**Lab Exercise 12- Logical Backups Using pg\_dump and pg\_restore**

**Objective**

* Perform logical backups of a PostgreSQL database
* Restore the database using pg\_restore
* Use both plain and custom backup formats
* Understand how to back up and restore specific objects like tables

**Prerequisites**

* PostgreSQL installed on a Windows system
* The PostgreSQL bin folder added to the system PATH  
  (for example: C colon backslash Program Files backslash PostgreSQL backslash fifteen backslash bin)
* Access to the command prompt or PowerShell
* A PostgreSQL user with permission to connect to the database

**Step 1: Create a Sample Database**

1. Open pgAdmin or SQL Shell and run the following:

Create a database named backup\_test

Create a table named employees with some sample rows

CREATE DATABASE backup\_test;

\c backup\_test

CREATE TABLE employees (

id SERIAL PRIMARY KEY,

name TEXT,

department TEXT

);

INSERT INTO employees (name, department)

VALUES ('Alice', 'HR'), ('Bob', 'IT'), ('Charlie', 'Finance');

**Step 2: Perform a Backup Using Plain SQL Format**

1. Open Command Prompt
2. Run the following command

pg\_dump -U postgres -d backup\_test -f "C:\temp\backup\_test.sql"l

Explanation:

* -U specifies the username
* -d is the name of the database
* -f specifies the file path to save the backup
* This creates a plain SQL file that can be opened and edited

**Step 3: Restore Using Plain SQL Format**

1. Create a new database to restore into

createdb -U postgres backup\_test\_restore

1. Restore using psql command

psql -U postgres -d backup\_test\_restore -f "C:\temp\backup\_test.sql"

**Step 4: Perform a Backup Using Custom Format**

1. Run this command in Command Prompt

pg\_dump -U postgres -d backup\_test -F c -f "C:\temp\backup\_custom.backup"

Explanation:

* -F c means custom format
* This format is not human-readable but allows flexible restore

**Step 5: Restore Using pg\_restore**

1. Create a new database for restore

createdb -U postgres backup\_custom\_restore

1. Run pg\_restore

pg\_restore -U postgres -d backup\_custom\_restore "C:\temp\backup\_custom.backup"

**Step 6: Backup and Restore a Specific Table**

1. Backup only the employees table

pg\_dump -U postgres -d backup\_test -t employees -f "C:\temp\employees\_table.sql"

1. Create a new database and restore only that table

createdb -U postgres employees\_restore

psql -U postgres -d employees\_restore -f "C:\temp\employees\_table.sql"

**Step 7: Verify the Restored Data**

Connect to each restored database and check the data

SELECT \* FROM employees;