**Lab Exercise 1- Exploring PostgreSQL System Catalogs**

**Objective**

Learn how to query PostgreSQL system catalogs to extract metadata about tables, columns, constraints, roles, and more.

**Pre-requisites**

* PostgreSQL installed and running
* Access to psql or any SQL client
* A sample database (like dvdrental or any test schema with multiple tables)

**Part 1: Inspect Tables and Columns**

**1. List all user-defined tables**

SELECT relname AS table\_name

FROM pg\_class

JOIN pg\_namespace ON pg\_class.relnamespace = pg\_namespace.oid

WHERE relkind = 'r' AND nspname NOT LIKE 'pg\_%' AND nspname <> 'information\_schema';

**Expected Output:**  
A list of table names excluding system and information\_schema tables.

**2. Describe columns in a specific table**

SELECT attname AS column\_name,

atttypid::regtype AS data\_type,

attnotnull AS not\_null

FROM pg\_attribute

WHERE attrelid = 'your\_table\_name'::regclass

AND attnum > 0 AND NOT attisdropped;

**Expected Output:**  
Column names, data types, and nullability.

**Part 2: View Constraints and Indexes**

**3. List all constraints for a specific table**

SELECT conname AS constraint\_name,

contype AS type,

confrelid::regclass AS foreign\_table

FROM pg\_constraint

WHERE conrelid = 'your\_table\_name'::regclass;

**Note on contype values:**

* p = Primary Key
* f = Foreign Key
* u = Unique
* c = Check

**4. Find indexes on a table**

SELECT i.relname AS index\_name,

a.attname AS column\_name

FROM pg\_class t

JOIN pg\_index ix ON t.oid = ix.indrelid

JOIN pg\_class i ON i.oid = ix.indexrelid

JOIN pg\_attribute a ON a.attrelid = t.oid AND a.attnum = ANY(ix.indkey)

WHERE t.relname = 'your\_table\_name';

**Part 3: Explore Users and Roles**

**5. List all roles and their attributes**

SELECT rolname,

rolsuper,

rolcreaterole,

rolcreatedb

FROM pg\_roles;

**Expected Output:**  
Role names and their privileges.

**Part 4: Discover Functions and Schemas**

**6. List all functions**

SELECT proname AS function\_name,

pg\_get\_function\_arguments(p.oid) AS arguments,

pg\_get\_function\_result(p.oid) AS return\_type

FROM pg\_proc p

JOIN pg\_namespace n ON p.pronamespace = n.oid

WHERE n.nspname NOT LIKE 'pg\_%' AND n.nspname <> 'information\_schema';

**7. List all schemas**

SELECT nspname FROM pg\_namespace

WHERE nspname NOT LIKE 'pg\_%' AND nspname <> 'information\_schema';