



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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WORKSHEET 8

Student Name: Sukhjinder Singh

UID: 23BAI70078

Branch: CSE(3rd Year)

Section: 23AIT_Krg_G2

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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.

2. Tools Used : Postgres

Solutions:

Q1)

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

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

```
DO
$$      BE
GIN
BEGIN
    INSERT INTO students(name, age, class) VALUES ('Supriya',16,8);
    INSERT INTO students(name, age, class) VALUES ('Rakshit',17,8);
```

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

RAISE NOTICE 'Transaction Successfully Done';

EXCEPTION
WHEN OTHERS THEN
    RAISE NOTICE 'Transaction Failed..! Rolling back changes.';
    RAISE;
END;
END;
$$;
```

```
SELECT * FROM students;
```

WRONG DATA TYPE SCENARIO

```
BEGIN; -- start transaction

SAVEPOINT sp1;
INSERT INTO students(name, age, class) VALUES ('Aarav',16,8);

SAVEPOINT sp2;
BEGIN
    INSERT INTO students(name, age, class) VALUES ('Rahul','wrong',9); -- fails
EXCEPTION WHEN OTHERS THEN
    RAISE NOTICE 'Failed to insert Rahul, rolling back to savepoint sp2';
    ROLLBACK TO SAVEPOINT sp2; END;

-- Next insert
INSERT INTO students(name, age, class) VALUES ('Sita',17,10);

COMMIT; -- commit all successful inserts
```

3. Output:

```
Query History
23      INSERT INTO students(name, age, class) VALUES ('Varun',19,9);
24
25      RAISE NOTICE 'Transaction Successfully Done';
26
27      EXCEPTION
28          WHEN OTHERS THEN
29              RAISE NOTICE 'Transaction Failed..! Rolling back changes.';
30              RAISE;
31      END;
32  END;
33  $$;
34
35  SELECT * FROM students;
36
```

Data Output Messages Notifications

NOTICE: Transaction Successfully Done
DO

Query returned successfully in 39 msec.

```
Query History
28      WHEN OTHERS THEN
29          RAISE NOTICE 'Transaction Failed..! Rolling back changes.';
30          RAISE;
31      END;
32  END;
33  $$;
34
35  SELECT * FROM students;
36
37 -----WRONG DATA TYPE SCENARIO-----
38
39 BEGIN;
40
41 SAVEPOINT spl;
```

Data Output Messages Notifications

Showing rows: 1 to 3 Page No: 1 of 1 < << > >>

	id [PK] integer	name character varying (50)	age integer	class integer
1	1	Supriya	16	8
2	2	Rakshit	17	8
3	3	Varun	19	9

Query History

```

42
43  SAVEPOINT sp2;
44  BEGIN
45    INSERT INTO students(name, age, class) VALUES ('Rahul','wrong',9); -- fails
46  EXCEPTION WHEN OTHERS THEN
47    RAISE NOTICE 'Failed to insert Rahul, rolling back to savepoint sp2';
48    ROLLBACK TO SAVEPOINT sp2;
49  END;
50
51  -- Next insert
52  INSERT INTO students(name, age, class) VALUES ('Sita',17,10);
53
54  COMMIT; -- commit all successful inserts
55

```

Data Output Messages Notifications

ERROR: syntax error at or near "INSERT"
LINE 2: INSERT INTO students(name, age, class) VALUES ('Rahul',...
A

SQL state: 42601
Character: 11

Data Output Messages Notifications

ROLLBACK

Query returned successfully in 35 msec.

4. Learning Outcomes:

- Understand the concept of PostgreSQL transactions and how to start, commit, and rollback.
- Learn how to use **SAVEPOINT** to handle partial rollbacks within a transaction.
- Practice controlled error handling for individual insert failures without affecting other successful operations.
- Gain experience in maintaining **data integrity** while performing multiple inserts.
- Learn to generate informative **NOTICES** to monitor transaction progress and errors.