# Lab: Data Types and Table Basics

This document defines the **lab exercise assignments** for the [PostgreSQL course @ Software University](https://softuni.bg/trainings/4244/postgresql-september-2023).

## Part I - Simple Database Operations Using PostgreSQL pgAdmin

### Create New Database

First, let us create an **empty database** called **"gamebar"**. Right-click on the databases field; choose **"Create"** -> **"Database"**:

Graphical user interface, application

Description automatically generated

A new **"Create Database"** window will appear. In the "**Database**" field type our new database's name - "**gamebar**".

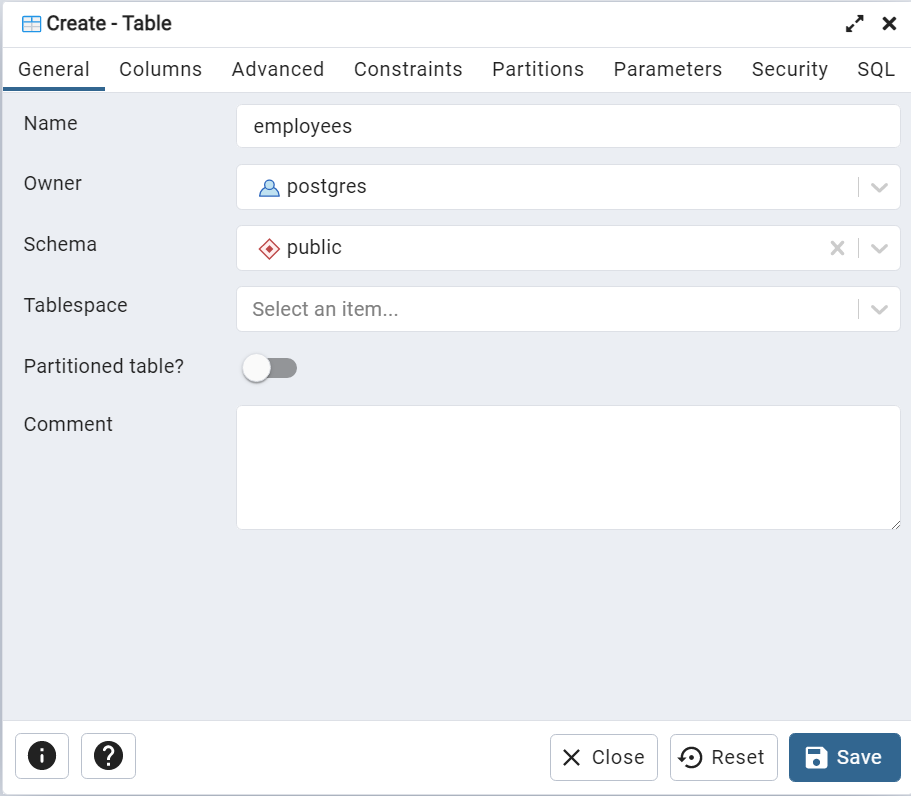
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### Create New Table

Graphical user interface, text

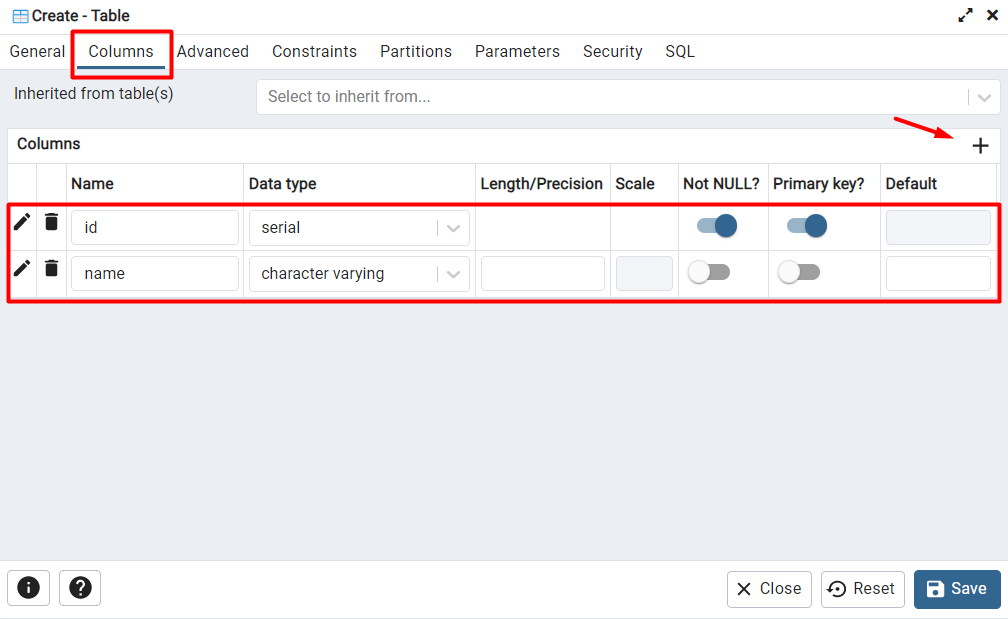
Description automatically generatedOpen the newly created "**gamebar**" database, then open "Schemas" -> "public". Right-click the "**Tables**" and select "**Create" -> "Table**".

****The table creation tab will appear. In the "**Table Name**" field type the name of your new table – "**employees**".

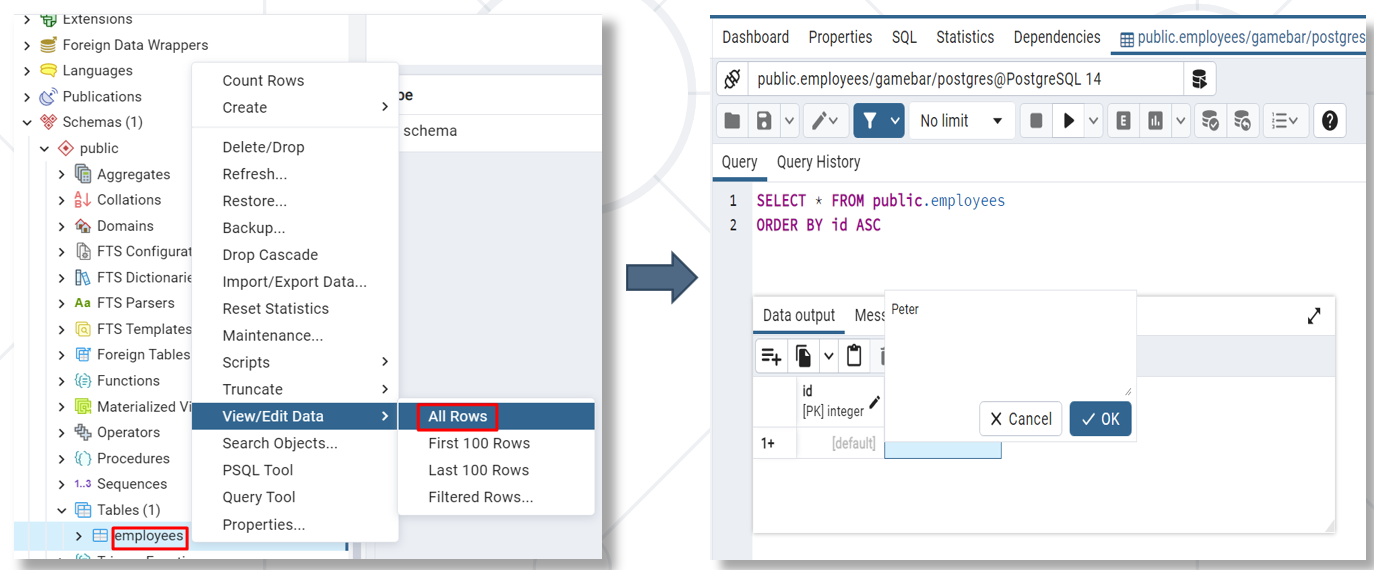
From the "**Columns**" tab you can start creating your table fields.

First, create an "**id**" field. Set the data type to serial, Primary key(PK), and Not NULL.

Create one more field – "**name**" with data type **character varying.**

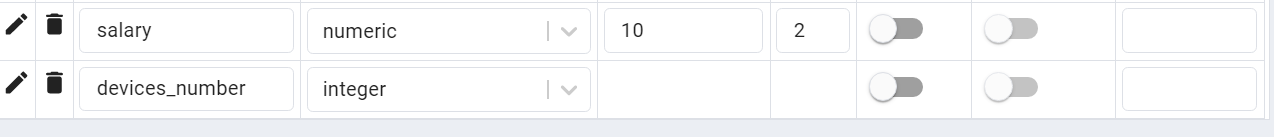
Click **Save** buttonin order to finish the table creation.

### View and Edit Tables



Now you can modify your table and add **2** more columns to it (adding columns to tables was already described above):

• **salary** – numeric, specified to the **second** decimal place, and has **10** digits in total.

• **devices**\_**number** – integer.

### Create Tables "departments" and "issues"

Similar to "**employees**" create **2** more tables.

Table "**departments**":

• **id** – **serial**, primary key, Not NULL;

• **name** – character varying, max length 50;

• **code** – character, fixed length 3;

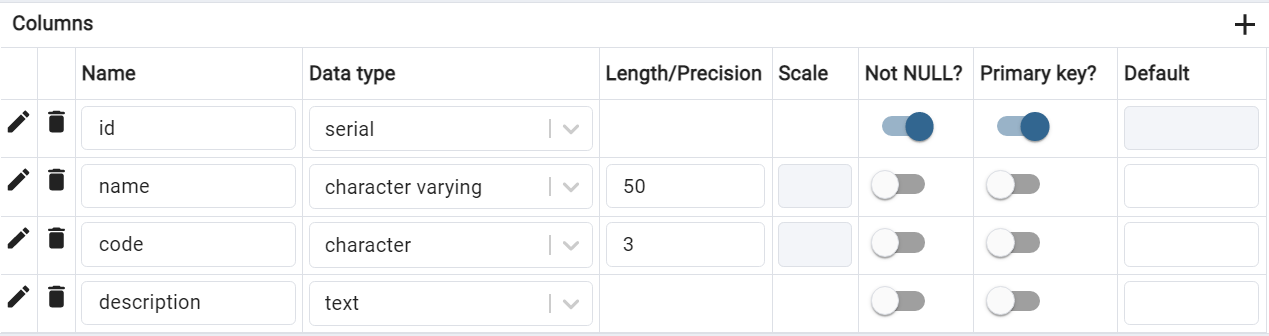
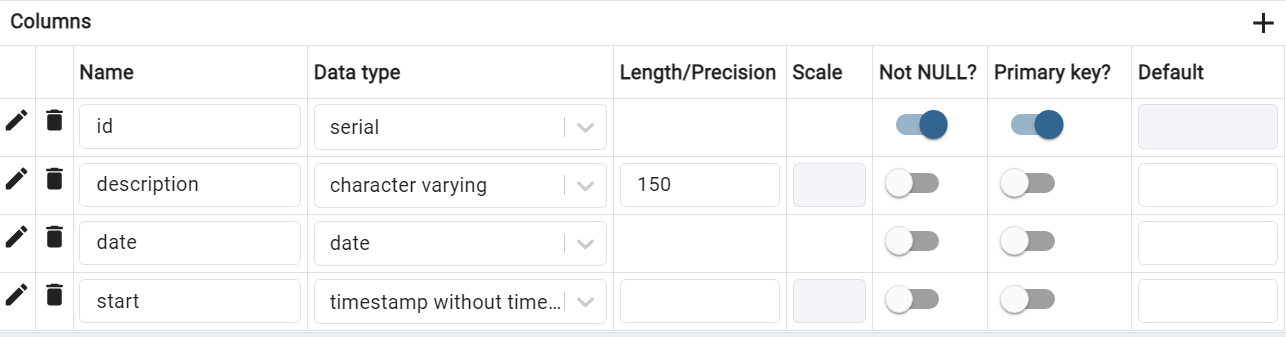
• **description** – text;

Table "**issues**":

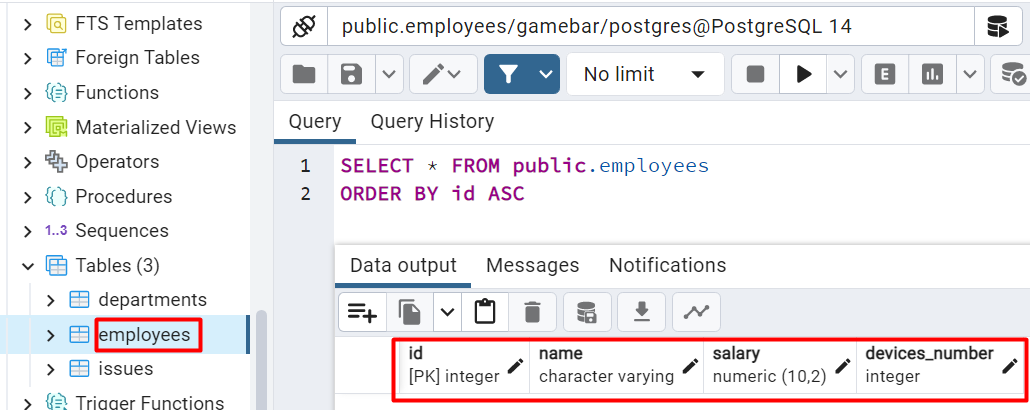
• **id** – **serial**, primary key,unique;

• **description** – character varying, max length 150;

• **date** – date;

• **start** – timestamp without time zone

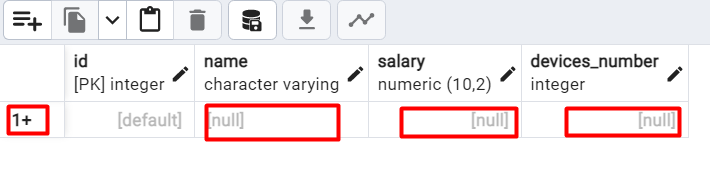
### 05. Insert Data in Tables

Now we can start adding some records to our newly created tables. First, select the "**employees**" table to see all rows:



Select the **button** to add a new record.

Fill in the fields with values by double-clicking inside the desired field. Create 3 records in each table. **Save** data by clicking on the **database** **icon.**

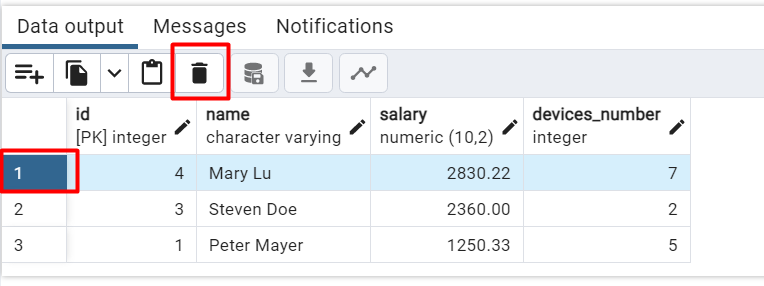


### 06. Editing Data

Data in tables can easily be edited with the GUI. Now that we've populated our tables with values, we can edit them by **double-clicking** on the **value** field. **Save** data by clicking on the **database** **icon.**

### 07. Deleting Data

Data deletion is easy too. We can just select the row we are about to delete and click on the **bin** **icon**. Do not forget to **save** your changes.

Delete **all rows** from table **employees.**

### 08. Modifying Columns and Adding Constraints

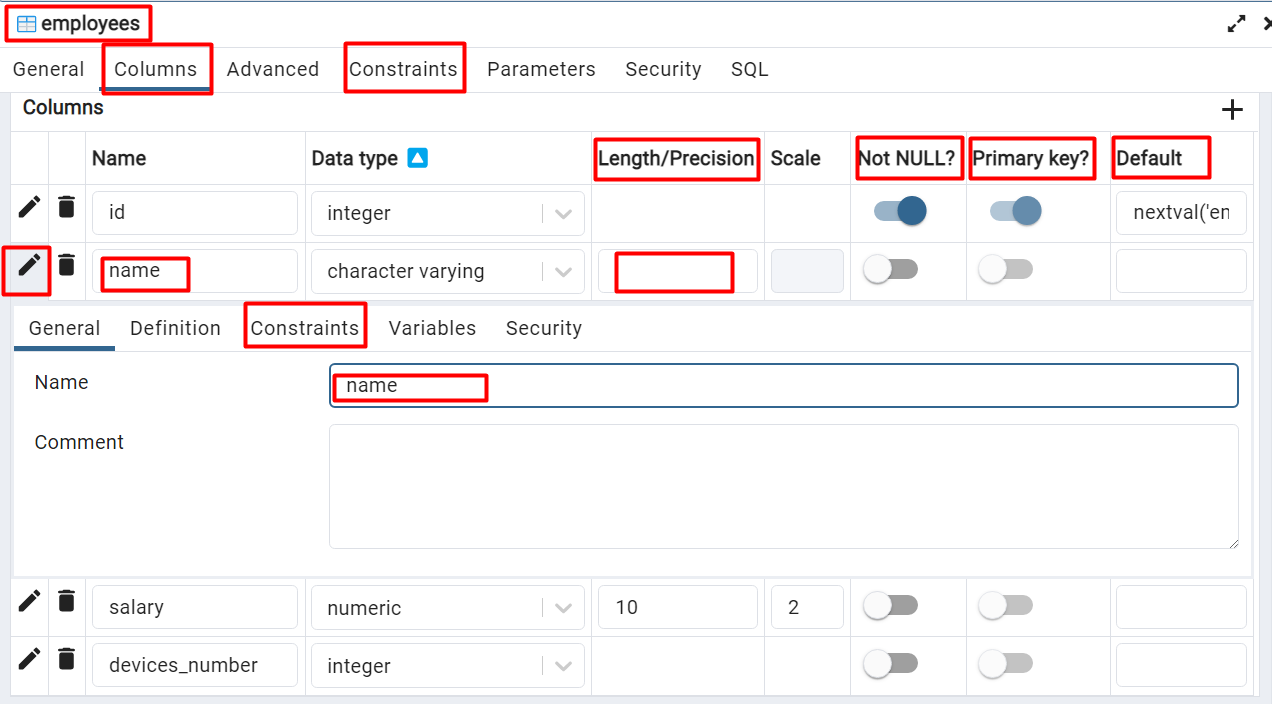
Select the table **"employees"**. You can modify the column named "**name"**, so you change it to **first\_name**, then **add** a new column **last\_name.** Add a new column **hiring\_date** as well.

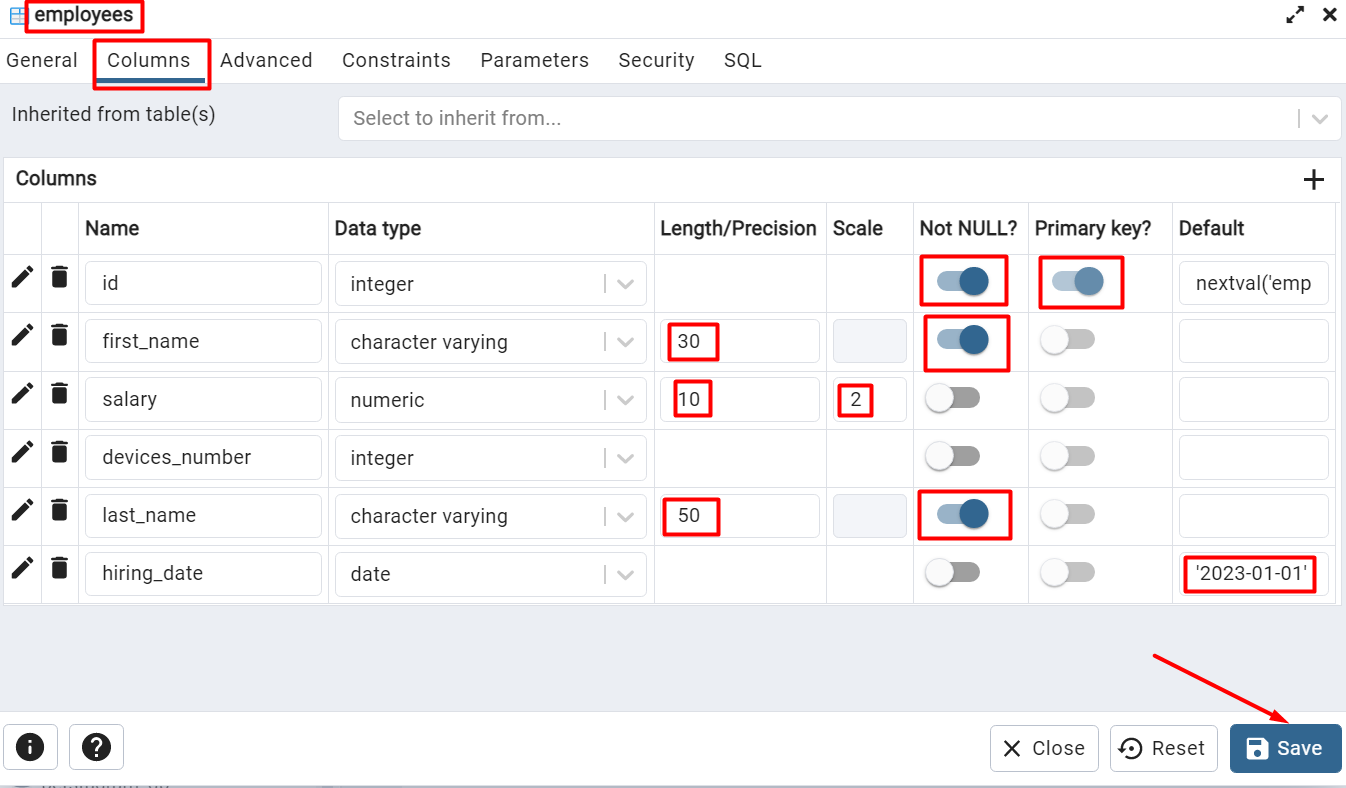
Set all constraints as follows:

• first\_name – character varying, max length 30, Not NULL;

• last\_name – character varying, max length 50, Not NULL;

• hiring\_date– date, default '2023-01-01';



Your **modified** table **employees** should look like the following now:

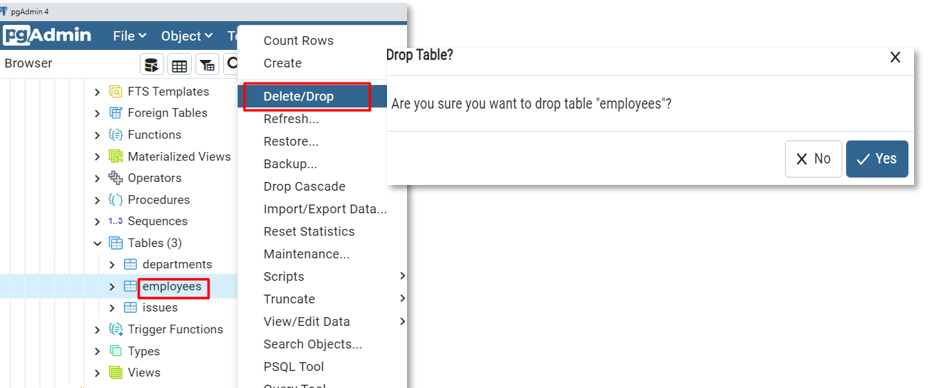
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### 09. Dropping Tables

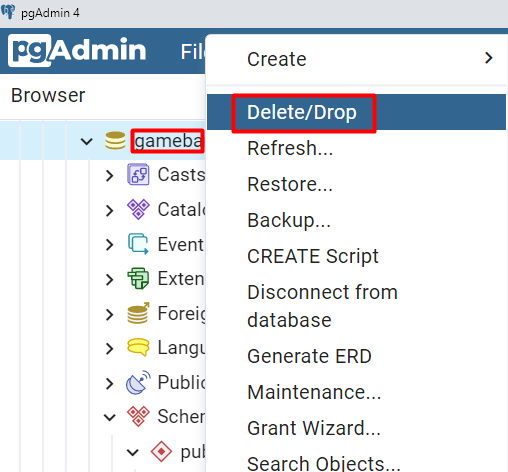
We can delete the whole table, by selecting the one we want to delete, right-clicking, and selecting "**Delete/Drop**". **You cannot undo this action.**

Now drop your 3 tables from your database.



### 10. Dropping the Database

As the table dropping, we can drop the database too. **This action cannot be undone too.**

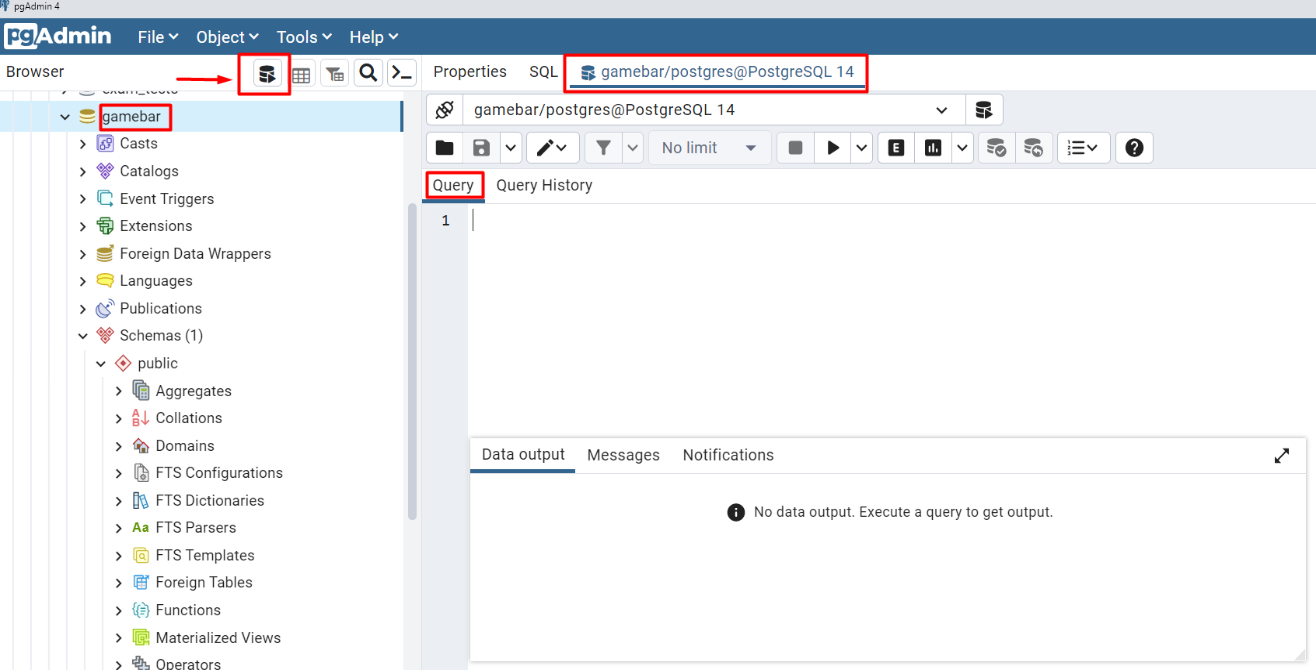
Right-click the database you want to drop and select "**Delete/Drop**".

## Part II - Simple Database Operations Using Queries

Now we are going to do the same steps from Part I, using simple SQL queries.

Exercises from this section should be submitted to [**Judge Contest**](https://judge.softuni.org/Contests/4100/Data-Types-and-Table-Basics-Lab) (tasks 1, 3 to 7).

Queries are written in the "**Query**" tab.



### Descriptions for Exercises in Judge System

### 0. Create New Database

Write a query that will create the "**gamebar**" database. Open its **Query Tool**

### 1. Create Tables

Table "**employees**":

• id – **serial**, primary key, Not NULL;

• first\_name – character varying, max length 30;

• last\_name – character varying, max length 50;

• hiring\_date– date, default "2023-01-01";

• salary – numeric, specified to the **second** decimal place, and has **10** digits in total;

• devices\_number – integer;

Create the "**departments**" and "**issues**" tables analogically:

Table "**departments**":

• id – **serial**, primary key, Not NULL;

• name – character varying, max length 50;

• code– character, fixed length 3;

• description – text;

Table "**issues**":

• id – **serial**, primary key, unique;

• description – character varying, max length 150;

• date – date;

• start – timestamp without time zone;

### 2. Insert Data in Tables

Populate the "**employees**" table with 3 test values using pgAdmin UI.

*\*This task is not included in the Judge Contest.*

### 3. Alter Tables

Altering the tables is done via the "ALTER TABLE" clause. Add a new column – "**middle\_name**", "VARCHAR(50)" to the "**employees**" table.

### 4. Add Constraints

In the table "**employees**", set the **salary** column as **Not NULL** with a **default value of 0**.Set the **hiring date** columnas **Not NULL** too**.**

### 5. Modify Columns

Change the property "VARCHAR(50)" to "VARCHAR(100)" for the **middle\_name** column in "**employees**" table.

### 6. Truncate Tables

Truncate table "**issues**".

### 7. Drop Tables

Drop table "**departments**".