Lab 01: Introduction to PostgreSQL, PostGIS, pgAdmin

Due date: Wednesday, January 26, 2025 submitted as Word document to Canvas Lab01 link

This lab counts 8 % toward your total grade.

Objectives: In this lab, you will practice your skills in

- a) Create a database in pdAdmin
- b) Query tool in pgAdmin
- c) Basic SQL
- d) SQL sheel (psql)

Format of answer: Submit your answers as a **Word document or pdf** with graphs under **Output** section, properly labeled in the task sequence.

Notice: All SQL commands are in blue color

Task 1: Create a database in pdAdmin (2 pts)

Before you create a database, you should have a server under Servers section in the left panel. Launch pdAdmin.

- a) Right-click Databases under your connected server.
- b) Select Create > Database.
- c) In the **General** section, enter the name of your database (name: test).
- d) **Owner:** Choose your PostgreSQL username (default owner: postgres).
- e) Expand Databases under your connected server. You should see your new database listed.

≡ Create - Database					· · ·	×
General Definition	Security P	arameters	Advanced	SQL		
Database	test					
OID						
Owner	🐣 poste	gres				I ~
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Task 1 Output: Take a screenshot of the test database under the Database section in pgAdmin.

Task 2: Add extension to database (2 pts)

Pre-requisite: Make sure PostGIS is installed.

- a) Right-click on the target **database** (e.g., test).
- b) Select **Query Tool** from the context menu.
- c) In the **Query Tool**, run the following SQL command:

CREATE EXTENSION postgis;

Explanation: This command enables the **PostGIS** extension in your database. PostGIS provides spatial types (e.g., geometry, geography) and functions for spatial operations.

d) To check if the **PostGIS** extension is successfully installed, run this query:

SELECT * FROM pg_extension;

	oid [PK] oid	extname name	extowner 🖍	extnamespace oid	extrelocatable 🖍	extversion text	extconfig oid[]	extcondition text[]
1	15054	plpgsql	10	11	false	1.0	[null]	[null]
2	25659	postgis	10	2200	false	3.5.0	{25981}	{"WHERE NOT (

- e) Alternatively, you can verify it from **pgAdmin**:
 - 1. In the **Object Browser**, expand **Databases > [Your Database] > Extensions**.

2. You should see **postgis** listed.

Task 2 Output: Take a screenshot of the postgis extension under the Extensions section in pgAdmin.

Task 3: SQL Shell (psql) (2 pts)

a) Launch SQL Shell (psql) from your system.



- b) You will be prompted to provide the following details:
 - 1) Server: Press Enter to use the default (localhost).
 - 2) Database: Press Enter to connect to the default (postgres).
 - 3) **Port**: Press **Enter** to use the default (5432).
 - 4) Username: Enter your PostgreSQL username (e.g., postgres).
 - 5) **Password:** Enter your **PostgreSQL password**.

SQL Shell (psql) × + ∨							
Server [localhost]: localhost Database [postgres]: postgres Port [5432]: 5432 Username [postgres]: postgres Password for user postgres:							
psql (17.2) WARNING: Console code page (437) differs from Windows code page (1252) 8-bit characters might not work correctly. See psql reference page "Notes for Windows users" for details. Type "help" for help.							
postgres=#							

c) run the following SQL command to create a new database:

CREATE DATABASE test_psql;

d) To switch to your newly created database, use the \c command:

\c test_psql

You'll see a message like this: You are now connected to database " test_psql " as user "postgres".

e) To list all databases, use:

AL CONTRACT								
test_psql=# \l								
	List of databases							
Name	Owner	Encoding	Locale Provider	Collate	Ctype	Locale	ICU Rules	Access privileges
postois 35 sample	postares	+ UTF8	libc	English United States.1252	+ English United States.1252	+ 		
postgres	postgres	UTF8	libc	English_United States.1252	English_United States.1252	i i		
spatialanalysis	postgres	UTF8	libc	English_United States.1252	English_United States.1252	i i		
template0	postgres	UTF8	libc	English_United States.1252	English_United States.1252			=c/postgres +
								postgres=CTc/postgres
template1	postgres	UTF8	libc	English_United States.1252	English_United States.1252			=c/postgres +
								postgres=CTc/postgres
test	postgres	UTF8	libc	English_United States.1252	English_United States.1252			
test02	postgres	UTF8	libc	English_United States.1252	English_United States.1252			
test_psql	postgres	UTF8	libc	English_United States.1252	English_United States.1252			
(8 rows)								

f) Refresh the Database under your server then you will see the 'test_psql' under your Databases.



Task 3 Output: Take a screenshot of the test_psql database under the Databases section in pgAdmin.

Task 4: Delete a database (test_psql) in psql. (2 pts)

Important:

When you delete (DROP) a database in PostgreSQL, all data, tables, and relationships inside the database are permanently removed. This action cannot be undone 😟.

- a) Disconnect from the database (test_psql) you want to delete. You cannot delete a database you are currently connected to. Make sure you are connected to a different database (like postgres) in psql and pgAdmin.
 - 1) To disconnect test_psql in psal, you need switch to another database (e.g., postgres), run:

\c postgres

- Disconnect test_psql in pgAdmin.
 In pgAdmin, right click test_psql and select **Disconnect from Database**.
- b) Use the DROP DATABASE command to delete the database (test_psql) in psql DROP DATABASE test_psql;

Task 4 Output: Take a screenshot of all databases under the Databases section in pgAdmin. The test_psql database should have a red cross on it, indicating that this database has been deleted.