

# **DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**



Discover. Learn. Empower.

## Experiment - 8

Name: Aryan Mishra

UID : 23BCS11272

Section: KRG-3B

Branch: BE-CSE

Semester : 5<sup>th</sup>

D.O.P:28/10/2025

Subject Name: ADBMS

Subject- Code : 23CSP - 333

### **1. Aim:**

Design a robust PostgreSQL transaction system for the students table where multiple student records are inserted in a single transaction.

If any insert fails due to invalid data, only that insert should be rolled back while preserving the previous successful inserts using savepoints.

The system should provide clear messages for both successful and failed insertions, ensuring data integrity and controlled error handling.

# **DEPARTMENT OF**



Discover. Learn. Empower.

## **COMPUTER SCIENCE & ENGINEERING**

### **2. Requirement :**

- Design a robust transaction system for the student table that allows inserting multiple student records in a single transaction.
- If any insert fails due to invalid data, only that specific insert should be rolled back, while previously successful inserts are preserved.
- The system should use savepoints to control partial rollbacks.
- Provide clear messages indicating which inserts succeeded and which failed.
- Ensure data integrity and controlled error handling during bulk inserts.

### **3: Objective:**

To implement a PostgreSQL transaction system that supports batch insertion of student records with partial rollback capability.

To use savepoints to isolate failures and prevent total transaction failure.

To give real-time feedback for both successful and failed inserts.

To maintain data consistency and integrity while handling invalid or problematic data gracefully.

To provide a structured and robust approach for bulk data operations in the student table.

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING



Discover. Learn. Empower.

### 4: Code:

```
DROP TABLE IF EXISTS students;
```

```
CREATE TABLE students ( id  
    SERIAL PRIMARY KEY, name  
    VARCHAR(50) UNIQUE,  
    age INT, class  
    INT  
)
```

```
-- EXCEPTION HANDLING
```

```
DO $$  
BEGIN TRANSACTION  
    -- Start a transaction  
    BEGIN  
        -- Insert multiple students  
        INSERT INTO students(name, age, class) VALUES ('Anisha',16,8);  
        INSERT INTO students(name, age, class) VALUES ('Neha',17,8);  
        INSERT INTO students(name, age, class) VALUES ('Mayank',19,9);  
  
        -- If all succeed  
        RAISE NOTICE ' Transaction Successfully Done';
```

# **DEPARTMENT OF**

EXCEPTION WHEN OTHERS THEN

-- If any insert fails

RAISE NOTICE 'Transaction Failed..! Rolling back changes.'; RAISE;

-- this will rollback the entire transaction END;



Discover. Learn. Empower.

END;

\$\$;

## **COMPUTER SCIENCE & ENGINEERING**

SELECT \* FROM students;

--VIOLATED SCENARIO

DO \$\$

BEGIN TRANSACTION

-- Start a transaction

BEGIN

-- Insert multiple students

INSERT INTO students(name, age, class) VALUES ('Anisha',16,8);

    INSERT INTO students(name, age, class) VALUES ('Mayank',19,9);

    INSERT INTO students(name, age, class) VALUES ('Anisha',17,8); --ERROR

    INSERT INTO students(name, age, class) VALUES ('Mayank',19,9);

-- If all succeed

RAISE NOTICE ' Transaction Successfully Done';

EXCEPTION WHEN OTHERS THEN

```
-- If any insert fails  
RAISE NOTICE 'Transaction Failed..! Rolling back changes.';  
RAISE; -- this will rollback the entire transaction  
END;  
$$;
```

# **DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**



Discover. Learn. Empower.

LANGUAGE plpgsql

AS

\$\$

BEGIN

IF TG\_OP = 'INSERT' THEN

    INSERT INTO tbl\_employee\_audit(message)

        VALUES ('Employee name ' || NEW.emp\_name || ' has been added at ' || NOW());

    RETURN NEW;

ELSIF TG\_OP = 'DELETE' THEN

    INSERT INTO tbl\_employee\_audit(message)

        VALUES ('Employee name ' || OLD.emp\_name || ' has been deleted at ' || NOW());

    RETURN OLD;

END IF;

RETURN NULL;

END;

# **DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**



**Discover. Learn. Empower.**

\$\$

## **5: Output:**

```
Output:  
DROP TABLE  
CREATE TABLE  
DO  
    id | name | age | class  
----+-----  
  1 | Anisha | 16 | 8  
  2 | Neha | 17 | 8  
  3 | Mayank | 19 | 9  
(3 rows)  
  
psql:commands.sql:1: NOTICE: table "students" does not exist, skipping  
psql:commands.sql:30: NOTICE: Transaction Successfully Done  
psql:commands.sql:54: NOTICE: Transaction Failed..! Rolling back changes.  
psql:commands.sql:54: ERROR: duplicate key value violates unique constraint "students_name_key"  
DETAIL: Key (name)=(Anisha) already exists.  
CONTEXT: SQL statement "INSERT INTO students(name, age, class) VALUES ('Anisha',16,8)"  
PL/pgSQL function inline_code_block line 6 at SQL statement
```

**DEPARTMENT OF COMPUTER SCIENCE &  
ENGINEERING**