

# Hands-on Lab: Create Tables and Load Data in PostgreSQL using pgAdmin



Skills  
Network

**Estimated time needed:** 20 minutes

In this lab, you will learn how to create tables and load data in the PostgreSQL database service using the pgAdmin graphical user interface (GUI) tool. The pgAdmin GUI provides an alternative to the command line for interacting with a PostgreSQL database using a graphical interface. This GUI provides a number of key features for interacting with a PostgreSQL database in an easy to use format.

## Software used in this lab

In this lab, you will use [PostgreSQL Database](#). PostgreSQL is a Relational Database Management System (RDBMS) designed to efficiently store, manipulate, and retrieve data.



PostgreSQL

To complete this lab you will utilize the PostgreSQL relational database service available as part of IBM Skills Network Labs (SN Labs) Cloud IDE. SN Labs is a virtual lab environment used in this course.

## Database used in this lab

You will use the Books database in this lab.

The following diagram shows the structure of the "myauthors" table from the Books database:

| myauthors   |              |
|-------------|--------------|
| author_id   | int          |
| first_name  | varchar(100) |
| middle_name | varchar(50)  |
| last_name   | varchar(100) |

## Objectives

After completing this lab, you will be able to use pgAdmin with PostgreSQL to:

- Create databases and tables in a PostgreSQL instance
- Load data into tables manually using the pgAdmin GUI
- Load data into tables from a text/script file

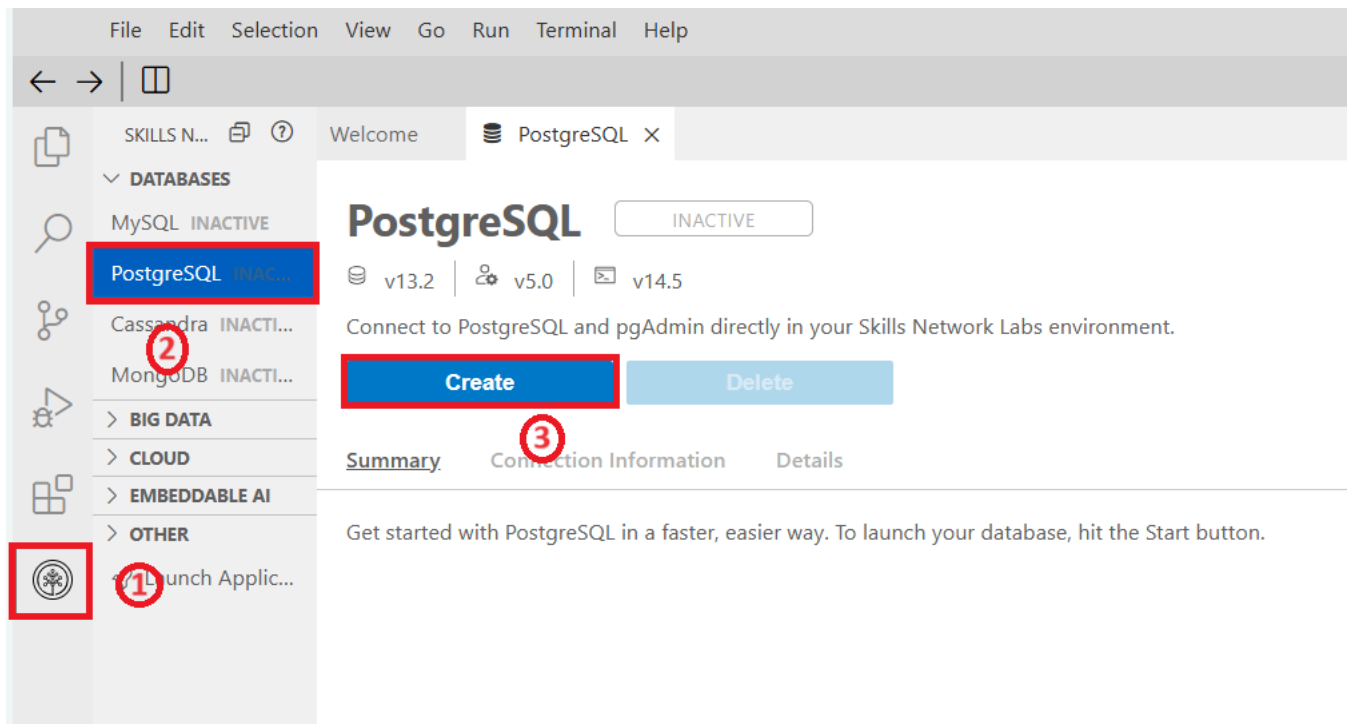
## Lab Structure

In this lab, you will complete several tasks in which you will learn how to create tables and load data in the PostgreSQL database service using the pgAdmin graphical user interface (GUI) tool.

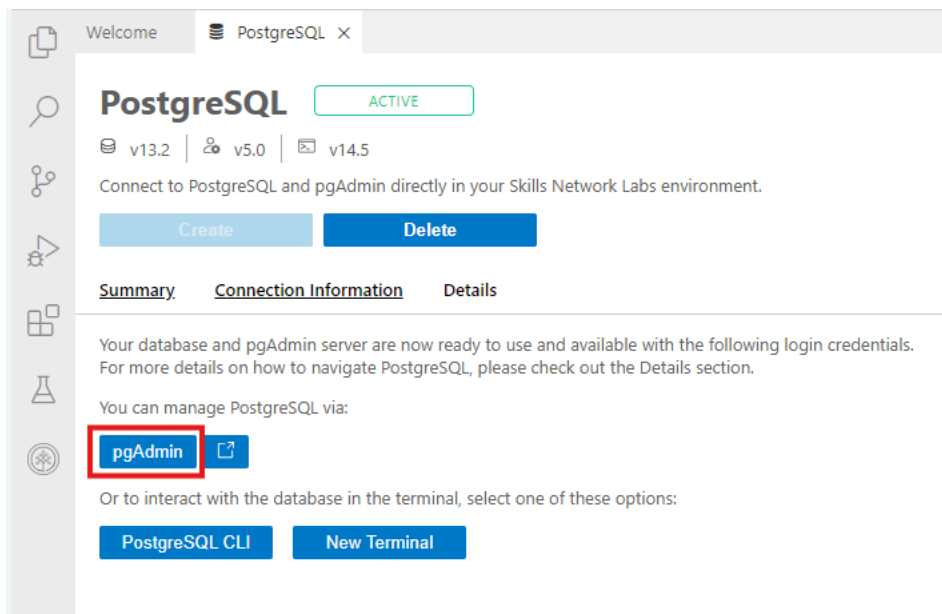
## Task A: Create a database

First, to create a database on a PostgreSQL server instance, you'll first launch a PostgreSQL server instance on Cloud IDE and open the pgAdmin Graphical User Interface.

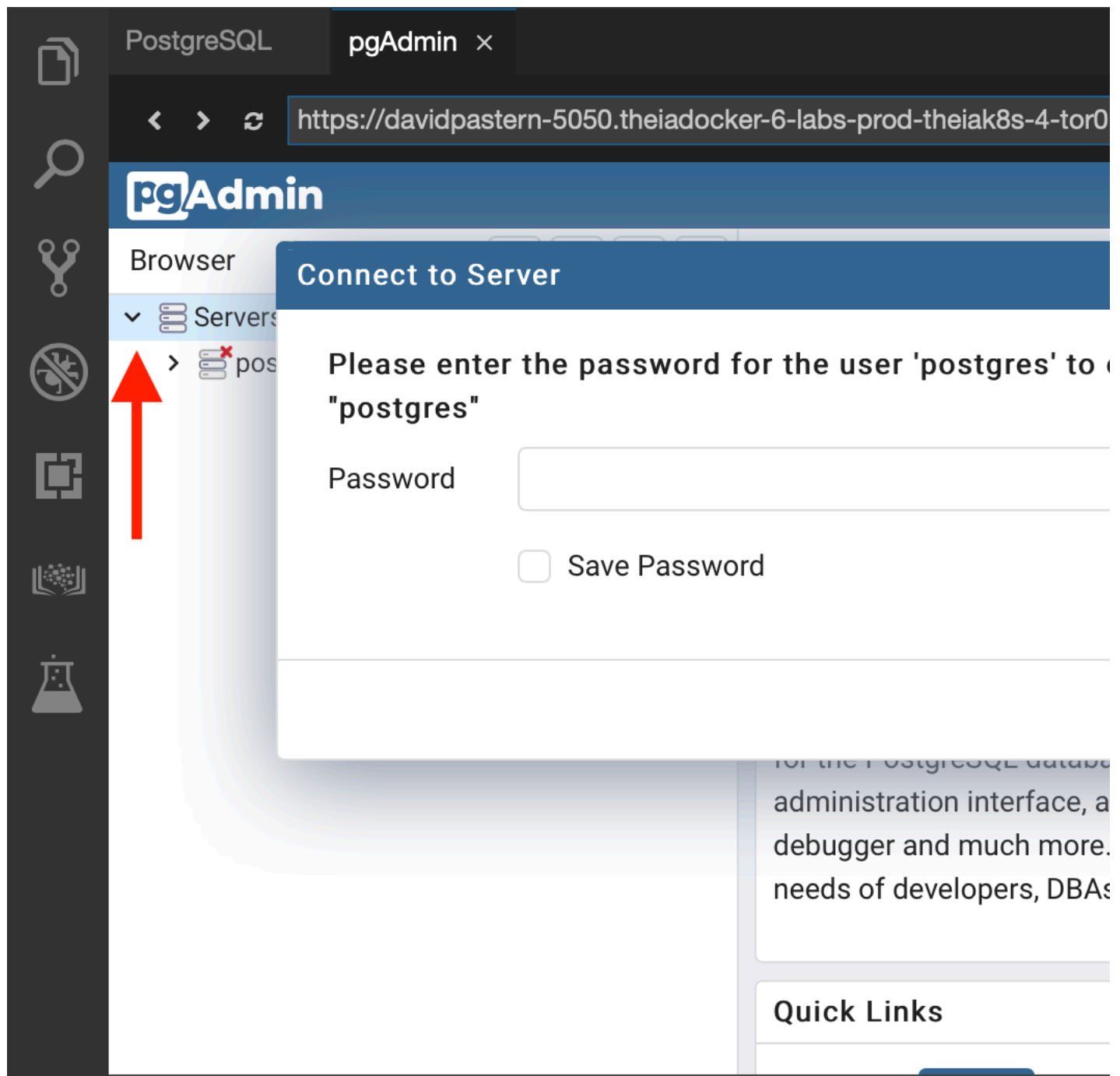
1. Click the Skills Network extension button on the left side of the window.
2. Open the **DATABASES** menu and click **PostgreSQL**.
3. Click **Create**. PostgreSQL may take a few moments to start.



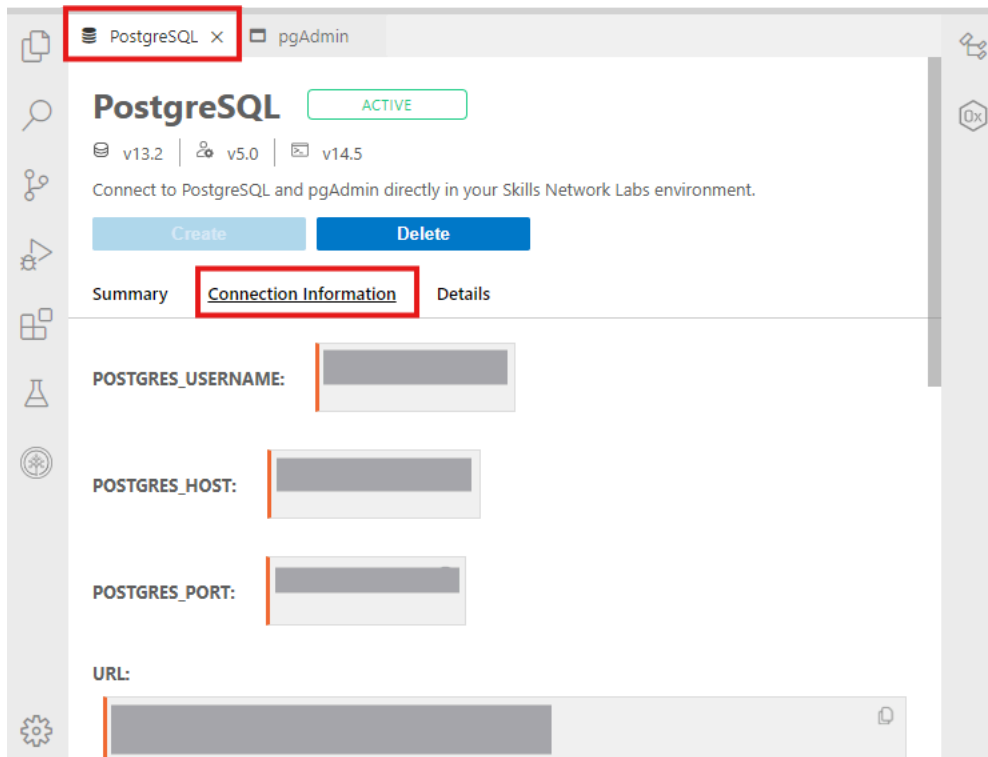
4. Next, open the pgAdmin Graphical User Interface by clicking **pgAdmin** in the Cloud IDE interface.



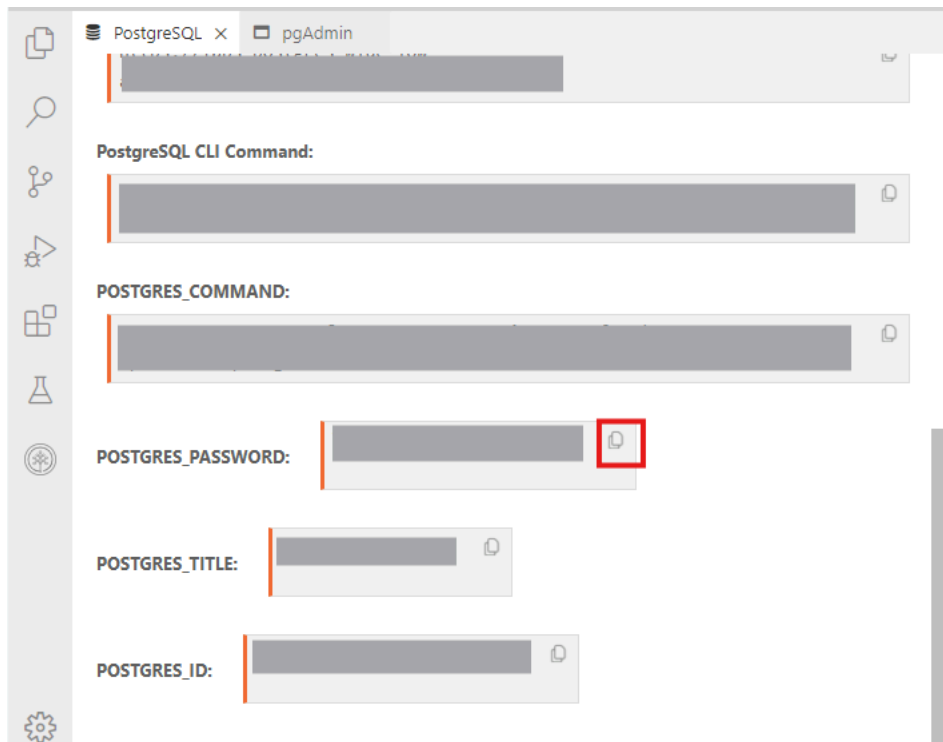
5. Once the pgAdmin GUI opens, click **Servers** tab on the left side of the page. You will be prompted to enter a password.



6. To retrieve your password, click **PostgreSQL** tab near the top of the interface and select **Connection Information** tab.



7. Scroll down and click the Copy icon on the left of your password to copy the session password onto your clipboard.



8. Navigate back to the **pgAdmin** tab and paste in your password, then click **OK**.

9. You will then be able to access the pgAdmin GUI tool.



## Welcome



pgAdmin  
Management

Feature rich | Maximise

pgAdmin is an Open Source admir  
is designed to answer the needs o

## Quick Links

## Getting Started



PostgreSQL Document

10. In the tree-view, expand **Servers > postgres > Databases**. If prompted, enter your PostgreSQL service session password. Right-click on **Databases** and go to **Create > Database**. In the **Database** box, type **Books** as the name for your new database, and then click **Save**. Proceed to Task B.

The screenshot shows the pgAdmin 4 web interface. The top navigation bar includes the pgAdmin logo and menus for File, Object, Tools, and Help. Below the navigation bar is a toolbar with icons for Browser, Dashboard, Properties, and SQL. The main area is divided into two panes. The left pane, titled 'Browser', contains a tree view of the database structure. The tree view shows a hierarchy: Servers (1) > postgres > Databases (1). The 'Databases (1)' node is selected, and a context menu is open over it. The context menu has a 'Create' option, which is highlighted, and a 'Database...' option is visible. The right pane, titled 'Server sessions', shows a table with 7 rows and 1 column. Below this, there is a section titled 'Tuples in' with 1 row and 1 column.

pgAdmin File Object Tools Help

Browser Servers (1) postgres Databases (1)

Dashboard Properties SQL

Server sessions

7

4

3

2

1

0

Tuples in

1

## Create - Database

General

Definition

Security

Parameters

Advanced

SQL

Database

Books

Owner

 postgres

Comment

i

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✕ Cancel

## Task B: Create tables

Now that you have your PostgreSQL service active and have created the **Books** database using pgAdmin, let's create a few tables to populate the database and store the data that you wish to eventually upload into it.

1. In the tree-view, expand **Books** > **Schemas** > **public**. Right-click on **Tables** and go to **Create** > **Table**.

Browser



Dashboard

Properties

SQL

▾ Servers (1)

▾ postgres

▾ Databases (2)

▾ Books 1

&gt; Casts

&gt; Catalogs

&gt; Event Triggers

&gt; Extensions

&gt; Foreign Data Wrappers

&gt; Languages

&gt; Publications

▾ Schemas (1) 2

▾ public 3

&gt; Collations

&gt; Domains

&gt; FTS Configurations

&gt; FTS Dictionaries

&gt; FTS Parsers

&gt; FTS Templates

&gt; Foreign Tables

&gt; Functions

&gt; Materialized Views

&gt; Procedures

&gt; 1..3 Sequences

4 &gt; Tables

&gt; Trigger

&gt; Types

&gt; Views

&gt; Subscriptions

&gt; postgres

&gt; Login/Group Roles

## Database sessions

1

0

## Tuples in

1

0

## Server activity

Sessions

Locks

Prepared Transactions

PID

User

Create



Table...


Refresh...

Grant Wizard...

Search Objects...



2. On the **General** tab, in the **Name** box, type **myauthors** as name of the table. Don't click **Save**, proceed to the next step.

 **Create - Table**

**General**

Columns

Advanced

Constraints

Partitions


Parameters

Security


Name

myauthors

Owner

 postgres

Schema

 public


Tablespace


Select an item...


Partitioned table?

No

Comment





 Cancel

3. Switch to the tab **Columns** and click the **Add new row** button four times to add 4 column placeholders. Don't click **Save**, proceed to the next step.









## Create - Table

General **Columns** Advanced Constraints Partitions Parameters Security

Inherited from table(s)

Select to inherit from...

### Columns

|   |   | Name ▲               | Data type           | Length/Precision | Scale | N |
|---|---|----------------------|---------------------|------------------|-------|---|
|  |  | <input type="text"/> | Select an item... ▼ |                  |       |   |
|  |  | <input type="text"/> | Select an item... ▼ |                  |       |   |
|  |  | <input type="text"/> | Select an item... ▼ |                  |       |   |
|  |  | <input type="text"/> | Select an item... ▼ |                  |       |   |

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✕ Cancel

4. Enter the **myauthors** table definition structure information as shown in the image below in the highlighted boxes. Then click **Save**. Proceed to Task C.

Create - Table

General

Columns

Advanced

Constraints

Partitions

Parameters

Security

Inherited from table(s)

Columns

|  |  | Name        | Data type         | Length/Precision | Scale | Nullable |
|--|--|-------------|-------------------|------------------|-------|----------|
|  |  | author_id   | integer           |                  |       |          |
|  |  | first_name  | character varying | 100              |       |          |
|  |  | middle_name | character varying | 50               |       |          |
|  |  | last_name   | character varying | 100              |       |          |

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✕ Cancel

## Task C: Load data into tables manually using the pgAdmin GUI

You now have a database and have created tables within it. With the pgAdmin GUI, you can insert values into the tables manually. This is useful if you have a few new entries you wish to add to the database. Let's see how to do it.

1. In the tree-view, expand **Tables**. Right-click **myauthors** and go to **View/Edit Data > All Rows**.

Browser



Dashboard

Properties

SQL

▾ Servers (1)

▾ postgres

▾ Databases (2)

▾ Books

&gt; Casts

&gt; Catalogs

&gt; Event Triggers

&gt; Extensions

&gt; Foreign Data Wraps

&gt; Languages

&gt; Publications

▾ Schemas (1)

▾ public

&gt; Collations

&gt; Domains

&gt; FTS Config

&gt; FTS Dictionaries

&gt; FTS Parsers

&gt; FTS Templates

&gt; Foreign Tables

&gt; Functions

&gt; Materialized Views

&gt; Procedures

&gt; Sequences

1 ▾ Tables (1)

2 ▾ myauthors

&gt; Columns

&gt; Constraints (1)

&gt; Indexes

&gt; RLS Policies

&gt; Roles

Type

🔑 Primary Key

Create &gt;

Refresh...

Count Rows

Delete/Drop

Drop Cascade

Reset Statistics

Import/Export...

Maintenance...

Scripts &gt;

Truncate &gt;

Backup...

Restore...

View/Edit Data &gt;

Search Objects...

Query Tool

Properties...

All Rows

First 100 Rows

Last 100 Rows

Filtered Rows...

Rules

Triggers

2. You will insert 2 rows of data into the **myauthors** table. In the lower **Data Output** pane, enter **myauthors** table data information for 2 rows as shown in the highlighted boxes in the image below. Then click the **Save Data Changes** icon. Proceed to Task D.

Dashboard × Properties × SQL × Statistics × Dependencies × Dependents × Processes :

public.myauthors/Books/postgres@PostgreSQL

No limit

Query Query History

```
1 SELECT * FROM public.myauthors
2 ORDER BY author_id ASC
```

Select "Add Row" to add values to the Table

Data Output Messages Notifications

Add row  
Alt Shift A

| first_name             | middle_name            | last_name              |
|------------------------|------------------------|------------------------|
| character varying (30) | character varying (20) | character varying (30) |

3. Enter the values into the table as shown below:

|   | author_id<br>[PK] integer | first_name<br>character varying (100) | middle_name<br>character varying (50) |
|---|---------------------------|---------------------------------------|---------------------------------------|
| 1 | 1                         | Merrit                                | [null]                                |
| 2 | 2                         | Linda                                 | [null]                                |

Data Output Messages Notifications

author\_id [PK] integer first\_name character varying (30) middle\_name character varying (20)

|    | author_id | first_name | middle_name |
|----|-----------|------------|-------------|
| 1+ | 2         | Linda      | [null]      |
| 2+ | 1         | Merritt    | [null]      |

Eric

Double-click the cell to enter values into the table.

4. Save the values.

Data Output Messages Notifications

author\_id [PK] integer first\_name character varying (30) middle\_name character varying (20) last\_name character varying (30)

|    | author_id | first_name | middle_name | last_name |
|----|-----------|------------|-------------|-----------|
| 1+ | 2         | Linda      | [null]      | Mui       |
| 2+ | 1         | Merritt    | [null]      | Eric      |

Click here to save the values.

Save Data Changes (F6)

## Task D: Load data into tables using a text/script file

In the previous task, you entered some data entries into a table manually with pgAdmin. While this method can be useful for small additions, if you wish to upload large amounts of data at once, the process becomes tedious. An alternative is to load data into tables from a text or script file containing the data you wish to enter. Let's take a look at how to do this.

1. You will import the remainder of the **myauthors** table data from a csv text file. Download the csv file below to your local computer:

- [myauthors.csv](#)

2. In the tree-view, right-click on **myauthors** and go to **Import/Export**.

pgAdmin

File ▾Object ▾Tools ▾Help ▾

Browser

Servers (1)

postgres

Databases (2)

Books

Casts

Catalogs

Event Triggers

Extensions

Foreign Data V

Languages

Publications

Schemas (1)

public

Collatio

Domain

FTS Co

FTS Dic

FTS Par

FTS Ter

Foreign

Funcio

Materia

Procedu

1..3 Sequen

1 Tables

2 mya

Columns

Constraints (1)

Indexes

RLS Policies

Dashboard

Pr

public.mya

Query Editor

1 SELECT \*

R BY

2

Create

Refresh...

Count Rows

Delete/Drop

Drop Cascade

Reset Statistics

Import/Export...

Maintenance...

Scripts

Truncate

Backup...



Restore...

View/Edit Data

Search Objects...

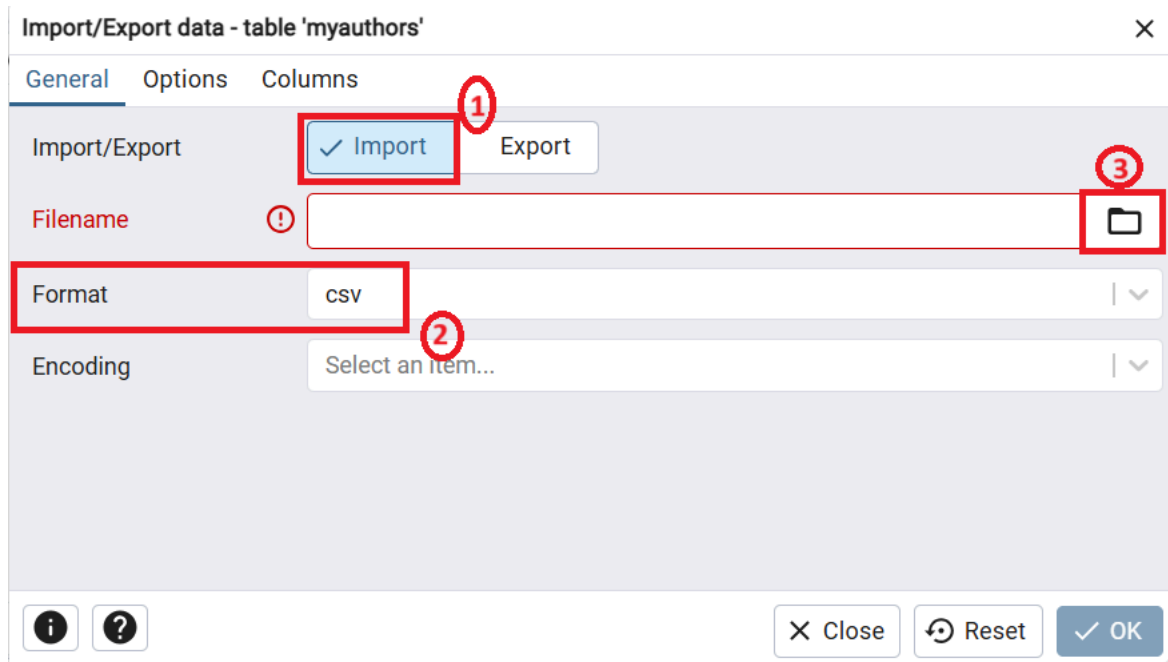
Query Tool

Properties...

- >  Rules
- >  Triggers

3. Follow the instructions below to import:


1. Make sure **Import/Export** is set to **Import**,
2. **Format** = **csv**.
3. Then click **Select file** icon by the **Filename** box.



Import/Export data - table 'myauthors'



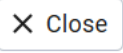
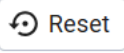
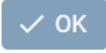
General Options Columns

Import/Export ☒ Import ☐ Export

Filename  

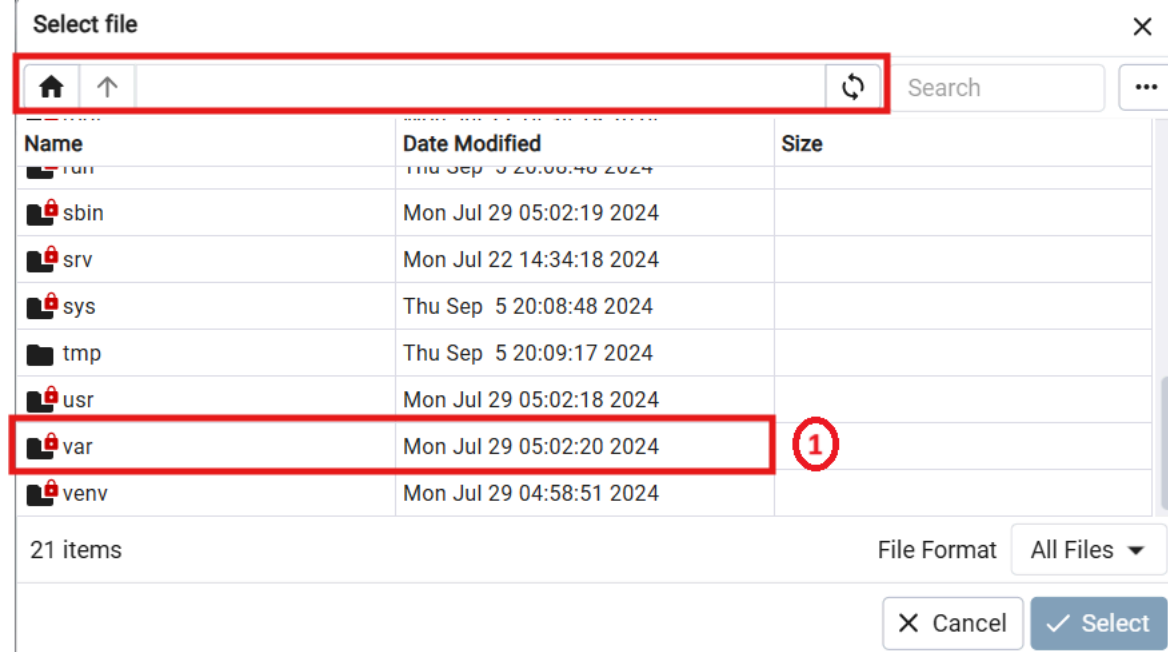
Format

Encoding





    

4. Steps to **Upload File**.

- o Step 1: Initially make sure the folder details empty and select the var option from the list as shown in the screenshot below. Select var folder



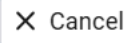

Select file

    Search 

| Name       | Date Modified            | Size |
|------------|--------------------------|------|
| bin        | Thu Sep 5 20:00:48 2024  |      |
| sbin       | Mon Jul 29 05:02:19 2024 |      |
| srv        | Mon Jul 22 14:34:18 2024 |      |
| sys        | Thu Sep 5 20:08:48 2024  |      |
| tmp        | Thu Sep 5 20:09:17 2024  |      |
| usr        | Mon Jul 29 05:02:18 2024 |      |
| <b>var</b> | Mon Jul 29 05:02:20 2024 |      |
| venv       | Mon Jul 29 04:58:51 2024 |      |

21 items

File Format

- o Step 2: Select lib folder.



Select file

🏠









↑

/var

↺

Search

...

| Name  | Date Modified            | Size |
|---|--------------------------|------|
|  cache | Mon Jul 22 14:34:18 2024 |      |
|  db    | Mon Jul 29 05:02:20 2024 |      |
|  empty | Mon Jul 22 14:34:18 2024 |      |
|  lib   | Mon Jul 29 05:02:26 2024 |      |
|  local | Mon Jul 22 14:34:18 2024 |      |
|  lock  | Mon Jul 22 14:34:18 2024 |      |
|  log   | Mon Jul 22 14:34:18 2024 |      |
|  mail  | Mon Jul 22 14:34:18 2024 |      |

12 items

File Format All Files ▾

✕ Cancel

✓ Select

- Step 3: Select pgadmin folder. Here you could notice the folders are locked except the pgadmin folder.

Select file

🏠





↑

/var/lib

↺

Search

...

| Name  | Date Modified            | Size |
|---|--------------------------|------|
|  misc      | Mon Jul 22 14:34:18 2024 |      |
|  pgadmin | Fri Sep 6 01:00:10 2024  |      |
|  postfix | Thu Sep 5 20:09:12 2024  |      |
|  sudo    | Mon Jul 29 05:02:20 2024 |      |

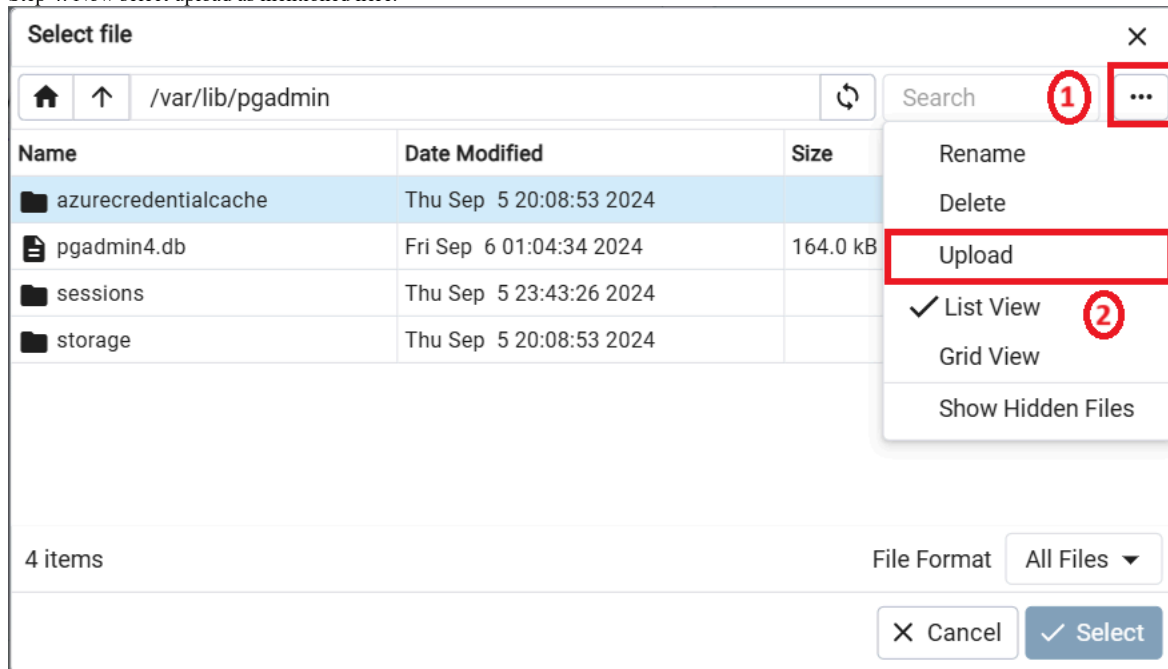
4 items

File Format All Files ▾

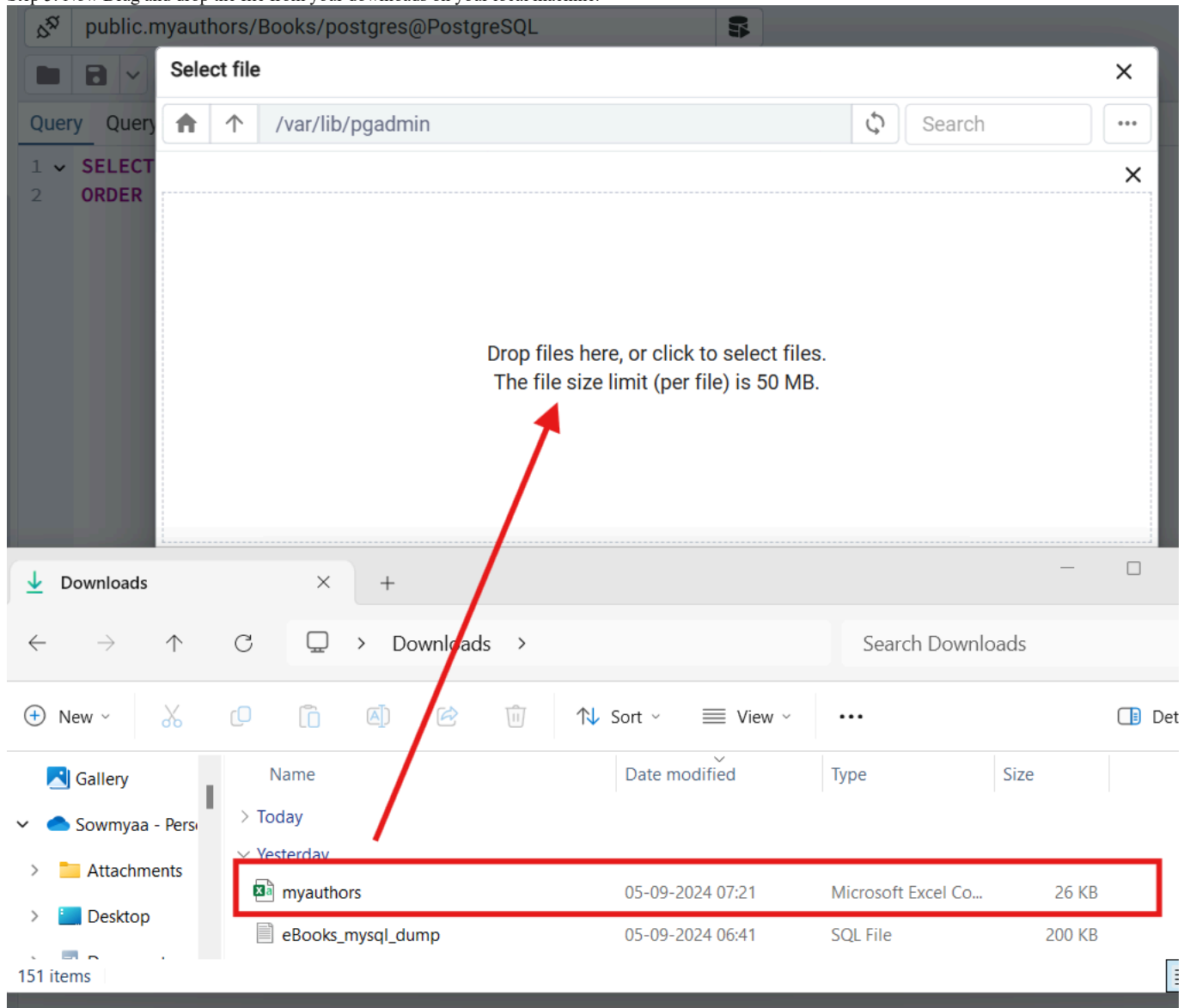
✕ Cancel

✓ Select

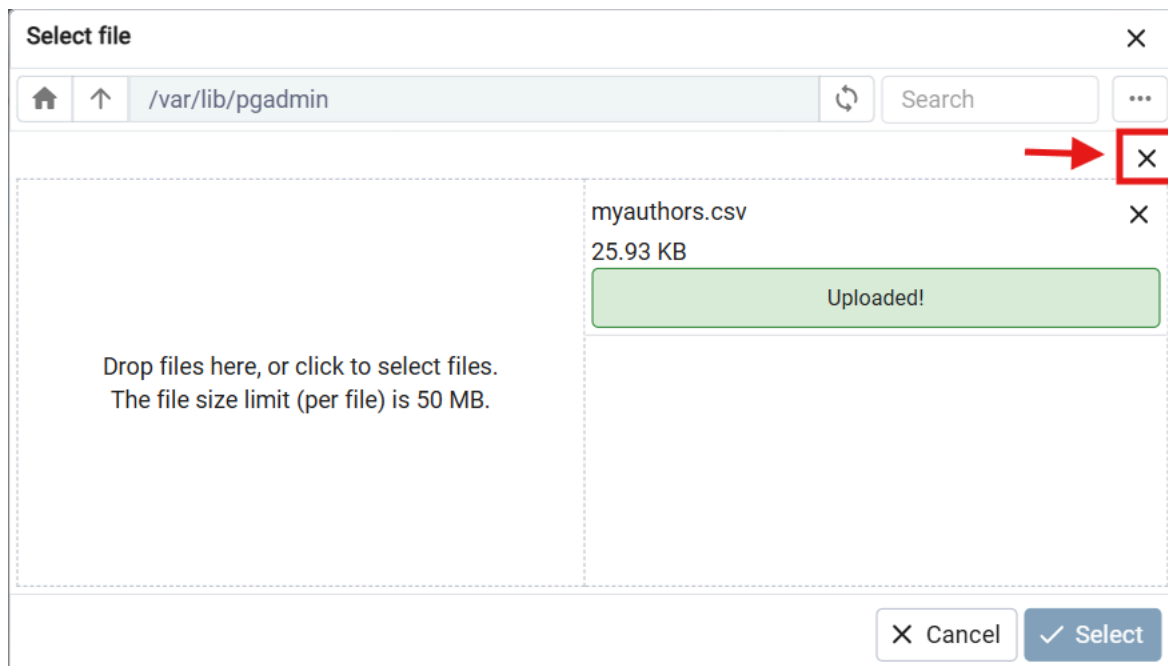
- Step 4: Now select upload as mentioned here.



- Step 5: Now Drag and drop the file from your downloads on your local machine.



- Step 6: Finally, the upload is successful. When the upload is complete, close the drop files area by clicking X.



- Select the uploaded **myauthors.csv** file from the list and click **Select**.

## Select file



/var/lib/pgadmin/myauthors.csv



| Name  | Size    |   |
|---|---------|---|
|  myauthors.csv | 26.0 kB |  |
|  sessions      | 4.0 kB  |  |
|  storage       | 4.0 kB  |  |



Size



M



myauthors.csv

26.0 kB



sessions

4.0 kB



storage

4.0 kB



Show hidden files and folders?☐

- Ensure the file has selected.

Import/Export data - table 'myauthors'

General

Options

Columns

Import/Export

✓ Import

Export

Filename

/var/lib/pgadmin/myauthors.csv

Format

csv

Encoding

Select an item...

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✕ Close

↺ Reset

✓ OK

- Under **Options** enable **Header** and Click OK and notification of import success will appear.

Import/Export data - table 'myauthors'

General

Options

Columns

OID

Header

Delimiter

,

Specifies the character that separates columns within each row (line) of the file. The default is a tab character in text format, a comma in CSV format. This must be a single one-byte character. This option is not allowed when using binary format.

Quote

"

Specifies the quoting character to be used when a data value is quoted.

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✕ Close

↺ Reset

✓ OK

```
1 SELECT * FROM public.myauthors
2 ORDER BY author_id ASC
```











|   | <b>author_id</b><br>[PK] integer | <b>first_name</b><br>character varying (30) | <b>middle_name</b><br>character varying (20) | <b>last_name</b><br>character varying (30) |
|---|----------------------------------|---|--|--|
| 1 | 2                                | Linda                                       | [null]                                       | Murphy                                     |
| 2 | 1                                | Merritt                                     | [null]                                       | Erin                                       |

```
Copying table data 'public.myauthors' on database '
low-mechanic:5432'
```

```
Copying table data 'public.myauthors' on database '
low-mechanic:5432')
```

4. Repeat Task C Step 1 to check that the newly imported data rows appear along with your previously inserted 2 rows.

Query Editor
Query History

```

1 SELECT * FROM public.myauthors
2 ORDER BY author_id ASC

```

Data Output
Explain
Messages
Notifications

|    | author_id    |    | first_name              |  | middle_name            |  | last_name               |
|----|--------------|----|-------------------------|--|------------------------|--|-------------------------|
|    | [PK] integer |    | character varying (100) |  | character varying (50) |  | character varying (100) |
| 1  |              | 1  | Merrit                  |  | [null]                 |  | Eric                    |
| 2  |              | 2  | Linda                   |  | [null]                 |  | Mu                      |
| 3  |              | 3  | Alecos                  |  | [null]                 |  | Paq                     |
| 4  |              | 4  | Paul                    |  | C.van                  |  | Ooi                     |
| 5  |              | 5  | David                   |  | [null]                 |  | Cro                     |
| 6  |              | 6  | Richard                 |  | [null]                 |  | Blu                     |
| 7  |              | 7  | Yuval                   |  | Noah                   |  | Har                     |
| 8  |              | 8  | Paul                    |  | [null]                 |  | Alb                     |
| 9  |              | 9  | David                   |  | [null]                 |  | Bea                     |
| 10 |              | 10 | John                    |  | Paul                   |  | She                     |
| 11 |              | 11 | Andrew                  |  | [null]                 |  | Mill                    |
| 12 |              | 12 | Melanie                 |  | [null]                 |  | Swi                     |
| 13 |              | 13 | Neal                    |  | [null]                 |  | For                     |
| 14 |              | 14 | Nir                     |  | [null]                 |  | Sha                     |
| 15 |              | 15 | Tim                     |  | [null]                 |  | Kin                     |
| 16 |              | 16 | Mike                    |  | [null]                 |  | Mc                      |
| 17 |              | 17 | Brian                   |  | P.                     |  | Hog                     |
| 18 |              | 18 | Jean-Philippe           |  | [null]                 |  | Aur                     |
| 19 |              | 19 | Lance                   |  | [null]                 |  | For                     |

|    |    |         |        |     |
|----|----|---------|--------|-----|
| 20 | 20 | Richard | C.     | Jef |
| 21 | 21 | William | L.     | Sir |
| 22 | 22 | Magnus  | Lie    | Het |
| 23 | 23 | Mike    | [null] | Mc  |
| 24 | 24 | Norman  | [null] | Ma  |
| 25 | 25 | John    | E.     | Hol |
| 26 | 26 | S.      | [null] | Suc |

As you can see, the data contained in the `csv` file was successfully uploaded into the table and you did not have to manually input hundreds of entries.

## Conclusion

Congratulations! You have completed this lab, and you have learned how to create databases and tables in a PostgreSQL instance, load data into tables manually using the pgAdmin GUI, and load data into tables from a text/script file.

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# Skills Network

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