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

**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 provides a number of key features for interacting with a PostgreSQL database in an easy to use format.

## Software Used in this Lab

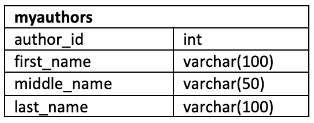
In this lab, you will use PostgreSQL Database. PostgreSQL is a Relational Database Management System (RDBMS) designed to efficiently store, manipulate, and retrieve data.

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

Books database has been used 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.

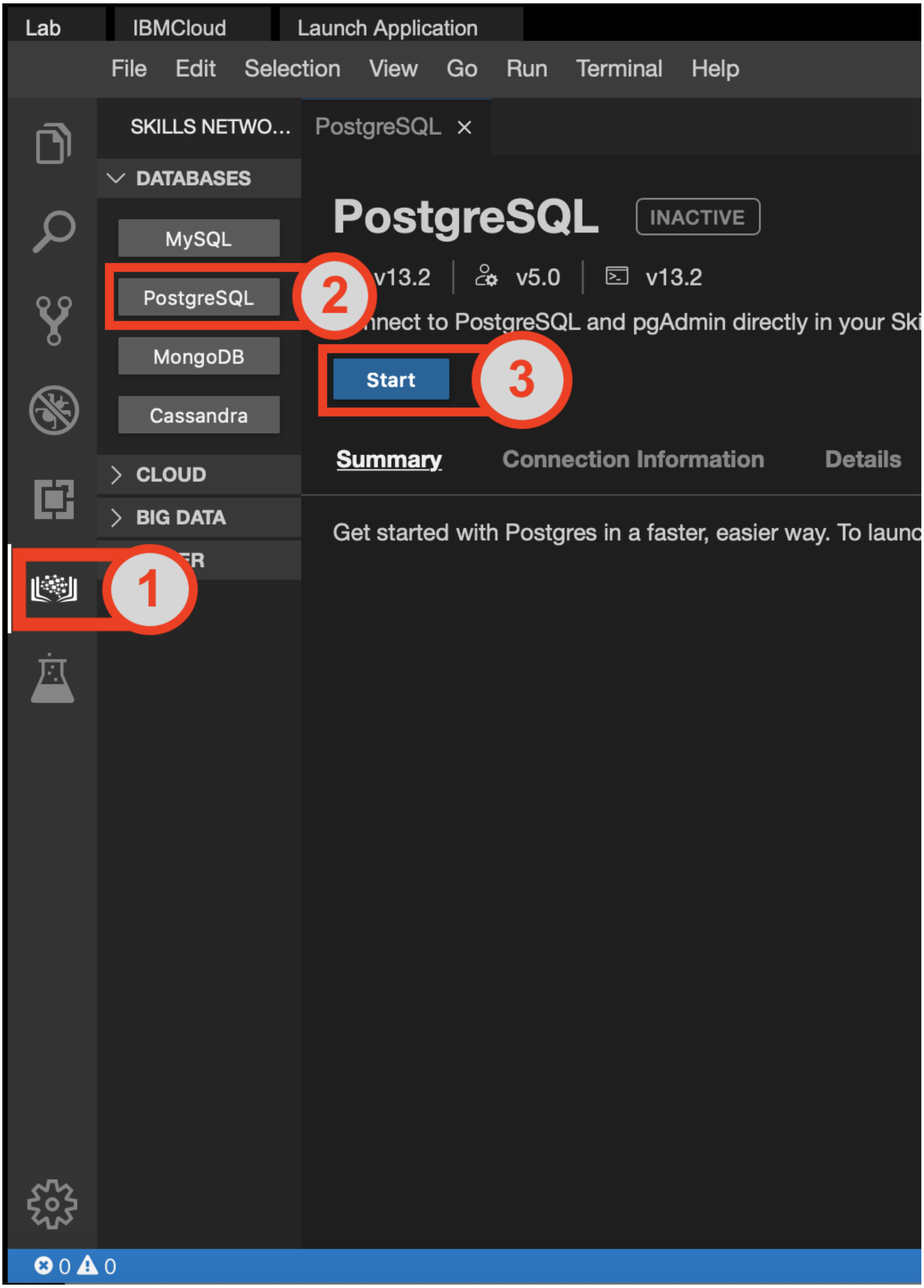
## Task A: Create a database

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

1. Click on the Skills Network extension button on the left side of the window.

2. Open the “DATABASES” drop down menu and click on “PostgreSQL”

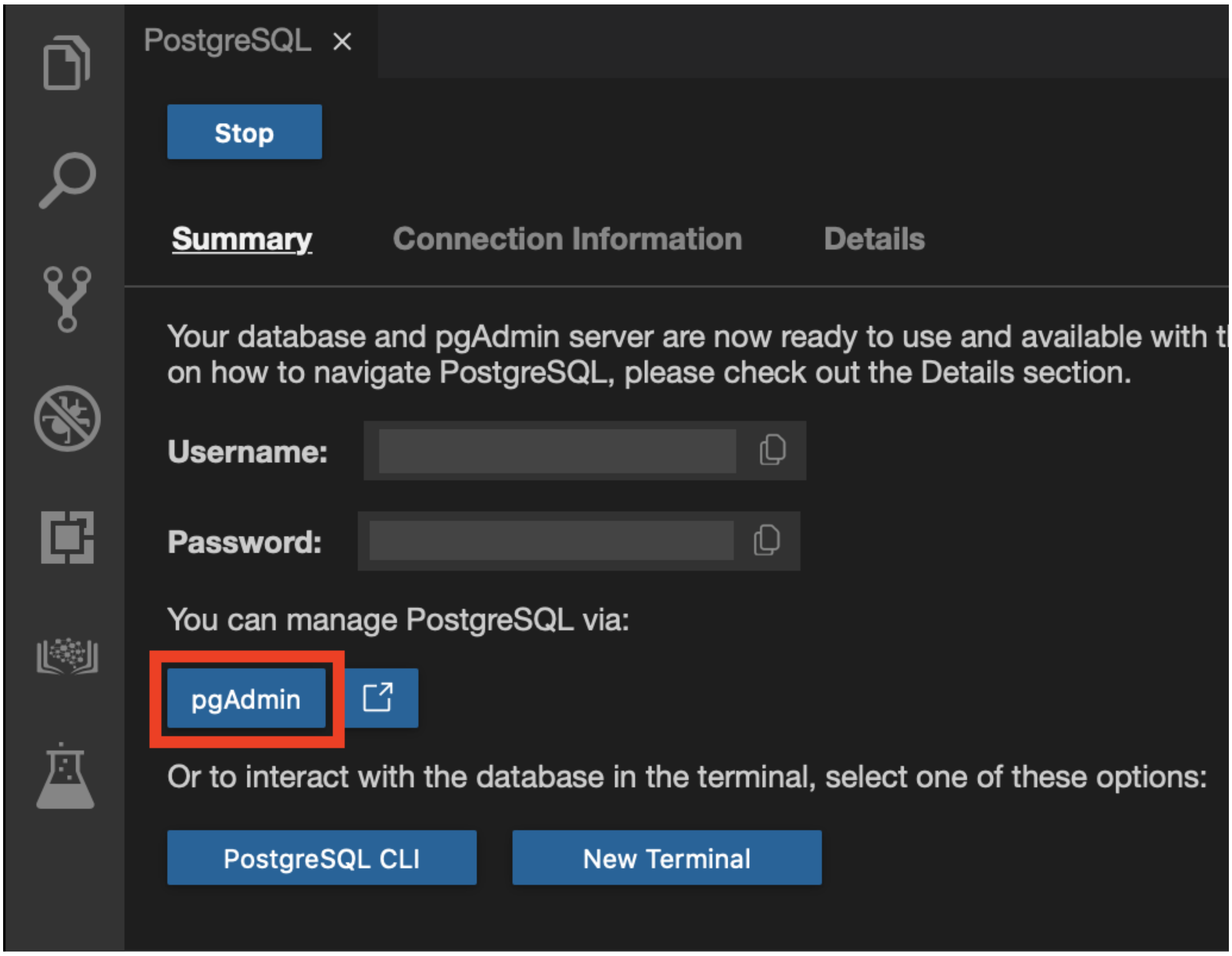
3. Click on the “Start” button. PostgreSQL may take a few moments to start.



nnect to PostgreSQL and pgAdmin directly in your Ski

Get started with Postgres in a faster, easier way. To launc

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


PostgreSQL ×

Stop

Summary Connection Information Details

Your database and pgAdmin server are now ready to use and available with t
on how to navigate PostgreSQL, please check out the Details section.

Username:

Password:

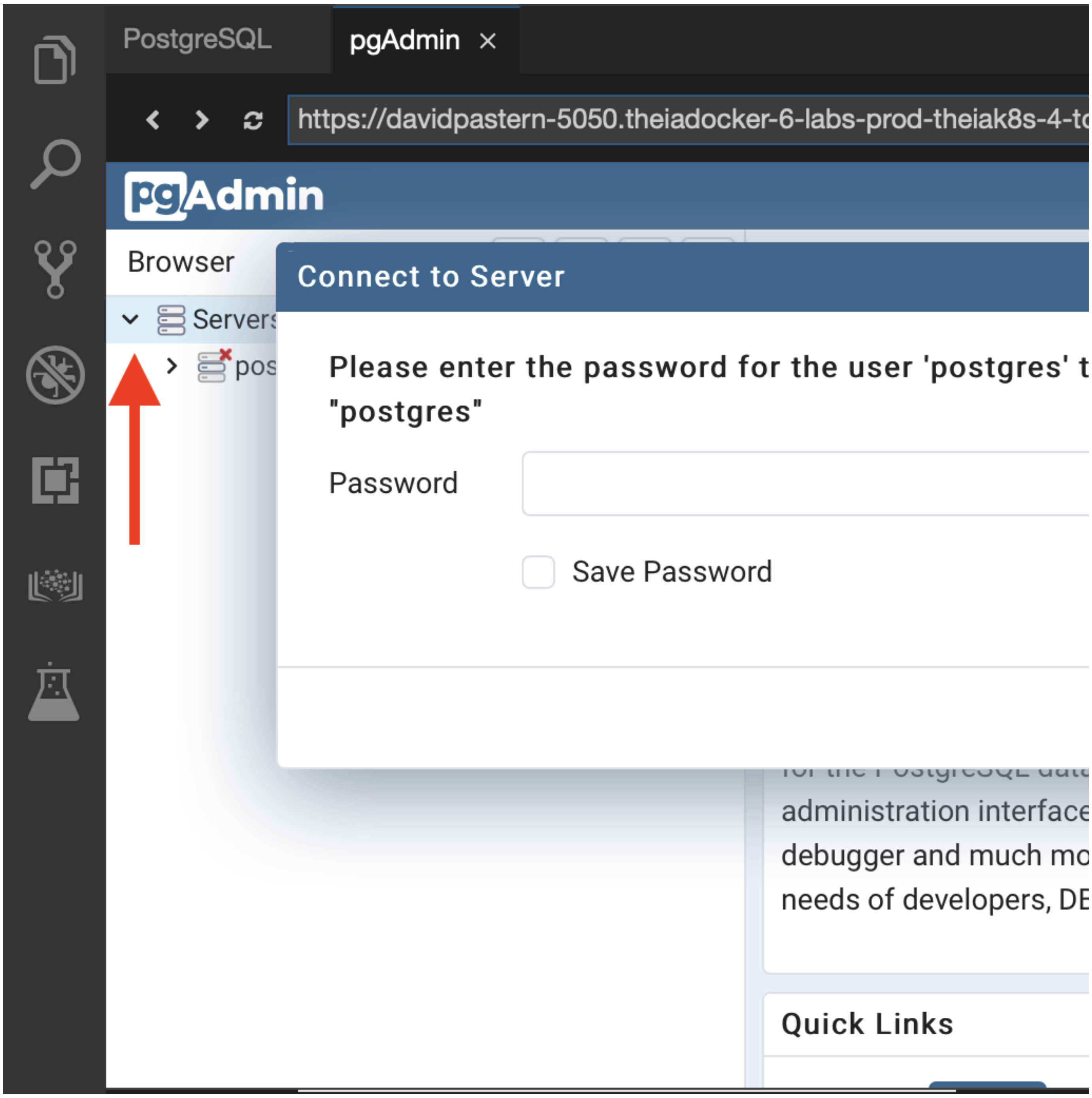
You can manage PostgreSQL via:

pgAdmin

Or to interact with the database in the terminal, select one of these options:

PostgreSQL CLI New Terminal

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


PostgreSQL
pgAdmin
https://davidpastern-5050.theiadocker-6-labs-prod-theiak8s-4-t
pgAdmin
Browser
Servers
pos
Quick Links

Connect to Server

Please enter the password for the user 'postgres' t
"postgres"

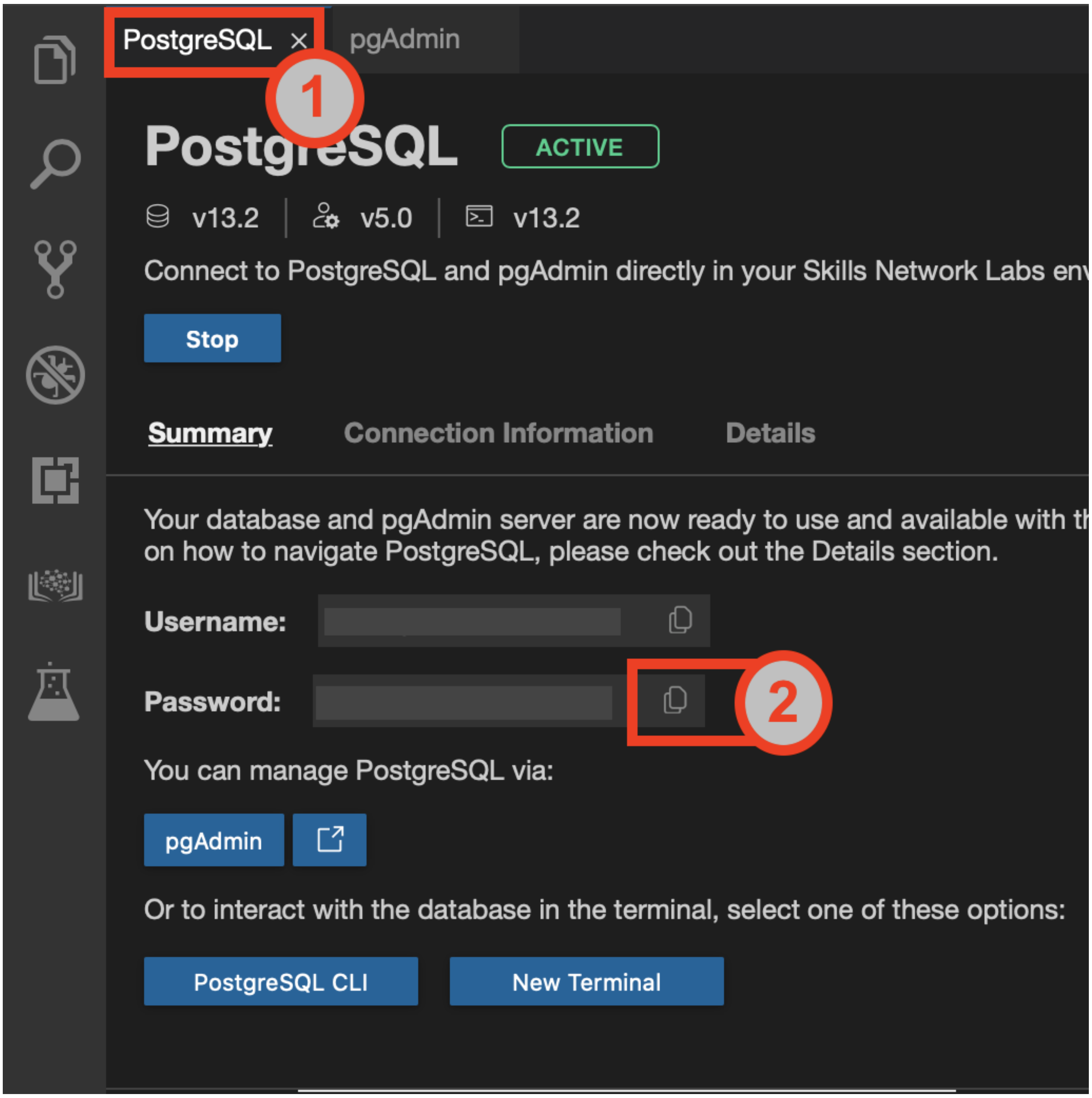
Password

Save Password

administration interface
debugger and much mo
needs of developers, DE

6. To retrieve your password, click on the “PostgreSQL” tab near the top of the interface.

7. Click on the Copy icon to the left of your password to copy the session password onto your clipboard.



PostgreSQL ACTIVE

v13.2 | v5.0 | v13.2

Connect to PostgreSQL and pgAdmin directly in your Skills Network Labs env

Your database and pgAdmin server are now ready to use and available with th
on how to navigate PostgreSQL, please check out the Details section.

Username: [redacted]

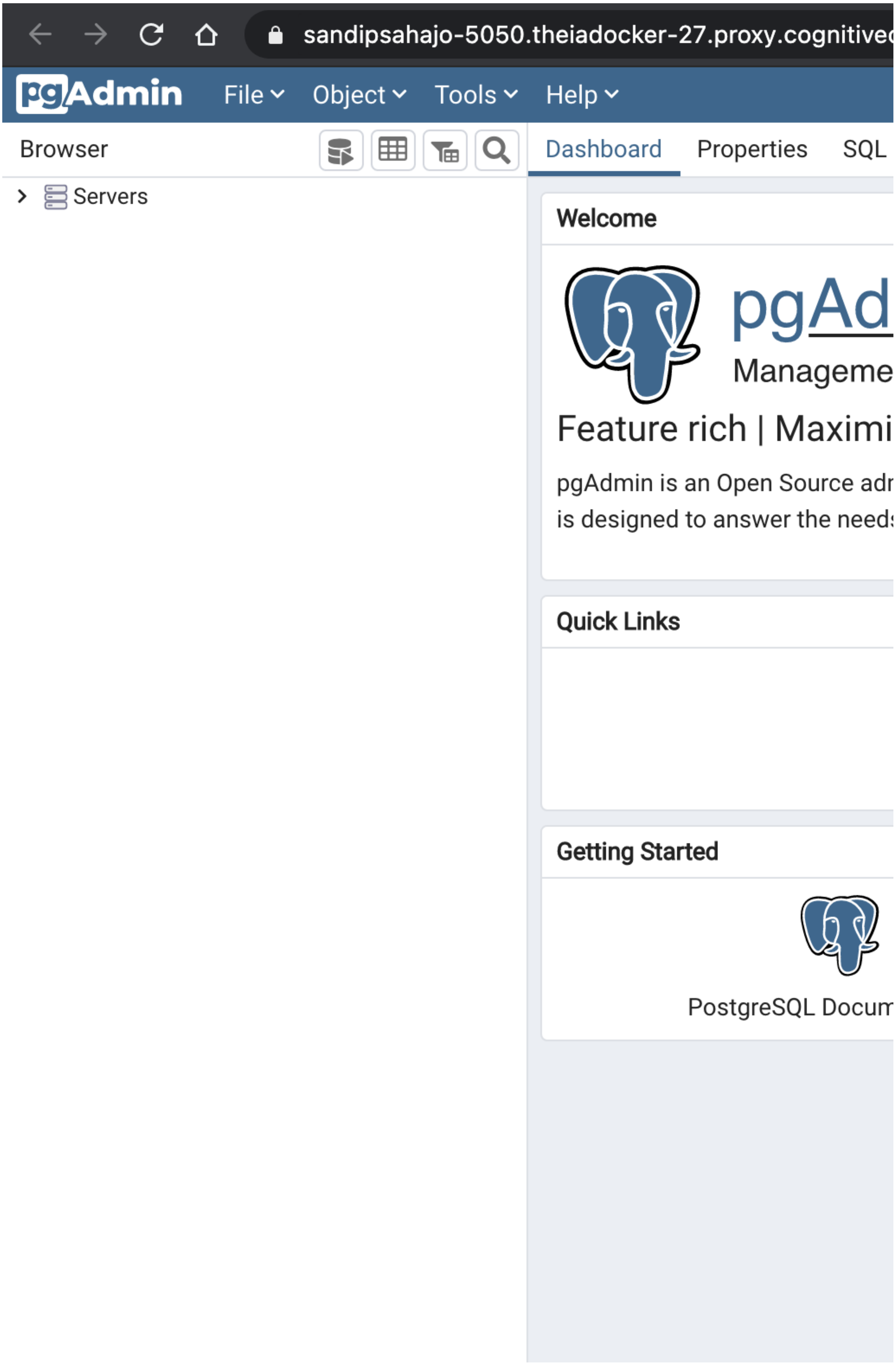
Password: [redacted]

You can manage PostgreSQL via:

Or to interact with the database in the terminal, select one of these options:

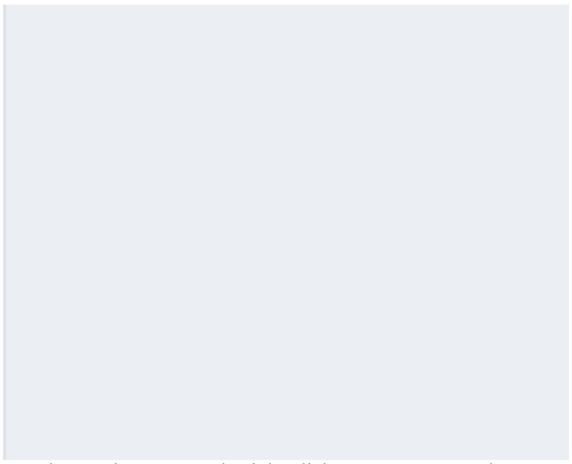
8. Navigate back to the “pgAdmin” tab and paste in your password, then click `OK`

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

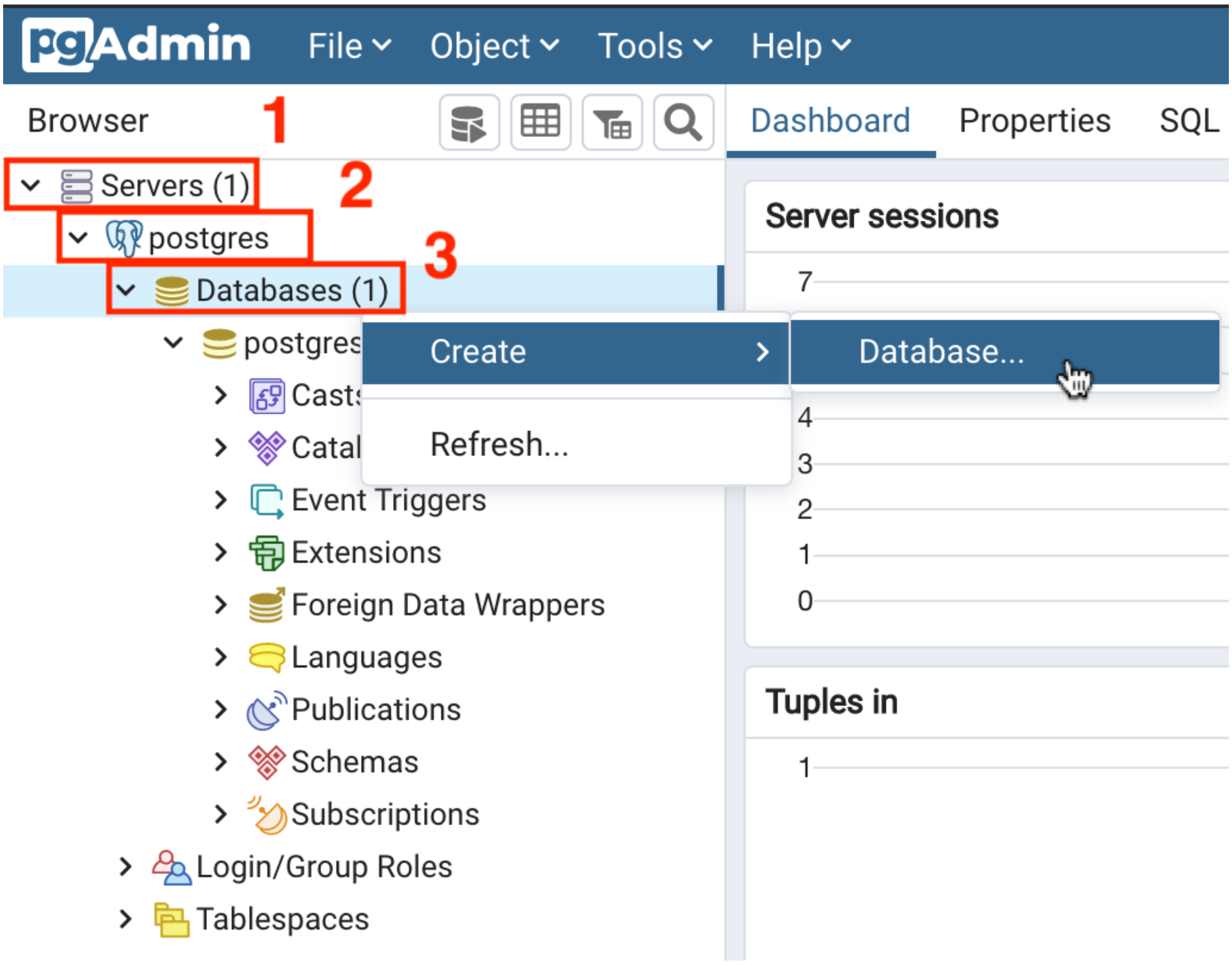


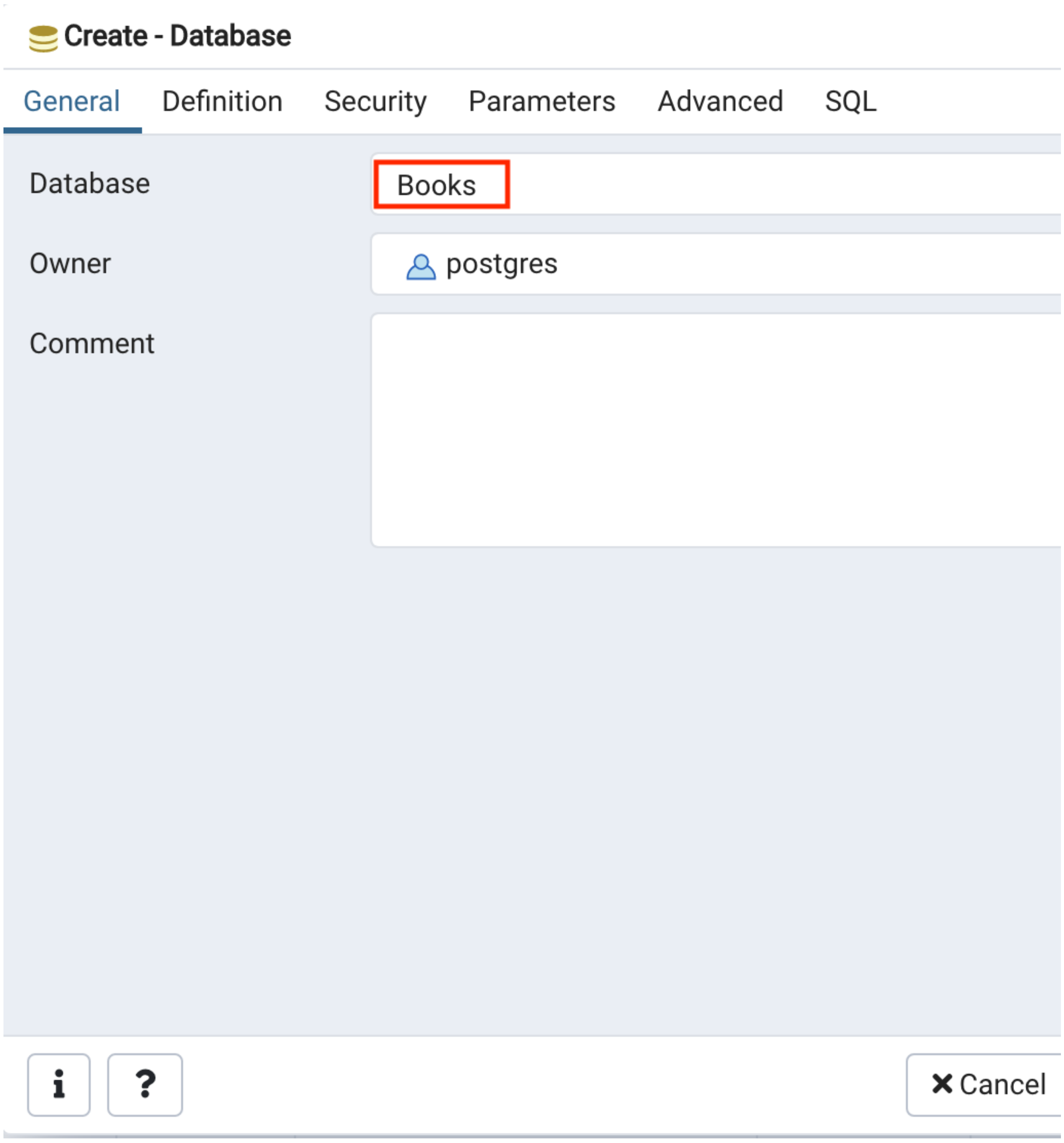
Feature rich | Maximi

pgAdmin is an Open Source adr
is designed to answer the need



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.




Create - Database

General | Definition | Security | Parameters | Advanced | SQL

Database: Books

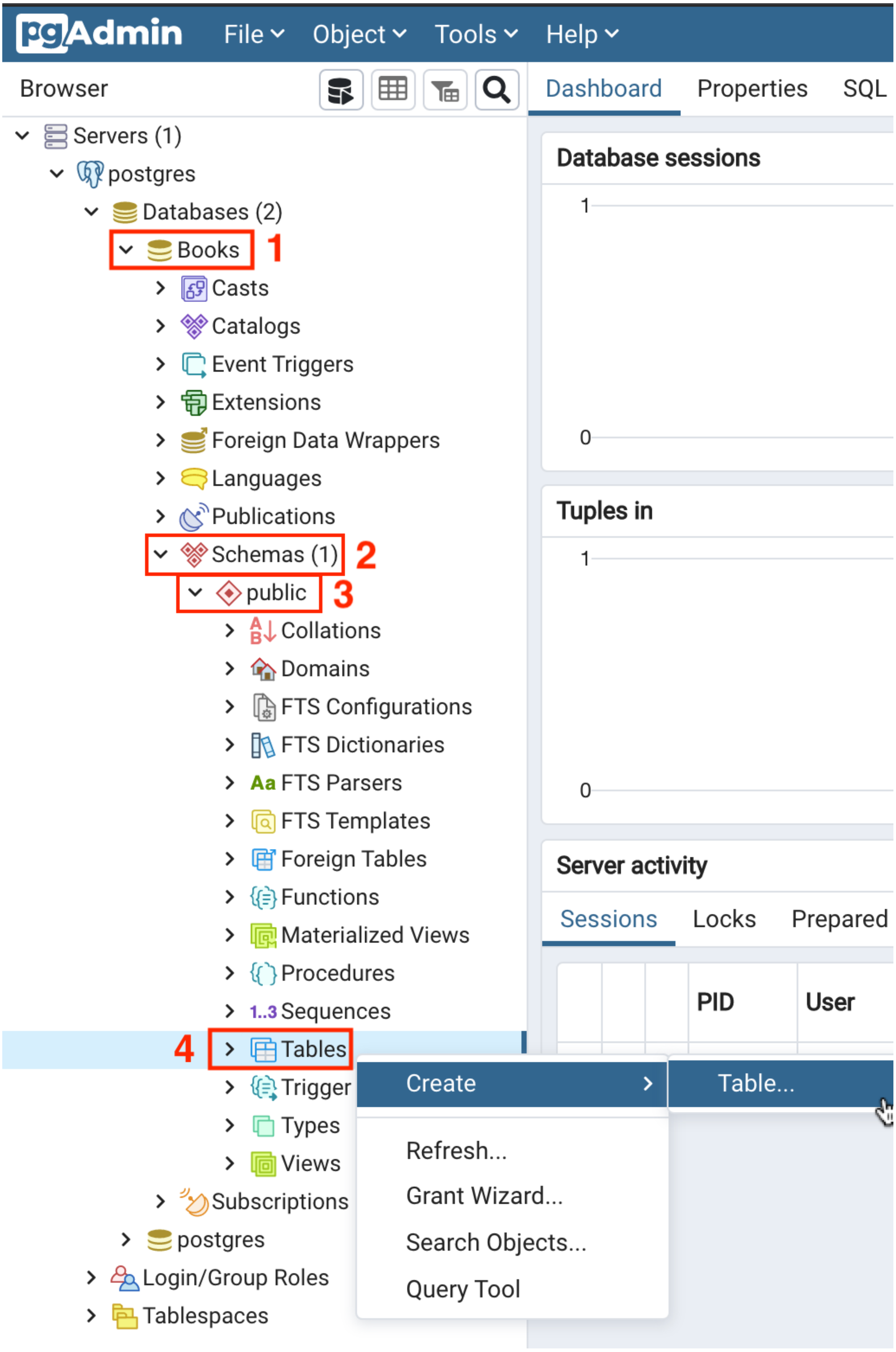
Owner: postgres

Comment:

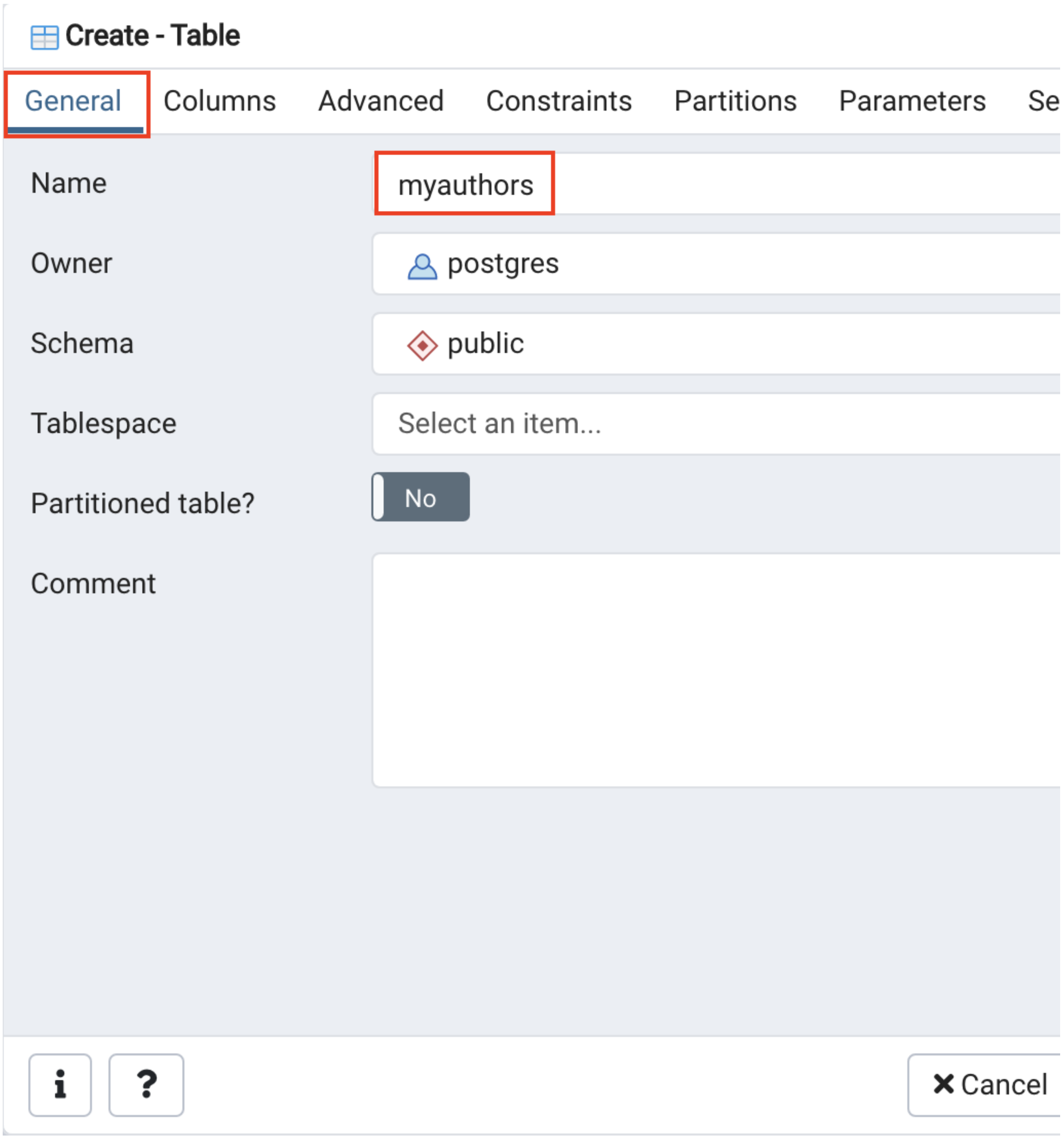
## Task B: Create tables

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

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


pgAdmin
File
Object
Tools
Help
Browser
Dashboard
Properties
SQL
Servers (1)
postgres
Databases (2)
Books
1
Casts
Catalogs
Event Triggers
Extensions
Foreign Data Wrappers
Languages
Publications
Schemas (1)
2
public
3
Collations
Domains
FTS Configurations
FTS Dictionaries
FTS Parsers
FTS Templates
Foreign Tables
Functions
Materialized Views
Procedures
Sequences
4
Tables
Trigger
Types
Views
Subscriptions
postgres
Login/Group Roles
Tablespaces
Database sessions
1
0
Tuples in
1
0
Server activity
Sessions
Locks
Prepared
PID
User
Create
Table...
Refresh...
Grant Wizard...
Search Objects...
Query Tool

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.

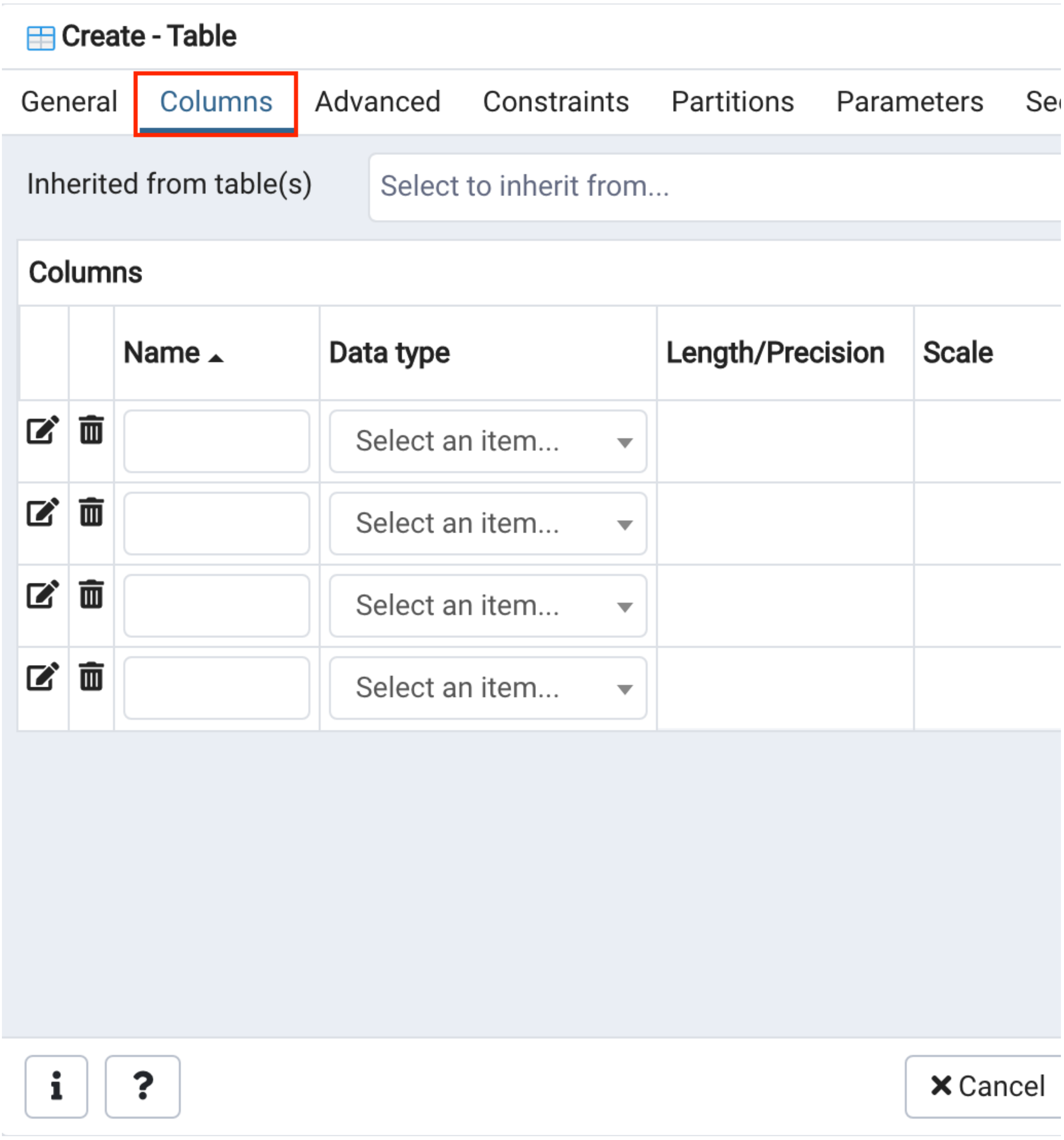


Create - Table

General | Columns | Advanced | Constraints | Partitions | Parameters | Se

| | |
|---|---|
| Name | myauthors |
| Owner | postgres |
| Schema | public |
| Tablespace | Select an item... |
| Partitioned table? | No |
| Comment | |

3. Switch to 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.

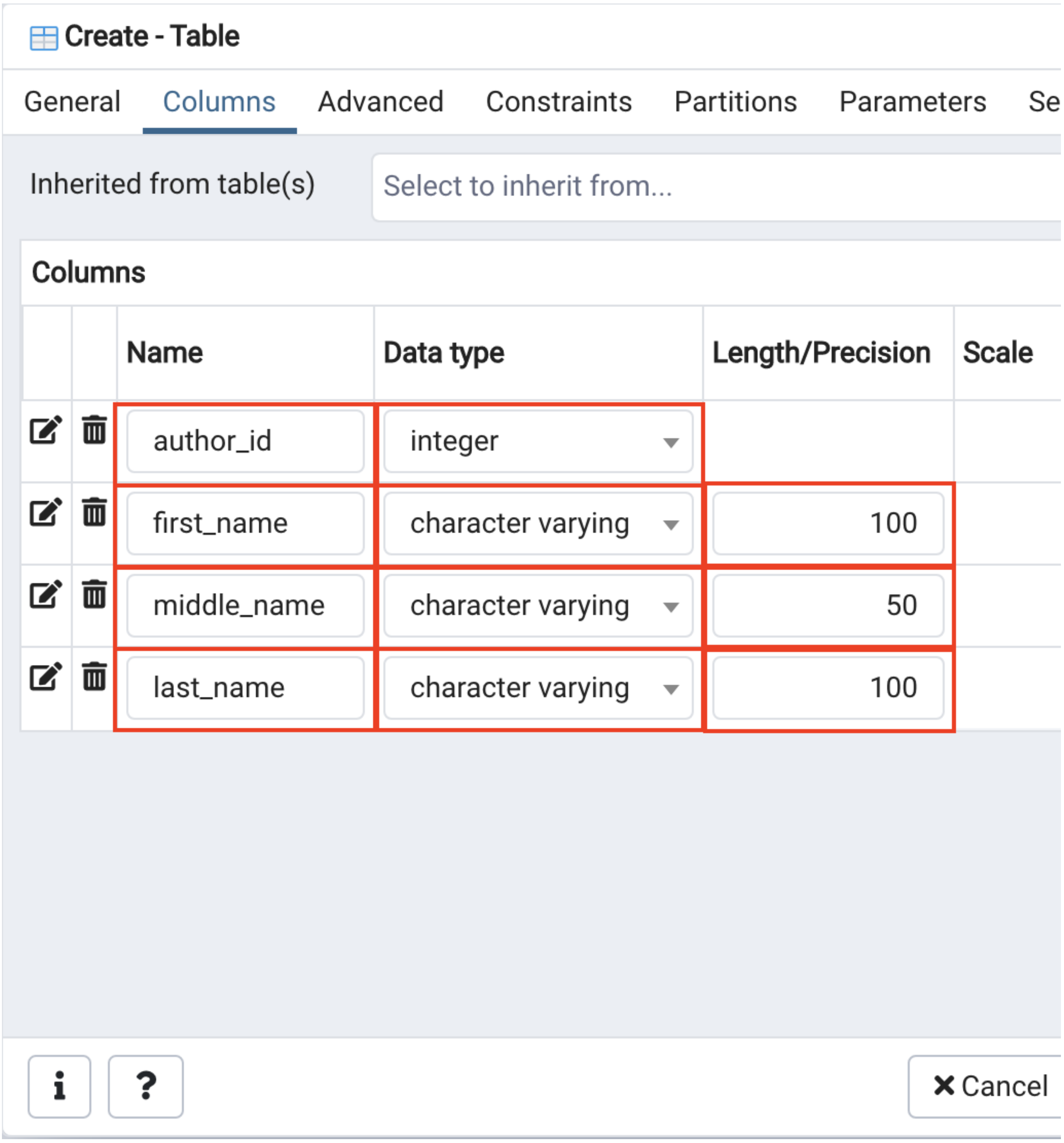


Inherited from table(s): Select to inherit from...

Columns

| | | Name ▲ | Data type | Length/Precision | Scale |
|---|---|---|---|---|---|
| | | | Select an item... | | |
| | | | Select an item... | | |
| | | | Select an item... | | |
| | | | Select an item... | | |

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 | Se

Inherited from table(s) Select to inherit from...

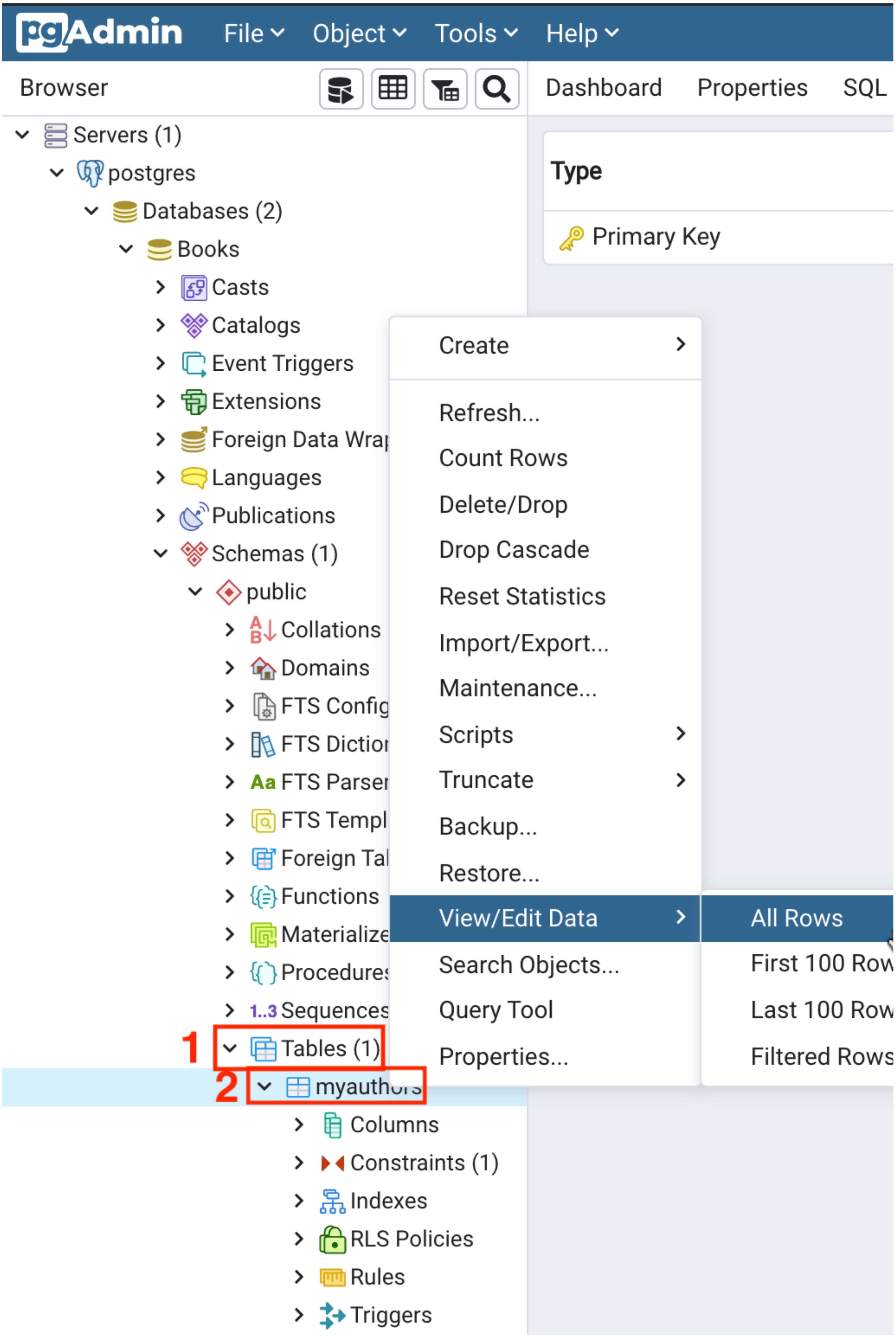
Columns

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

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

Great! 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 on **myauthors** and go to **View/Edit Data > All Rows**.


pgAdmin
File
Object
Tools
Help
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Dashboard
Properties
SQL
Type
Primary Key
Servers (1)
postgres
Databases (2)
Books
Casts
Catalogs
Event Triggers
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Publications
Schemas (1)
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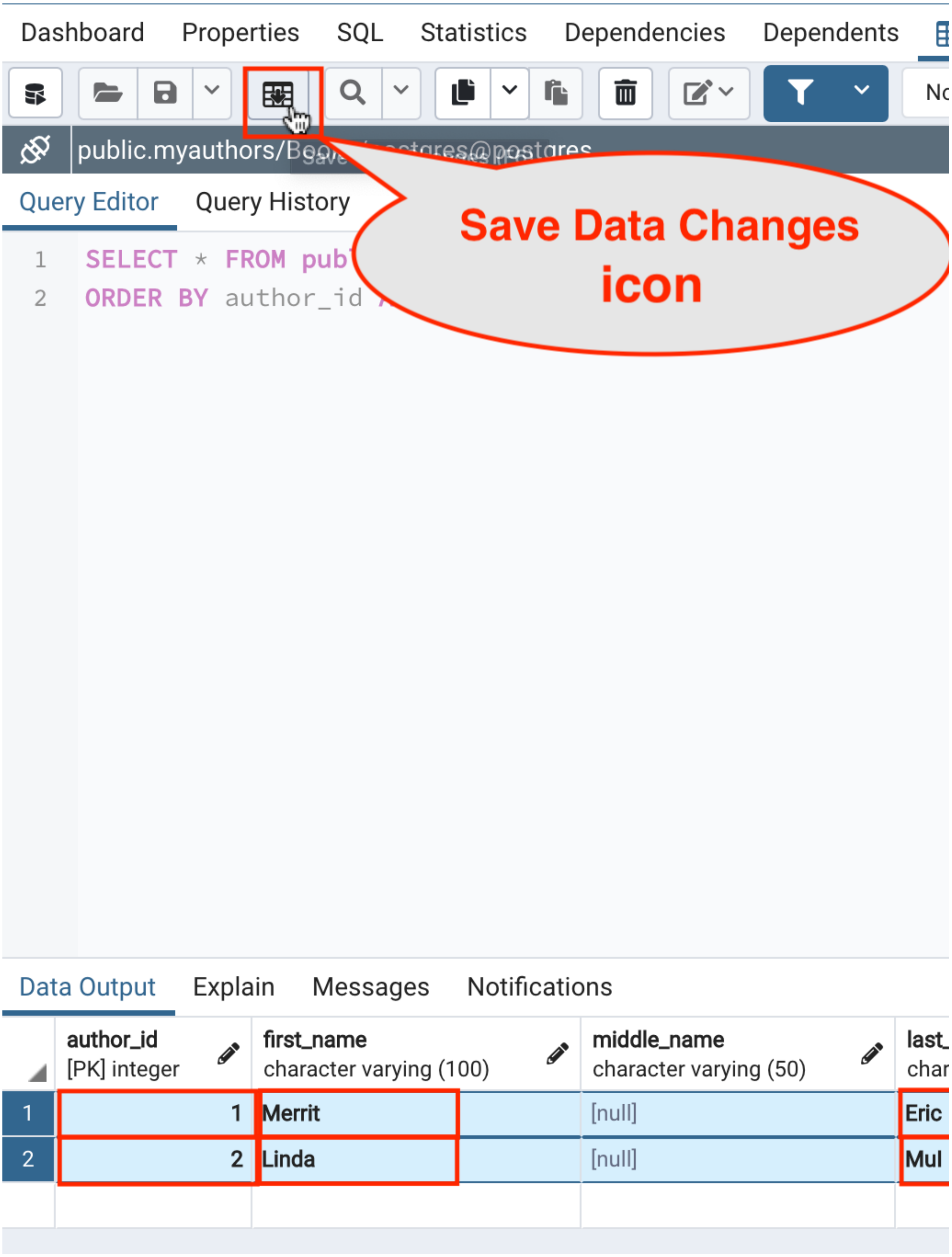
Tables (1)
2
myauthors
Columns
Constraints (1)
Indexes
RLS Policies
Rules
Triggers
Create
Refresh...
Count Rows
Delete/Drop
Drop Cascade
Reset Statistics
Import/Export...
Maintenance...
Scripts
Truncate
Backup...
Restore...
View/Edit Data
Search Objects...
Query Tool
Properties...
All Rows
First 100 Row
Last 100 Row
Filtered Rows

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** button. Proceed to Task D.



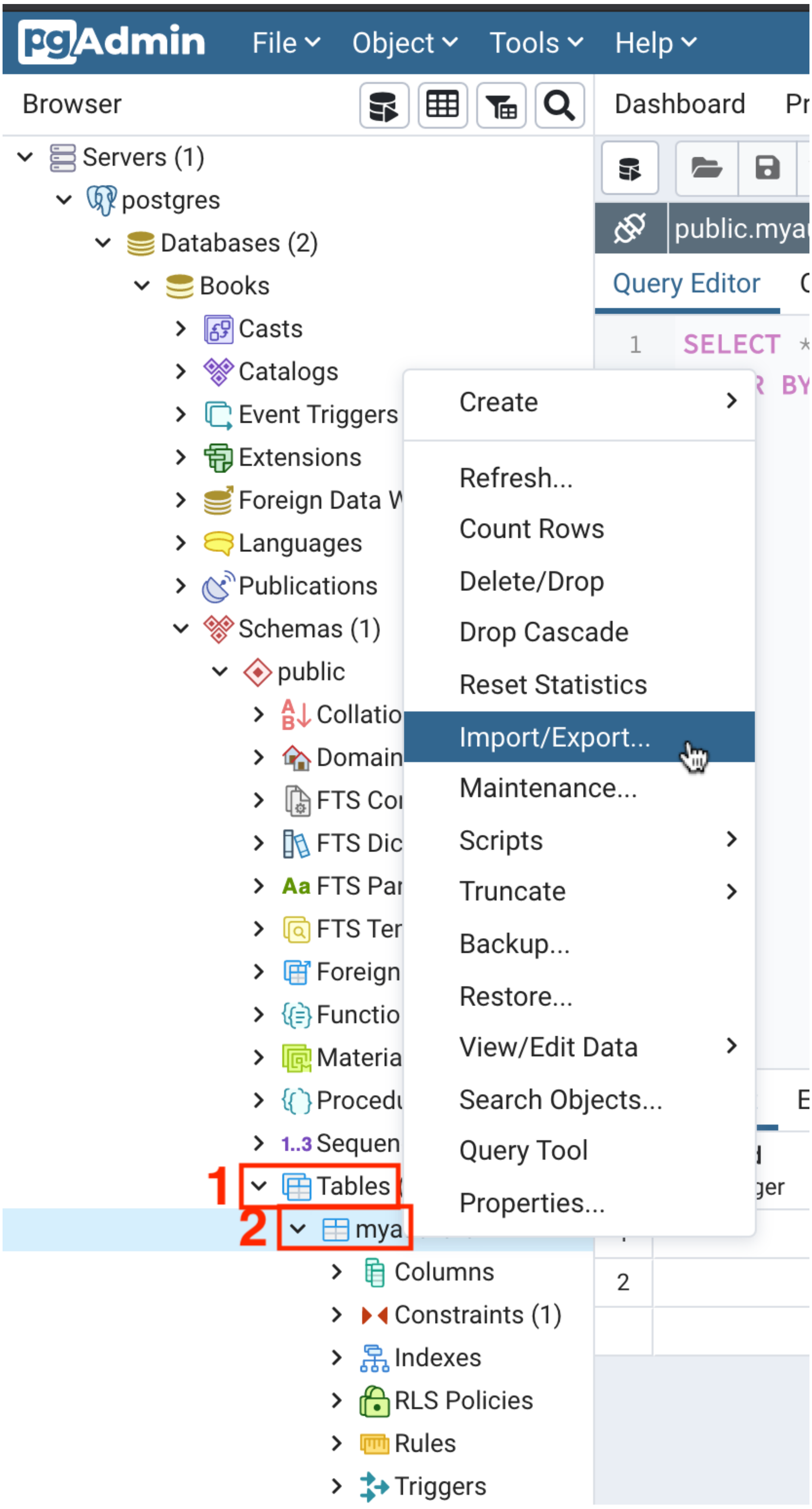
```
SELECT * FROM pub
ORDER BY author_id
```

| | author_id [PK] integer | first_name character varying (100) | middle_name character varying (50) | last_ char |
|---|---|---|---|---|
| 1 | 1 | Merrit | [null] | Eric |
| 2 | 2 | Linda | [null] | Mul |

## 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, that process becomes far too 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. Finally, 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
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Dashboard
Servers (1)
postgres
Databases (2)
Books
Casts
Catalogs
Event Triggers
Extensions
Foreign Data W
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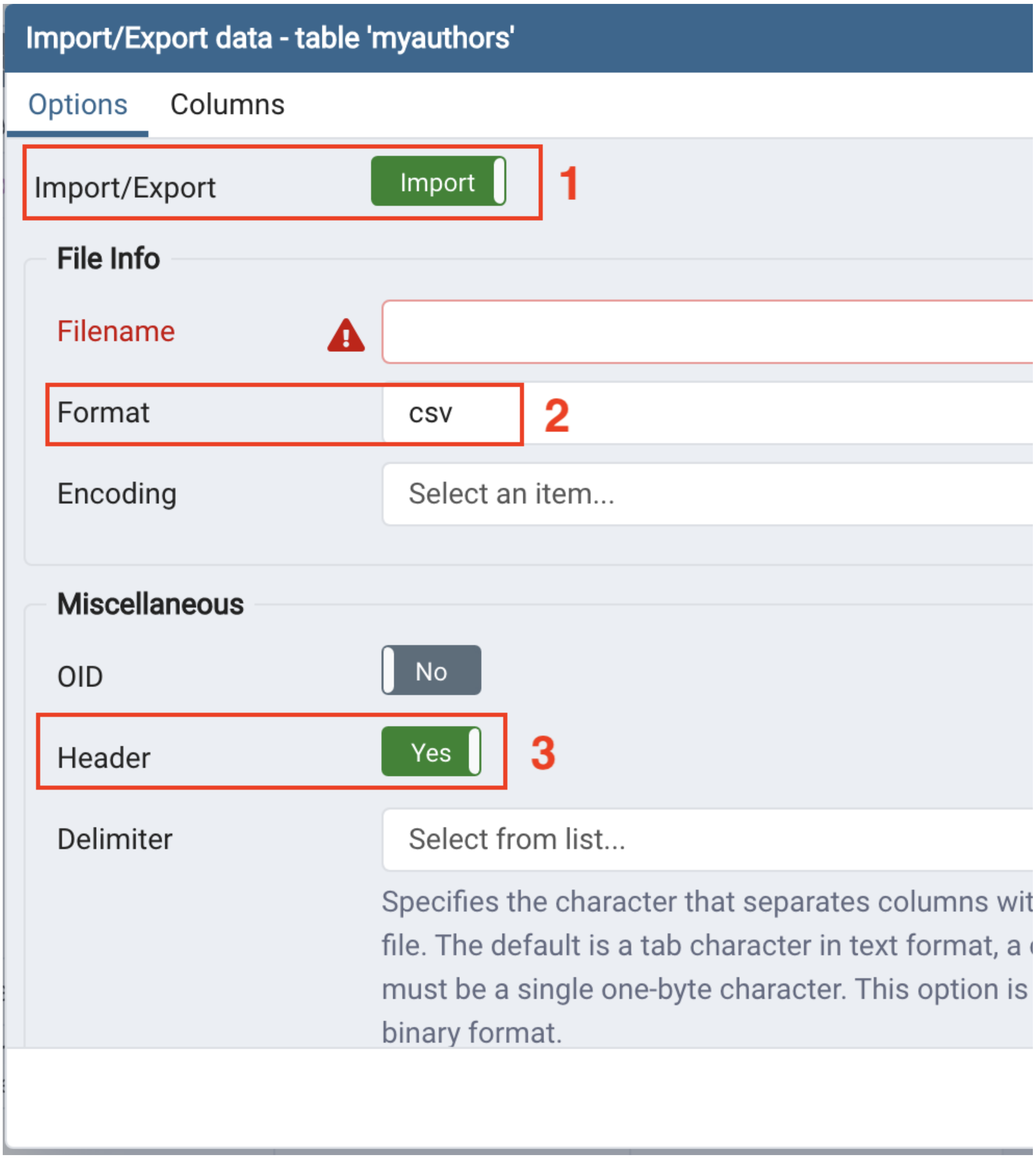
Indexes
RLS Policies
Rules
Triggers
public.mya
Query Editor
SELECT
BY
Create
Refresh...
Count Rows
Delete/Drop
Drop Cascade
Reset Statistics
Import/Export...
Maintenance...
Scripts
Truncate
Backup...
Restore...
View/Edit Data
Search Objects...
Query Tool
Properties...

3. Follow the instructions below to import:

- Make sure Import/Export is set to **Import**, Format = **csv** and Header = **Yes**. Then click on the **Select file** button by the Filename box.



Import/Export data - table 'myauthors'

Options Columns

Import/Export: Import 1

File Info

Filename

Format: csv 2

Encoding: Select an item...

Miscellaneous

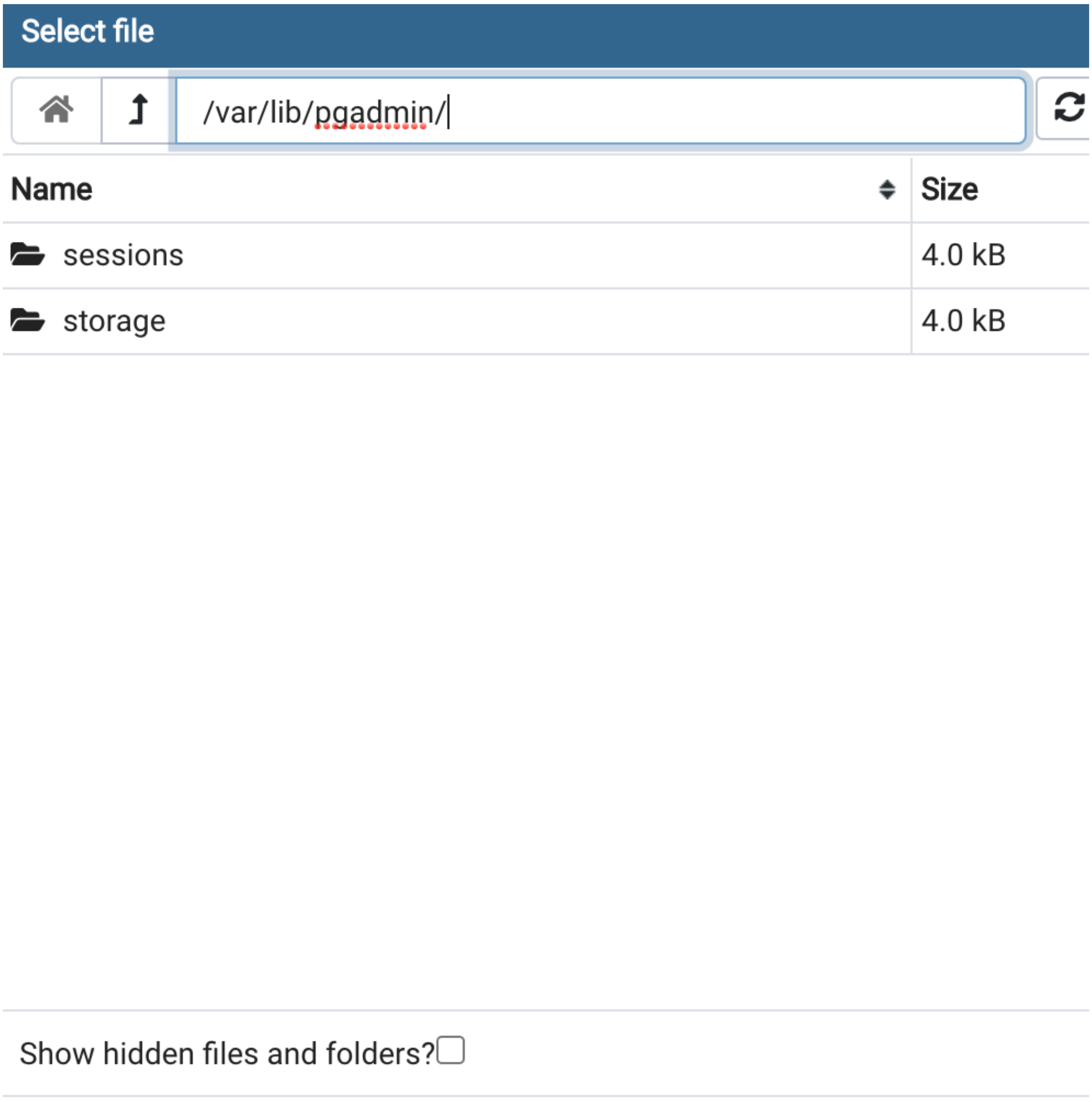
OID: No

Header: Yes 3

Delimiter: Select from list...

Specifies the character that separates columns wit
file. The default is a tab character in text format, a
must be a single one-byte character. This option is
binary format.

- Click the **Upload File** button.



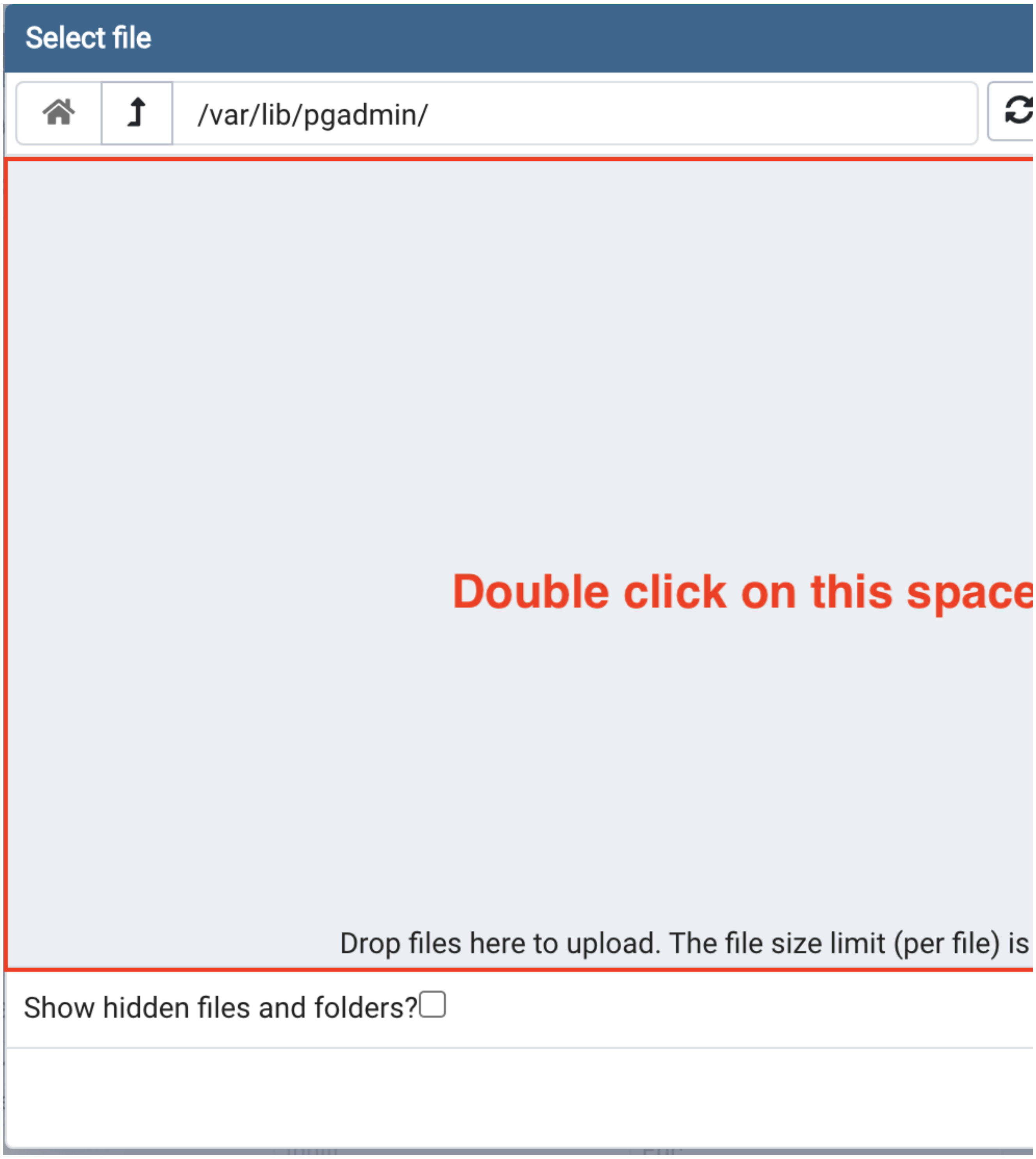
Select file

/var/lib/pgadmin/

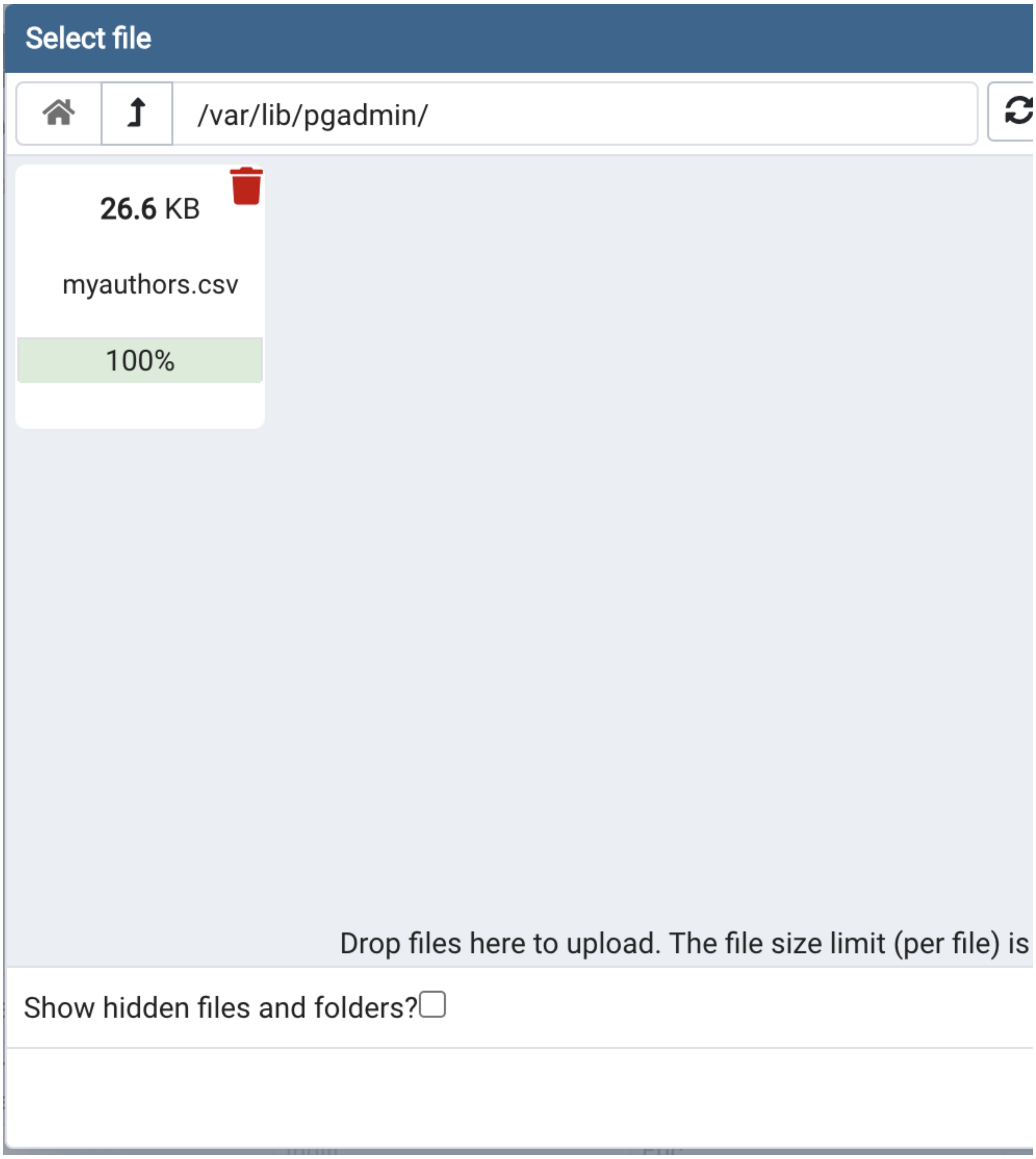
| Name | Size |
|---|---|
| sessions | 4.0 kB |
| storage | 4.0 kB |

Show hidden files and folders?☐

- Double-click on the drop files area and load the **myauthors.csv** you downloaded earlier from your local computer storage.


Select file
/var/lib/pgadmin/
Double click on this space
Drop files here to upload. The file size limit (per file) is
Show hidden files and folders?

- When the upload is complete, close the drop files area clicking the **X** button.


Select file

/var/lib/pgadmin/

26.6 KB

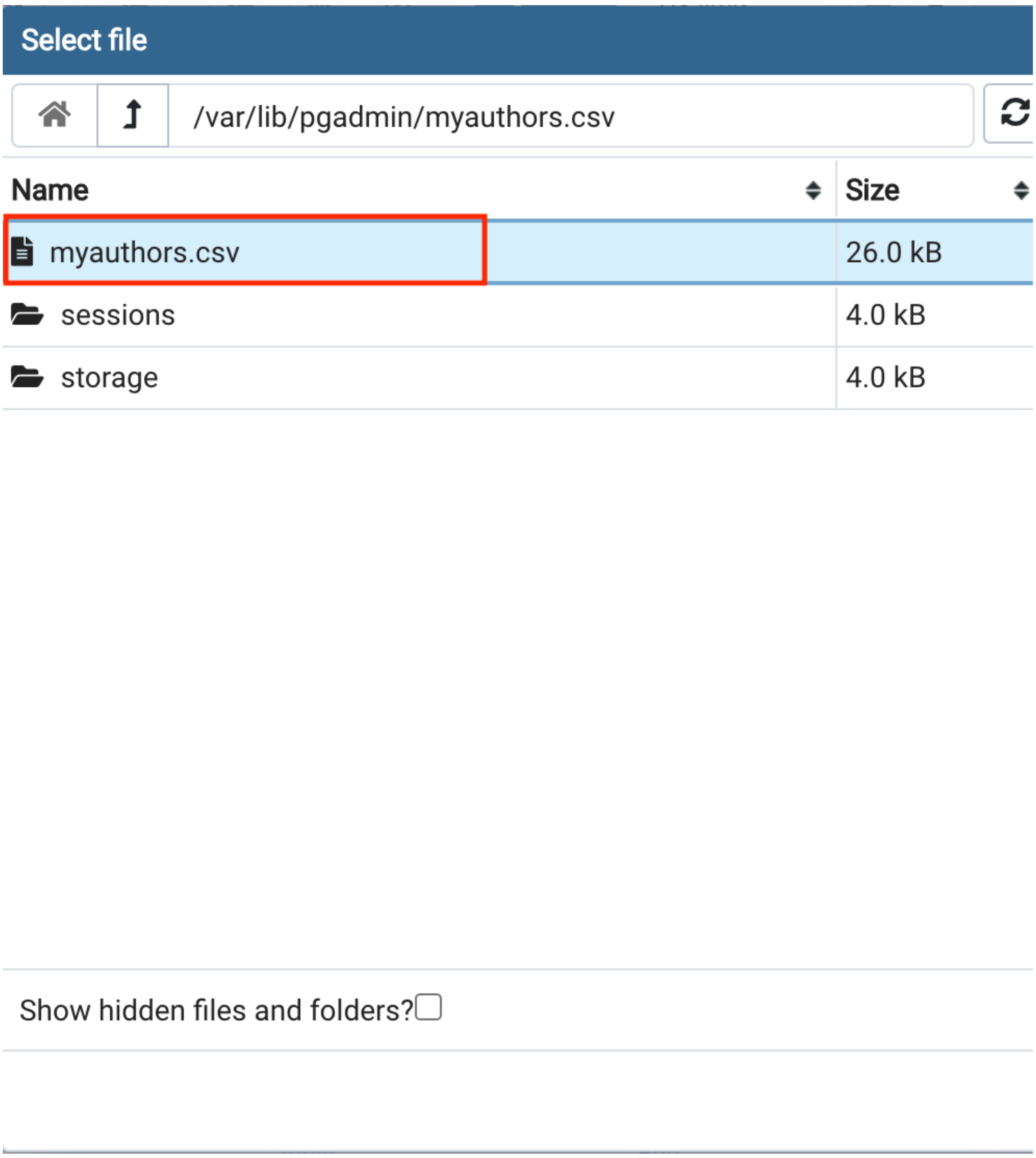
myauthors.csv

100%

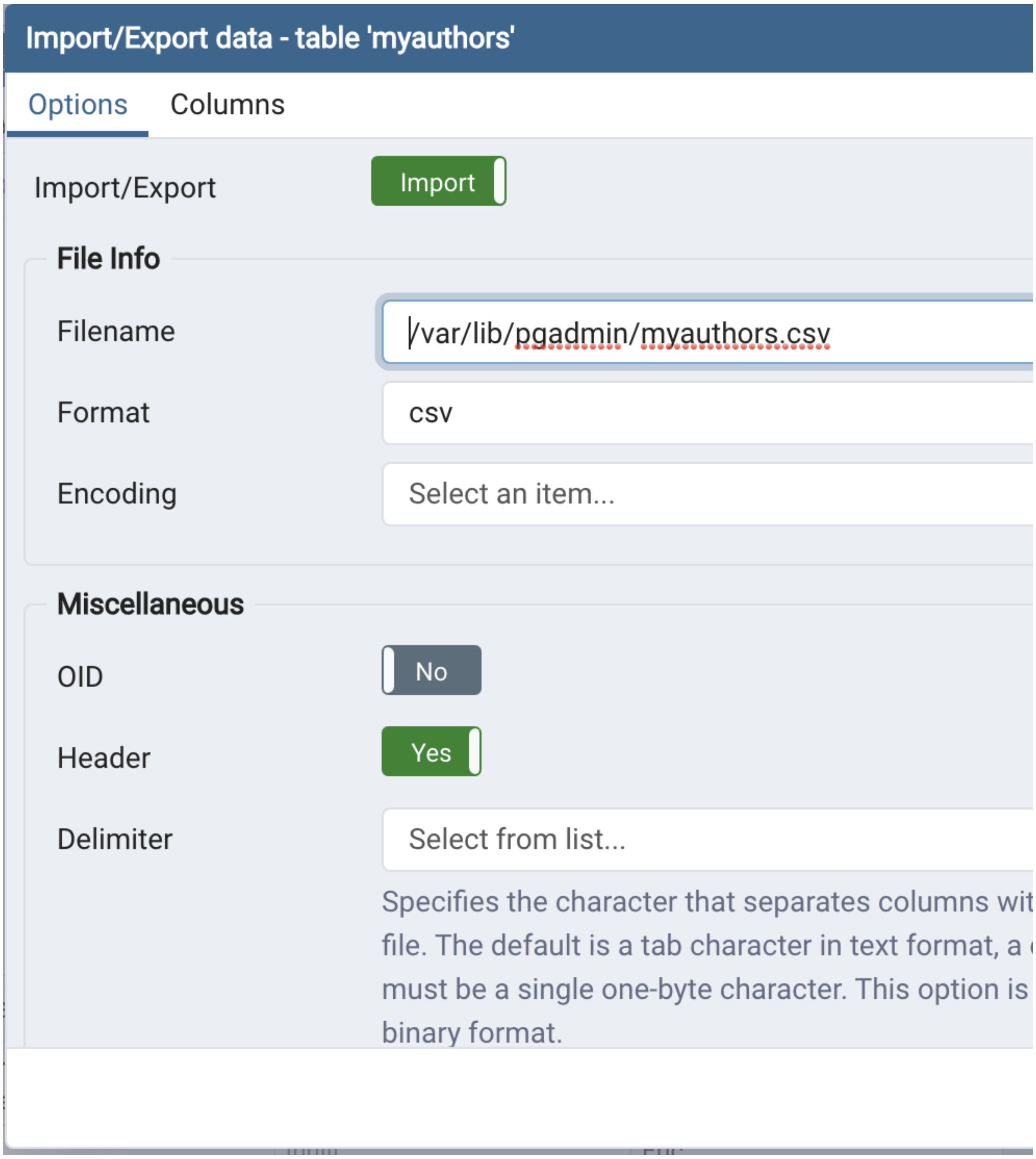
Drop files here to upload. The file size limit (per file) is

Show hidden files and folders? ☐

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



- Click **OK** and notification of import success should appear.



Import/Export data - table 'myauthors'

Options Columns

| | |
|---|---|
| Import/Export | Import |

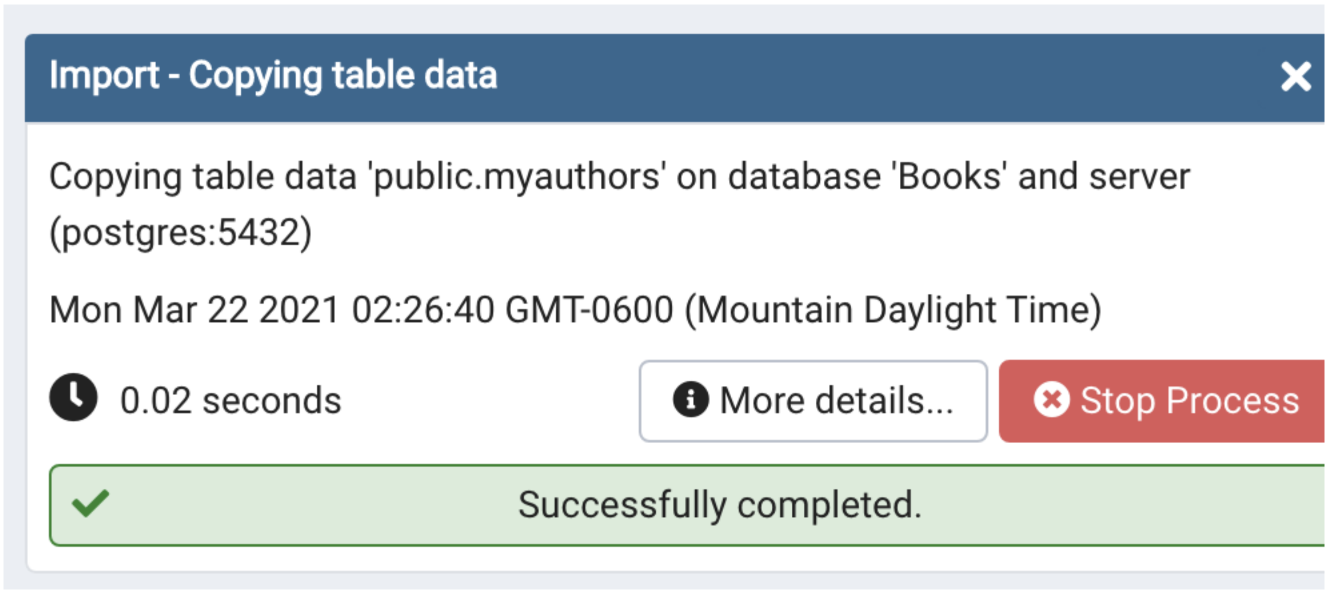
File Info

| | |
|---|---|
| Filename | /var/lib/pgadmin/myauthors.csv |
| Format | csv |
| Encoding | Select an item... |

Miscellaneous

| | |
|---|---|
| OID | No |
| Header | Yes |
| Delimiter | Select from list... |

Specifies the character that separates columns wit
file. The default is a tab character in text format, a
must be a single one-byte character. This option is
binary format.



Import - Copying table data

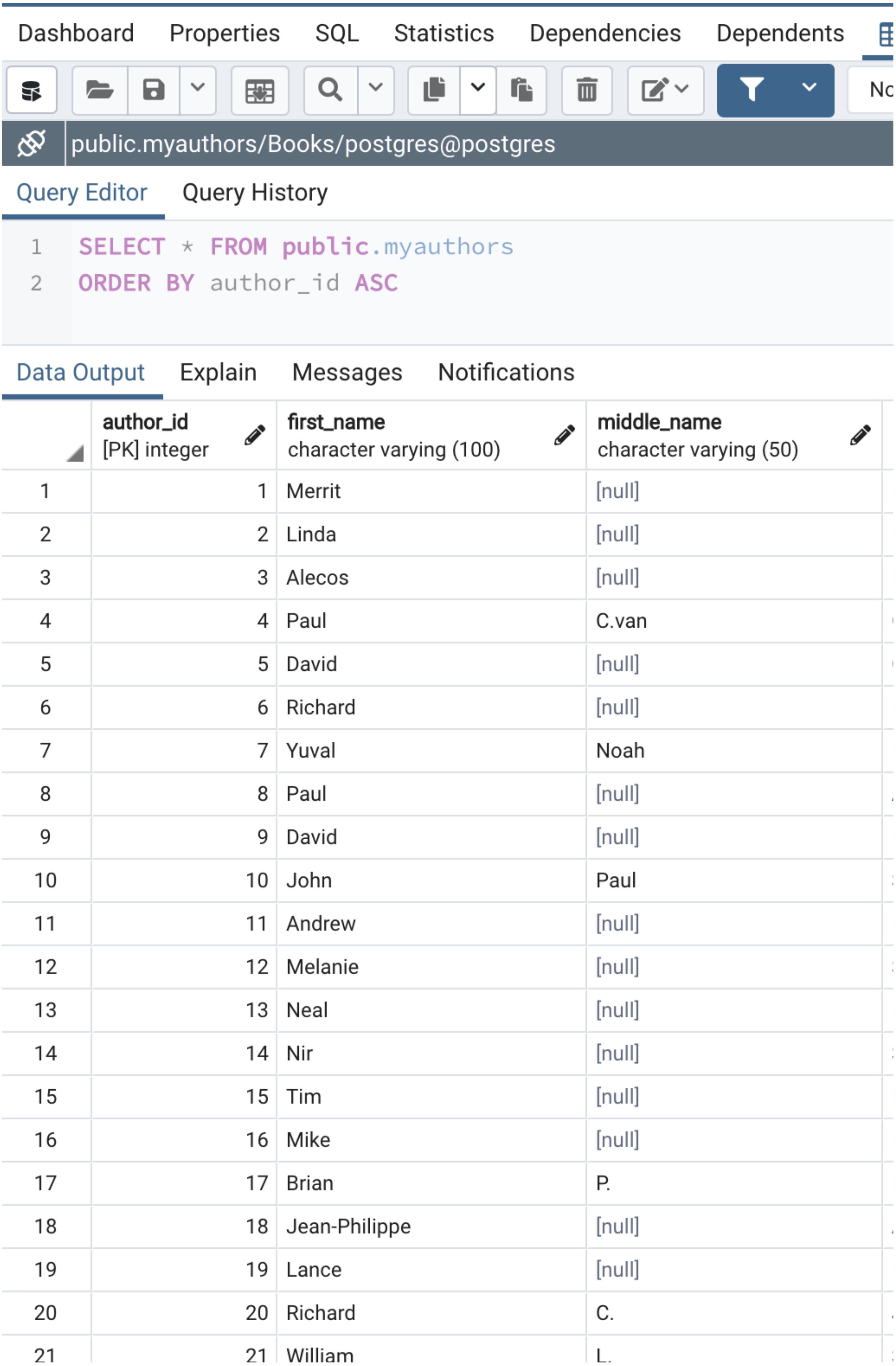
Copying table data 'public.myauthors' on database 'Books' and server (postgres:5432)

Mon Mar 22 2021 02:26:40 GMT-0600 (Mountain Daylight Time)

0.02 seconds

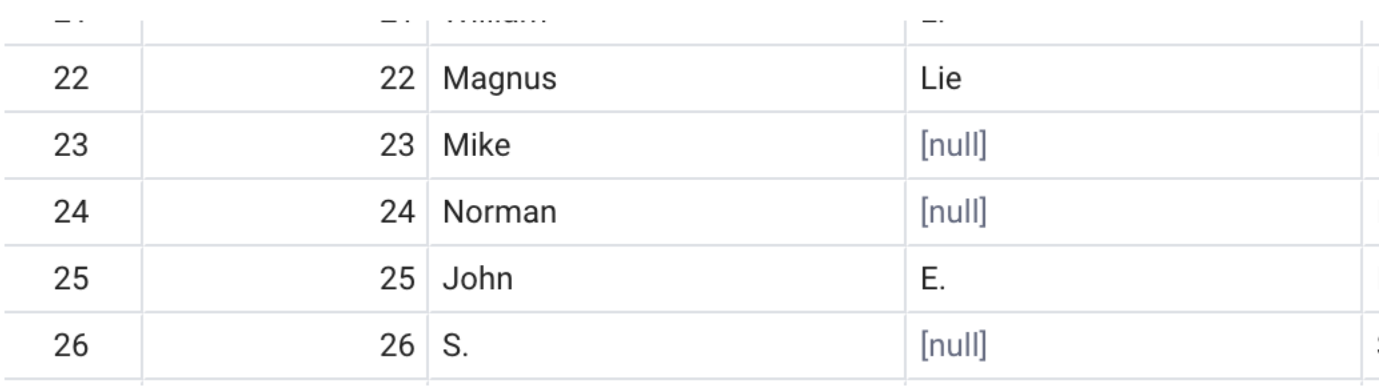
Successfully completed.

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



```sql
SELECT * FROM public.myauthors
ORDER BY author_id ASC
```

| | author_id [PK] integer | first_name character varying (100) | middle_name character varying (50) |
|---|---|---|---|
| 1 | 1 | Merrit | [null] |
| 2 | 2 | Linda | [null] |
| 3 | 3 | Alecos | [null] |
| 4 | 4 | Paul | C.van |
| 5 | 5 | David | [null] |
| 6 | 6 | Richard | [null] |
| 7 | 7 | Yuval | Noah |
| 8 | 8 | Paul | [null] |
| 9 | 9 | David | [null] |
| 10 | 10 | John | Paul |
| 11 | 11 | Andrew | [null] |
| 12 | 12 | Melanie | [null] |
| 13 | 13 | Neal | [null] |
| 14 | 14 | Nir | [null] |
| 15 | 15 | Tim | [null] |
| 16 | 16 | Mike | [null] |
| 17 | 17 | Brian | P. |
| 18 | 18 | Jean-Philippe | [null] |
| 19 | 19 | Lance | [null] |
| 20 | 20 | Richard | C. |
| 21 | 21 | William | L. |



| | | | |
|---|---|---|---|
| 22 | 22 | Magnus | Lie |
| 23 | 23 | Mike | [null] |
| 24 | 24 | Norman | [null] |
| 25 | 25 | John | E. |
| 26 | 26 | S. | [null] |

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 are ready for the next topic.**

### Author

- Sandip Saha Joy

### Other Contributors

- David Pasternak

### Changelog

| Date | Version | Changed by | Change Description |
|---|---|---|---|
| 2021-03-15 | 1.0 | Sandip Saha Joy | Created initial version |
| 2021-10-18 | 1.1 | David Pasternak | Updated lab instructions |