

Experiment 2

AIM:- Create a PostgreSQL Query for Department-Course Subquery and Access Control

Explanation:- Here in this query we will be looking forward to create three tables named Students, Courses and Enrolments with three students named Ashish, Samaran and Vaibhav along with their courses called DBMS, Operating System and Computer Networks and for the Access control we will be creating a user with any name and for granting the permission for any kind of statement like Select statements we will use the keyword Grant and in order to take that granted permission back we will be using the keyword Revoke

Code:

--creating the tables we use the following queries

```
CREATE TABLE Students(student_id INT PRIMARY KEY, name VARCHAR(100),  
dob DATE);
```

```
CREATE TABLE Courses(course_id INT PRIMARY KEY, title VARCHAR(100));
```

```
CREATE TABLE Enrollments(enroll_id INT PRIMARY KEY, student_id INT,  
course_id INT, grade VARCHAR(2), FOREIGN KEY (student_id) REFERENCES  
Students(student_id), FOREIGN KEY (course_id) REFERENCES  
Courses(course_id));
```

--for inserting the values to the table we use the following queries

```
Insert into Students( student_id, name, dob) values(1, 'Ashish', '2002-03-14'), (2,  
'Samaran', '2003-01-05') , (3, 'Vaibhav', '2003-01-05');
```

```
Insert into Courses(course_id, title) values (101,'DBMS') , (102,'Operating System') ,  
(103 , 'Computer Networks');
```

```
Insert into Enrollments(enroll_id, student_id, course_id, grade) values (1, 1, 101, 'A')  
, (2, 1, 102, 'B+');
```

--To showcase all the tables so created we use the following queries

```
Select * from Students;
```

```
Select * from Courses;
```

```
select * from Enrollments;
```

-- to delete the table

DROP TABLE Courses;

DROP TABLE Students;

DROP TABLE Enrollments;

Begin; *--here the (TCL) starts*

Savepoint Here; *--here we create a checkpoint*

select * from Enrollments; *--for showcasing the table*

INSERT INTO Enrollments(enroll_id, student_id, course_id, grade) VALUES (1, 2, 103, 'A+'); *-- This is created to fail intentionally*

Rollback to savepoint Here; *--Checkpoint created*

COMMIT; *-- used to to finalize the safe state*

SELECT Students.name AS student_name, Courses.title AS course_title,
Enrollments.grade

FROM Enrollments JOIN Students ON Enrollments.student_id = Students.student_id
JOIN Courses ON Enrollments.course_id = Courses.course_id; *--the tables created
above are joined together to make all data required by the dev to be showcased the
way we want in lesser time*

OUTPUT:

Students table

	student_id [PK] integer	name character varying (100)	dob date
1	1	Ashish	2002-03-14
2	2	Samaran	2003-01-05
3	3	Vaibhav	2003-01-05

✓ Successfully run. Total query runtime: 102 msec. 3 rows affected. ✕

Total rows: 3 Query complete 00:00:00.102

CRLF Ln 10, Col 1

Courses table

Data OutputMessagesNotifications

SQL

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

	course_id [PK] integer	title character varying (100)
1	101	DBMS
2	102	Operating System
3	103	Computer Networks

Total rows: 3Query complete 00:00:00.079

✓ Successfully run. Total query runtime: 79 msec. 3 rows affected.

CRLF Ln 11, Col 1

Enrollment table

Data OutputMessagesNotifications

SQL

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

	enroll_id [PK] integer	student_id integer	course_id integer	grade character varying (2)
1	1	1	101	A
2	2	1	102	B+
3	3	1	103	A

Total rows: 3Query complete 00:00:00.101

✓ Successfully run. Total query runtime: 101 msec. 3 rows affected.

CRLF Ln 12, Col 1

Begin statement starts

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BEGIN

Query returned successfully in 41 msec.

Total rows:Query complete 00:00:00.041

✓ Query returned successfully in 41 msec.

CRLF Ln 18, Col 6

Savepoint created

Data OutputMessagesNotifications

SAVEPOINT

Query returned successfully in 35 msec.

Total rows:Query complete 00:00:00.035

✓ Query returned successfully in 35 msec.

CRLF Ln 20, Col 1

The failed testcase as mentioned in the code

Data Output

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ERROR: duplicate key value violates unique constraint "enrollments_pkey"
Key (enroll_id)=(1) already exists.

SQL state: 23505
Detail: Key (enroll_id)=(1) already exists.

Total rows: Query complete 00:00:00.040CRLF Ln 22, Col 1

Rolled back to the savepoint successfully

Data Output

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Notifications

ERROR: duplicate key value violates unique constraint "enrollments_pkey"
Key (enroll_id)=(1) already exists.

SQL state: 23505
Detail: Key (enroll_id)=(1) already exists.

Total rows: Query complete 00:00:00.040CRLF Ln 22, Col 1

Changes made successfully

Data Output

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Notifications

COMMIT

Query returned successfully in 33 msec.

✓ Query returned successfully in 33 msec. ✕

Total rows: Query complete 00:00:00.033CRLF Ln 24, Col 7

Final table after the joints are made

Data Output

Messages

Notifications

Showing rows: 1 to 3

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	student_name character varying (100)	course_title character varying (100)	grade character varying (2)
1	Ashish	DBMS	A
2	Ashish	Operating System	B+
3	Ashish	Computer Networks	A

✓ Successfully run. Total query runtime: 42 msec. 3 rows affected. ✕

Total rows: 3 Query complete 00:00:00.042CRLF Ln 27, Col 138

Learning Outcomes:

1. we learnt how the tables are created and how the values are inserted

2. we learnt how the TCL commands are used (Begin, Savepoint, Rollback, Commit)
3. we learnt about joins of the tables