

Rootslab@lunch

Streamlit Introduction



What is Streamlit?

What is Streamlit?

- Data scientists build apps
 - dashboard, data browser, etc.
- Ad hoc building flow
 - jupyter notebook > python script > flask app > need more features...
 - maintainability

What is Streamlit?

- Streamlit is an app framework for data scientists
- Key Idea
 - Make webapps as easy as writing python scripts
 - Use traditional iterative scripting process
 - Instead of layout and event flow
- Workflow
 - Start with python script
 - Slightly annotate to make it an app

What is Streamlit?

- Embrace python scripting
 - everything you can do in a python script
 - you can do in streamlit
- Treat widgets as variables
 - substitute variables with a widget such as `st.slider()`
 - reuse variables as widgets iteratively
- Reuse data and computation
 - cache computation

Get Started

Install Streamlit

```
$ pip install streamlit
```

Install Streamlit

```
$ streamlit hello
```

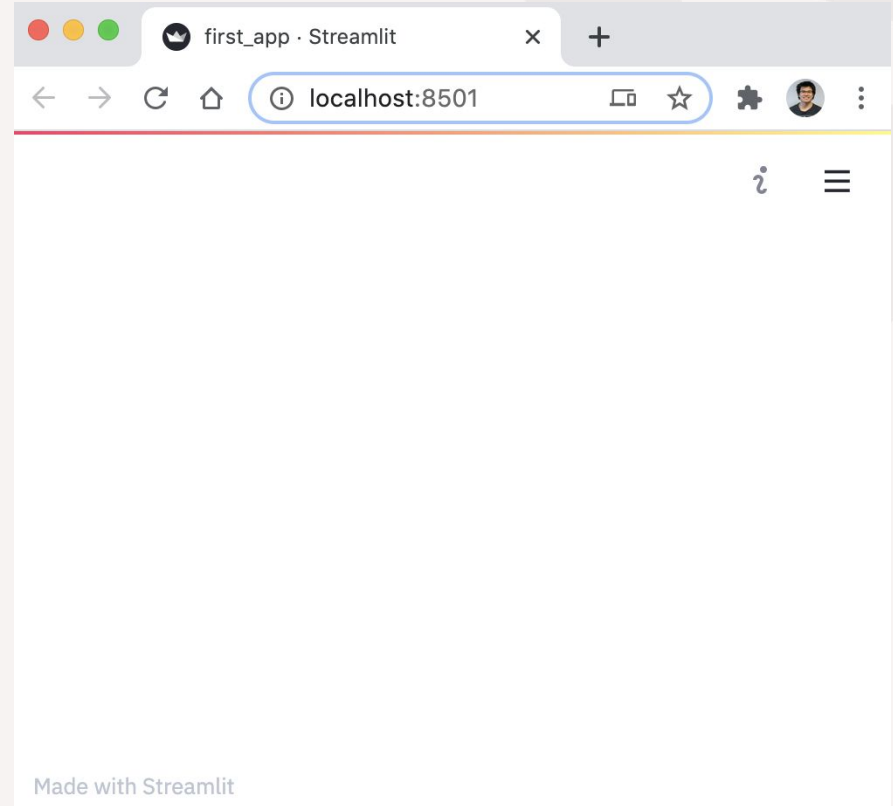

Import Streamlit

Create a new Python file named `first_app.py`

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

Import Streamlit

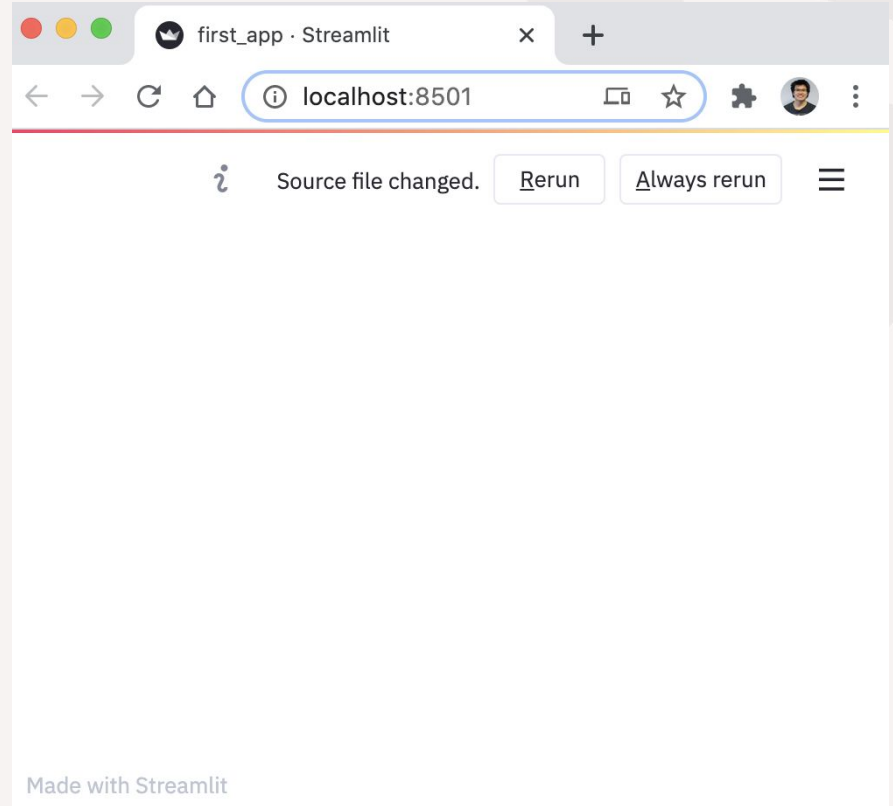
```
$ streamlit run first_app.py
```



Import Streamlit

Add a title with `st.title()`:

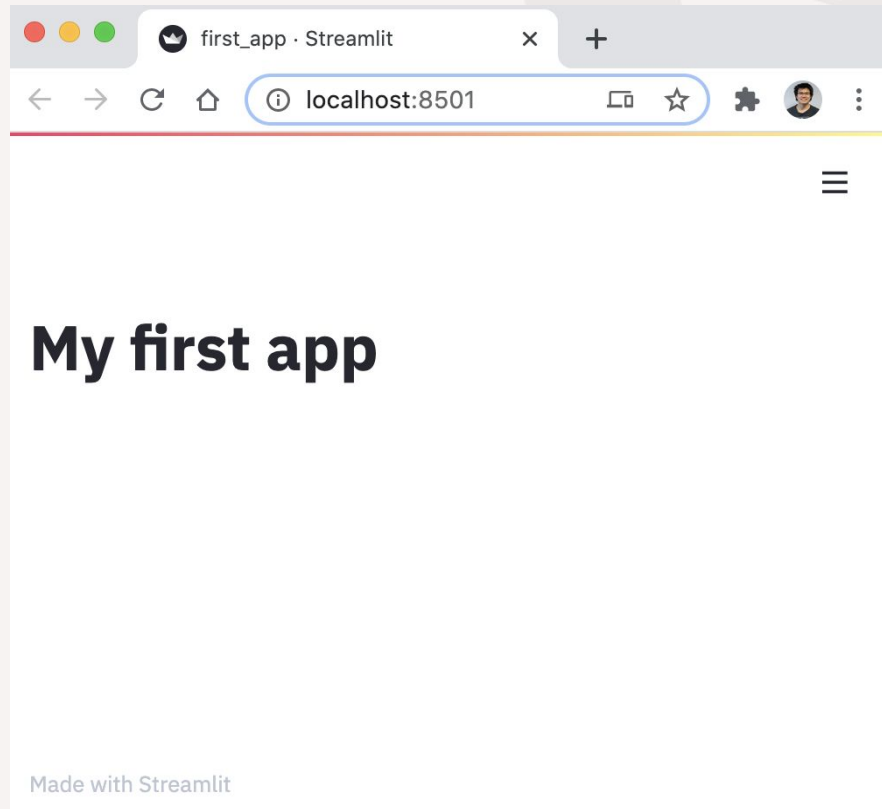
```
st.title('My first app')
```



Import Streamlit

Add a title with `st.title()`:

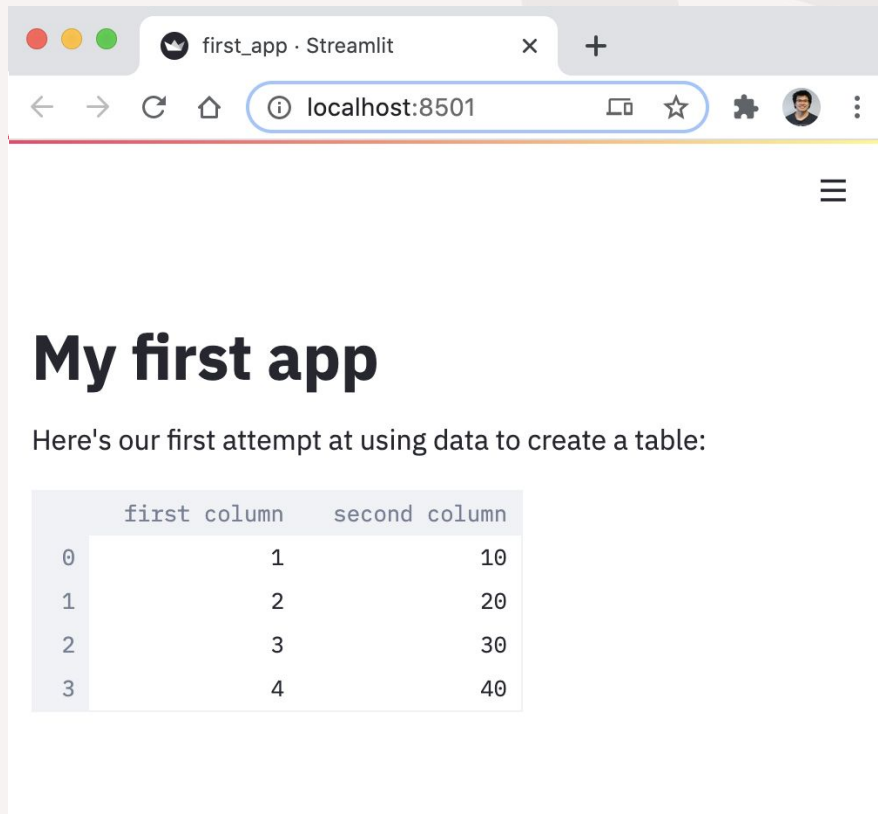
```
st.title('My first app')
```



Add text and data

Add data with `st.write()`:

```
st.write("Here's our first attempt at  
using data to create a table:")  
st.write(pd.DataFrame({  
    'first column': [1, 2, 3, 4],  
    'second column': [10, 20, 30, 40]  
}))
```

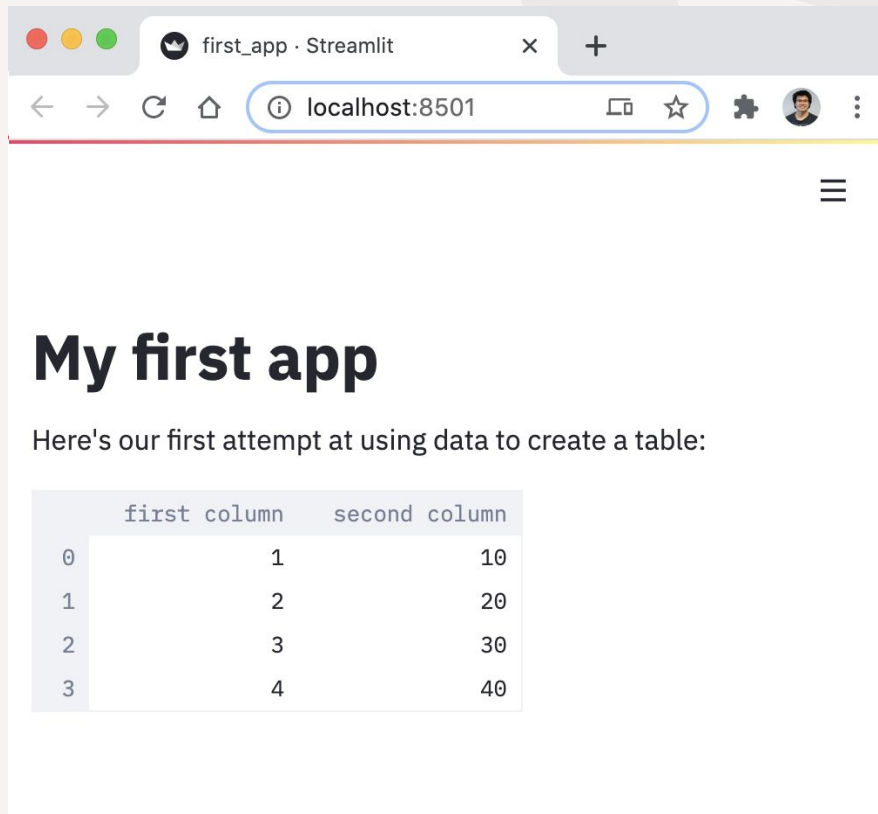


Use magic

Use magic without `st.write()`

```
"""
# My first app
Here's our first attempt at using data to
create a table:
"""
df = pd.DataFrame({
    'first column': [1, 2, 3, 4],
    'second column': [10, 20, 30, 40]
})
df
```

dataroots



The screenshot shows a web browser window with the title "first_app · Streamlit". The address bar shows "localhost:8501". The page content includes a heading "My first app" and a paragraph "Here's our first attempt at using data to create a table:". Below this is a table with two columns: "first column" and "second column". The table has four rows of data, indexed from 0 to 3. The first column contains values [1, 2, 3, 4] and the second column contains values [10, 20, 30, 40].

	first column	second column
0	1	10
1	2	20
2	3	30
3	4	40

Draw charts and maps

Draw a line chart with `st.linechart()`

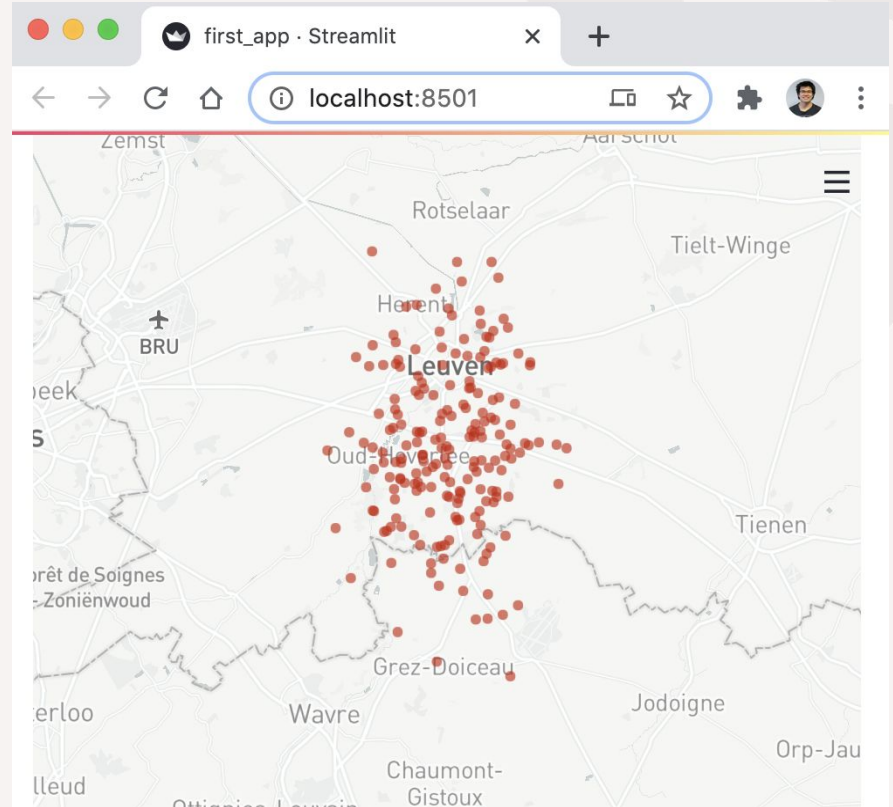
```
chart_data = pd.DataFrame(  
    np.random.randn(20, 3),  
    columns=['a', 'b', 'c'])  
  
st.line_chart(chart_data)
```



Draw charts and maps

Draw a map with `st.map()`

```
map_data = pd.DataFrame(  
    np.random.randn(200, 2) / [28, 28]  
    + [50.84, 4.7],  
    columns=['lat', 'lon'])  
  
st.map(map_data)
```

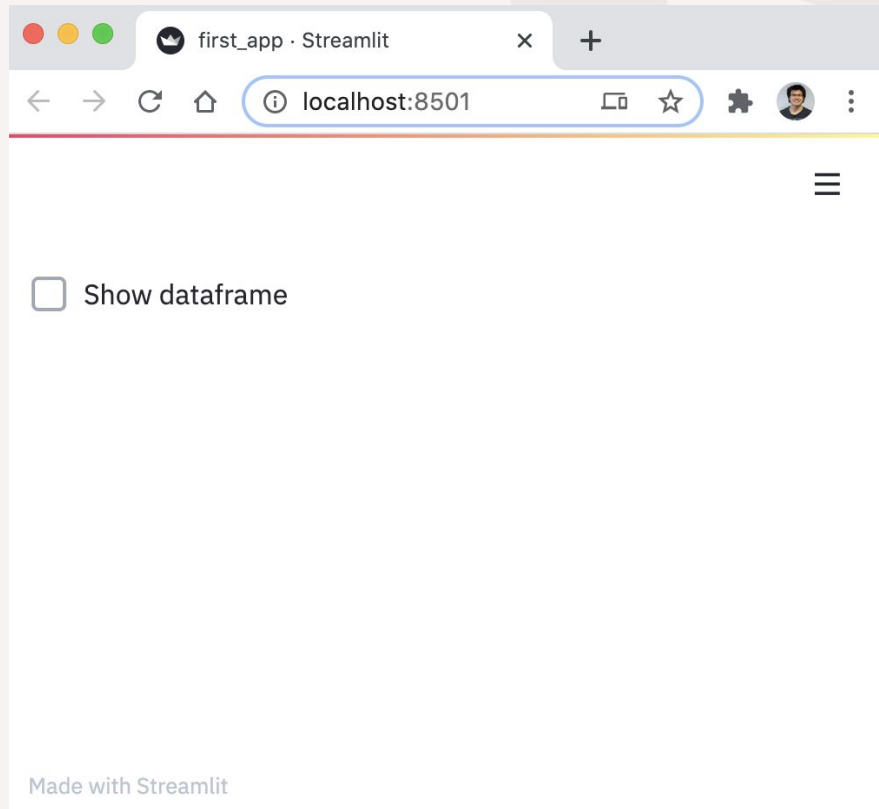


Add interactivity with widgets

Show/hide data with `st.checkbox()`

```
if st.checkbox('Show dataframe'):
    chart_data = pd.DataFrame(
        np.random.randn(20, 3),
        columns=['a', 'b', 'c'])

    st.line_chart(chart_data)
```

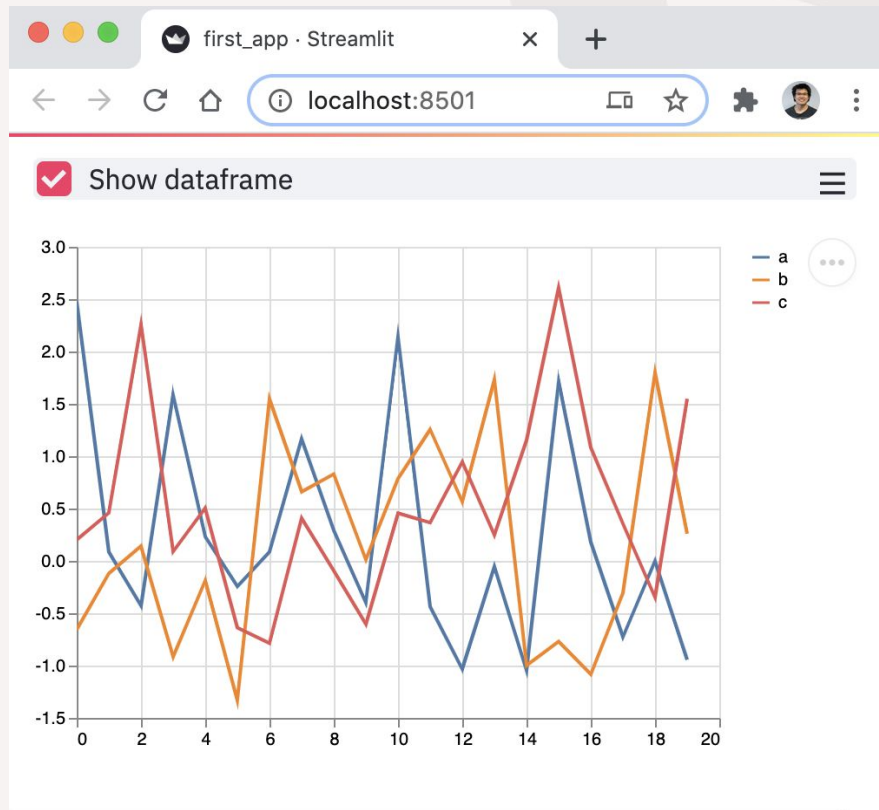


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```

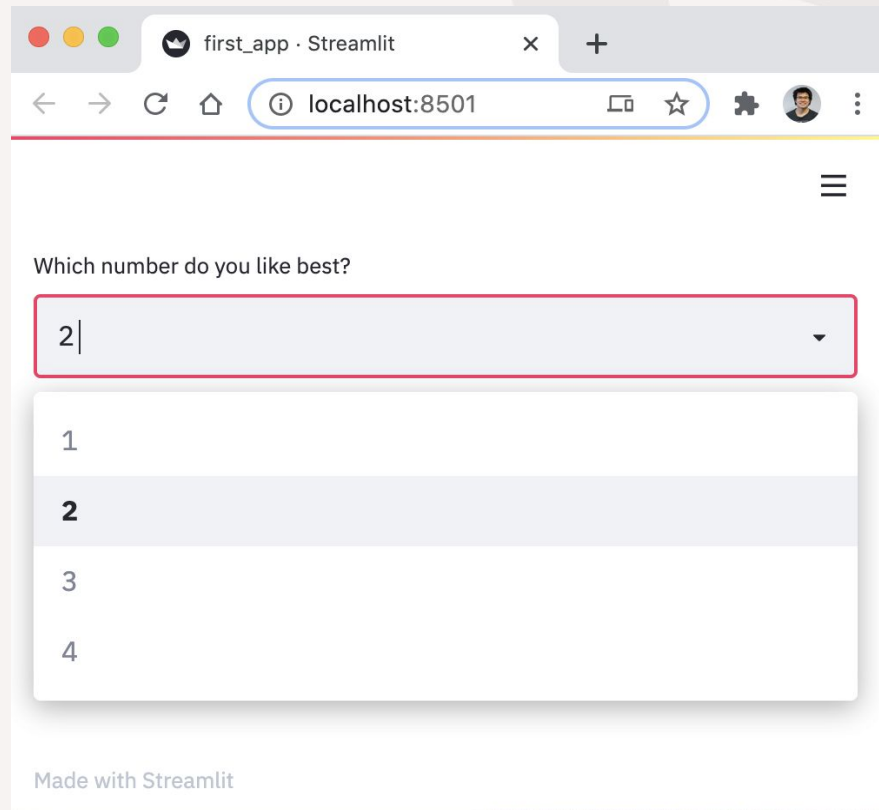


Add interactivity with widgets

Use `st.selectbox()` for options

```
option = st.selectbox(
    'Which number do you like best?',
    df['first column'])

'You selected: ', option
```

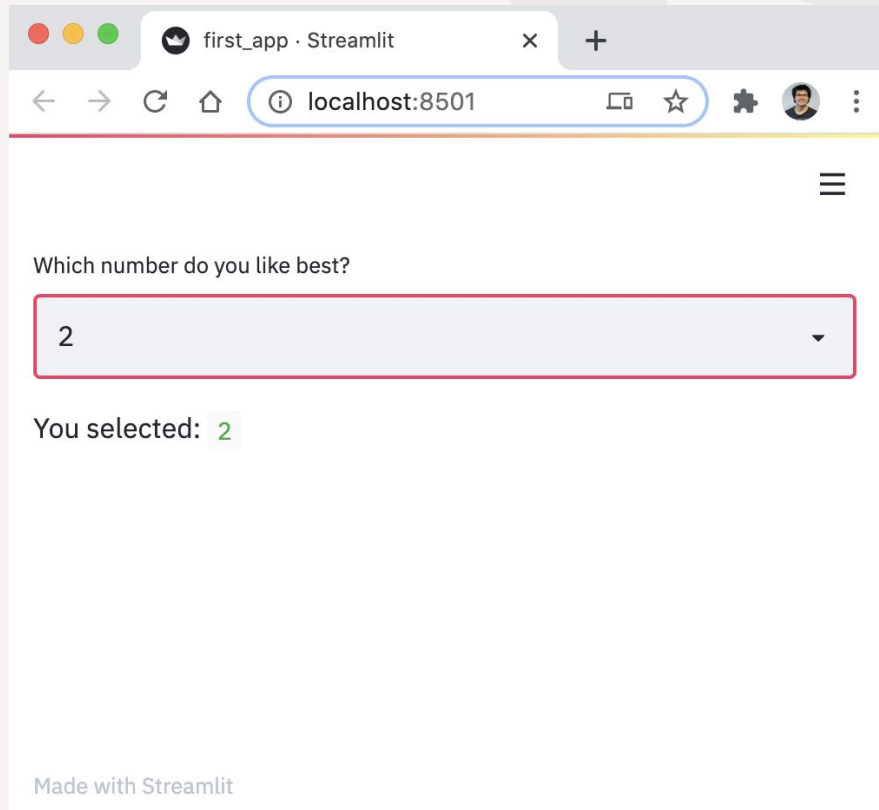


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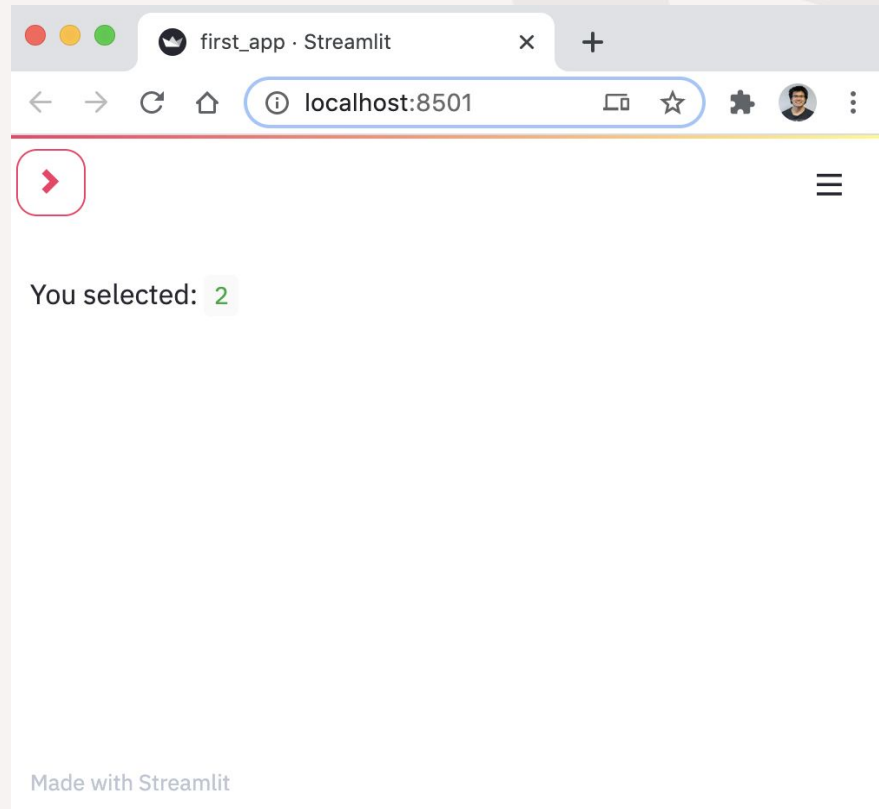


Add interactivity with widgets

Widgets in a sidebar with `st.sidebar`

```
option = st.sidebar.selectbox(
    'Which number do you like best?',
    df['first column'])

'You selected: ', option
```

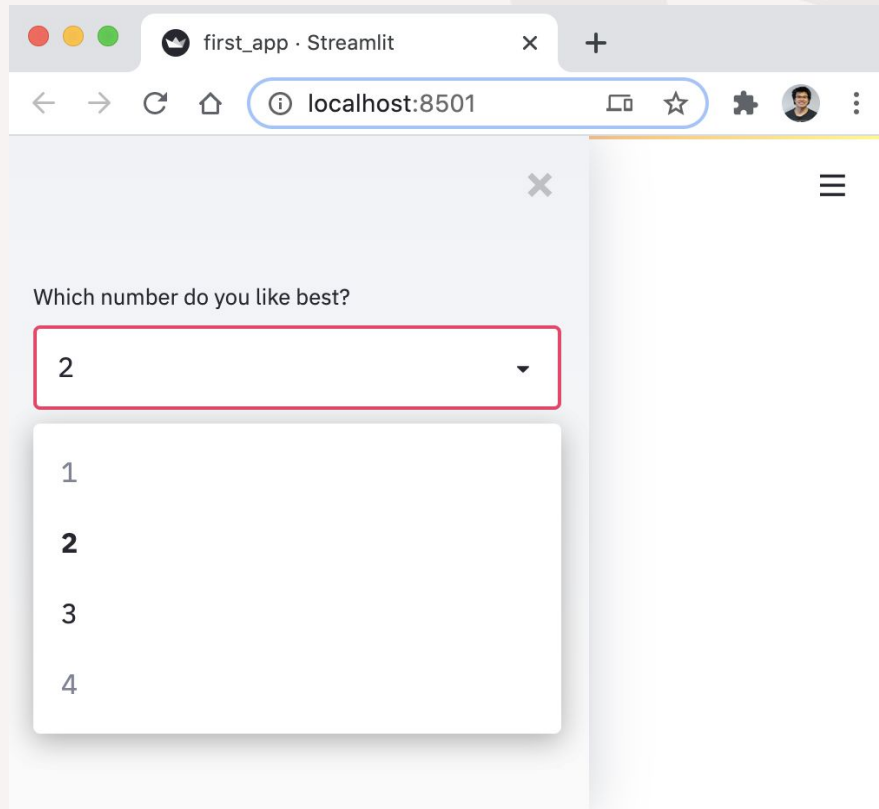


Add interactivity with widgets

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```
option = st.sidebar.selectbox(
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    df['first column'])

'You selected: ', option
```



Show progress

Use `st.progress()` to display status

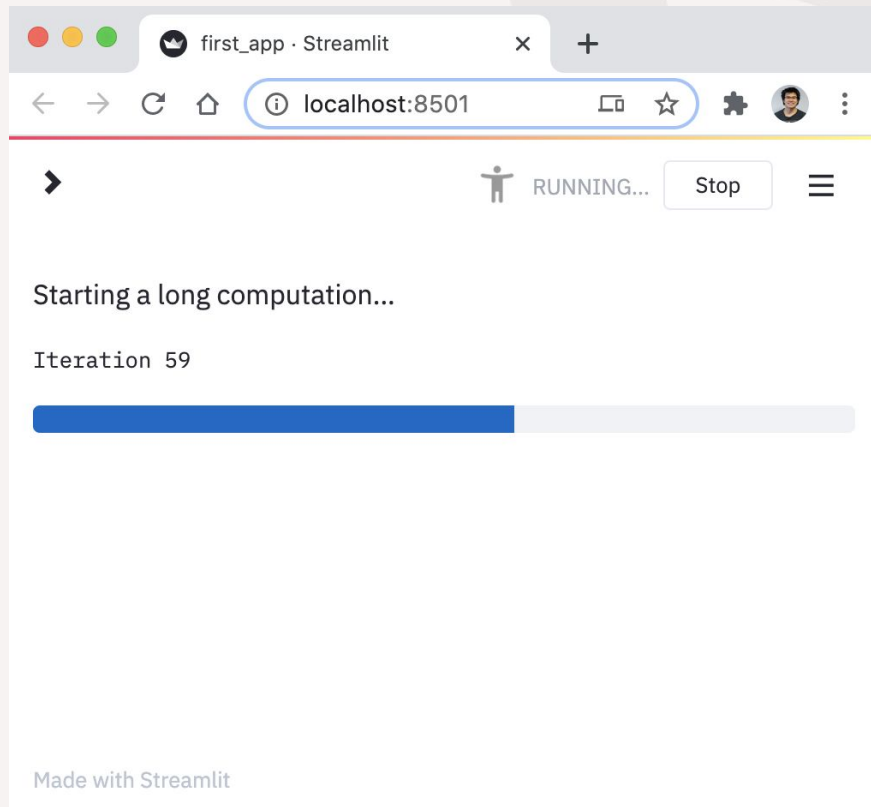
```
import time

'Starting a long computation...'

# Add a placeholder
latest_iteration = st.empty()
bar = st.progress(0)

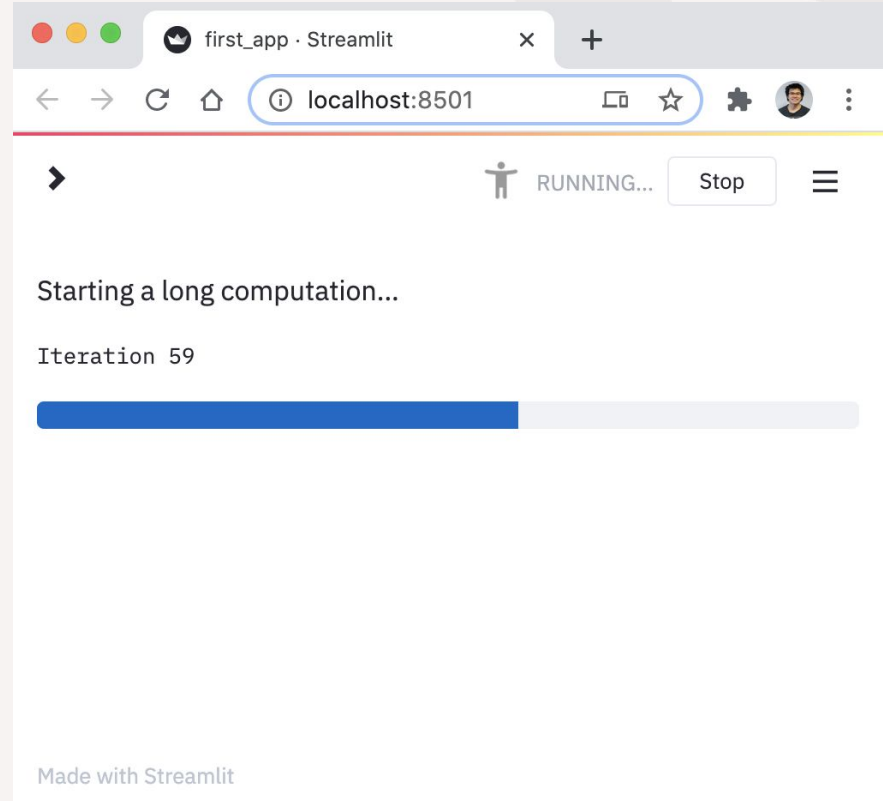
for i in range(100):
    # Update the progress bar with each
    iteration.
    latest_iteration.text(f'Iteration
{i+1}')
    bar.progress(i + 1)
    time.sleep(0.1)

'...and now we\'re done!'
```



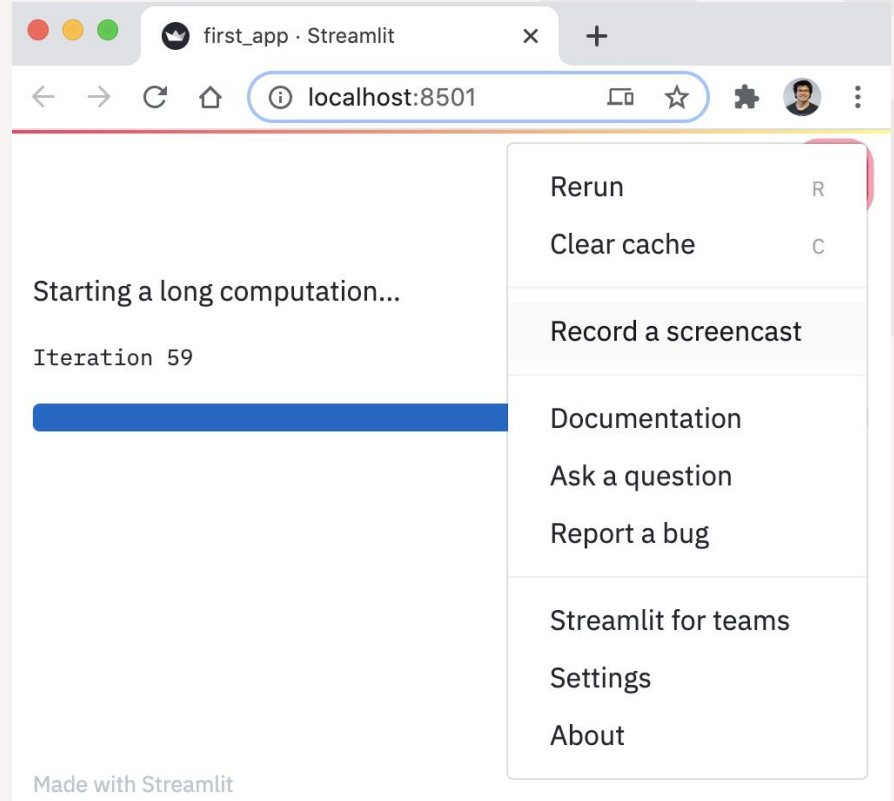
Record a screencast

- Record and share
- Upper right corner of your app (☰), select **Record a screencast**



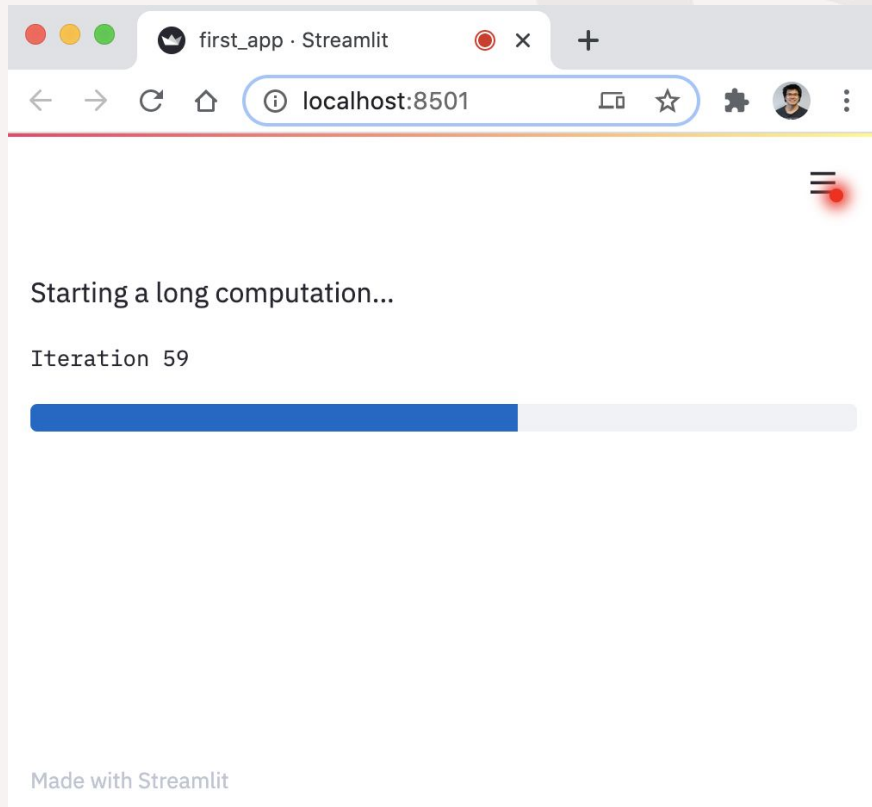
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Record a screencast

- Record and share
- Upper right corner of your app (☰), select **Record a screencast**
- To stop your screencast, go back to the menu (☰) and select **Stop recording** (or hit the **ESC** key)



Demo

More info

- <https://www.streamlit.io/>

The End