


Building a Machine Learning Web Application with Streamlit



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Personal Demo Home Page:

<https://www.richieyyptutorialpage.com/>

*** Open Source and Not-For-Profit Sharing / Demo**

What will be covered?

- Introduction to Streamlit
- Streamlit vs Dash
- Streamlit vs Shiny
- Streamlit Sharing/Cloud
- Creating a web app using Streamlit
- Machine Learning Examples/Use Cases

Ok, let's go...

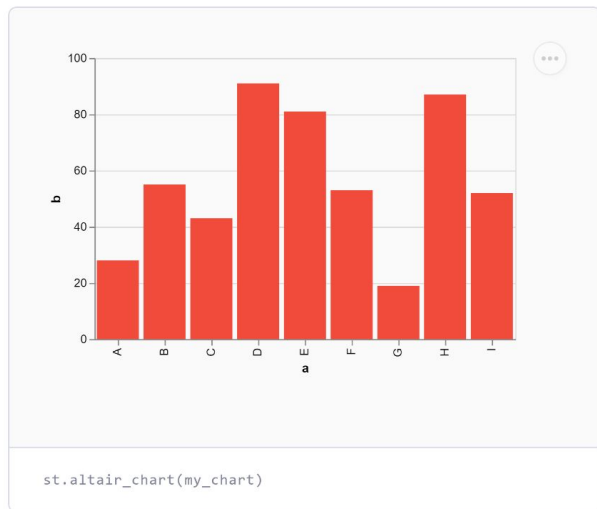


Before We continue:

Register Your [Streamlit Cloud](#)
and [Github](#) accounts first



A: Introduction to Streamlit



Pick a file

Drag and drop files here
Limit 200MB per file • TXT

Browse files

```
file = st.file_uploader("Pick a file")
```

Pick a color



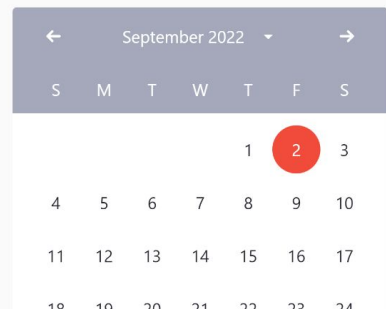
```
color = st.color_picker
```

Pick a pet

☒ Dog
☐ Cat
☐ Bird

```
pet = st.radio("Pick
```

Pick a date



S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24

Image Credit: [HERE](#)

A: Introduction to Streamlit

- turns data scripts into shareable web apps in minutes
- All in pure Python
- No front-end experience required

A: Introduction to Streamlit

- Compatible to many other libraries

 bokeh

 Altair

 PyTorch

 OpenCV

DECK.GL

 pandas
 $y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \epsilon_i$

Vega-Lite

 matplotlib

 NumPy

 learn

 TensorFlow

 plotly

 Keras

Image Credit: [HERE](#)

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B: Streamlit vs Dash

- *(Very) minimal overhead effort: **Streamlit***
- *Need for CSS customisation: **Dash***
- *Effortless responsiveness: **Streamlit(?)***
- *REST Endpoints: **Dash***
- *Rapid Multiple Tabs / Sidebar: **Streamlit***
- *Low-latency UI: **Dash***

Source: [HERE](#)

C: Streamlit vs Shiny

	Dash	Shiny	Streamlit
Languages Supported	Python and R	Python and R	Python
OSS License	MIT	AGPL	Apache 2.0
Back-end Architecture	Stateless	Stateful	Stateful
Downloads/month	890,000	330,000	900,000
Web protocol	HTTP(S)	Websockets	Websockets
Recommended deployment	Dash Enterprise	Shiny Server Pro (RStudio Connect)	Heroku
User experience	Web app	Model output with controls in a Web page	Notebook with controls
App structure	Multi-page	Single page	Notebook with code
Front end	React	jQuery	React
Interactivity	Complete: any component can be an input/output, including tables	Partial: some components can be inputs/outputs	Limited: only widgets as inputs, graphs and tables can only be outputs

Source: [HERE](#)

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C: Streamlit Cloud

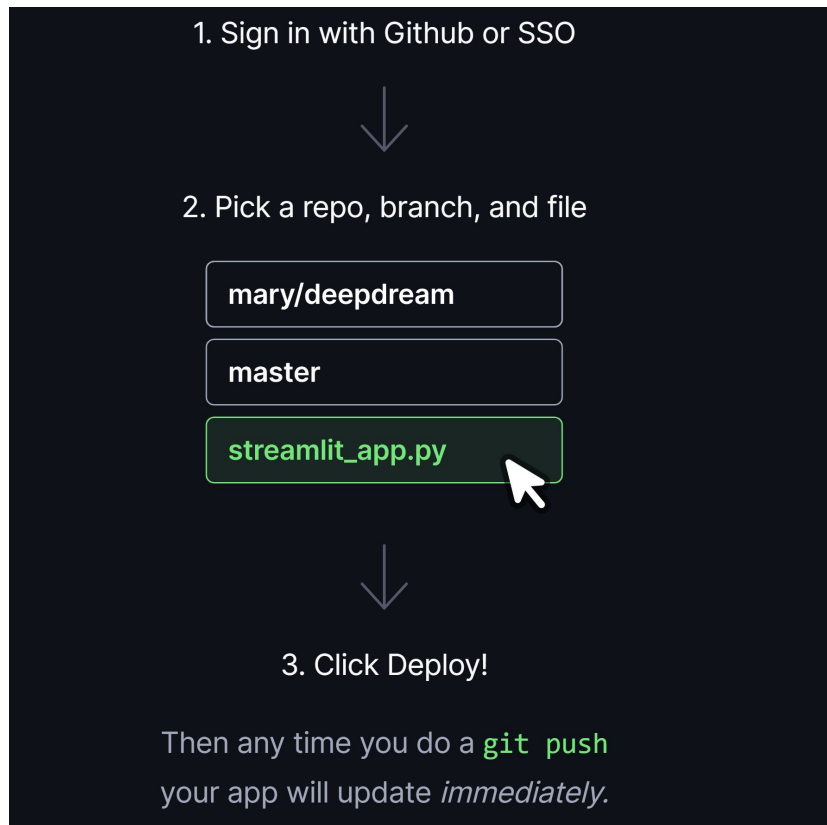


Image Credits: [HERE](#)

C: Streamlit Cloud



Deploy in one click

Your fully hosted app is ready to share in under a minute.



Keep your code in your repo

No changes to your development process. Code stays on GitHub.



Live updates

Your apps update instantly when you push code changes.



Securely connect to data

Connect to all your data sources using secure protocols.



Restrict access to apps

Authenticate viewers with per-app viewer allow-lists.



Easily manage your apps

View, collaborate, and manage all your apps in a single place.

Image Credits: [HERE](#)

(Question - how about anaconda prompt/jupyter notebook and colab??)

In the terminal that appears, type:

```
pip install streamlit
```

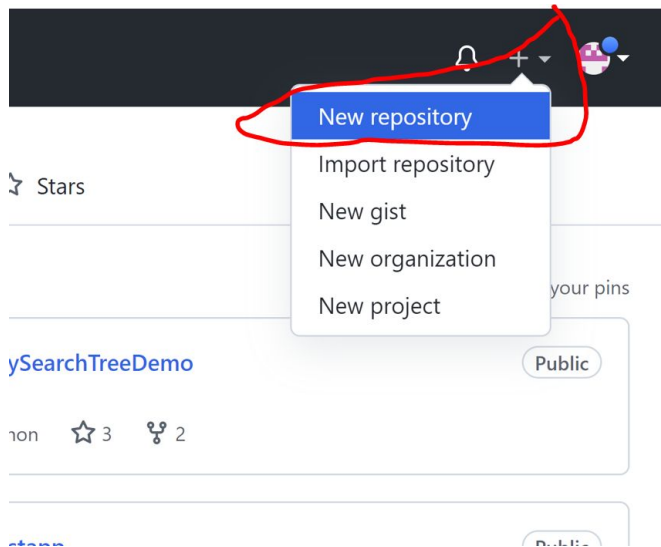
More Details: [HERE](#)

D: Creating a simple web app

- Example:
<https://www.richieyyptutorialpage.com/demo-python-series/deploying-python-web-app-to-heroku>
- Note: we will deploy and host it on streamlit cloud

D: Creating a simple web app

- Login your github
- Create a new repository



D: Creating a simple web app

- Follow the instructions

The screenshot shows the GitHub repository creation interface. Red circles highlight the 'Repository name' field (containing 'myfirstapplication' with a green checkmark), the 'Public' radio button, the 'Add a README file' checkbox, and the 'Choose a license' dropdown (set to 'None'). A red arrow points from the handwritten text 'choose a licence' to the license dropdown.

Owner * / Repository name * myfirstapplication ✓

Great repository names are short myfirstapplication is available. ation? How about curly-octo-m

Description (optional)

☒ Public
Anyone on the internet can see this repository. You choose who can commit.

☐ Private
You choose who can see and commit to this repository.

Initialize this repository with:
Skip this step if you're importing an existing repository.

☒ Add a README file
This is where you can write a long description for your project. [Learn more.](#)

Add .gitignore
Choose which files not to track from a list of templates. [Learn more.](#)

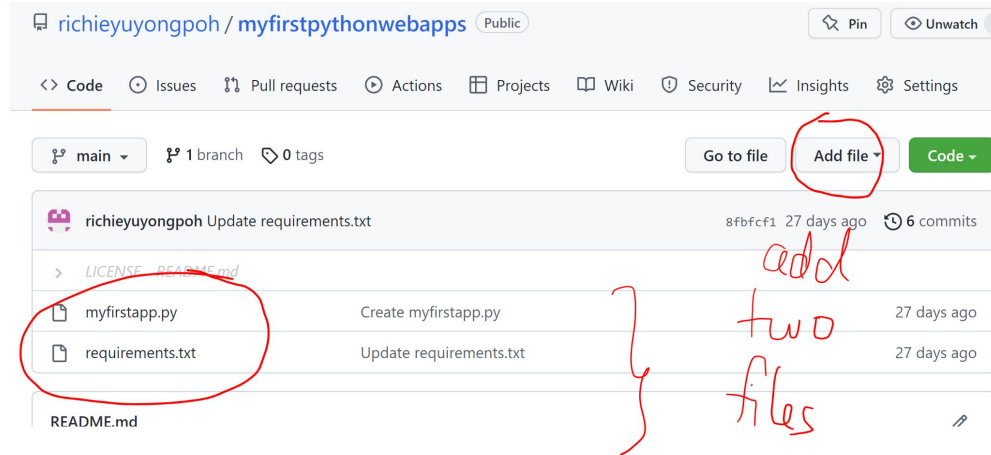
.gitignore template: None ▾

Choose a license
A license tells others what they can and can't do with your code. [Learn more.](#)

License: None ▾

choose a licence

D: Creating a simple web app



- Add/Create two files: myfirstapp.py & requirements.txt
- Reference:
<https://github.com/richieyuyongpoh/myfirstpythonwebapps>

D: Creating a simple web app

- **myfirstapp.py**: main python file that runs streamlit and other libraries/functions
- **requirements.txt**: list of python libraries to be installed in the cloud
- Reference:
<https://github.com/richieyuyongpoh/myfirstpythonwebapps>

D: Creating a simple web app

- Sign in your streamlit cloud account
- Add new app
- Link/Connect to your github

Analytics

Settings



richieyuyongpoh

New app



D: Creating a simple web app

- Deploy the app

Deploy an app

Repository

[Paste GitHub URL](#)

richieuyongpoh/myfirstpythonwebapps ✓

Branch

main

Main file path

myfirstapp.py ✓

[Advanced settings...](#)

Deploy!

D: Creating a simple web app

- **Streamlit Cloud is “baking” now**
- **Once your app is deployed successfully,
Share the link by typing it in the chat
room there**

E: Machine Learning Use Cases

Ok... what is the
next...?



Myth!

Learning a tool is the
equivalent of learning
data science



E: Machine Learning Use Cases

Ok, why don't we try
the classical example -
iris classification?



E: Machine Learning Use Cases

Iris Dataset

<https://archive.ics.uci.edu/ml/datasets/iris>



E: Machine Learning Use Cases

Ok. Go to the
following github
page...

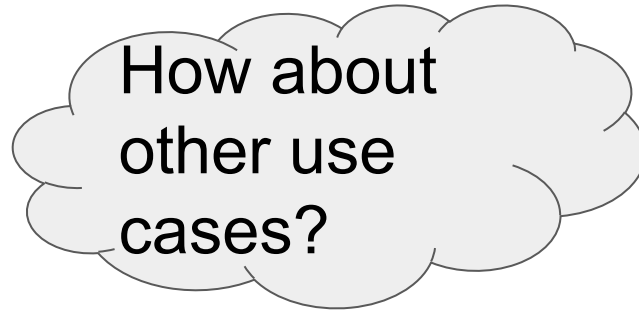
https://github.com/richieyuyongpoh/IRIS_Classification



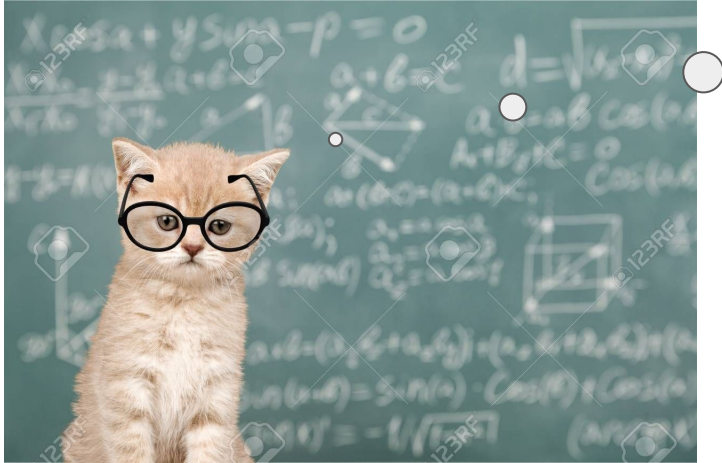
Image Credit: [HERE](#)

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E: Machine Learning Use Cases



E: Machine Learning Use Cases



Object
Recognition...

<https://github.com/richieyuyongpoh/objectrecognitionyolov5>



Finally, the talk
is over...

