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

1. Create a database in pdAdmin
2. Query tool in pgAdmin
3. Basic SQL
4. 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.

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

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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.

1. Right-click on the target **database** (e.g., test).
2. Select **Query Tool** from the context menu.
3. 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.

1. To check if the **PostGIS** extension is successfully installed, run this query:

SELECT \* FROM pg\_extension;

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1. Alternatively, you can verify it from **pgAdmin**:
2. In the **Object Browser**, expand **Databases > [Your Database] > Extensions**.
3. 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)

1. Launch **SQL Shell (psql)** from your system.

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1. 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**.

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1. run the following SQL command to create a new database:

CREATE DATABASE test\_psql;

1. 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".

1. To list all databases, use:

\l

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1. Refresh the Database under your server then you will see the ‘test\_psql’ under your Databases.

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### 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 😟.**

1. 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.
2. To disconnect test\_psql in psal, you need switch to another database (e.g., postgres), run:

\c postgres

1. Disconnect test\_psql in pgAdmin.

In pgAdmin, right click test\_psql and select **Disconnect from Database.**

1. 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.