DCL & TCL

DATA CONTROL LANGUAGE (DCL)

- Data Control Language(DCL) deals with the commands used in SQL that **permit a user to access, modify or work** on the different privileges in order to control the database.
- It allows the **owner** of the database to give access, revoke access, and change the given permissions as and when required.
- DCL is basically used for enforcing **data security**.
- Common DCL Commands are **GRANT** and **REVOKE**.

DCL COMMANDS

Common DCL Commands in SQL are:

S.No	Command	Description
1	**GRANT**	to **give access** to security **privileges** to specific users of the database.
2	**REVOKE**	This command **withdraws** the user's access **privileges** given by using the GRANT command.

1) GRANT COMMAND

- The GRANT command is used to give access to privileges to specific users to maintain Data Security.

Syntax :

GRANT <privileges>
ON <object name>
TO <user/roles>

Explanation:

Privileges here refer to the INSERT, DELETE, SELECT, UPDATE, EXECUTE, ALTER, reference relations and all options provided by SQL.
Object could be anything amongst tables, views.
Roles are the users to whom the privileges are granted or revoked.

2) REVOKE COMMAND

- The REVOKE command is used to withdraw access to privileges given to users before using the grant command.

Syntax :

REVOKE <privileges>
ON <object name>
TO <user/roles>

Example :

GRANT SELECT, UPDATE
ON customer_table
TO root_user

TRANSACTION CONTROL LANGUAGE (TCL)

- TCL stands for **Transaction Control Language** in SQL. Transaction Control Language (TCL) is a set of special commands that **deal with the transactions** within the database.
- TCL commands are used mostly after DML Commands such as INSERT, UPDATE, and DELETE to make the required changes.
- In general, the **TCL commands** consist of:
  - COMMIT
  - ROLLBACK
  - SAVEPOINT

TCL COMMANDS…

Common TCL Commands in SQL are:

S.No	Command	Description
1	**COMMIT**	It is used to **permanently save any transaction into the database**.
2	**ROLLBACK**	The ROLLBACK command in TCL is used for **restoring the database to the last committed state**.
3	**SAVEPOINT**	The SAVEPOINT command in TCL is basically used to **temporarily save a transaction** so that we can roll back to that point (saved point) whenever required.

TCL COMMANDS…

AUTOCOMMIT Mode

- **By default,** MySQL starts the session for each new connection with **autocommit enabled**, so MySQL does a commit after each SQL statement if that statement did not return an error.

- To **check** whether auto-committed mode is enabled or not, you can use the following command

```
SELECT @@autocommit;
```

Result-grid → **1** means enabled(ON), whereas **0** means disabled(OFF).

- To **disable** autocommit mode, use the following command

```
SET autocommit = 0;
```

- To **enable** autocommit mode, use the following command

```
SET autocommit = 1;
```

1) COMMIT COMMAND

- The COMMIT command in SQL is used to **permanently save any transaction into the database**.
- Generally, whenever we use any **DML** command such as INSERT, UPDATE, or DELETE, the changes made by these commands are **not permanent**.
- Hence, before closing the current session, we may **roll back** any changes made through these commands.

Syntax :
COMMIT ;

2) ROLLBACK COMMAND

- The rollback command in TCL is used for **restoring the database to the last committed state**.
- The rollback command will **basically revert or roll back** any changes that were **not committed** during our transaction.

Syntax :

```
ROLLBACK ;
```

Syntax :

```
ROLLBACK  TO savepoint_name ;
```

3) SAVEPOINT COMMAND

- The SAVEPOINT command is used to **temporarily save a transaction** so that we can roll back to that point (saved point) whenever required.
- It is highly beneficial when we want to roll the transactions back to a certain point without rolling back the whole group of transactions.
- Also, we can release(remove) any particular SAVEPOINT.

Syntax :

```
SAVEPOINT savepoint_name ;
```

Syntax :

```
RELEASE SAVEPOINT savepoint_name ;
```

THANK YOU