

Build a Python App with CockroachDB and psycopg2

1. Step 1. Start CockroachDB

Create a free cluster:

- Log in to your CockroachDB Cloud account.
- On the Clusters page, click Create Cluster.



Create a new cluster

Choose your plans, regions, and cloud providers.

Create Cluster

Or, review our [Getting Started Guide](#).

- On the Create your cluster page, select Serverless, and then Click Create cluster.

Create your cluster

Cancel

Choose a Plan

Serverless

Highly available clusters that scale instantly. Only pay for what you use.

✓

Get started for free

✓

Auto-scaling performance

✓

Pay-as-you-go

Dedicated standard

Dedicated single-tenant clusters starting at \$262/month.

✓

Free 30-Day trial

✓

Multi-region capabilities

Summary

Plan

Serverless

Cloud

Google Cloud

Region

Jurong West (asia-southeast1)

Resources

50,000,000 RUs

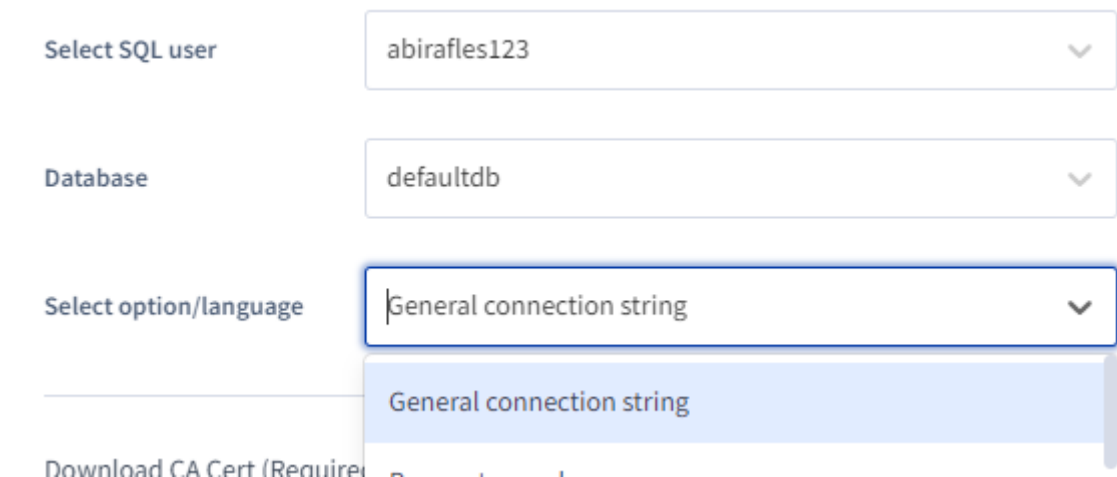
10 GiB storage

Free

Create Cluster

2. Get the root certificate:

- Select General connection string from the Select option dropdown.



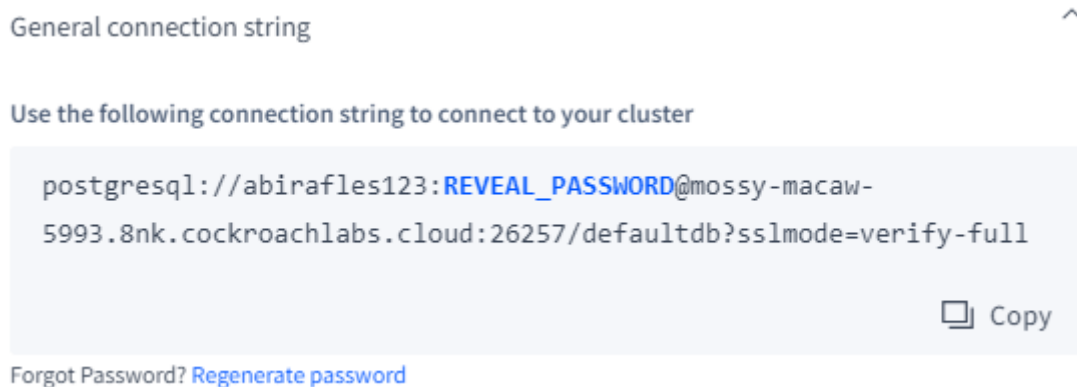
The screenshot shows a web interface with four dropdown menus. The first two are 'Select SQL user' (set to 'abirafles123') and 'Database' (set to 'defaultdb'). The third is 'Select option/language', which is open and shows 'General connection string' selected. The fourth is 'Download CA Cert (Required...)'.

- Open a new terminal on your local machine, and run the CA Cert download command provided in the Download CA Cert section. The client driver used in this tutorial requires this certificate to connect to CockroachDB Cloud.

```
PS C:\Users\Abi Rahman> Invoke-WebRequest -Uri https://cockroachlabs.cloud/clusters/2dbcf74b-eccc-44be-8f74-b7904e0968a3/cert -OutFile $env:appdata\postgresql\root.crt
PS C:\Users\Abi Rahman>
```

3. Get the connection string:

Open the General connection string section, then copy the connection string provided and save it in a secure location.



The screenshot shows the 'General connection string' section. It has a title 'General connection string' with an upward arrow. Below it is a heading 'Use the following connection string to connect to your cluster'. A light blue box contains the connection string: `postgresql://abirafles123:REVEAL_PASSWORD@mossy-macaw-5993.8nk.cockroachlabs.cloud:26257/defaultdb?sslmode=verify-full`. To the right of the box is a 'Copy' button with a clipboard icon. Below the box is a link: 'Forgot Password? [Regenerate password](#)'.

4. Step 2. Get the sample code:

Clone the sample code's GitHub repo: `git clone https://github.com/cockroachlabs/hello-world-python-psycopg2`

```

t.crt
git clone https://github.com/cockroachlabs/hello-world-python-psycpg2bi Rahman>
Cloning into 'hello-world-python-psycpg2'...
remote: Enumerating objects: 93, done.
remote: Counting objects: 100% (93/93), done.
remote: Compressing objects: 100% (62/62), done.
remote: Total 93 (delta 48), reused 68 (delta 30), pack-reused 0
Receiving objects: 100% (93/93), 20.41 KiB | 908.00 KiB/s, done.
Resolving deltas: 100% (48/48), done.
PS C:\Users\Abi Rahman>

```

5. Step 3. Install the psycpg2 driver

To install psycpg2-binary, run the following command: pip install psycpg2-binary

```

PS C:\Users\Abi Rahman> pip install psycpg2-binary
Collecting psycpg2-binary
  Downloading psycpg2_binary-2.9.7-cp311-cp311-win_amd64.whl (1.2 MB)
----- 1.2/1.2 MB 4.3 MB/s eta 0:00:00
Installing collected packages: psycpg2-binary
Successfully installed psycpg2-binary-2.9.7

[notice] A new release of pip is available: 23.1.2 -> 23.2.1
[notice] To update, run: python.exe -m pip install --upgrade pip
PS C:\Users\Abi Rahman>

```

6. Step 4. Run the code

- Set the DATABASE_URL environment variable to the connection string to your cluster:
\$env:DATABASE_URL = "postgresql://abirafles123:RJoFkN_Z2gPfRnmzJo3Udw@mossy-macaw-5993.8nk.cockroachlabs.cloud:26257/defaultdb?sslmode=verify-full"

```

PS C:\Users\Abi Rahman> $env:DATABASE_URL = "postgresql://abirafles123:RJoFkN_Z2gPfRnmzJo3Udw@mossy-macaw-5993.8nk.cockroachlabs.cloud:26257/defaultdb?sslmode=verify-full"
PS C:\Users\Abi Rahman>

```

The app uses the connection string saved to the DATABASE_URL environment variable to connect to your cluster and execute the code.

- Run the code:

```

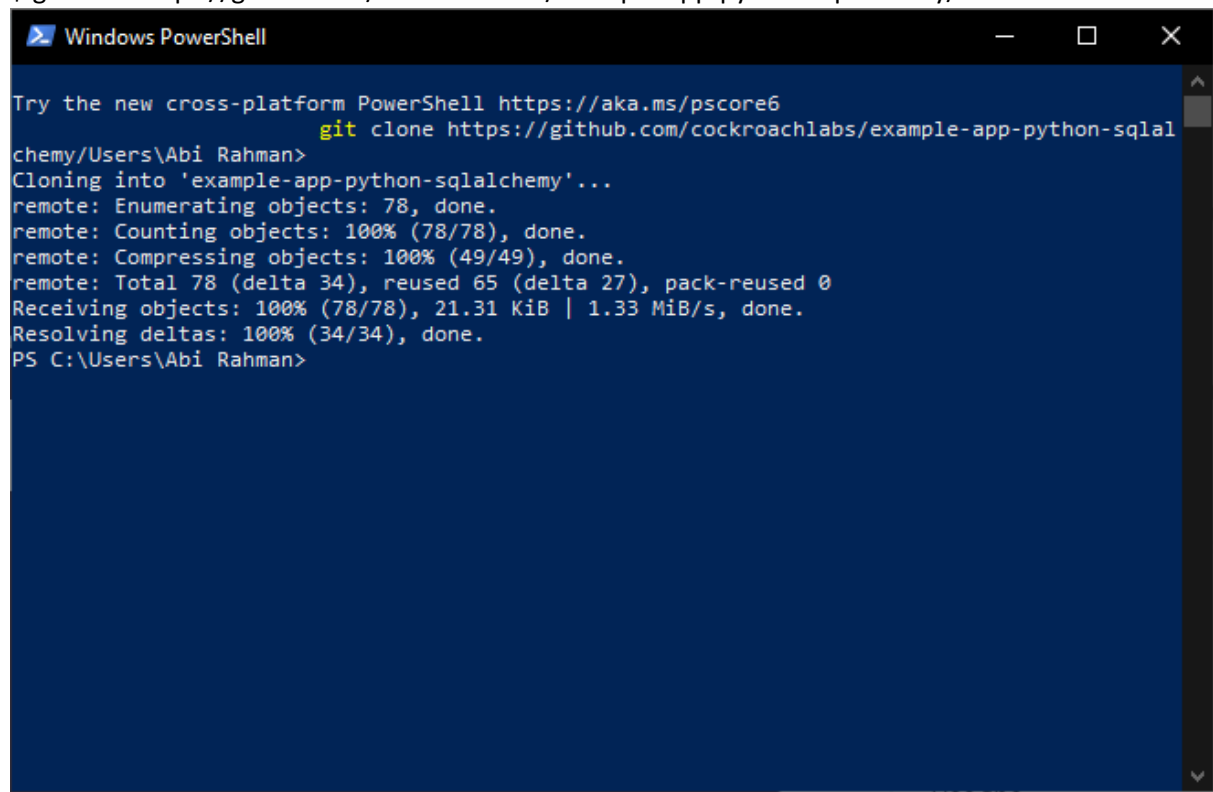
PS C:\Users\Abi Rahman> cd hello-world-python-psycpg2
PS C:\Users\Abi Rahman\hello-world-python-psycpg2> python example.py
Balances at Mon Aug 28 12:59:38 2023:
account id: 17540f17-386e-40b4-b2f5-936c6589237a balance: $1000
account id: 246e0b89-af0d-44f2-bb30-0e1060a5701e balance: $250
Balances at Mon Aug 28 12:59:38 2023:
account id: 17540f17-386e-40b4-b2f5-936c6589237a balance: $900
account id: 246e0b89-af0d-44f2-bb30-0e1060a5701e balance: $350
PS C:\Users\Abi Rahman\hello-world-python-psycpg2>

```

Build a Simple CRUD Python App with CockroachDB and SQLAlchemy

1. Get the code:

\$ git clone https://github.com/cockroachlabs/example-app-python-sqlalchemy/



```
Windows PowerShell

Try the new cross-platform PowerShell https://aka.ms/pscore6
git clone https://github.com/cockroachlabs/example-app-python-sqlalchemy/Users\Abi Rahman>
Cloning into 'example-app-python-sqlalchemy'...
remote: Enumerating objects: 78, done.
remote: Counting objects: 100% (78/78), done.
remote: Compressing objects: 100% (49/49), done.
remote: Total 78 (delta 34), reused 65 (delta 27), pack-reused 0
Receiving objects: 100% (78/78), 21.31 KiB | 1.33 MiB/s, done.
Resolving deltas: 100% (34/34), done.
PS C:\Users\Abi Rahman>
```

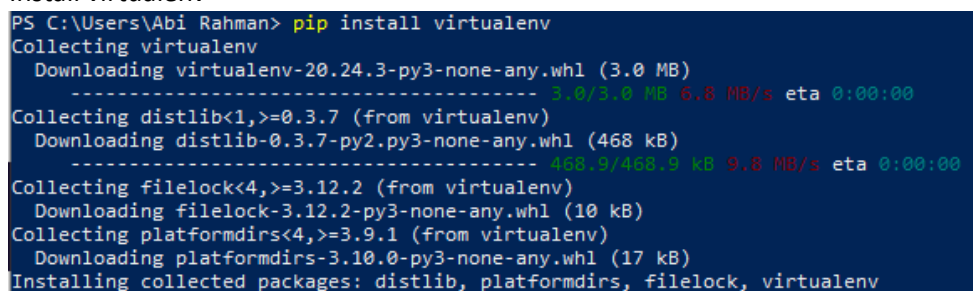
The project has the following directory structure:

Name	Date modified	Type	Size
.git	28/08/2023 13:04	File folder	
.gitignore	28/08/2023 13:04	Text Document	1 KB
dbinit	28/08/2023 13:04	SQL Source File	1 KB
LICENSE	28/08/2023 13:04	File	11 KB
main	28/08/2023 13:04	Python Source File	4 KB
models	28/08/2023 13:04	Python Source File	1 KB
README	28/08/2023 13:04	Markdown Source...	1 KB
requirements	28/08/2023 13:04	Text Document	1 KB

2. Install the application requirements

This tutorial uses virtualenv for dependency management.

- Install virtualenv



```
PS C:\Users\Abi Rahman> pip install virtualenv
Collecting virtualenv
  Downloading virtualenv-20.24.3-py3-none-any.whl (3.0 MB)
    ----- 3.0/3.0 MB 6.8 MB/s eta 0:00:00
Collecting distlib<1,>=0.3.7 (from virtualenv)
  Downloading distlib-0.3.7-py2.py3-none-any.whl (468 kB)
    ----- 468.9/468.9 kB 9.8 MB/s eta 0:00:00
Collecting filelock<4,>=3.12.2 (from virtualenv)
  Downloading filelock-3.12.2-py3-none-any.whl (10 kB)
Collecting platformdirs<4,>=3.9.1 (from virtualenv)
  Downloading platformdirs-3.10.0-py3-none-any.whl (17 kB)
Installing collected packages: distlib, platformdirs, filelock, virtualenv
```

- At the top level of the app's project directory, create and then activate a virtual environment:

```
C:\Windows\system32>python -m venv env
```

```
C:\Windows\system32>
```

```
C:\Windows\system32>.\env\Scripts\activate
```

```
(env) C:\Windows\system32>
```

- Install the required modules to the virtual environment:

3. Set the DATABASE_URL environment variable to the connection string for your cluster:
env:DATABASE_URL = "postgresql://abirafles123:RJoFkN_Z2gPfRnmzJo3Udw@mossy-macaw-5993.8nk.cockroachlabs.cloud:26257/defaultdb?sslmode=verify-full"

```
PS C:\Users\Abi Rahman> $env:DATABASE_URL = "postgresql://abirafles123:RJoFkN_Z2gPfRnmzJo3Udw@mossy-macaw-5993.8nk.cockroachlabs.cloud:26257/defaultdb?sslmode=verify-full"
PS C:\Users\Abi Rahman>
```

4. To initialize the example database, use the cockroach sql command to execute the SQL statements in the dbinit.sql file:

```
cat example-app-python-sqlalchemy\dbinit.sql | cockroach sql --url "postgresql://abirafles123:RJoFkN_Z2gPfRnmzJo3Udw@mossy-macaw-5993.8nk.cockroachlabs.cloud:26257/defaultdb?sslmode=verify-full"
```

```
PS C:\Users\Abi Rahman> cockroach sql --url "postgresql://abirafles123:RJoFkN_Z2gPfRnmzJo3Udw@mossy-macaw-5993.8nk.cockroachlabs.cloud:26257/defaultdb?sslmode=verify-full"
#
# Welcome to the CockroachDB SQL shell.
# All statements must be terminated by a semicolon.
# To exit, type: \q.
#
FATAL: codeParamsRoutingFailed: missing cluster identifier
SQLSTATE: 08C00
HINT: Ensure that your cluster identifier is uniquely specified using any of the following methods:
1) Host name:
   Use a driver that supports server name identification (SNI) with TLS connection and the hostname assigned to your cluster
   (e.g. serverless-101.5xj.gcp-us-central1.cockroachlabs.cloud)
2) Options parameter:
   Use "--cluster=<cluster identifier>" as the options parameter.
   (e.g. options="--cluster=active-roach-42")
3) Database parameter:
   Use "<cluster identifier>.<database name>" as the database parameter.
   (e.g. database="active-roach-42.defaultdb")
For more details, please visit our docs site at:
https://www.cockroachlabs.com/docs/cockroachcloud/connect-to-a-serverless-cluster
Failed running "sql"
PS C:\Users\Abi Rahman>
```