WORKSHEET 8

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Branch: CSE(3rd Year) **Section/Group: Krg-1-B**

Semester: 5th **Date of Performance: 09/10/25**

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.

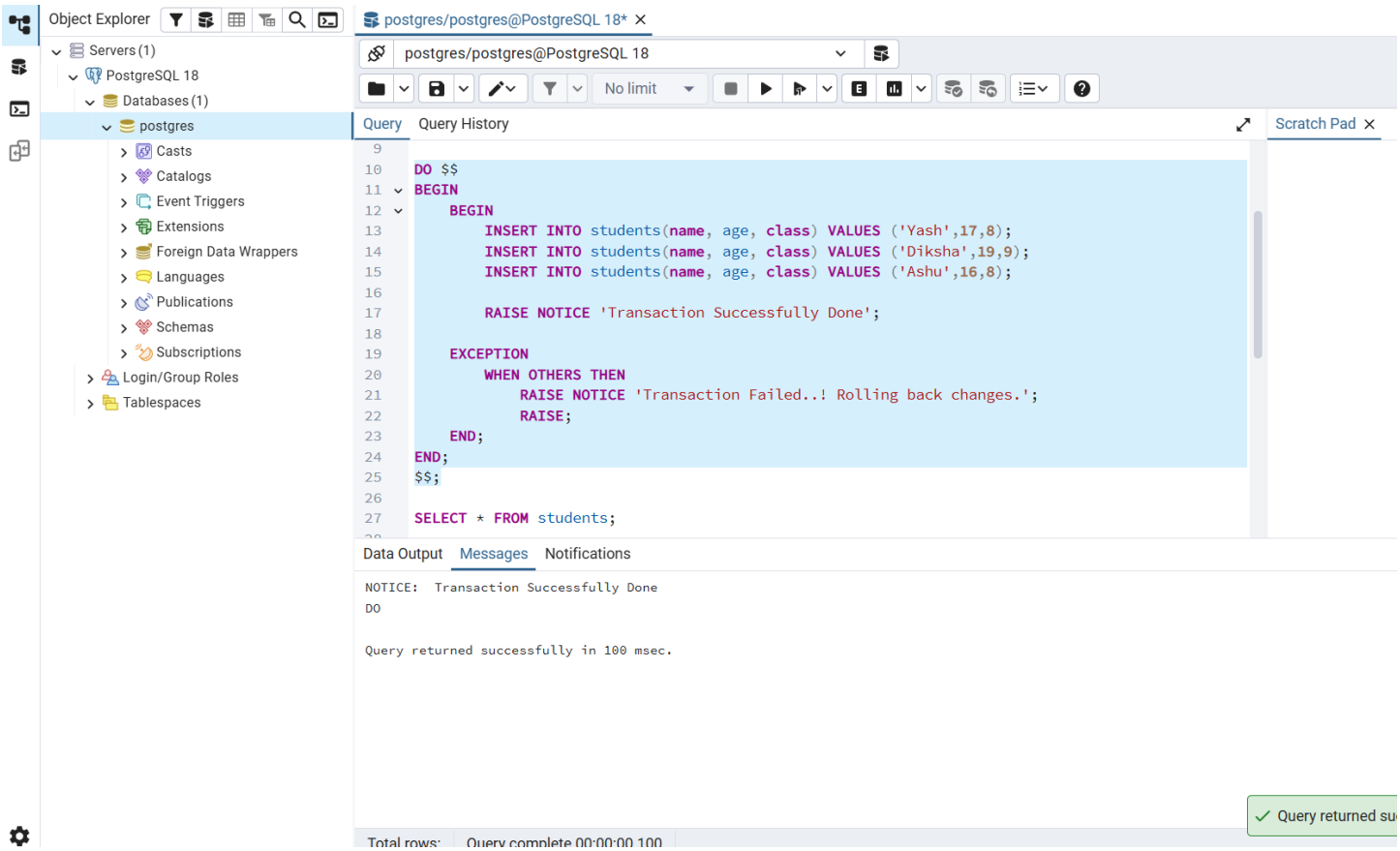
2. **Tools Used :** PostGres

Solutions:

```
DROP TABLE IF EXISTS students;

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

DO $$
BEGIN
    BEGIN
        INSERT INTO students(name, age, class) VALUES ('Yash',17,8);
        INSERT INTO students(name, age, class) VALUES ('Diksha',19,9);
        INSERT INTO students(name, age, class) VALUES ('Ashu',16,8);
```

```
      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 ('Aman',16,8);

SAVEPOINT sp2;
BEGIN
   INSERT INTO students(name, age, class) VALUES ('Akash','wrong',9);  -- fails
EXCEPTION WHEN OTHERS THEN
   RAISE NOTICE 'Failed to insert Akash, 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
```

Output:


Object Explorer
Servers (1)
PostgreSQL 18
Databases (1)
postgres
Casts
Catalogs
Event Triggers
Extensions
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Publications
Schemas
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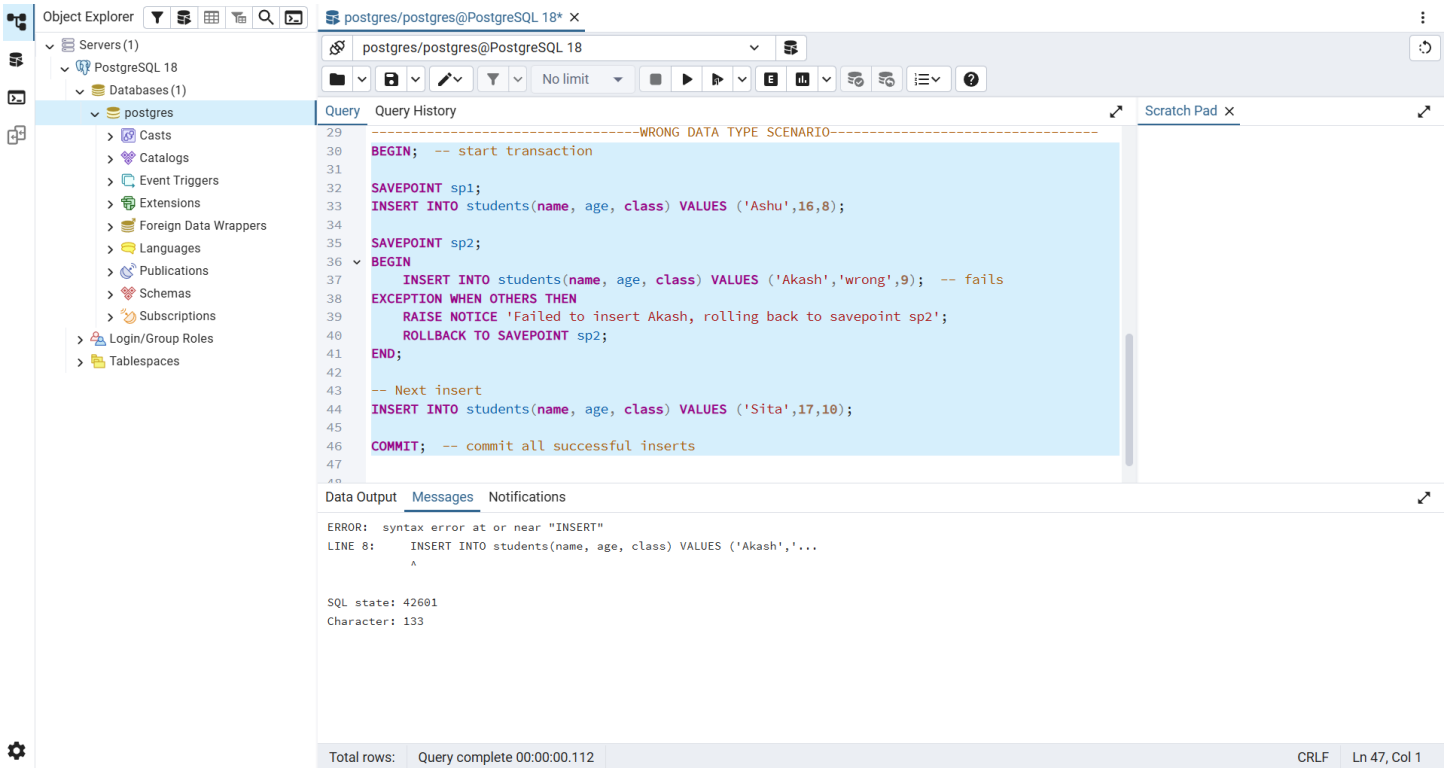
Tablespaces
postgres/postgres@PostgreSQL 18*
postgres/postgres@PostgreSQL 18
No limit
Query
Query History
Scratch Pad
DO $$
BEGIN
BEGIN
INSERT INTO students(name, age, class) VALUES ('Yash',17,8);
INSERT INTO students(name, age, class) VALUES ('Diksha',19,9);
INSERT INTO students(name, age, class) VALUES ('Ashu',16,8);
RAISE NOTICE 'Transaction Successfully Done';
EXCEPTION
WHEN OTHERS THEN
RAISE NOTICE 'Transaction Failed..! Rolling back changes.';
RAISE;
END;
END;
$$;
SELECT * FROM students;
Data Output
Messages
Notifications
NOTICE: Transaction Successfully Done
DO
Query returned successfully in 100 msec.
Query returned su
Total rows:
Query complete 00:00:00.100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Query
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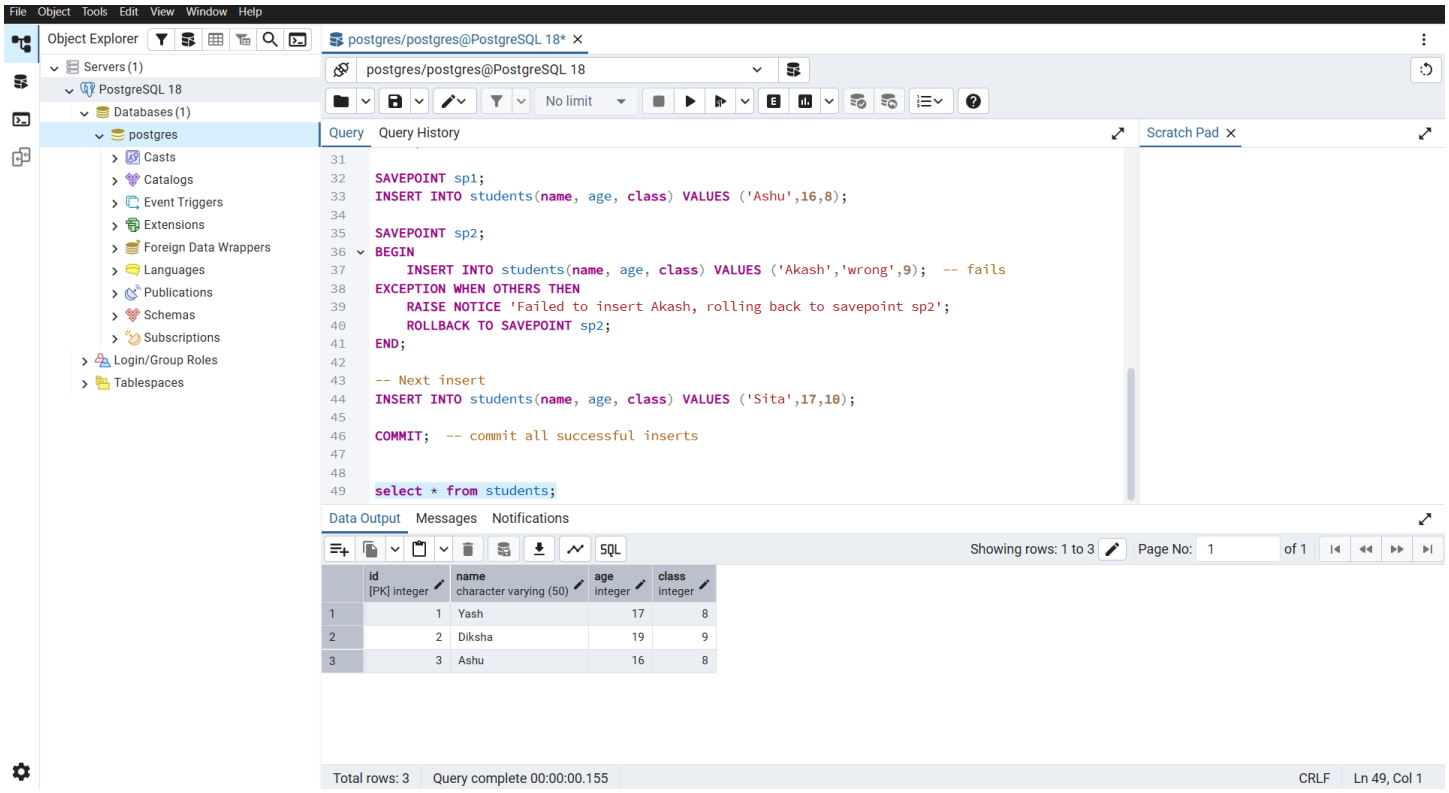
Scratch Pad
----------WRONG DATA TYPE SCENARIO----------
BEGIN; -- start transaction
SAVEPOINT sp1;
INSERT INTO students(name, age, class) VALUES ('Ashu',16,8);
SAVEPOINT sp2;
BEGIN
INSERT INTO students(name, age, class) VALUES ('Akash','wrong',9); -- fails
EXCEPTION WHEN OTHERS THEN
RAISE NOTICE 'Failed to insert Akash, 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
Data Output
Messages
Notifications
ERROR: syntax error at or near "INSERT"
LINE 8: INSERT INTO students(name, age, class) VALUES ('Akash','...
^
SQL state: 42601
Character: 133
Total rows:
Query complete 00:00:00.112
CRLF
Ln 47, Col 1


File Object Tools Edit View Window Help
Object Explorer
Servers (1)
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postgres/postgres@PostgreSQL 18
No limit
Query
Query History
Scratch Pad
31
32 SAVEPOINT sp1;
33 INSERT INTO students(name, age, class) VALUES ('Ashu',16,8);
34
35 SAVEPOINT sp2;
36 BEGIN
37 INSERT INTO students(name, age, class) VALUES ('Akash','wrong',9); -- fails
38 EXCEPTION WHEN OTHERS THEN
39 RAISE NOTICE 'Failed to insert Akash, rolling back to savepoint sp2';
40 ROLLBACK TO SAVEPOINT sp2;
41 END;
42
43 -- Next insert
44 INSERT INTO students(name, age, class) VALUES ('Sita',17,10);
45
46 COMMIT; -- commit all successful inserts
47
48
49 select * from students;
Data Output
Messages
Notifications
SQL
Showing rows: 1 to 3
Page No: 1 of 1
id [PK] integer
name character varying (50)
age integer
class integer
1 1 Yash 17 8
2 2 Diksha 19 9
3 3 Ashu 16 8
Total rows: 3
Query complete 00:00:00.155
CRLF
Ln 49, Col 1

3. 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.