



Streamlit

-실습-

컴퓨터공학부
천세진

Contents

- Streamlit이란?
- Basic text elements
- Basic display elements
- Basic interactive widgets
- Sidebar & Graphs
- Deployment
- STEP UP

■ 파이썬 프레임워크

- 데이터사이언스를 위한 WebApp 개발 프레임워크
- 기계학습, 딥러닝 을 핵심만 단기간에 GUI를 통해 외부에 보여줄 수 있음

■ 장점

- Scikit, Keras, Numpy, Pandas, Tensorflow와 호환
- 개발 속도가 매우 빠름
- 안전하고 보안이 지원되는 WebApp
- No HTML, CSS & Javascript
- 배포가 매우 쉬움



Showcase

■ <https://streamlit.io/gallery>

CATEGORIES

Featured

Science & technology

NLP & language

Computer vision & images

Finance & business

Data visualization

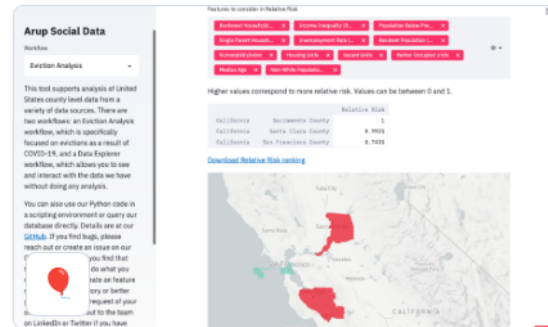
Geography & society

Sports & fun

Education

Other

Streamlit templates



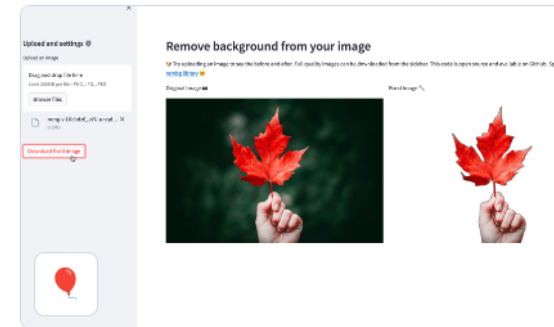
Arup Social Data

This is a repository for collection and analysis of open social data. This type of data can be useful to planners, NGO's,

by Jared Stock

[View source code →](#)

[Go to app →](#)



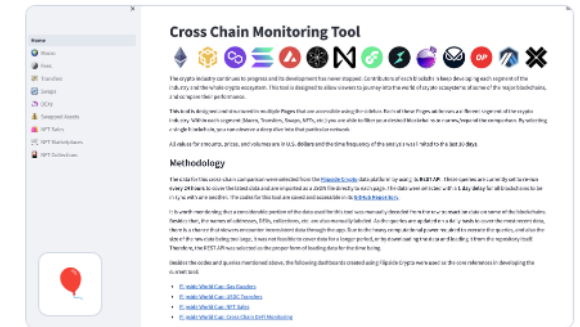
Background Remover

A simple Streamlit app that removes the background on an uploaded image and lets you download the result.

by Tyler Simons

[View source code →](#)

[Go to app →](#)



Cross Chain Monitoring Tool

This app lets you compare +10 blockchains in different sectors and view the performance of each blockchain.

by Ali Taslimi

[View source code →](#)

[Go to app →](#)

Setup in Colab

■ !pip install -q streamlit

```
1 !pip install -q streamlit
```

```
----- 8.9/8.9 MB 21.8 MB/s eta 0:00:00
Preparing metadata (setup.py) ... done
----- 164.8/164.8 kB 5.0 MB/s eta 0:00:00
----- 4.8/4.8 MB 45.4 MB/s eta 0:00:00
----- 82.1/82.1 kB 1.6 MB/s eta 0:00:00
----- 184.3/184.3 kB 4.2 MB/s eta 0:00:00
----- 62.7/62.7 kB 3.3 MB/s eta 0:00:00
Building wheel for validators (setup.py) ... done
```

Setup in Colab

■ Create a streamlit app example

✓
0s



```
1 %%writefile app.py
2 import streamlit as st
3
4 x = st.slider('Select a value')
5 st.write(x, 'squared is', x * x)
```

Setup in Colab

■ Install localtunnel

✓ [3] 1 !npm install localtunnel

■ Run streamlit in background

✓ 0s [play] 1 !streamlit run /content/app.py &>/content/logs.txt &

■ Expose the port 8501

[5] 1 !npx localtunnel --port 8501

Setup in Colab

■ Install localtunnel

✓ [3] 1 !npm install localtunnel

■ Run streamlit in background

✓ 0s [play] 1 !streamlit run /content/app.py &>/content/logs.txt &

■ Expose the port 8501

[5] 1 !npx localtunnel --port 8501

Basic Text elements

- `st.title("this is the app title")`
- `st.header("this is the markdown")`
- `st.markdown("this is the header")`
- `st.subheader("this is the subheader")`
- `st.caption("this is the caption")`
- `st.code("x=2021")`
- `st.latex(r''' a+a r^1+a r^2+a r^3 ''')`

Basic Text elements

```
main.py X
C: > Users > nedia > OneDrive > Desktop > DataCamp > main.py
1 import streamlit as st
2
3 st.title("this is the app title")
4 st.markdown("this is the markdown")
5 st.header("this is the header")
6 st.subheader("this is the subheader")
7 st.caption("this is the caption")
8 st.code("x=2021")
9 st.latex(r'''
10 | a + a r ^1+ a r^2 + a r^3 ''')
11
```

this is the app title

this is the markdown

this is the header

this is the subheader

this is the caption

```
x=2021
```

$$a + ar^1 + ar^2 + ar^3$$

Made with Streamlit

Display an image, video or audio file

- `st.image("kid.jpg")`
- `st.audio("Audio.mp3")`
- `st.video("video.mp4")`

Display an image, video or audio file

main.py

C: > Users > nedia > OneDrive > Desktop > DataCamp > main.py

```
1 import streamlit as st
2
3 st.subheader("Image :")
4 st.image("kid.jpg")
5
6 st.subheader("Audio :")
7 st.audio("Audio.mp3")
8
9 st.subheader("Video :")
10 st.video("video.mp4")
```

Image :



Audio :

0:00 / 1:16

Video :



Input widgets

- `st.checkbox('yes')`
- `st.button('Click')`
- `st.radio('Pick your gender',['Male','Female'])`
- `st.selectbox('Pick your gender',['Male','Female'])`
- `st.multiselect('choose a planet',['Jupiter', 'Mars', 'neptune'])`
- `st.select_slider('Pick a mark', ['Bad', 'Good', 'Excellent'])`
- `st.slider('Pick a number', 0,50)`

Input widgets

main.py

C: > Users > nedia > OneDrive > Desktop > DataCamp > main.py

```
1 import streamlit as st
2 st.checkbox('yes')
3 st.button('click')
4 st.radio('Pick your gender', ['Male', 'Female'])
5 st.selectbox('Pick your gender', ['Male', 'Female'])
6 st.multiselect('choose a planet', ['Jupiter', 'Mars', 'neptune'])
7 st.select_slider('Pick a mark', ['Bad', 'Good', 'Excellent'])
8 st.slider('Pick a number', 0, 50)
9
```

☐ yes

Click

Pick your gender

☒ Male
☐ Female

Pick your gender

Male

choose a planet

Choose an option

Pick a mark

Bad



Bad

Excellent

Pick a number

0



0

50

Made with Streamlit



Input widgets

- `st.number_input('Pick a number', 0,10)`
- `st.text_input('Email address')`
- `st.date_input('Travelling date')`
- `st.time_input('School time')`
- `st.text_area('Description')`
- `st.file_uploader('Upload a photo')`
- `st.color_picker('Choose your favorite color')`

Input widgets

main.py

C: > Users > nedia > OneDrive > Desktop > DataCamp > main.py

```
1 import streamlit as st
2 st.number_input('Pick a number', 0, 10)
3 st.text_input('Email adress')
4 st.date_input('Travelling date')
5 st.time_input('School time')
6 st.text_area('Description')
7 st.file_uploader('Upload a photo')
8 st.color_picker('Choose your favourite color')
```

Pick a number

1

Email adress

Travelling date

2022/06/17

School time

08:00

Description

Upload a photo



Drag and drop file here
Limit 200MB per file

Browse files

Choose your favourite color



Sidebar

main.py

C: > Users > nedia > OneDrive > Desktop > DataCamp > main.py

```
1 import streamlit as st
2
3 st.sidebar.title("This is written inside the sidebar")
4 st.sidebar.button("Click")
5 st.sidebar.radio("Pick your gender", ["Male", "Female"])
6 |
```

✕

This is written inside the sidebar

Click

Pick your gender

☒ Male

☐ Female

Container: invisible container

main.py

C: > Users > nedia > OneDrive > Desktop > DataCamp > main.py

```
1 import streamlit as st
2
3 container = st.container()
4 container.write("This is written inside the container")
5 st.write("This is written outside the container")
6 |
```

This is written inside the container

This is written outside the container

Made with Streamlit

Visualization with Streamlit

BarChart with Pyplot

- `import streamlit as st`
- `import matplotlib.pyplot as plt`
- `import numpy as np`

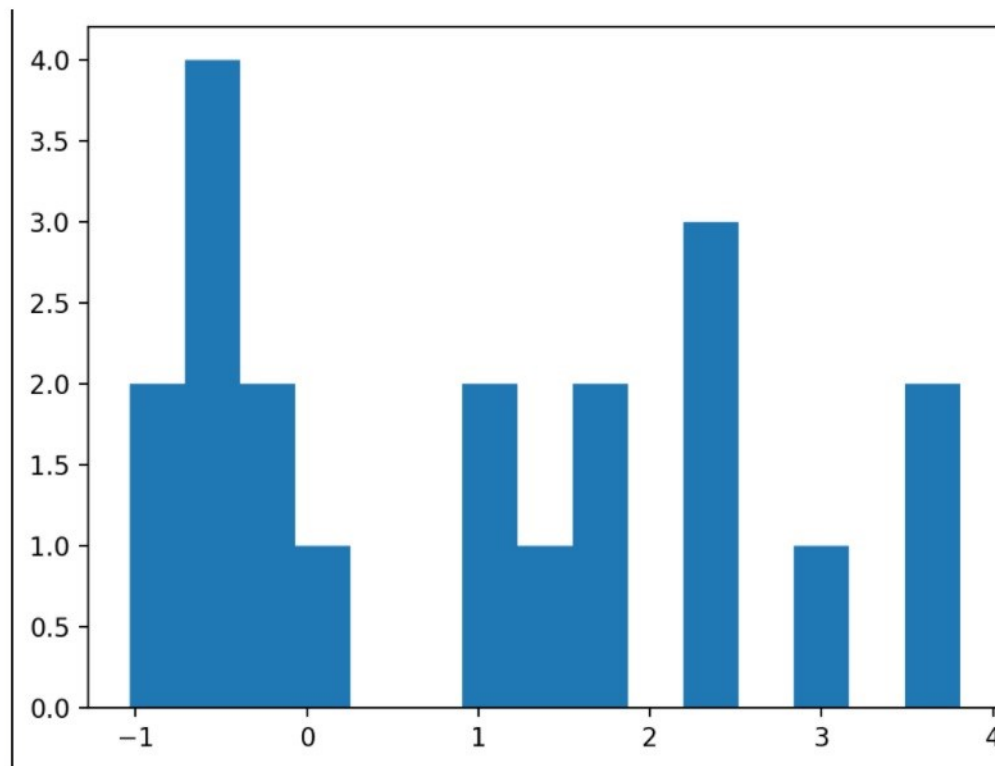
- `rand=np.random.normal(1, 2, size=20)`
- `fig, ax = plt.subplots()`
- `ax.hist(rand, bins=15)`
- `st.pyplot(fig)`

BarChart with Pyplot

main.py X

C: > Users > nedia > OneDrive > Desktop > DataCamp > main.py

```
1 import streamlit as st
2 import matplotlib.pyplot as plt
3 import numpy as np
4
5
6 rand = np.random.normal(1, 2, size=20)
7 fig, ax = plt.subplots()
8 ax.hist(rand, bins=15) #,color="pink"
9 st.pyplot(fig)
```



Made with Streamlit

LineChart with Pandas

- `import streamlit as st`
- `import pandas as pd`
- `import numpy as np`

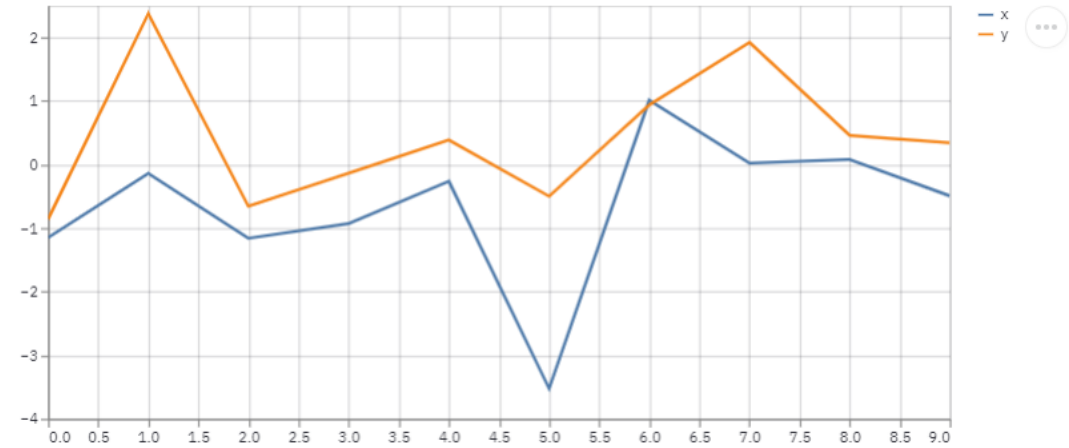
- `df= pd.DataFrame(np.random.randn(10, 2), columns=['x', 'y'])`
- `st.line_chart(df)`

LineChart with Pandas

main.py

C: > Users > nedia > OneDrive > Desktop > DataCamp > main.py

```
1 import streamlit as st
2 import pandas as pd
3 import numpy as np
4 df = pd.DataFrame(
5     np.random.randn(10, 2),
6     columns=['x', 'y'])
7 st.line_chart(df)
8
```



Made with Streamlit



Graph with Graphviz

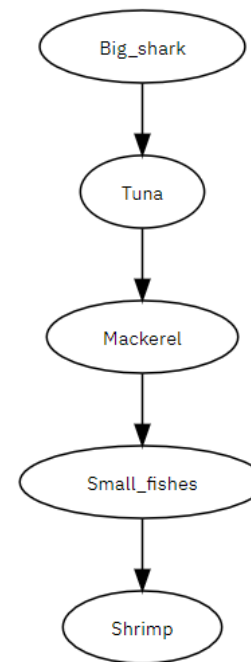
- `import streamlit as st`
- `import graphviz as graphviz`
- `st.graphviz_chart("""
 digraph {
 Big_shark -> Tuna
 Tuna -> Mackerel
 Mackerel -> Small_fishes
 Small_fishes -> Shrimp
 }
""")`

Graph with Graphviz

main.py X

C: > Users > nedia > OneDrive > Desktop > DataCamp > main.py

```
1 import streamlit as st
2 import graphviz as graphviz
3 st.graphviz_chart('''
4     digraph {
5         Big_shark -> Tuna
6         Tuna -> Mackerel
7         Mackerel -> Small_fishes
8         Small_fishes -> Shrimp
9     }
10 ''')
11
```



Made with Streamlit

Maps with Streamlit

- `import pandas as pd`
- `import numpy as np`
- `import streamlit as st`
- `df = pd.DataFrame(np.random.randn(500, 2) / [50, 50] + [37.76, -122.4], columns=['lat', 'lon'])`
- `st.map(df)`

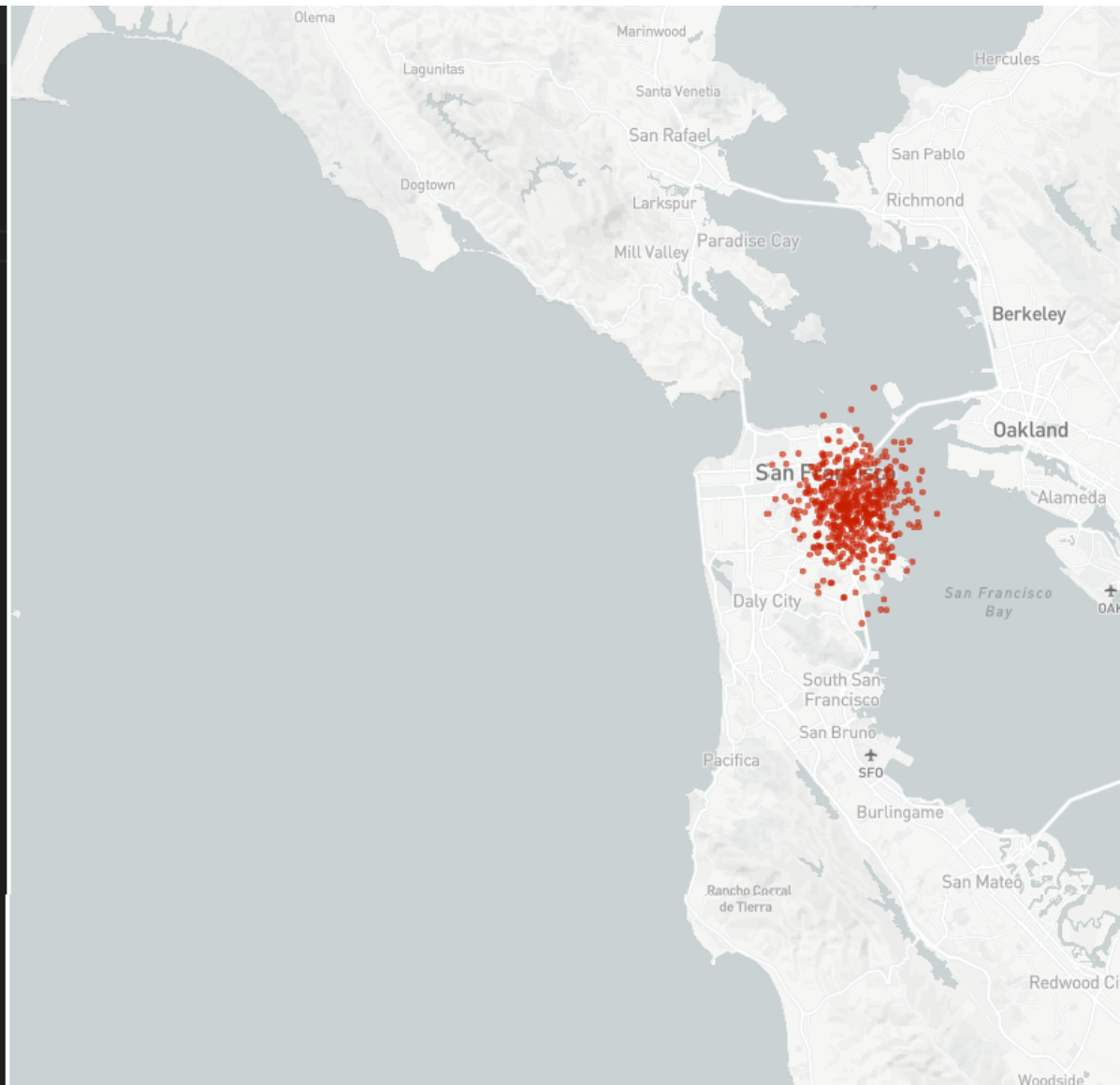


Maps with Streamlit

used_cases.py

C: > Users > nedia > OneDrive > Desktop > DataCamp > used_cases.py


```
1 import pandas as pd
2 import numpy as np
3 import streamlit as st
4 df = pd.DataFrame(np.random.randn(500, 2) / [50, 50] + [37.76, -122.4],
5 columns=['lat', 'lon'])
6 st.map(df)
```
















Deploy Streamlit App







Upload app.py to streamlit



■ app.py 과 requirements를 업로드





 **chunsejin / streamlit** Public


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 **Code**  Issues  Pull requests  Actions  Projects  Wiki  Security  Insights  Settings


 main  1 branch  0 tags  Go to file  Add file  **Code**

 **chunsejin** Create requirements abaf388 1 minute ago  3 commits






 LICENSE	Initial commit	3 minutes ago
 README.md	Initial commit	3 minutes ago
 app.py	Create app.py	2 minutes ago
 requirements	Create requirements	1 minute ago

README.md 

streamlit

About 

No description, website, or topics provided.

 Readme  MIT license  0 stars  1 watching  0 forks

Releases

No releases published
[Create a new release](#)

■ Github 계정으로 로그인

Sign in

Continue with Google

Continue with GitHub

OR

Your email...

Continue with email

New to Streamlit? [Sign up, it's free!](#)

Set up your account

First Name required

Sejin

Last Name

Chun

Primary Email required

sjchun@dau.ac.kr

How long have you been building apps with Streamlit?

Just started

How are you planning on using Streamlit Community Cloud?

For myself

What's your functional area?

Data Science

Company name

Dong-A University

Are you using Snowflake in any capacity?

No

Country or region required

South Korea

By submitting this form, I agree to the [Terms of Service](#) and understand Streamlit will process my personal information in accordance with its [Privacy Notice](#).

protected by reCAPTCHA
[Privacy](#) - [Terms](#)



I accept



Set up your account

First Name required

Sejin

Last Name

Chun

Primary Email required

sjchun@dau.ac.kr

How long have you been building apps with Streamlit?

Just started

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South Korea

By submitting this form, I agree to the [Terms of Service](#) and understand Streamlit will process my personal information in accordance with its [Privacy Notice](#).

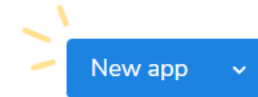
protected by reCAPTCHA
[Privacy](#) - [Terms](#)



I accept



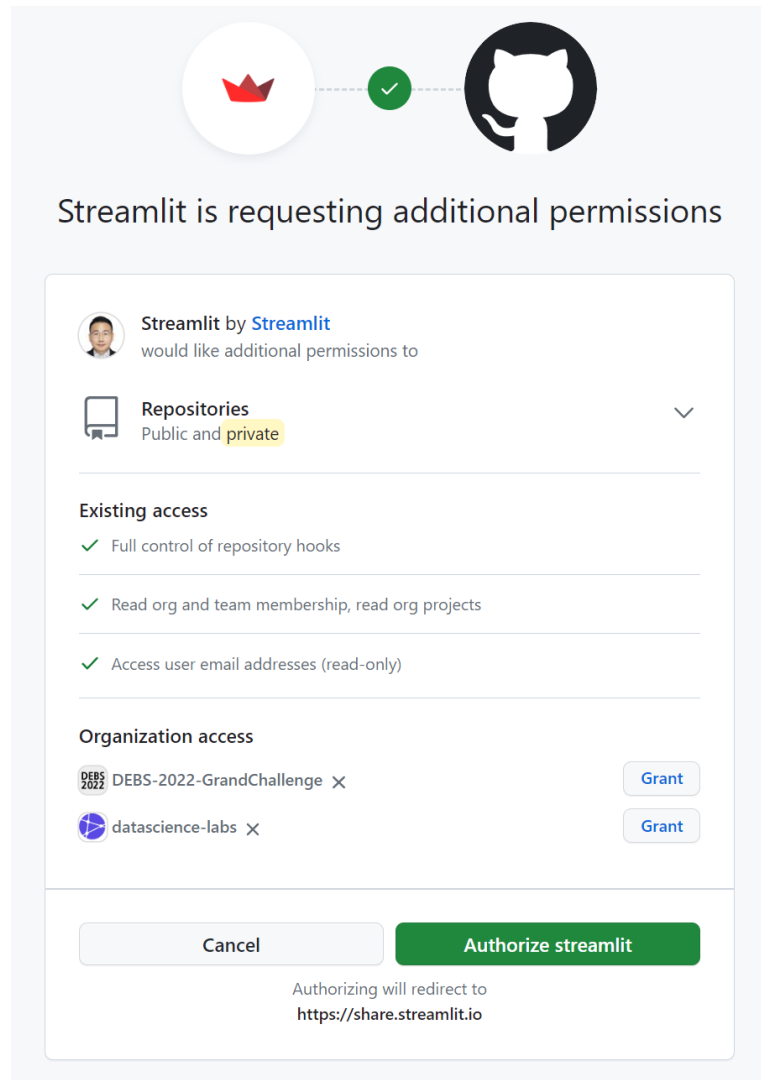
Your apps



No apps to show in this workspace

[Deploy one now](#)





[← Back](#)

Deploy an app

Repository

[Paste GitHub URL](#)

chunsejin/streamlit

Branch

main

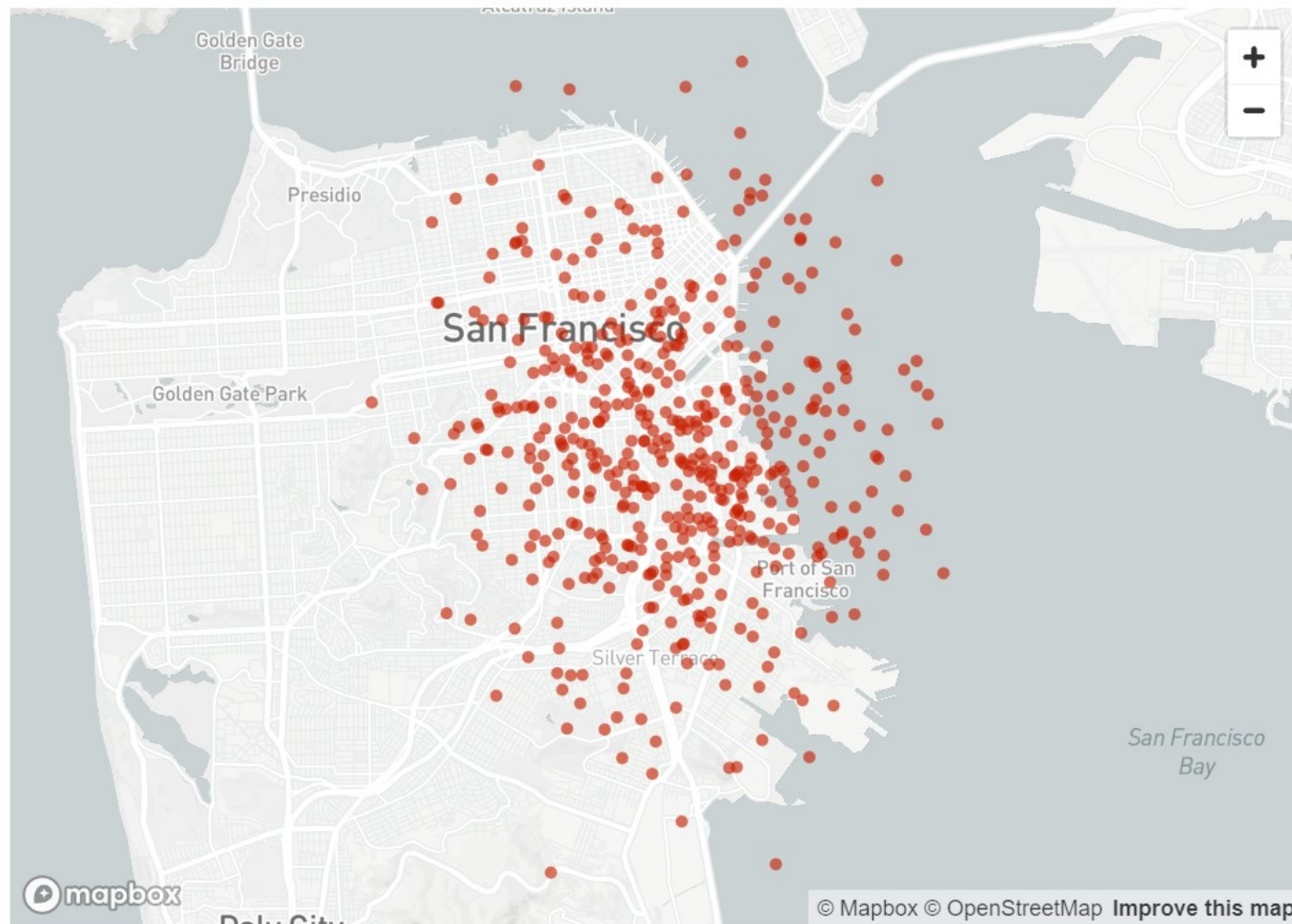
Main file path

app.py

[Advanced settings...](#)

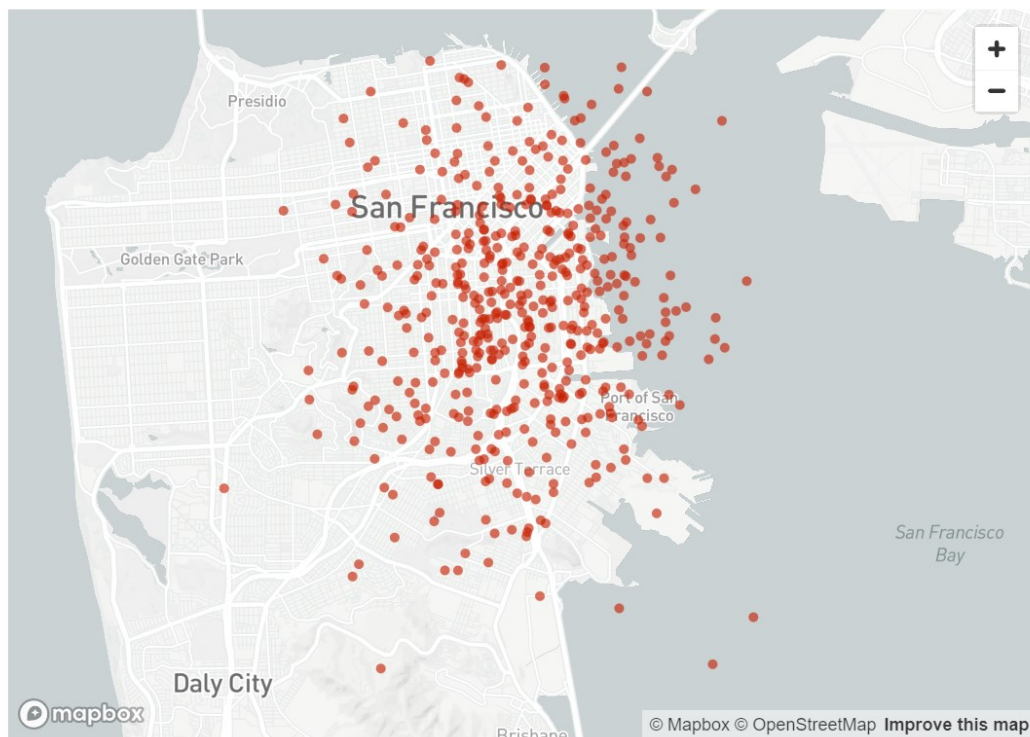
Deploy!

Done!



■ Github 내 app.py에서 title 추가

최고의 수업, oss 개발에서 배운
Streamlit



```
Downloading idna-3.4-py3-none-any.whl (61 k
Collecting urllib3<1.27,>=1.21.1
  Downloading urllib3-1.26.15-py2.py3-none-an
140.9
Collecting certifi>=2017.4.17
  Downloading certifi-2022.12.7-py3-none-any.
155.3
Collecting charset-normalizer<4,>=2
  Downloading charset_normalizer-3.1.0-cp39-c
199.2
Collecting pygments<3.0.0,>=2.13.0
  Downloading Pygments-2.15.1-py3-none-any.wh
1.1
Collecting markdown-it-py<3.0.0,>=2.2.0
  Downloading markdown_it_py-2.2.0-py3-none-a
84.1
Collecting pytz-deprecation-shim
  Downloading pytz_deprecation_shim-0.1.0.pos
Collecting decorator>=3.4.0
  Downloading decorator-5.1.1-py3-none-any.wh
Collecting smmap<6,>=3.0.1
  Downloading smmap-5.0.0-py3-none-any.whl (2
Collecting MarkupSafe>=2.0
  Downloading MarkupSafe-2.1.2-cp39-cp39-many
Collecting pyrsistent!=0.17.0,!0.17.1,!0.17
  Downloading pyrsistent-0.19.3-py3-none-any.
57.1
Collecting attrs>=17.4.0
  Downloading attrs-23.1.0-py3-none-any.whl (
61.1
Collecting mdurl~=0.1
  Downloading mdurl-0.1.2-py3-none-any.whl (1
Building wheels for collected packages: valid
Building wheel for validators (setup.py): s
Building wheel for validators (setup.py): f
Created wheel for validators: filename=valid
Stored in directory: /tmp/pip-ephem-wheel-c
Successfully built validators
Installing collected packages: pytz, zipp, wa
Successfully installed MarkupSafe-2.1.2 altai
WARNING: You are using pip version 22.0.3; ho
You should consider upgrading via the '/home/

[13:41:21] 🍯 Processed dependencies!
Collecting usage statistics. To deactivate, s
[13:42:07] 🚀 Pulling code changes from Githu
[13:42:08] 🍯 Processing dependencies...
[13:42:08] 🍯 Processed dependencies!
[13:42:10] 📡 Updated app!
```

Share ☆ 🔗 ☰

Rerun R

Settings

Print

Record a screencast

View all apps

About

Developer options

Clear cache C

Summary

- 앞으로 핵심 컴포넌트만 개발하는데 집중하자
 - 로그인, 회원가입, 회원관리는 나중에
 - Core에 대해 사전공부를 더 열심히 하자
- 여러분이 앞으로 고민할 부분
 - 기계학습과 딥러닝 컴포넌트를 연결 및 처리, 시각화
 - 다양한 딥러닝 컴포넌트를 비교 분석
 - 실시간 데이터에 대한 연결 및 처리, 시각화
 - 다양한 웹서비스와의 연동

STEP UP

Your streamlit WebApp with GIS

- 공공데이터, 학습한 Input Widgets과 Charts/Map/Graph 를 사용하여 조건에 변화하는 WebApp을 만들고 공유하세요
 - 공유장소: 열린게시판
 - 기본: 추가점수 1~3점(만점 3점) , 조건 불충족시는 0점
 - 최우수작(추가점수 3점 & 기말시험 +5)
 - 기간: 5/31까지
- 안내사항
 - 현재 이용가능한 공공데이터를 사용해야함
 - 학습한 Input Widget의 유형을 두 개 이상 사용해야함
 - 입력 값에 따라 Chart가 필히 변화해야 함
 - Charts는 필요한 경우 다른 유형의 차트를 사용해도 무관
 - 출력되는 컴포넌트(Chart/Map/Graph)는 2개 이하이어야 함

Your streamlit WebApp with GIS

■ 게시 템플릿

- WebApp 소개(3줄내외)
- 접근 URL
- 사용차트와 입력 컴포넌트
- 최우수작으로 선정되어야하는 이유(2줄이내)