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EXPERIMENT – 03

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Subject Name: Technical Training	**Subject Code: 25CAP-652**

Implementation of Conditional Logic using IF–ELSE and CASE Statements in PostgreSQL

Aim

To implement conditional decision-making logic in PostgreSQL using **IF–ELSE constructs** and **CASE expressions** for classification, validation, and rule-based data processing.

Tools Used

- PostgreSQL

Objectives

- To understand conditional execution in SQL
- To implement decision-making logic using CASE expressions

- To simulate real-world rule validation scenarios
- To classify data based on multiple conditions
- To strengthen SQL logic skills required in interviews and backend systems

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Experiment / Practical Steps

Prerequisite Understanding

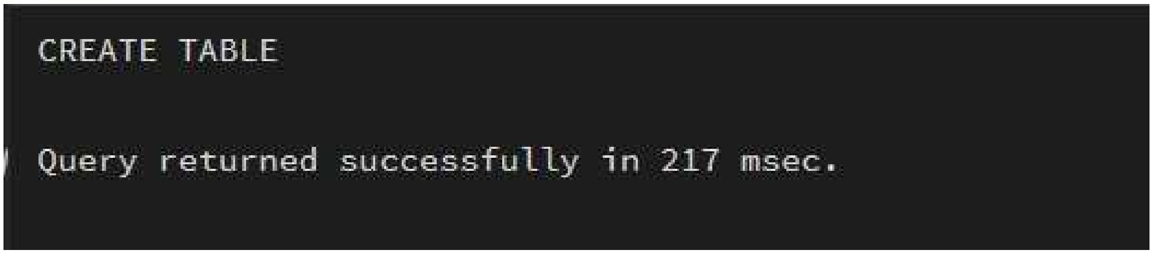
Students should first create a table that stores:

- A unique identifier
- A schema or entity name
- A numeric count representing violations or issues

Populate the table with multiple records having different violation counts.

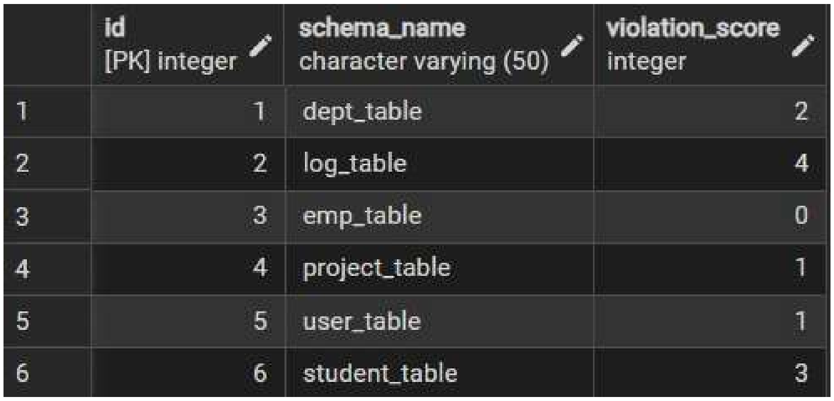
Step 1: Classifying Data Using CASE Expression

```
create table schema_Analysis
(
id int primary key,
schema_name varchar(50),
violation_score int
)
```



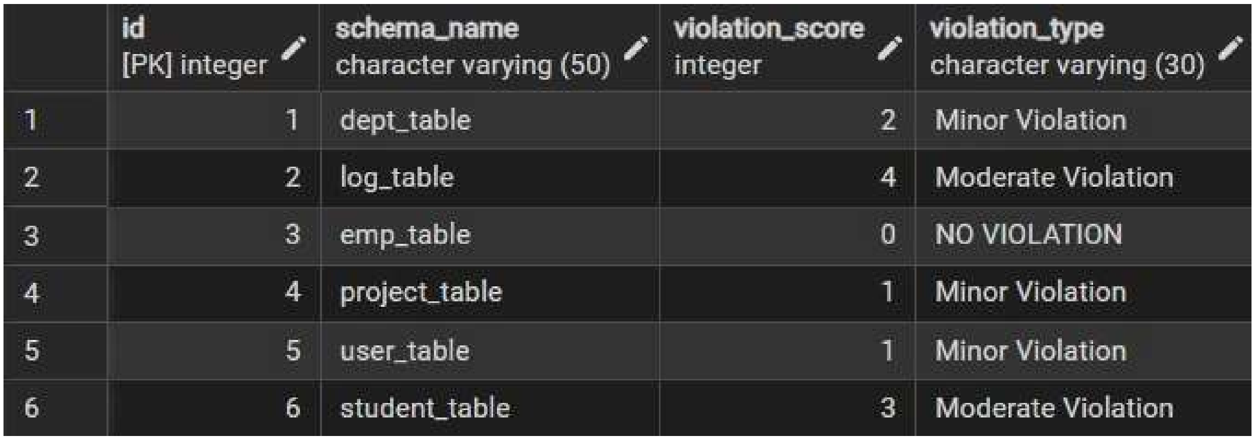
```
CREATE TABLE

Query returned successfully in 217 msec.
```

```
insert into schema_Analysis values(1,'dept_table',2),
(2,'log_table',4),
(3,'emp_table',0),
(4,'project_table',1),
(5,'user_table',1),
(6,'student_table',3)

select* from schema_Analysis
```



	id [PK] integer	schema_name character varying (50)	violation_score integer
1	1	dept_table	2
2	2	log_table	4
3	3	emp_table	0
4	4	project_table	1
5	5	user_table	1
6	6	student_table	3

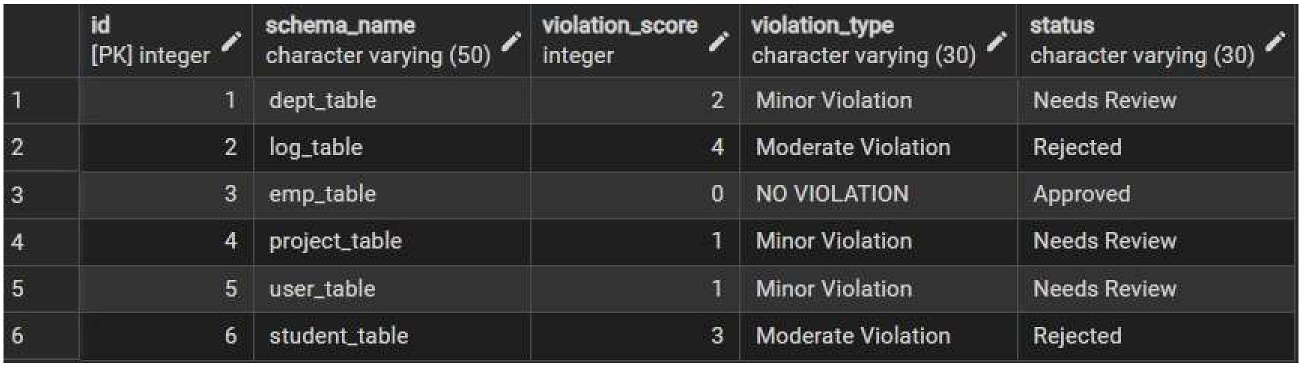
```
ALTER TABLE schema_analysis
ADD COLUMN violation_type VARCHAR(30);

UPDATE schema_Analysis
SET violation_type =
  CASE
    WHEN violation_score = 0 THEN 'NO VIOLATION'
    WHEN violation_score BETWEEN 1 AND 2 THEN 'Minor Violation'
    WHEN violation_score BETWEEN 3 AND 4 THEN 'Moderate Violation'
    ELSE 'Critical Violation'
  END;
```



	id [PK] integer	schema_name character varying (50)	violation_score integer	violation_type character varying (30)
1	1	dept_table	2	Minor Violation
2	2	log_table	4	Moderate Violation
3	3	emp_table	0	NO VIOLATION
4	4	project_table	1	Minor Violation
5	5	user_table	1	Minor Violation
6	6	student_table	3	Moderate Violation

Step 2: Applying CASE Logic in Data Updates

```
ALTER TABLE schema_analysis

ADD COLUMN status VARCHAR(30);



UPDATE schema_Analysis

SET status =

  CASE

    WHEN violation_score = 0 THEN 'Approved'

    WHEN violation_score BETWEEN 1 AND 2 THEN 'Needs Review'

    ELSE 'Rejected'

  END;
```

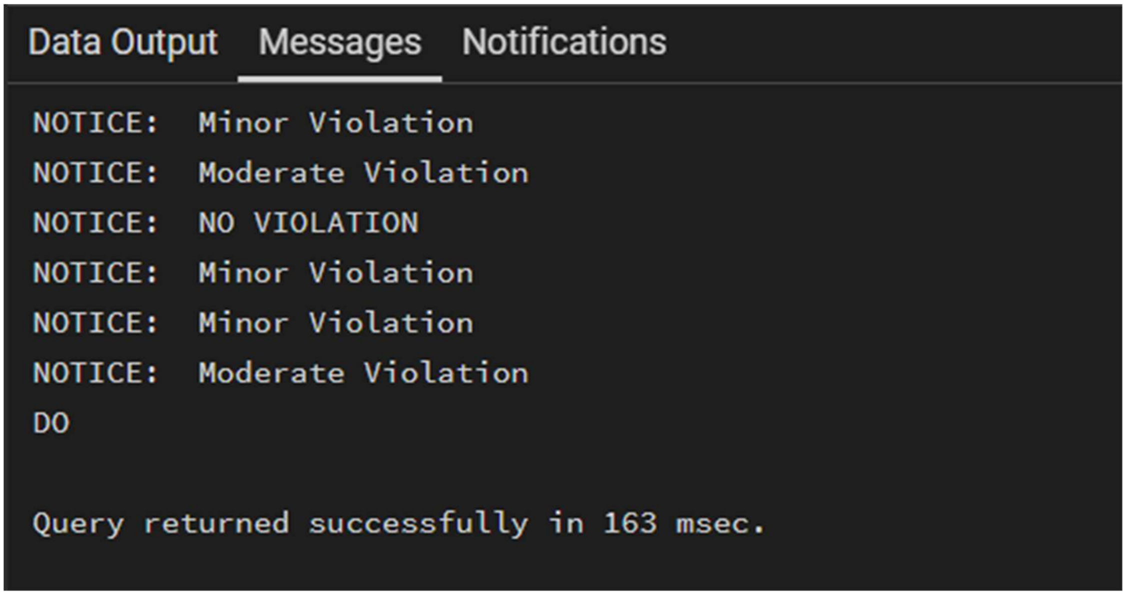


	id [PK] integer	schema_name character varying (50)	violation_score integer	violation_type character varying (30)	status character varying (30)
1	1	dept_table	2	Minor Violation	Needs Review
2	2	log_table	4	Moderate Violation	Rejected
3	3	emp_table	0	NO VIOLATION	Approved
4	4	project_table	1	Minor Violation	Needs Review
5	5	user_table	1	Minor Violation	Needs Review
6	6	student_table	3	Moderate Violation	Rejected

Step 3: Implementing IF–ELSE Logic Using PL/pgSQL

```
DO $$
DECLARE
  r RECORD;
BEGIN
  FOR r IN
    SELECT violation_count
    FROM system_analysis
  LOOP
    IF r.violation_count = 0 THEN
      RAISE NOTICE 'NO VIOLATION';
    ELSIF r.violation_count BETWEEN 1 AND 2 THEN
      RAISE NOTICE 'Minor Violation';
    ELSIF r.violation_count BETWEEN 3 AND 4 THEN
      RAISE NOTICE 'Moderate Violation';
    ELSE
```

```
            RAISE NOTICE 'Critical Violation';
        END IF;
    END LOOP;
END $$;
```

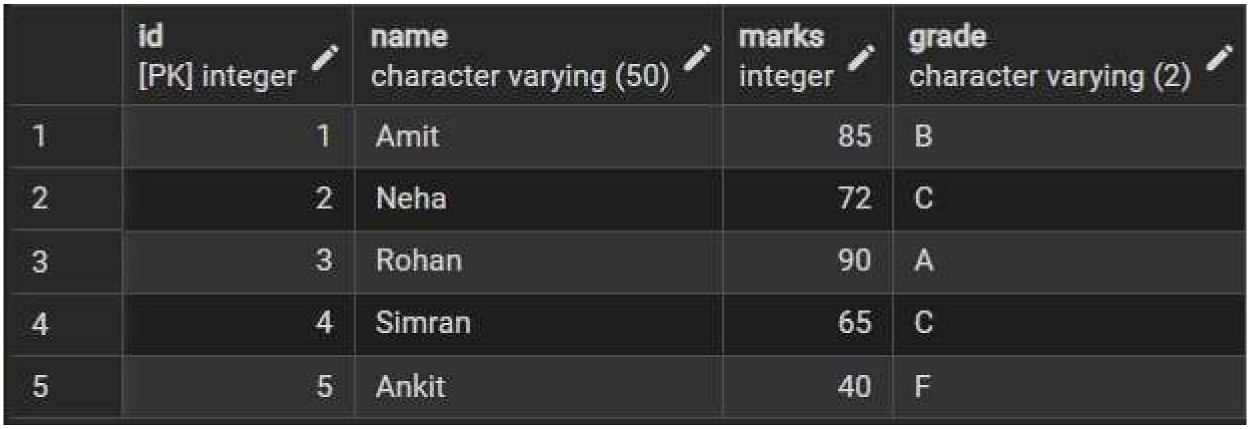


```
NOTICE:  Minor Violation
NOTICE:  Moderate Violation
NOTICE:  NO VIOLATION
NOTICE:  Minor Violation
NOTICE:  Minor Violation
NOTICE:  Moderate Violation
DO

Query returned successfully in 163 msec.
```

Step 4: Real-World Classification Scenario (Grading System)

```
create table student (
id int primary key ,
name varchar(50),
marks int
)

INSERT INTO student (id, name, marks) VALUES
(1, 'Amit', 85),
(2, 'Neha', 72),
(3, 'Rohan', 90),
(4, 'Simran', 65),
(5, 'Ankit', 40);

select * from student;
```

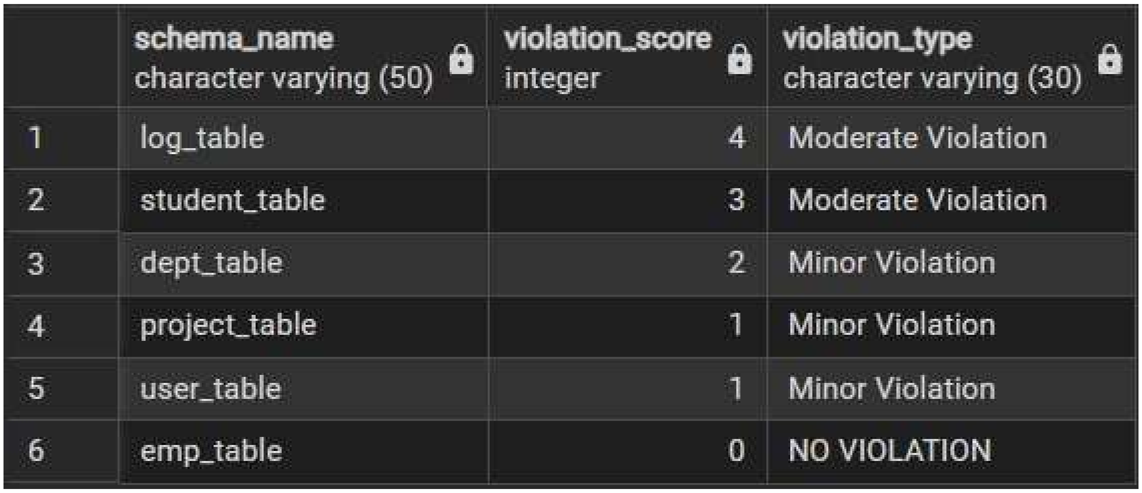
```
ALTER TABLE student
ADD COLUMN grade VARCHAR(2);

DO $$
DECLARE
   r RECORD;
BEGIN
   FOR r IN SELECT id, marks FROM student
   LOOP
      IF r.marks >= 90 THEN
         UPDATE student SET grade = 'A' WHERE id = r.id;
      ELSIF r.marks >= 75 THEN
         UPDATE student SET grade = 'B' WHERE id = r.id;
      ELSIF r.marks >= 50 THEN
         UPDATE student SET grade = 'C' WHERE id = r.id;
      ELSE
         UPDATE student SET grade = 'F' WHERE id = r.id;
      END IF;
   END LOOP;
END $$;
```



	id [PK] integer	name character varying (50)	marks integer	grade character varying (2)
1	1	Amit	85	B
2	2	Neha	72	C
3	3	Rohan	90	A
4	4	Simran	65	C
5	5	Ankit	40	F

Step 5: Using CASE for Custom Sorting

```
SELECT

   schema_name,

   violation_score,
   violation_type
FROM schema_Analysis
ORDER BY
   CASE
     WHEN violation_type = 'Critical Violation' THEN 1
     WHEN violation_type = 'Moderate Violation' THEN 2
     WHEN violation_type = 'Minor Violation' THEN 3
     ELSE 4
   END,schema_name;
```



	schema_name character varying (50)	violation_score integer	violation_type character varying (30)
1	log_table	4	Moderate Violation
2	student_table	3	Moderate Violation
3	dept_table	2	Minor Violation
4	project_table	1	Minor Violation
5	user_table	1	Minor Violation
6	emp_table	0	NO VIOLATION

Course Outcome

This experiment demonstrates how conditional logic is implemented in PostgreSQL using **CASE expressions** and **IF–ELSE constructs**.
Students gain strong command over **rule-based SQL logic**, which is essential for:

- Backend systems

- Analytics
- Compliance reporting
- Placement and technical interviews