CHANDIGARH UNIVERSITY
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Experiment 7

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Subject Name: ADBMS

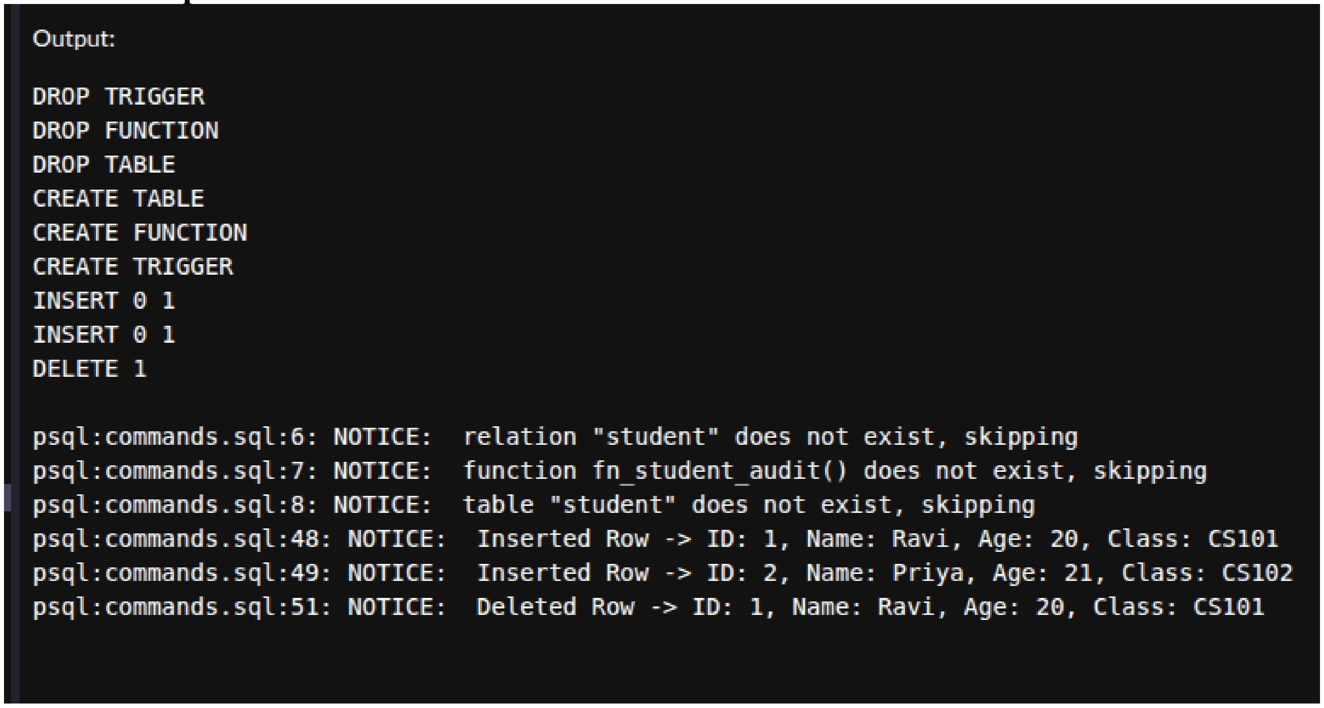
Subject Code: 23CSP-333

MEDIUM - LEVEL

1. **Problem Title:** Triggers Medium
2. **Problem Description:** WHENEVER THERE IS A INSERTION ON STUDENT TABLE THEN, THE CURRENTLY INSERTED OR DELETED ROW SHOULD BE PRINTED AS IT AS ON THE OUTPUT CONSOLE WINDOW.
3. **SQL Commands:**

```
CREATE TABLE student (
   id SERIAL PRIMARY KEY,
   name VARCHAR(50),
   age INT,
   class VARCHAR(10)
);

CREATE OR REPLACE FUNCTION fn_student_audit()
RETURNS TRIGGER
LANGUAGE plpgsql
AS
$$
BEGIN
   IF TG_OP = 'INSERT' THEN
      RAISE NOTICE 'Inserted Row -> ID: %, Name: %, Age: %, Class: %',
                NEW.id, NEW.name, NEW.age, NEW.class;
      RETURN NEW;
   ELSIF TG_OP = 'DELETE' THEN
      RAISE NOTICE 'Deleted Row -> ID: %, Name: %, Age: %, Class: %',
                  OLD.id, OLD.name, OLD.age, OLD.class;
      RETURN OLD;
   END IF;

   RETURN NULL;
END;
$$;

CREATE TRIGGER trg_student_audit
AFTER INSERT OR DELETE
ON student
FOR EACH ROW
EXECUTE FUNCTION fn_student_audit();



INSERT INTO student (name, age, class)
VALUES ('Ravi', 20, 'CS101');

DELETE FROM student WHERE id = 1;
```

4. **Output:**



```
Output:

DROP TRIGGER
DROP FUNCTION
DROP TABLE
CREATE TABLE
CREATE FUNCTION
CREATE TRIGGER
INSERT 0 1
INSERT 0 1
DELETE 1

psql:commands.sql:6: NOTICE:  relation "student" does not exist, skipping
psql:commands.sql:7: NOTICE:  function fn_student_audit() does not exist, skipping
psql:commands.sql:8: NOTICE:  table "student" does not exist, skipping
psql:commands.sql:48: NOTICE:  Inserted Row -> ID: 1, Name: Ravi, Age: 20, Class: CS101
psql:commands.sql:49: NOTICE:  Inserted Row -> ID: 2, Name: Priya, Age: 21, Class: CS102
psql:commands.sql:51: NOTICE:  Deleted Row -> ID: 1, Name: Ravi, Age: 20, Class: CS101
```

Fig1: View OUTPUT

Learning Outcomes:

- I learned how to create new triggers.
- I learned how to perform different types of triggers.
- I learned how to create triggers with specific types.

HARD - LEVEL

5. **Problem Title:** Triggers Hard level
6. **Problem Description:** Whenever a new employee is inserted in tbl_employee, a record should be added to tbl_employee_audit like: "Employee name <emp_name> has been added at <current_time>" Whenever an employee is deleted from tbl_employee, a record should be added to tbl_employee_audit like:
"Employee name <emp_name> has been deleted at <current_time>"

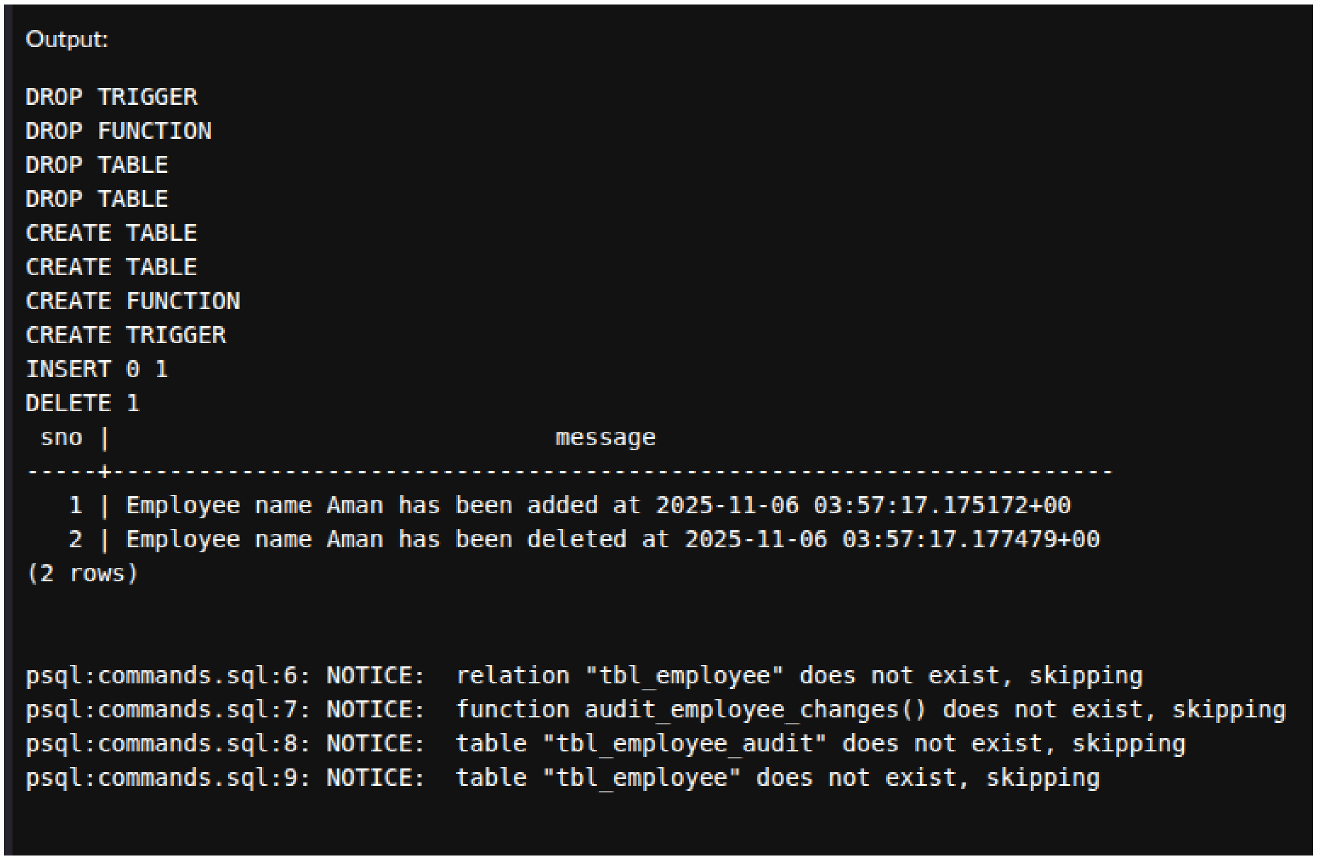
   The solution must use PostgreSQL triggers.

7. **SQL Commands:**

```
CREATE TABLE tbl_employee (
   emp_id SERIAL PRIMARY KEY,
   emp_name VARCHAR(100) NOT NULL,
   emp_salary NUMERIC
);

CREATE TABLE tbl_employee_audit (
   sno SERIAL PRIMARY KEY,
   message TEXT
);



CREATE OR REPLACE FUNCTION audit_employee_changes()
RETURNS TRIGGER
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;
$$



CREATE TRIGGER trg_employee_audit
AFTER INSERT OR DELETE
ON
tbl_employee
FOR EACH ROW
EXECUTE FUNCTION audit_employee_changes();


INSERT INTO tbl_employee(emp_name, emp_salary) VALUES ('Aman',
50000);

DELETE FROM tbl_employee WHERE emp_name = 'Aman';

SELECT * FROM tbl_employee_audit;
```

8. Output:



```
Output:

DROP TRIGGER
DROP FUNCTION
DROP TABLE
DROP TABLE
CREATE TABLE
CREATE TABLE
CREATE FUNCTION
CREATE TRIGGER
INSERT 0 1
DELETE 1
 sno |                              message
-----+---------------------------------------------------------------------
   1 | Employee name Aman has been added at 2025-11-06 03:57:17.175172+00
   2 | Employee name Aman has been deleted at 2025-11-06 03:57:17.177479+00
(2 rows)


psql:commands.sql:6: NOTICE:  relation "tbl_employee" does not exist, skipping
psql:commands.sql:7: NOTICE:  function audit_employee_changes() does not exist, skipping
psql:commands.sql:8: NOTICE:  table "tbl_employee_audit" does not exist, skipping
psql:commands.sql:9: NOTICE:  table "tbl_employee" does not exist, skipping
```

Fig1: View OUTPUT

9. Learning Outcomes:

- I learned how to create triggers.
- I learned how to perform types of triggers.