# Lab: Data Types and Table Basics

This document defines the **lab exercise assignments** for the[PostgreSQL course @ Software University](https://softuni.bg/modules/137/python-db).

## Part I - Simple Database Operations Using PostgreSQL pgAdmin

### Create a New Database

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

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Описанието е генерирано автоматично

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

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

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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.**

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Click the **Save** buttonto finish the table creation.

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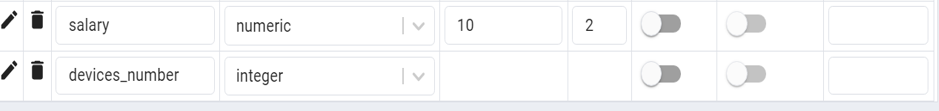
### View and Edit Tables

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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;

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Table "**issues**":

* **id –** **serial,** primarykey, unique**;**
* **description –** character varying, max length 150**;**
* **date –** date**;**
* **start –** timestamp without time zone

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### 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:

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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.**

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Описанието е генерирано автоматично

### 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.**

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### 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.**

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### 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';

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

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Описанието е генерирано автоматично

Картина, която съдържа текст, Шрифт, екранна снимка, номер

Описанието е генерирано автоматично

### 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.

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Описанието е генерирано автоматично

### Dropping the Database

Similar to table dropping, you also have the option to delete the entire database. **It's important to note that this action is irreversible.**

To proceed, right-click on the database you like to remove and choose the **"Delete/Drop"** option.

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Описанието е генерирано автоматично

## 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.

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Описанието е генерирано автоматично

### Descriptions for Exercises in Judge System

### Create New Database

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

### 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;

### Insert Data in Tables

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

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

### Alter Tables

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

### 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**.**

### Modify Columns

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

### Truncate Tables

Truncate table "**issues**".

### Drop Tables

Drop table "**departments**".