



DEPARTMENT OF
COMPUTER SCIENCE & ENGINEERING
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WORKSHEET 8

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Section: 23AIT_Krg_G1

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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

The screenshot shows a PostgreSQL query editor interface. The top bar has tabs for 'Query' (selected), 'Query History', and 'Scratch Pad'. The main area contains the following SQL code:

```
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
```

Below the code, there are three tabs: 'Data Output' (selected), 'Messages', and 'Notifications'. The 'Messages' tab displays the following error output:

```
ERROR: syntax error at or near "INSERT"
LINE 2:     INSERT INTO students(name, age, class) VALUES ('Rahul',...
^
SQL state: 42601
Character: 11
```

The 'Data Output' tab shows the following results:

```
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.