



BUILD ['22]

The Data Cloud Dev Summit

Building an Interactive Data App with Snowflake & Streamlit



GORRIE
2022



<https://www.daanalytics.nl>



<https://www.daanalytics.nl/blog>



<https://daanalytics.medium.com>



<https://github.com/daanalytics>



<https://www.linkedin.com/in/daanbakboord>



<https://www.twitter.com/daanbakboord>



IT's a people's business



Agenda

Introduction into Streamlit

Demo

Wrapping Up

Questions





**“a Python library that allows
the creation of
interactive, data-driven web applications
in Python”**



Key Takeaways

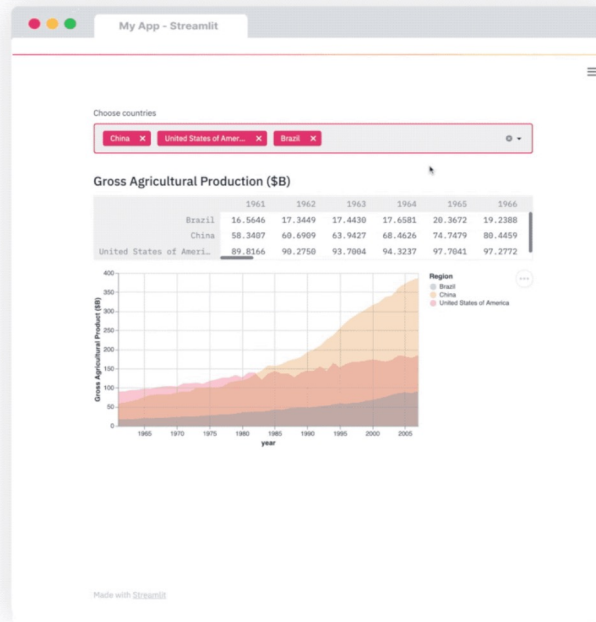
- > Streamlit brings your data to life
- > Today Snowflake customers can get started with the Streamlit Open Source Library
- > Coming soon Snowflake integration to build, deploy, and share Streamlit apps in Snowflake

“Build interactive apps with Python”



Streamlit is a new way of creating apps

```
1 import streamlit as st
2 import pandas as pd
3 import altair as alt
4
5 @st.cache
6 def get_US_data():
7     AWS_BUCKET_URL = "https://streamlit-demo-data.s3-us-west-2.amazonaws.com"
8     df = pd.read_csv(AWS_BUCKET_URL + "/agri.csv.gz")
9     return df.set_index("Region")
10
11 df = get_US_data()
12
13 countries = st.multiselect(
14     "Choose countries", list(df.index), ["China", "United States of America"])
15
16 data = df.loc[countries]
17 data /= 1000000.0
18 st.write("### Gross Agricultural Production ($B)", data.sort_index())
19
20 data = data.T.reset_index()
21 data = pd.melt(data, id_vars=["index"], rename(
22     columns={"index": "year", "value": "Gross Agricultural Product ($B)"}))
23
24 chart = {
25     alt.Chart(data)
26     .mark_area(opacity=0.3)
27     .encode(
28         x="year:T",
29         y=alt.Y("Gross Agricultural Product ($B):Q", stack=None),
30         color="Region:N",
31     )
32 }
33
34 st.altair_chart(chart, use_container_width=True)
```



- Directly from Data and Python code.
- Right from your favorite IDE.
- Create a Data App in minutes
- All Data Types because it's Python 🐍

“The best and latest from Data Science and Machine Learning”

Streamlit is built by and for data practitioners



Doing Data Science

Data scientists, ML engineers, data engineers, and others w/ Python knowledge love Streamlit



Coding in Python

If they are in the Snowpark preview for Python that's a good signal!



Looking for speed!

Create an app in minutes. No front-end experience necessary.



**SNOWPARK
FOR PYTHON**

Now generally available

Common use cases for Streamlit

Rapid prototyping

Data science teams quickly build data apps in Python to test hypotheses, gather feedback, and iterate quickly to deliver insights to their business stakeholders.

Demo-ing work

Data scientists use Streamlit as a direct method of sharing data with clients, customers, partners, and even suppliers to reduce lag and drive positive business outcomes. Often this starts as just a demo of capabilities but then turns into deliverables for customers and partners.

Creating tools for business users




Data teams struggle to share the outputs of their models in an easily consumable way for their stakeholders. Folks from sales, operations, marketing, and support can often benefit from interacting with models the data team has built. Streamlit creates a fast and easy way to create new tools from data that empower business users.

Today: Use Streamlit open source library to bring data to life

How it works:

- Install open source Python library
- Connect to data in Snowflake via Python connector
- Build and edit locally
- Deploy and share on your own

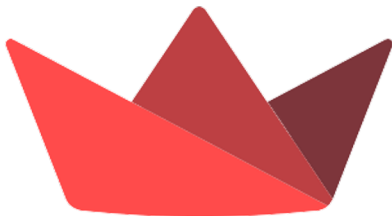
Why it matters

-  Only need Python to build an app
-  Explore your data and accelerate model development
-  Share your insights in a way everyone will understand

DEMO TIME



Demo Time!



DEMO

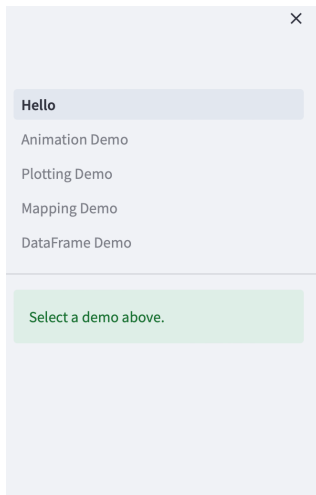


https://bit.ly/DaAnalytics_BUILD_local

Doing the Streamlit-magic

- Streamlit getting started
- Building a first Streamlit App
- Building a first Streamlit App on Snowflake
- Deploying a Streamlit App on the Streamlit Cloud
- Snowflake and Marketplace Data in Streamlit
- Snowflake Snowpark and Marketplace Data in Streamlit

Get Started in under a minute!



Welcome to Streamlit! 🙌

Streamlit is an open-source app framework built specifically for Machine Learning and Data Science projects. 📁 Select a demo from the sidebar to see some examples of what Streamlit can do!

Want to learn more?

- Check out streamlit.io
- Jump into our [documentation](#)
- Ask a question in our [community forums](#)

See more complex demos

- Use a neural net to [analyze the Udacity Self-driving Car Image Dataset](#)
- Explore a [New York City rideshare dataset](#)

```
conda create --name <ENV_NAME> python=3.8

conda activate <ENV_NAME>

conda install streamlit

streamlit hello
```

Building a first Streamlit App



```
import streamlit as st

st.header('HELLO WORLD APP')

st.write('Hello world!')
```

You can now view your Streamlit app in your browser.

Local URL: <http://localhost:8501>

Network URL: <http://192.168.1.251:8501>



HELLO WORLD APP

Hello world!



Building a first Streamlit App on Snowflake

- Setting up the connection to Snowflake
 - Install Snowflake for Python Connector
 - Validate Snowflake connection
- Creating Snowflake-objects
- Loading Data
- Doing the Streamlit-magic

```
python validate.py
```

```
1 -- Validate Connection
2 SELECT current_version()
3 ;
4
5
6
```

Objects Editor Results

	CURRENT_VERSION()
1	6.34.0

PETS APP

Mary has a 🐶

John has a 🐱

Robert has a 🐙

```
streamlit run st_sf_pets.py
```

Deploying a Streamlit App on the Streamlit Cloud

GitHub Account



Select Python-file from GitHub-Repository

Advanced Settings

Python version 3.8

Credentials

Deploy App

← Back

Deploy an app

Repository [Paste GitHub URL](#)
dsanalytics/snowflake

Branch
master

Main file path
presentation/BUILD.local/code/Streamlit_Cloud_Pets.py

Advanced settings... [←](#)

[Deploy!](#)

Advanced settings

Python version
3.8

Secrets
Provide environment variables and other secrets to your app using TOML format. This information is encrypted and served securely to your app at runtime. Learn more about Secrets in our docs. Changes take around a minute to propagate.

```
# _streamlit/secrets.toml

[secretflake]
user = "cuser"
password = "p@ssw0rd!"
role = "crole"
account = "accant"
warehouse = "cwarehouse"
database = "cdatabase"
schema = "cschema"
```

[Save](#)



Your app is in the oven

PETS APP

Mary has a 🐶

John has a 🐱

Robert has a 🐹

Deploy, manage, and share your apps with the world,
directly from Streamlit — all for free.

Snowflake Marketplace Data in Streamlit



Building a data application with
Marketplace, Snowpark and Streamlit

Updated Aug 9, 2022

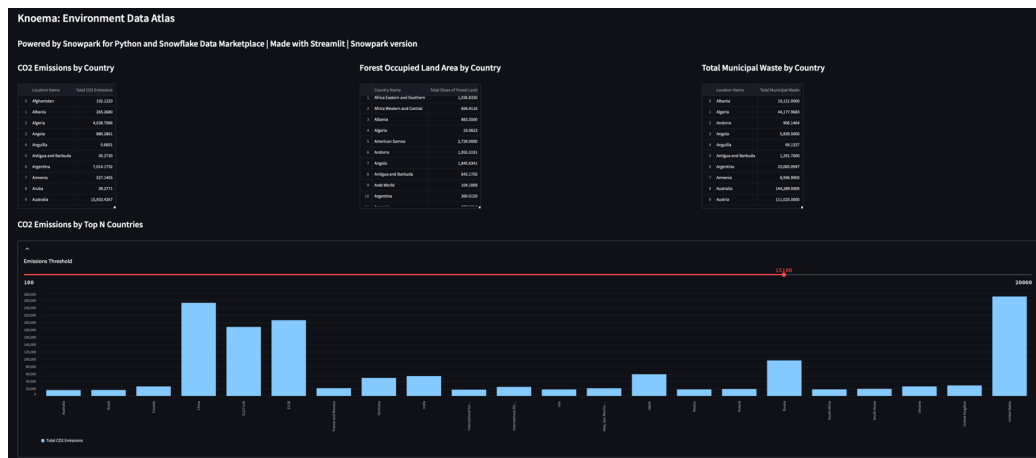
START



- Importing Libraries
- Connection to Snowflake
- Creating Data Sets (SQL)
- Formatting Streamlit App
- Doing the Streamlit-magic



Snowflake Snowpark & Marketplace Data in Streamlit



SQL Text

```
SELECT * FROM ( SELECT * FROM ( SELECT * FROM ( SELECT "Location Name", sum("S16") AS "Total CO2 Emissions" FROM ( SELECT * FROM ( SELECT * FROM ( SELECT * FROM ( ENVIRONMENT.EDGARED2019 ) WHERE ("Indicator Name" = "Fossil CO2 Emissions") WHERE ("Type Name" = "All Type")) GROUP BY "Location Name") WHERE ("Location Name" != "World") ORDER BY "Location Name" ASC NULLS FIRST) WHERE ("Total CO2 Emissions" > 10100 :: INT)
```



Building a data application with Marketplace, Snowpark and Streamlit

Updated Aug 9, 2022

START

```
conda install snowflake-snowpark-python
```

- Importing Libraries
- Connection to Snowflake
- Creating Data Sets (Python)
- Formatting Streamlit App
- Doing the Streamlit-magic



WRAPPING UP



Personal use cases for Streamlit

Open Source Data Visualization

Data Visualization for an Independent Consultant. No need to buy licences

Visualizing Snowflake

What happens inside Snowflake?

Demo-ing & Prototyping

Quickly building and showing apps and iterating.

Visualizing rankings of our own Pong game.

In Dev: Build, deploy, and share Streamlits in Snowflake

How it will work:

- Build in Snowflake Python worksheet
- Deploy from Snowflake
- Share with Snowflake users
- Monetize using Native App Framework

Why it matters:

- ▶ Streamline dev by building in Snowflake
- 📦 Deploy and run apps that leverage Snowflake infrastructure
- 🔒 Securely collaborate, iterate, and monetize

With Snowflake's Streamlit integration

Streamlit Resources



Forums

<https://discuss.streamlit.io>

<https://discord.gg/bTz5EDYh9Z>



Streamlit

Documentation

Gallery

Third-Party Components

<https://streamlit.io>

Tutorials

- <https://streamlitpython.com>
- <https://30days.streamlit.app>




DaAnalytics Build.local GitHub Code

https://bit.ly/DaAnalytics_BUILD_local

BUILD.local - Amsterdam

Building an Interactive Data App with Snowflake & Streamlit

Thursday, 17 November



The poster features a dark blue background with a cityscape and data visualization elements. The text on the poster reads: "Building an Interactive Data App with Snowflake & Streamlit", "BUILD.local", and "Amsterdam". At the bottom of the poster, it says "DATA SUPERHEROES" and "Thu, Nov 17, 6:00 PM (CET)".

Streamlit Applications

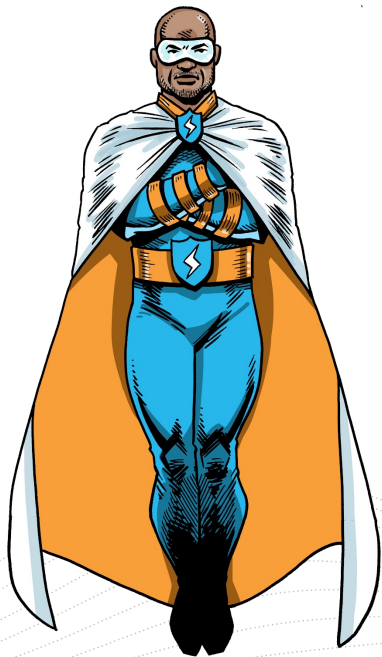
- Streamlit Pets [Open in Streamlit](#)



Snowflake Data Superheroes

DATA CLOUD ENTHUSIASTS, EXPERTS, & ADVOCATES

<https://community.snowflake.com/s/dataheroes>



Rewards & Benefits

- Product Access
- Training
- Swag
- VIP Experience

Obligations

- Content Creation
- Lead Discussions
- Supporting Others
- Snowflake Expertise

QUESTIONS?

THANK YOU



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