+----------+
|      1 | John Doe      | IT         | 60000.00 |
|      2 | Jane Smith    | HR         | 55000.00 |
|      3 | Alice Johnson | Finance    | 62000.00 |
|      4 | Bob Brown     | IT         | 58000.00 |
|      5 | David Green   | Marketing  | 50000.00 |
|      6 | Emily White   | Sales      | 48000.00 |
+--------+---------------+------------+----------+
6 rows in set (0.01 sec)
```

- Grant `jishnu` all permissions on `employees` table

```
GRANT ALL ON DEMO.employees TO 'jishnu'@'localhost';
```

- View all permissions for `jishnu`

```
SHOW GRANTS FOR jishnu@localhost;
```

```
mysql> SHOW GRANTS FOR jishnu@localhost;
+-----------------------------------------------------------------+
| Grants for jishnu@localhost                                     |
+-----------------------------------------------------------------+
| GRANT USAGE ON *.* TO `jishnu`@`localhost`                      |
| GRANT ALL PRIVILEGES ON `DEMO`.`employees` TO `jishnu`@`localhost` |
+-----------------------------------------------------------------+
2 rows in set (0.00 sec)
```

- Grant `jishnu` all permissions on `DEMO` database

```
GRANT ALL ON DEMO.* TO 'jishnu'@'localhost';
```

```
mysql> GRANT ALL ON DEMO.* TO 'jishnu'@'localhost';
Query OK, 0 rows affected (0.31 sec)

mysql> SHOW GRANTS FOR jishnu@localhost;
+-----------------------------------------------------------------+
| Grants for jishnu@localhost                                     |
+-----------------------------------------------------------------+
| GRANT USAGE ON *.* TO `jishnu`@`localhost`                      |
| GRANT ALL PRIVILEGES ON `DEMO`.* TO `jishnu`@`localhost`        |
| GRANT ALL PRIVILEGES ON `DEMO`.`employees` TO `jishnu`@`localhost` |
+-----------------------------------------------------------------+
3 rows in set (0.00 sec)
```

- If you want `jishnu` to be able to grant privileges to other users, you can add the `GRANT OPTION`

```
GRANT ALL ON DEMO.* TO 'jishnu'@'localhost' WITH GRANT OPTION;
```

```
mysql> GRANT ALL ON DEMO.* TO 'jishnu'@'localhost' WITH GRANT OPTION;
Query OK, 0 rows affected (0.17 sec)

mysql> SHOW GRANTS FOR jishnu@localhost;
+-----------------------------------------------------------------------+
| Grants for jishnu@localhost                                           |
+-----------------------------------------------------------------------+
| GRANT USAGE ON *.* TO `jishnu`@`localhost`                            |
| GRANT ALL PRIVILEGES ON `DEMO`.* TO `jishnu`@`localhost` WITH GRANT OPTION |
| GRANT ALL PRIVILEGES ON `DEMO`.`employees` TO `jishnu`@`localhost`    |
+-----------------------------------------------------------------------+
3 rows in set (0.00 sec)
```

- Grant all permissions to `jishnu`

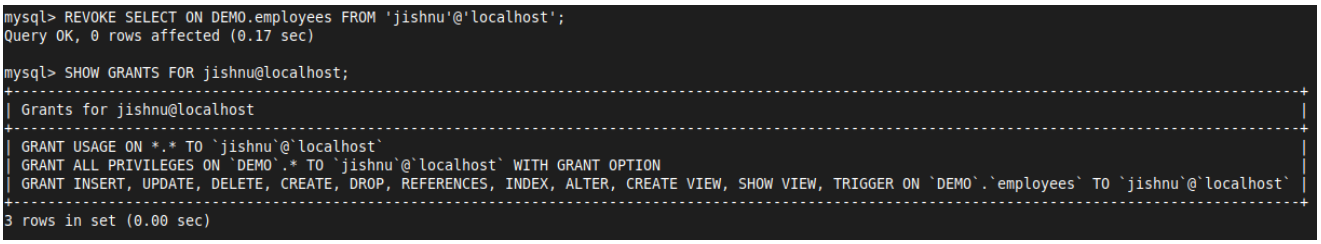
```
GRANT ALL ON *.* TO 'jishnu'@'localhost';
```

- Refresh Privileges : After granting privileges, it's a good practice to refresh the privileges to ensure they take effect

```
FLUSH PRIVILEGES;
```

Step 3: Revoke Privileges

```
REVOKE SELECT ON DEMO.employees FROM 'jishnu'@'localhost';
```




```
REVOKE ALL ON DEMO.employees FROM 'jishnu'@'localhost';
```

```
REVOKE ALL ON DEMO.* FROM 'jishnu'@'localhost';
```

```
REVOKE ALL ON *.* FROM 'jishnu'@'localhost';
```

```
mysql> REVOKE ALL ON DEMO.employees FROM 'jishnu'@'localhost';
Query OK, 0 rows affected (0.16 sec)

mysql> SHOW GRANTS FOR jishnu@localhost;
+-----------------------------------------------------------------------------+
| Grants for jishnu@localhost                                                 |
+-----------------------------------------------------------------------------+
| GRANT USAGE ON *.* TO `jishnu`@`localhost`                                  |
| GRANT ALL PRIVILEGES ON `DEMO`.* TO `jishnu`@`localhost` WITH GRANT OPTION |
+-----------------------------------------------------------------------------+
2 rows in set (0.00 sec)

mysql> REVOKE ALL ON DEMO.* FROM 'jishnu'@'localhost';
Query OK, 0 rows affected (0.06 sec)

mysql> SHOW GRANTS FOR jishnu@localhost;
+-------------------------------------------------------------------+
| Grants for jishnu@localhost                                       |
+-------------------------------------------------------------------+
| GRANT USAGE ON *.* TO `jishnu`@`localhost`                        |
| GRANT USAGE ON `DEMO`.* TO `jishnu`@`localhost` WITH GRANT OPTION |
+-------------------------------------------------------------------+
2 rows in set (0.00 sec)

mysql> REVOKE ALL ON *.* FROM 'jishnu'@'localhost';
Query OK, 0 rows affected (0.81 sec)

mysql> SHOW GRANTS FOR jishnu@localhost;
+-----------------------------------------+
| Grants for jishnu@localhost             |
+-----------------------------------------+
| GRANT USAGE ON *.* TO `jishnu`@`localhost` |
+-----------------------------------------+
1 row in set (0.00 sec)
```

Step 4: Drop User

```
DROP USER 'jishnu'@'localhost';
```