



Worksheet 1

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Branch:MCA (AI&ML)
Semester:2nd
Subject Name:- DBMS LAB

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Section/Group:1/A
Date of Performance:13/01/2026
Subject Code: 25CAP652

1. Aim of the Session

To design and implement a sample database system using DDL, DML, and DCL commands for managing departments, employees, and projects, and to apply role-based access control for secure data handling.

2. Objective of the Session

After completing this practical, the student will be able to:

- Understand the use of DDL commands to create and modify database structures.
- Perform DML operations such as INSERT, UPDATE, DELETE, and SELECT.
- Implement relationships using primary and foreign keys.
- Apply DCL commands to manage roles and privileges.
- Analyze input and output of SQL queries in a real database environment.

3. Practical / Experiment Steps

Design the database schema for Department, Employee, and Project tables.

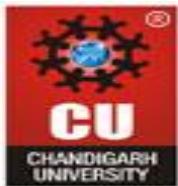
Create tables using appropriate constraints.

Insert sample records into tables.

Perform update and delete operations.

Retrieve data using SELECT queries.

Create a role and grant/revoke privileges.



Alter and drop database objects.

4. Procedure of the Practical

- (i) Start the system and log in to the computer.
- (ii) Open PostgreSQL software.
- (iii) create database CompanyDB;
- (iv) Create tables using DDL commands.

create table Department

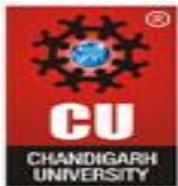
```
create table Department(  
Dept_id int primary key,  
Dept_name varchar(20) not null unique  
);
```

create table Employee

```
create table Employee(  
Emp_id int primary key ,  
Emp_name varchar(20)not null,  
Emp_email varchar(20) unique not null,  
Emp_phone varchar(20) unique not null,  
Dept_id int ,  
foreign key (Dept_id)references Department(Dept_id)  
);
```

create table Project

```
create table Project(  
Proj_id integer primary key,  
Proj_name varchar(20) not null,  
Proj_startDate varchar(20) not null,
```



Proj_EndDate varchar(20) not null,
Proj_Assign_Emp int,
foreign key (Proj_Assign_Emp) references Employee(Emp_id)
);

(v) Insert records using DML commands.

insert into Department values

insert into Department (Dept_id,Dept_name)

values

(1, 'Human Resources'),

(2, 'Engineering'),

(3, 'Marketing'),

(4, 'Finance');



| | dept_id [PK] integer | dept_name character varying (20) |
|---|-------------------------|-------------------------------------|
| 1 | 1 | Human Resources |
| 2 | 2 | Engineering |
| 3 | 3 | Marketing |
| 4 | 4 | Finance |

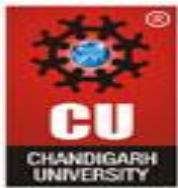
insert into Employee values

insert into Employee (Emp_id,Emp_name,Emp_email,Emp_phone,Dept_id)

values

(101, 'Amit Sharma', 'amit@gmail.com', '9876543210', 2),

(102, 'Neha Verma', 'neha@gmail.com', '9123456780', 2),



(103, 'Rohit Singh', 'rohit@gmail.com', '9988776655', 1),

(104, 'Priya Mehta', 'priya@gmail.com', '9090909090', 3),

(105, 'Ram Sen', 'Ram@gmail.com', '5555555555', 4);

| | emp_id [PK] integer | emp_name character varying (20) | emp_email character varying (20) | emp_phone character varying (20) | dept_id integer |
|---|------------------------|------------------------------------|-------------------------------------|-------------------------------------|--------------------|
| 1 | 101 | Amit Sharma | amit@gmail.com | 9876543210 | 2 |
| 2 | 102 | Neha Verma | neha@gmail.com | 9123456780 | 2 |
| 3 | 104 | Priya Mehta | priya@gmail.com | 9090909090 | 3 |
| 4 | 105 | Ram Sen | Ram@gmail.com | 5555555555 | 4 |
| 5 | 103 | Rohit Singh | rohit@gmail.com | 9988776655 | 1 |

insert into Project values

insert into Project(Proj_id, Proj_name, Proj_startDate, Proj_EndDate, Proj_Assign_Emp)

values

(1, 'AI Chatbot', '2026-01-01', '2026-06-30', 101),

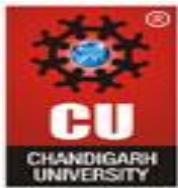
(2, 'E-Commerce App', '2026-02-01', '2026-07-31', 102),

(3, 'HR Portal', '2026-03-15', '2026-05-30', 103),

(4, 'Marketing Website', '2026-01-20', '2026-04-20', 104),

(5, 'Finance Website', '2025-01-20', '2026-04-20', 105);

| | proj_id [PK] integer | proj_name character varying (20) | proj_startdate character varying (20) | proj_enddate character varying (20) | proj_assign_emp integer |
|---|-------------------------|-------------------------------------|--|--|----------------------------|
| 1 | 1 | AI Chatbot | 2026-01-01 | 2026-06-30 | 101 |
| 2 | 2 | E-Commerce App | 2026-02-01 | 2026-07-31 | 102 |
| 3 | 3 | HR Portal | 2026-03-15 | 2026-05-30 | 103 |
| 4 | 4 | Marketing Website | 2026-01-20 | 2026-04-20 | 104 |
| 5 | 5 | Finance Website | 2025-01-20 | 2026-04-20 | 105 |



(vi) Update and delete records.

update Employee set Dept_id=4 where Emp_id=103;

| | emp_id [PK] integer | emp_name character varying (20) | emp_email character varying (20) | emp_phone character varying (20) | dept_id integer |
|---|------------------------|------------------------------------|-------------------------------------|-------------------------------------|--------------------|
| 1 | 101 | Amit Sharma | amit@gmail.com | 9876543210 | 2 |
| 2 | 102 | Neha Verma | neha@gmail.com | 9123456780 | 2 |
| 3 | 104 | Priya Mehta | priya@gmail.com | 9090909090 | 3 |
| 4 | 105 | Ram Sen | Ram@gmail.com | 5555555555 | 4 |
| 5 | 103 | Rohit Singh | rohit@gmail.com | 9988776655 | 4 |

delete Employee Data Emp=105

-- But the problem is, I was assigned project to employee .First, i need to delete or update project .Then I will delete employee

delete from Project where Proj_Assign_Emp=105;

| | proj_id [PK] integer | proj_name character varying (20) | proj_startdate character varying (20) | proj_enddate character varying (20) | proj_assign_emp integer |
|---|-------------------------|-------------------------------------|--|--|----------------------------|
| 1 | 1 | AI Chatbot | 2026-01-01 | 2026-06-30 | 101 |
| 2 | 2 | E-Commerce App | 2026-02-01 | 2026-07-31 | 102 |
| 3 | 3 | HR Portal | 2026-03-15 | 2026-05-30 | 103 |
| 4 | 4 | Marketing Website | 2026-01-20 | 2026-04-20 | 104 |

delete from Employee where Emp_id=105;

| | emp_id [PK] integer | emp_name character varying (20) | emp_email character varying (20) | emp_phone character varying (20) | dept_id integer |
|---|------------------------|------------------------------------|-------------------------------------|-------------------------------------|--------------------|
| 1 | 101 | Amit Sharma | amit@gmail.com | 9876543210 | 2 |
| 2 | 102 | Neha Verma | neha@gmail.com | 9123456780 | 2 |
| 3 | 104 | Priya Mehta | priya@gmail.com | 9090909090 | 3 |
| 4 | 103 | Rohit Singh | rohit@gmail.com | 9988776655 | 4 |

(vii) Create role and assign privileges.

create role CEO login password 'CEO';

Add New Connection

| | |
|----------|-------------------|
| Server | PostgreSQL 18 |
| Database | Experiment1 |
| User | ceo |
| Role | Select an item... |

Experiment1/ceo@PostgreSQL 18

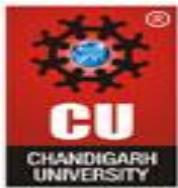
grant select on Employee, Department, Project to CEO;

revoke select on Department from CEO;

(viii) Alter and drop table.

alter table Employee add Address varchar(30);

| | emp_id [PK] integer | emp_name character varying (20) | emp_email character varying (20) | emp_phone character varying (20) | dept_id integer | address character varying (30) |
|---|------------------------|------------------------------------|-------------------------------------|-------------------------------------|--------------------|-----------------------------------|
| 1 | 101 | Amit Sharma | amit@gmail.com | 9876543210 | 2 | [null] |
| 2 | 102 | Neha Verma | neha@gmail.com | 9123456780 | 2 | [null] |
| 3 | 104 | Priya Mehta | priya@gmail.com | 9090909090 | 3 | [null] |
| 4 | 103 | Rohit Singh | rohit@gmail.com | 9988776655 | 4 | [null] |



drop table Project;

73 drop table Project;

Data Output Messages Notifications

ERROR: relation "project" does not exist
LINE 1: select*from Project;
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Learning Outcomes

- Understood the basics of relational database design using tables, keys, and relationships.
- Learned to apply primary and foreign key constraints to maintain data integrity.
- Gained hands-on experience with INSERT, UPDATE, and DELETE operations.
- Understood role-based access control using GRANT and REVOKE.
- Learned how to create read-only users for secure data access.
- Practiced ALTER TABLE and DROP TABLE commands for schema management.