

PostgreSQL – Complete Concepts (Table, Schema, Index, View, Trigger, Procedure)

TABLE

Definition: A table stores actual data in rows and columns.

Example: CREATE TABLE students(id SERIAL PRIMARY KEY, name TEXT, cgpa NUMERIC);

SCHEMA

Definition: A schema is a logical container that organizes database objects.

Example: CREATE SCHEMA academic; CREATE TABLE academic.students(id INT, name TEXT);

INDEX

Purpose: Improves SELECT query performance.

Important: Index is NOT a column. It is a separate data structure.

Example: CREATE INDEX idx_students_cgpa ON students(cgpa);

VIEW

Definition: A view is a saved SELECT query (virtual table).

Important: Views do NOT store data or previous states.

Example: CREATE VIEW high_cgpa AS SELECT name, cgpa FROM students WHERE cgpa > 3.5;

FUNCTION

Definition: A function returns a value and can be used in SELECT.

Example: CREATE FUNCTION add(a INT,b INT) RETURNS INT AS \$\$ SELECT a+b; \$\$ LANGUAGE SQL;

TRIGGER

Definition: Trigger executes automatically on INSERT/UPDATE/DELETE.

PostgreSQL Rule: Trigger must call a FUNCTION.

Example: CREATE TRIGGER before_insert_students BEFORE INSERT ON students FOR EACH ROW EXECUTE FUNCTION upper_student_name();

PROCEDURE

Definition: A stored procedure contains reusable SQL logic.

Note: Introduced in PostgreSQL 11.

Example: CREATE PROCEDURE get_high_cgpa(min NUMERIC) LANGUAGE plpgsql AS \$\$
BEGIN SELECT * FROM students WHERE cgpa >= min; END; \$\$;