

## EXPERIMENT – 02

**AIM:** Department-Course Subquery and Access Control

### THEORY:

- A **subquery** is a SELECT statement embedded within another query. It executes first and provides a result that the outer query uses—often within the WHERE clause—to filter data dynamically. For example, you can retrieve all employees working in the same department as 'John' without separately identifying his department.
- **Access control** in databases ensures security by defining what actions users can perform. Administrators use the GRANT command to provide permissions like SELECT or UPDATE, and the REVOKE command to withdraw them. This mechanism helps prevent unauthorized access and maintains data integrity.

### SQL QUERIES:

1. To create two tables- Departments and courses:  
create table department\_paras(dept\_id int primary key ,  
dept\_name VARCHAR(50));  
create table courses\_paras(course\_id int primary key ,  
course\_name VARCHAR(100) , dept\_id int, foreign key(dept\_id)  
REFERENCES department\_paras(dept\_id));

2. To insert values into Departments and Courses and display the table:

```
insert into department_paras values(1,'Computer Science'),(2,'Electrical'),(3,'Mechanical'),(4,'Civil'),(5,'Electronics');
```

```
insert into courses_paras values(101,'DBMS',1),(102,'Operating Systems',1),(103,'Power Systems',2),(104,'Digital Circuits',2),(105,'Thermodynamics',3),(106,'Fluid Mechanics',4),(107,'Structural Engineering',4),(108,'Surveying',4),(109,'Embedded Systems',5),(110,'VLSI Design',5);
```

```
select * from department_paras;
```

Query Query History

```
1 create table department_paras(dept_id int primary key , dept_name VARCHAR(50));
2 create table courses_paras(course_id int primary key , course_name VARCHAR(100) , dept_id int, for
3 insert into department_paras values(1,'Computer Science'),(2,'Electrical'),(3,'Mechanical'),(4,'C
4
5 insert into courses_paras values(101,'DBMS',1),(102,'Operating Systems',1),(103,'Power Systems',2,
6
7 select * from department_paras;
8 select * from courses_paras;
9 select dept_name from department_paras where dept_id in (select dept_id from courses_paras group b
10 create user viewer_user with password '123';
11
12 grant select on courses_paras to viewer_user
13
```

Data Output Messages Notifications

Showing rows: 1 to 5

	dept_id [PK] integer	dept_name character varying (50)
1	1	Computer Science
2	2	Electrical
3	3	Mechanical
4	4	Civil
5	5	Electronics

```
select * from courses_paras;
```

Query Query History

```
1 create table department_paras(dept_id int primary key , dept_name VARCHAR(50));
2 create table courses_paras(course_id int primary key , course_name VARCHAR(100) , dept_id int, for
3 insert into department_paras values(1,'Computer Science'),(2,'Electrical'),(3,'Mechanical'),(4,'C
4
5 insert into courses_paras values(101,'DBMS',1),(102,'Operating Systems',1),(103,'Power Systems',2,
6
7 select * from department_paras;
8 select * from courses_paras;
9 select dept_name from department_paras where dept_id in (select dept_id from courses_paras group b
10 create user viewer_user with password '123';
11
12 grant select on courses_paras to viewer_user
13
```


Data Output Messages Notifications

Showing rows: 1 to 10

	course_id [PK] integer	course_name character varying (100)	dept_id integer
1	101	DBMS	1
2	102	Operating Systems	1
3	103	Power Systems	2
4	104	Digital Circuits	2
5	105	Thermodynamics	3
6	106	Fluid Mechanics	4
7	107	Structural Engineering	4
8	108	Surveying	4
9	109	Embedded Systems	5

### 3.Retrieve Departments Offering More Than Two Courses Using Subquery:

```
select dept_name from department_paras where dept_id in (select
dept_id from courses_paras group by dept_id having
count(course_name)>2);
```

	dept_name character varying (50) 
1	Civil

#### 4. Grant SELECT Access on Courses Table Using DCL

create user viewer\_user with password '123';

grant select on courses\_paras to viewer\_user

---

Data Output Messages Notifications

---

GRANT

Query returned successfully in 48 msec.

**CONCLUSION: Subqueries** enhance query flexibility by allowing dynamic data filtering based on results from other queries.

**Access control** is essential for database security, ensuring that only authorized users can view or modify data.