



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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Experiment 1

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Section/Group: 25MAM-1A

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Subject Name: Technical Training

Subject Code: 25CAP-652

1.

Aim:

To design and implement a sample database system using DDL, DML, and DCL commands, including database creation, data manipulation, schema modification, and role-based access control to ensure data integrity and secure, read-only access for authorized users.

2.

Objective:

To gain practical experience in implementing Data Definition Language (DDL), Data Manipulation Language (DML), and Data Control Language (DCL) operations in a real database environment. This will also include implementing role-based privileges to secure data.

3.

Implementation/Code:

```
-- QUERY FROM postgres
```

```
-- DDL
```

```
-- DEPARTMENT TABLE CREATE
```

```
TABLE department( department_id
```

```
INT PRIMARY KEY,
```

```
department_name VARCHAR(20) NOT NULL UNIQUE, salary
```

```
FLOAT CHECK(salary>=0)
```



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);

-- EMPLOYEE TABLE

CREATE TABLE employee(

employee_id INT PRIMARY KEY, employee_name

VARCHAR(20) NOT NULL,

department_id INT NOT NULL REFERENCES department(department_id),

employee_contact VARCHAR(20), join_date DATE NOT NULL, end_date

DATE CHECK(end_date>=join_date)

);

ALTER TABLE employee ADD work_location VARCHAR(20);

ALTER TABLE employee DROP work_location;

ALTER TABLE employee ADD status VARCHAR(20) DEFAULT 'active';

-- PROJECT TABLE CREATE

TABLE project(project_id INT

PRIMARY KEY,

project_name VARCHAR(20) NOT NULL UNIQUE,

department_id INT NOT NULL REFERENCES department(department_id),

start_date DATE NOT NULL,

end_date DATE CHECK(end_date>=start_date)

);

-- DML

INSERT INTO department

VALUES

(101,'Manager',90000),

(102,'HR',70000),

(103,'EMPLOYEE',50000);



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```
UPDATE department SET salary=80000 WHERE department_id=101;
```

```
UPDATE department SET department_name='Employee' WHERE department_id=103;
```

```
INSERT INTO department  
VALUES  
(104,'DEVELOPER',-30000);
```

```
INSERT INTO department  
VALUES  
(104,'DEVELOPER',30000);
```

```
DELETE FROM department WHERE department_id=104;
```

```
INSERT INTO employee  
VALUES  
(1,'Rahul',101,8888888888,'2001-04-12','2010-07-13'),  
(2,'Anuj',102,7777777777,'2003-06-10','2004-05-11'),  
(3,'Aman',103,6666666666,'2006-05-20','2009-09-11'),  
(4,'Naman',103,5555555555,'2006-06-25','2009-08-11'),  
(5,'Karan',103,4444444444,'2006-03-12','2009-05-11');
```

```
DELETE FROM employee WHERE employee_id=3;
```

```
INSERT INTO project  
VALUES  
(11,'P1',103,'2025-08-14','2025-09-14'),  
(12,'P2',103,'2025-08-14','2025-08-30');
```

```
-- DQL
```



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```
SELECT * FROM department;
```

```
SELECT * FROM employee;
```

```
SELECT * FROM project;
```

-- DCL

```
CREATE ROLE reporting_user
```

```
LOGIN
```

```
PASSWORD
```

```
'user123';
```

```
GRANT SELECT ON department TO reporting_user;
```

```
REVOKE SELECT ON department FROM reporting_user;
```

```
GRANT SELECT ON project TO reporting_user;
```

```
REVOKE CREATE ON SCHEMA PUBLIC FROM reporting_user;
```

-- QUERY FROM reporting_user

```
SELECT * FROM project;
```

4. Output:



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```
53 VALUES
54 (1,'Rahul',101,8888888888,'2001-04-12','2010-07-13'),
55 (2,'Anuj',102,7777777777,'2003-06-10','2004-05-11'),
56 (3,'Aman',103,6666666666,'2006-05-20','2009-09-11'),
57 (4,'Naman',103,5555555555,'2006-06-25','2009-08-11'),
58 (5,'Karan',103,4444444444,'2006-03-12','2009-05-11');
59
60 DELETE FROM employee WHERE employee_id=3;
61
62 INSERT INTO project
63 VALUES
64 (11,'P1',103,'2025-08-14','2025-09-14'),
65 (12,'P2',103,'2025-08-14','2025-08-30');
66
```

Data Output Messages Notifications

	employee_id [PK] integer	employee_name character varying (20)	department_id integer	employee_contact character varying (20)	join_date date	end_date date	status character varying (20)
1	1	Rahul	101	8888888888	2001-04-12	2010-07-13	active
2	2	Anuj	102	7777777777	2003-06-10	2004-05-11	active
3	4	Naman	103	5555555555	2006-06-25	2009-08-11	active
4	5	Karan	103	4444444444	2006-03-12	2009-05-11	active

5. Learning Outcomes:

1. About query writing in PostgreSQL.
2. About various DDL, DML and DCL commands.
3. About the application of CHECK constraint.
4. About role-based privileges to secure data.