**Documentation on TLC**

**Definition of TCL in PostgreSQL**

In **PostgreSQL**, **TCL** stands for **Transaction Control Language**. These are special SQL commands used to **control the execution of transactions**, ensuring that groups of operations are treated as a single, atomic unit of work.

**🔹 Formal Definition:**

**TCL (Transaction Control Language)** commands in PostgreSQL are used to **manage transactions**, which help in maintaining the **integrity and consistency** of the database by controlling how and when changes made by SQL statements are permanently applied.

**🔹 Purpose of TCL:**

* **Start**, **commit**, or **rollback** groups of operations
* Ensure **atomicity** (all steps succeed or none)
* Prevent **partial updates** during errors or failures

**🔹 Key TCL Commands in PostgreSQL:**

| **Command** | **Description** |
| --- | --- |
| BEGIN | Starts a new transaction block |
| COMMIT | Saves all changes made during the transaction |
| ROLLBACK | Undoes all changes in the transaction |
| SAVEPOINT | Sets a point in a transaction for partial rollback |
| ROLLBACK TO SAVEPOINT | Undoes changes up to the savepoint |
| RELEASE SAVEPOINT | Deletes a savepoint |

## Example 1: COMMIT & ROLLBACK

sql

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BEGIN;

UPDATE accounts SET balance = balance - 500 WHERE acc\_id = 1;

UPDATE accounts SET balance = balance + 500 WHERE acc\_id = 2;

COMMIT;

## Example 2: Using SAVEPOINT

sql

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BEGIN;

UPDATE employees SET salary = salary + 1000 WHERE emp\_id = 1;

SAVEPOINT before\_bonus;

UPDATE employees SET salary = salary + 5000 WHERE emp\_id = 2;

ROLLBACK TO SAVEPOINT before\_bonus; -- Undo only the second update

COMMIT;