

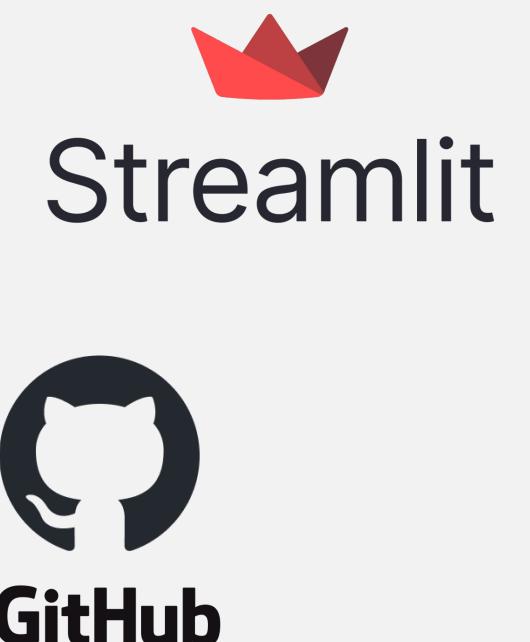
22 MARCH 2024

Web development in Python

Holly CHAN

HKUST Library

E: lbholly@ust.hk / T: 2358-6711

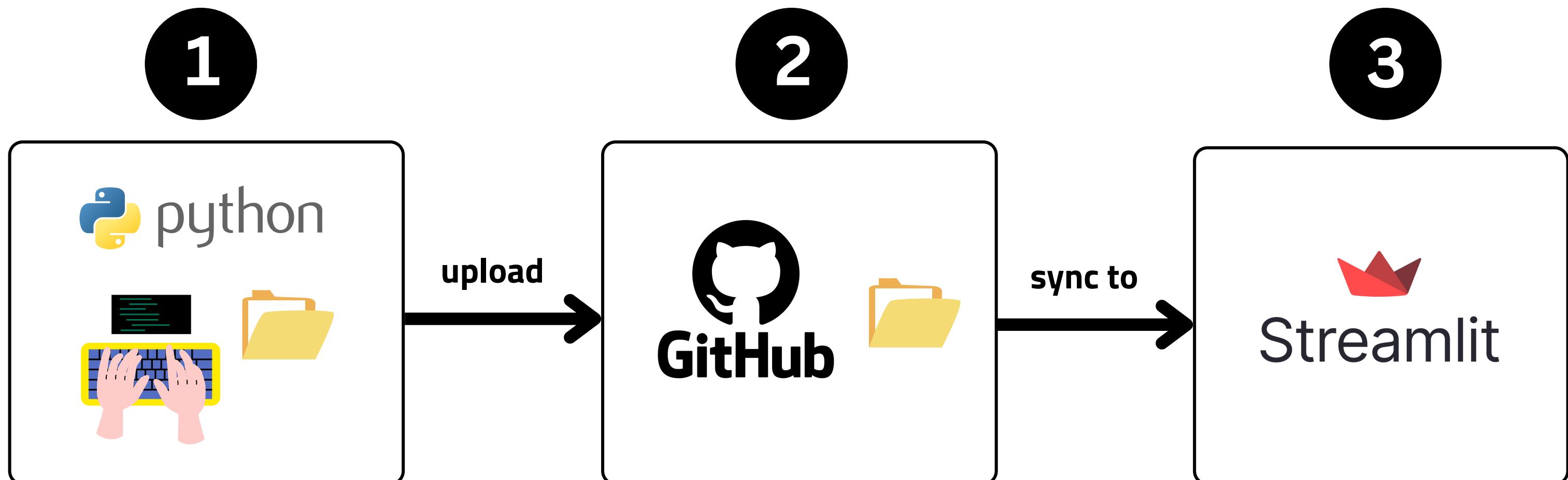


A blue circular background features three cartoon characters: a yellow circle with a smiling face, a pink dog-like shape with a black smiley face, and a green bear-like shape with a black smiley face. They are positioned on the left side of the slide.

Let's warm-up!

Go to menti.com

Workflow



**Create .py files
in your computer**

Use different python libraries,
such as streamlit, pandas, etc.
Similar to what you did in jupyter notebook (.ipynb)

Upload the files to Github

Publish on Streamlit

Your website is available online.
Everyone can visit your website now!

What is Streamlit?

 <https://streamlit.io/>

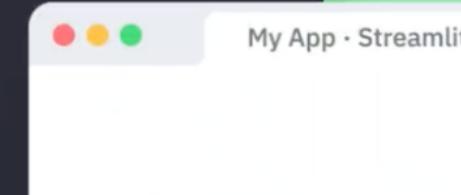
A faster way to build and share data apps

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

[Try Streamlit now](#)

[Deploy on Community Cloud \(it's free!\)](#)

```
1 import streamlit as st
2
3 st.write("Hello *world!*")
4 # My first app
```



What is Streamlit?

 <https://streamlit.io/> 

- a Python library
- Enable you to quickly create web applications
- All in pure Python
- No front-end experience required



Example use cases

<https://chatgpt.ust.hk/>

The screenshot shows the ChatGPT interface integrated into a web application. On the left, there's a sidebar with the university logo, a 'Logout' button, credit information (Free Credit: HK\$ 8.000000, Paid Credit: HK\$ 0.000000), and links for purchasing more credit and Azure OpenAI pricing. Below that, there are radio buttons for selecting ChatGPT or DALL-E, and a 'ChatGPT' section with a '+ New Chat' button and a green 'Chat0' button. At the bottom, there's a 'Chat configuration' dropdown and a 'Made with Streamlit' footer.

香港科技大學
THE HONG KONG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY

Logout

Free Credit: HK\$ 8.000000 ⓘ
Paid Credit: HK\$ 0.000000 ⓘ

[Purchase more credit](#)
[Azure OpenAI pricing](#)
[Azure OpenAI API access](#)

ChatGPT DALL·E

ChatGPT

+ New Chat

Chat0

Chat configuration

Made with Streamlit

Prompt: You are a helpful assistant that answers question as simple as possible.
0 of 20

Choose a text file

Drag and drop file here
Limit 1MB per file • TXT, PDF, DOCX

Browse files

Enter your question here
0/8000//

Example use cases

<https://bgremoval.streamlit.app/>

[Fork this app](#) [GitHub](#) [☰](#)

Upload and download

Upload an image

Drag and drop file here
Limit 200MB per file • PNG, JPG, JPEG

Browse files

[Download fixed image](#)

Remove background from your image

💡 Try uploading an image to watch the background magically removed. Full quality images can be downloaded from the sidebar. This code is open source and available [here](#) on GitHub. Special thanks to the [rembg library](#) 😊

Original Image Fixed Image

Made with Streamlit

Example use cases

<https://st-worldle.streamlit.app/>

Fork this app ⌂ ⌓

Guess the Country 'Worldle' Edition! 🌎

Heavily inspired by [Wordle](#) guessing game. Worldle is heavily inspired by [Wordle](#).

What is This? ▾

Hints (Optional)

Reveal your guesses on a map (will load an additional map below the mystery country)

Reveal the mystery country on a map (will load a map centered on the mystery country)

+

-



Leaher | Sanner

Afghanistan | 2996 km away | ← | 85.03%

Hong Kong | 7808 km away | ← | 60.99%

Guess the country (Click the drop down then type to filter)

Afghanistan

Submit Guess!

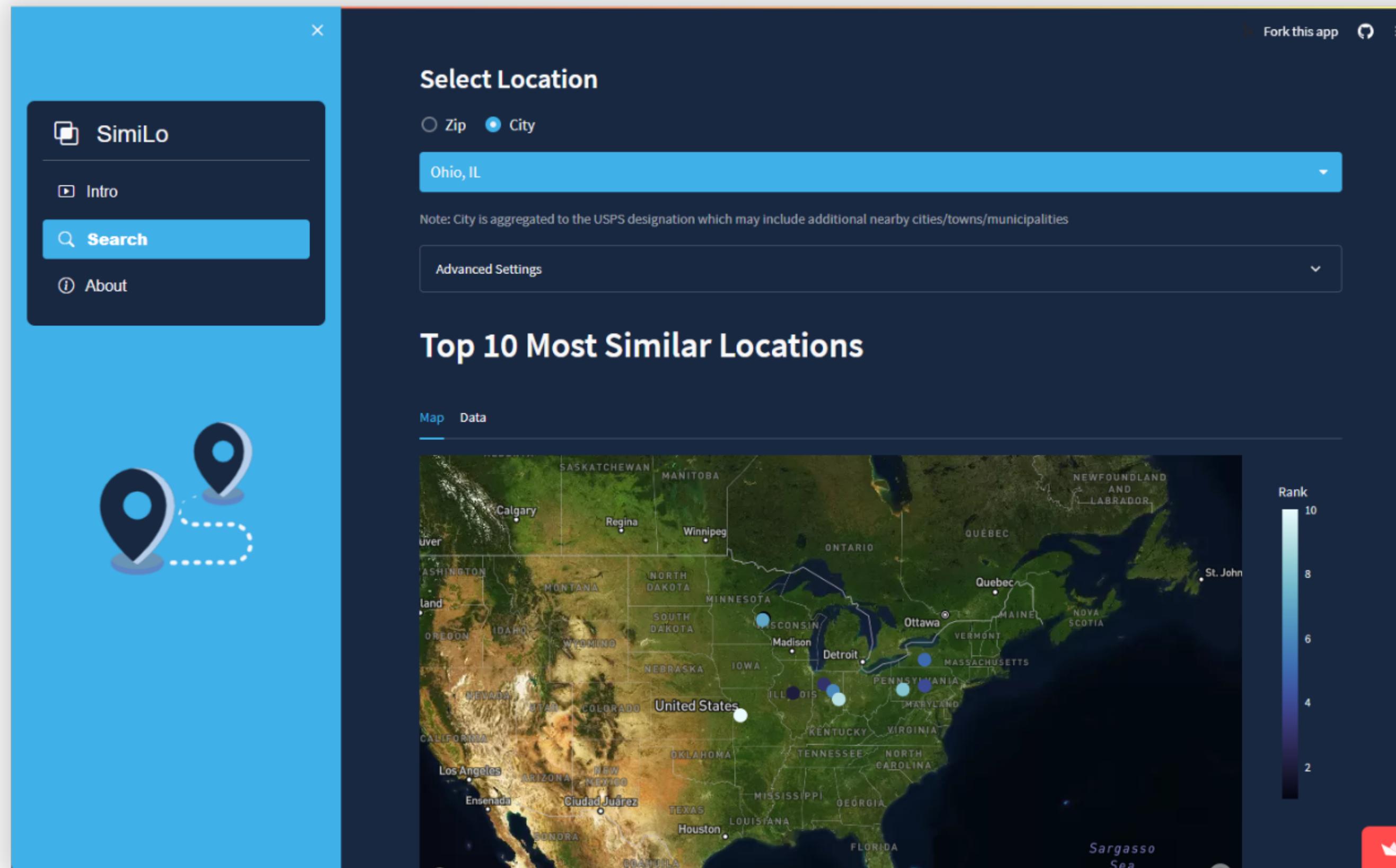
Get new Random Country

Submit a new Guess to continue!

Red crown icon

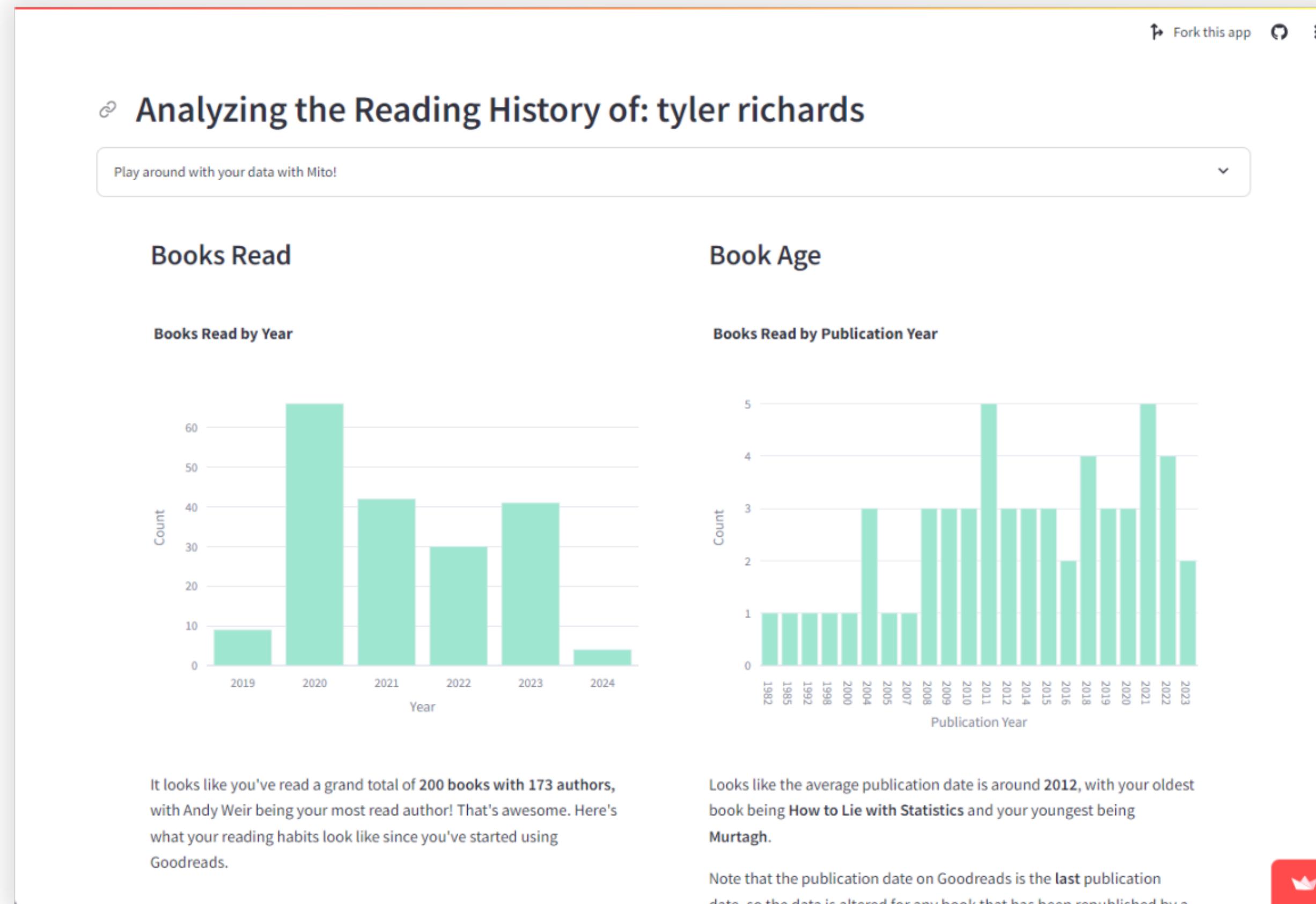
Example use cases

<https://similobeta2.streamlit.app/>



Example use cases

<https://goodreads.streamlit.app/>



Example use cases

<https://ipyvizzu-story-world-population.streamlit.app/>

<https://blog.streamlit.io/create-an-animated-data-story-with-ipyvizzu-and-streamlit/>



Example use cases

<https://mehulgupta2016154-resume-builder-streamlit-app-ajmqjx.streamlit.app/>

streamlit app

Data Science In Your Pocket ➔

My blogs

 **Mehul Gupta**
1,889
•3 •17 •36

Wish to connect?

✉: mehulgupta2016154@gmail.com

download resume

Career snapshot

DATA SCIENCE INTERN AT TATA 1IMG

(a) A printed prescription

(b) A handwritten prescription

Elsevier

sample prescriptions/rx

JULY 2019

1ST PROJECT

after working on backend development for sometime, I got my 1st core DS project i.e. prescription digitization for extracting important information in prescription images

DEvised MY 1ST ALGORITHM

Timeline

My Introduction to Data Science

Data Science Intern at Tata...

Devised my 1st algorithm

1st project

TCS humAIn...

Remote internshi...

Founded Data...

Joined Tat as Data...

Timeline

Skills & Tools

Data Science RDBMS Cassandra AWS Athena Snowflake

Comet-ML Python Java C++ Airflow

AWS S3 Tableau Metabase Thoughtspot Streamlit

DuSpark TensorFlow Noodi Langchain ConAI

Search more examples for inspiration!

- <https://streamlit.io/gallery>
- Keywords search, e.g.
 - YouTube search: `streamlit <keywords>`
 - Google search : `streamlit <keywords> site:github.com`
 - etc.

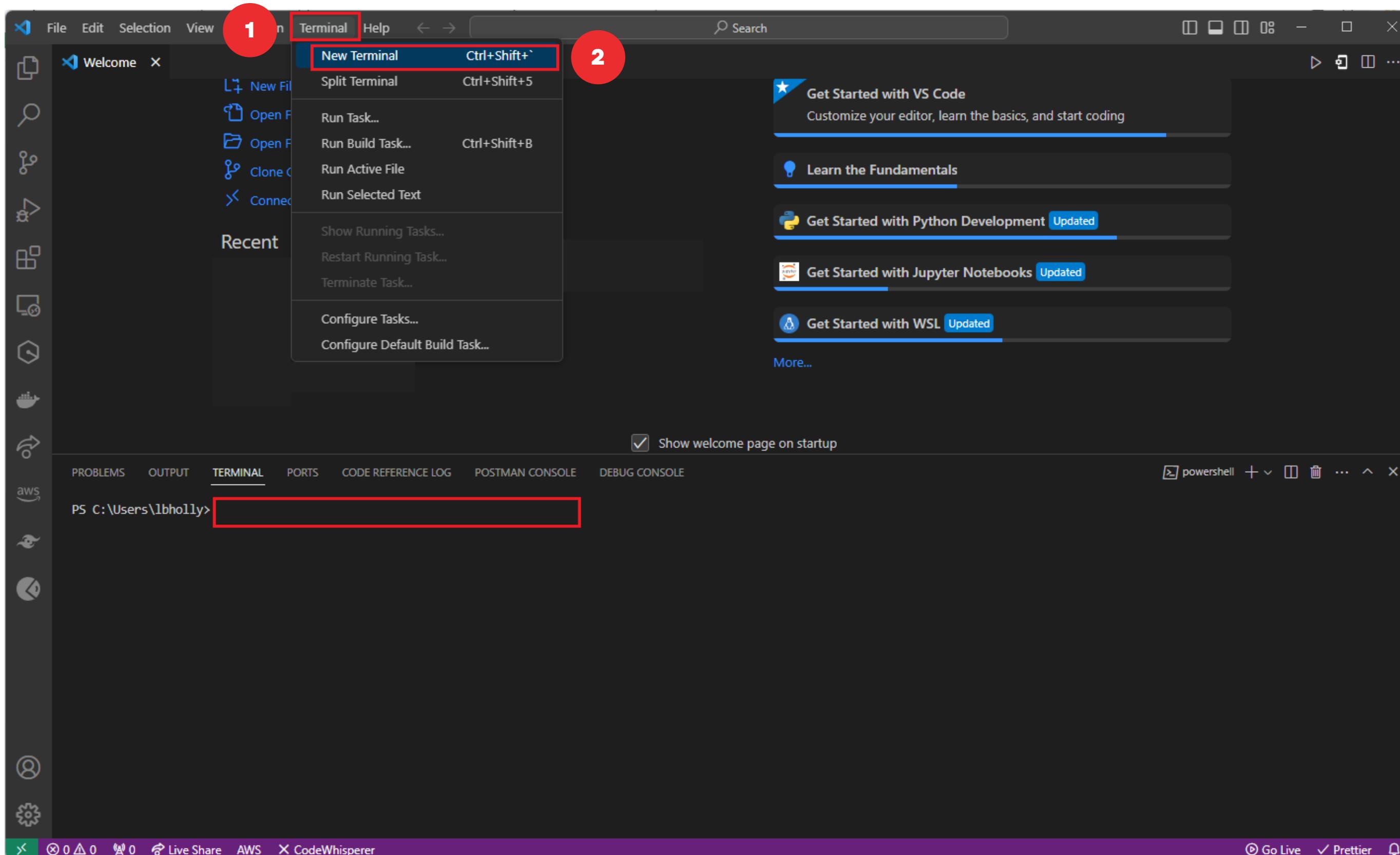


Time for hands-on Let's code together!



You should be already pre-installed the necessary as mentioned in [here](#) beforehand, so let's jump right in and get started.

Tips: Open Terminal in VS Code





Quick commands in terminal

```
pip3 install streamlit
```

OR

```
pip install streamlit
```

```
python -m streamlit run Homepage.py
```

OR

```
streamlit run Homepage.py
```

Ctrl + C



stop running the streamlit app



Auto-Generate requirements.txt

<https://github.com/damnever/pigar>

pip install pigar

OR

pip3 install pigar

pigar generate

pip3 install -r requirements.txt

OR

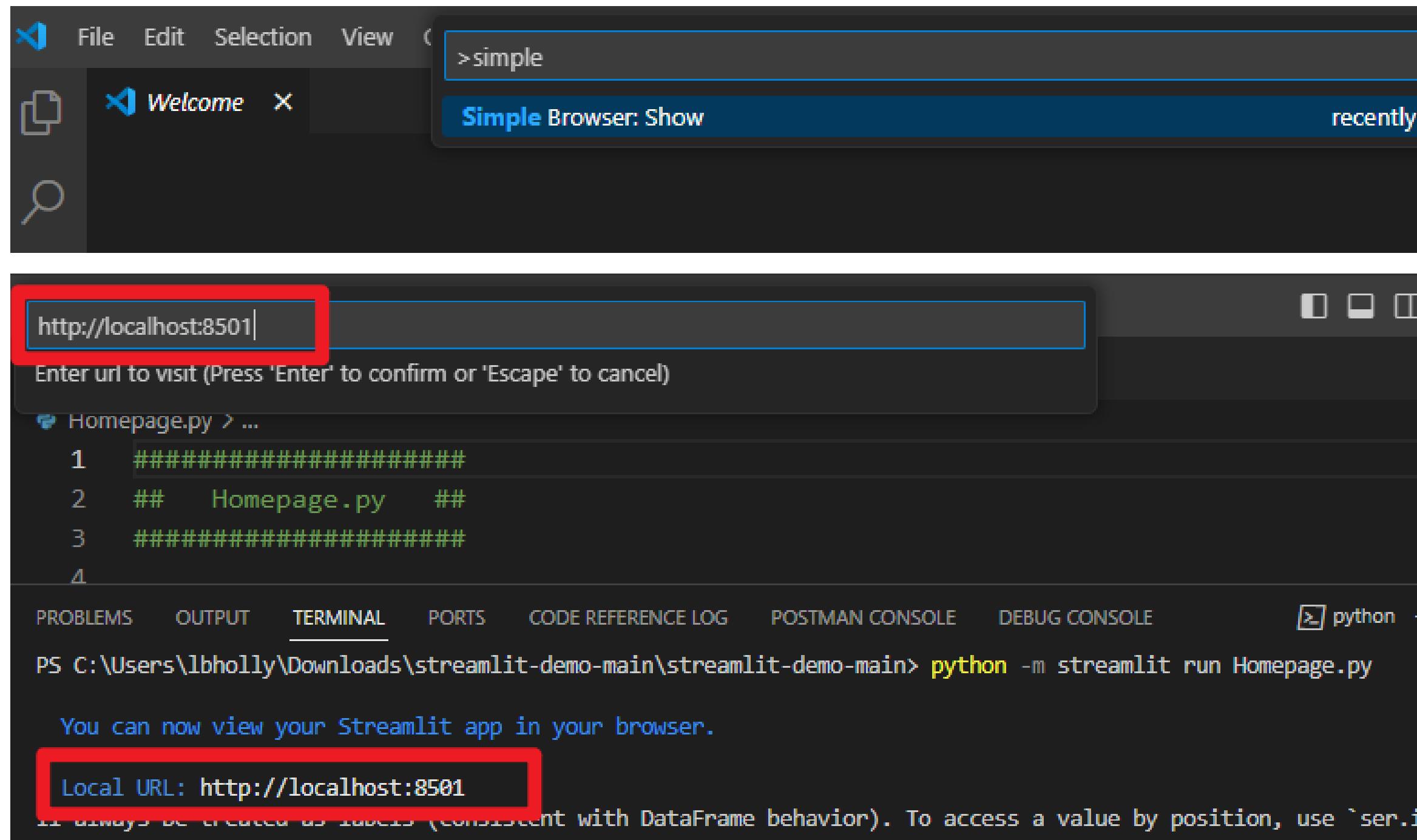
pip install -r requirements.txt

Tips: Editing code + Preview results side-by-side

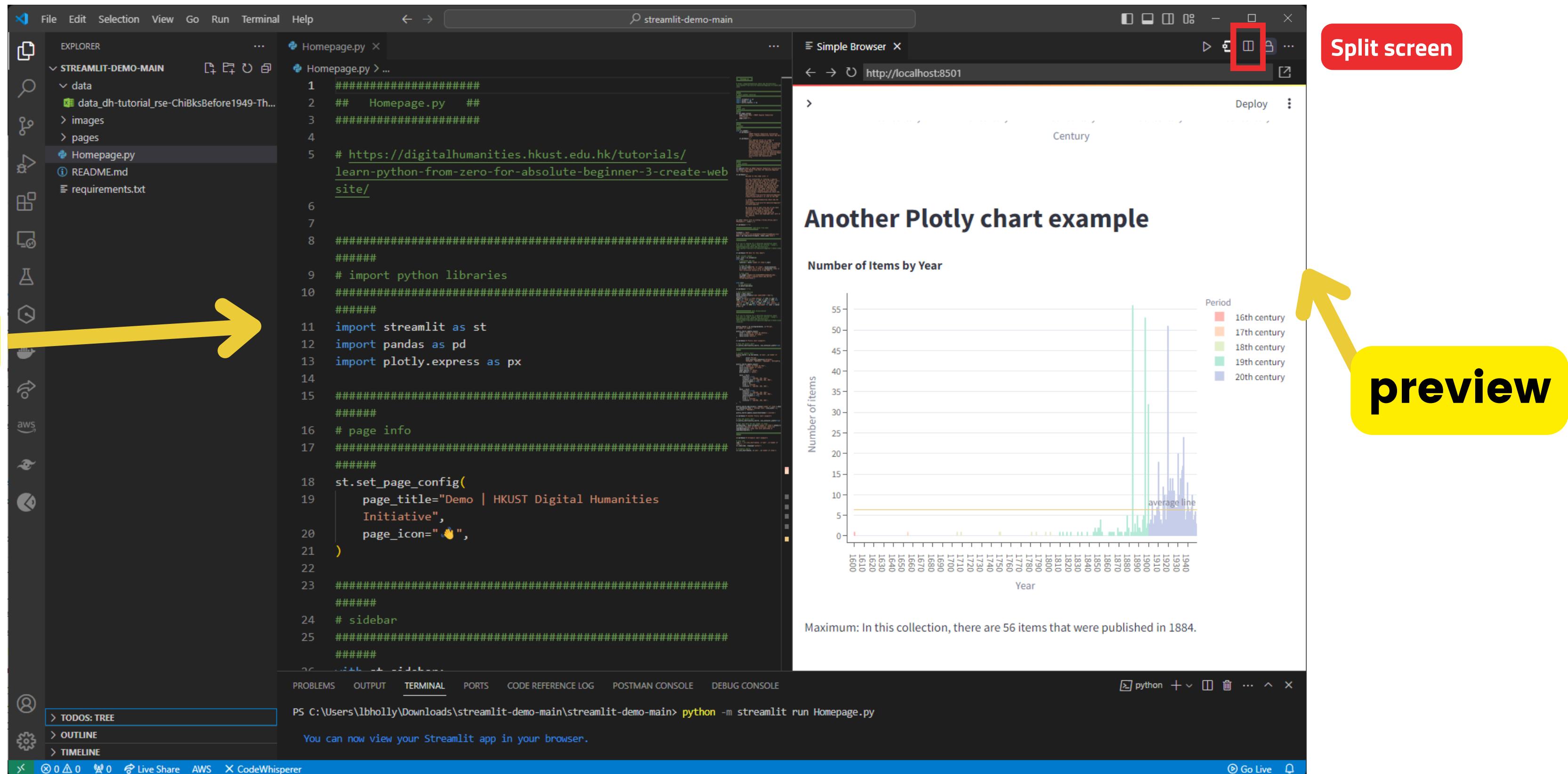
1 Press **Ctrl + Shift + P**, a search bar will then appeared in VS Code

2 Search and click “simple browser”

3 Paste the Local URL



Tips: Editing code + Preview results side-by-side



Possible data from our Library Collections!

Rare & Special e-Zone

<https://lbezone.hkust.edu.hk/rse/>

See next slide for the URLs!

Rare & Special e-Zone
古籍及特藏閱覽區

HKUST LIBRARY

Home About Collections

Digital collections from the University Archives and Special Collections

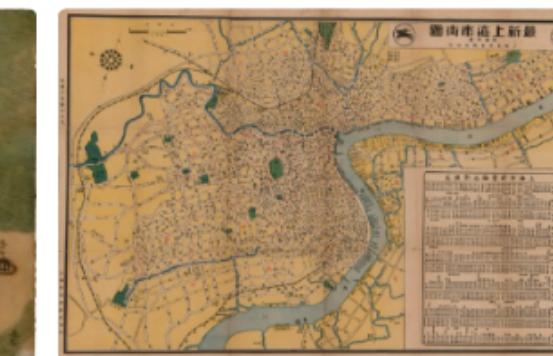
[Advanced Search](#) | [Browse All](#)



Antique Maps of China



Ancient East Asian Maps



Maps of China, Late Qing Dynasty-1949



Rare Books on History of Science



Western books about China before 1949



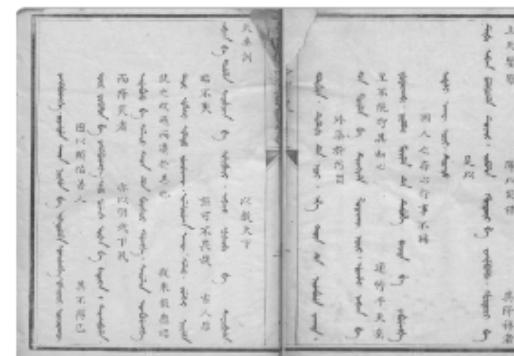
James Lee Collection



Paul Lin and Soong Ching-ling Correspondence



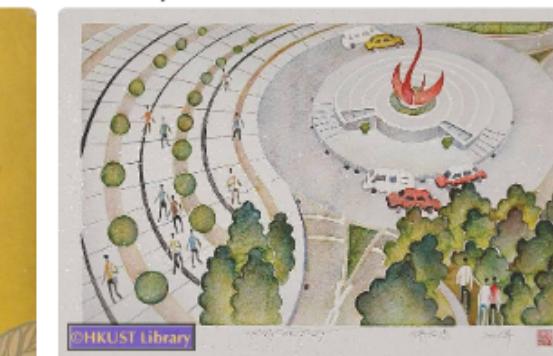
Sha Fei Photographic Collection



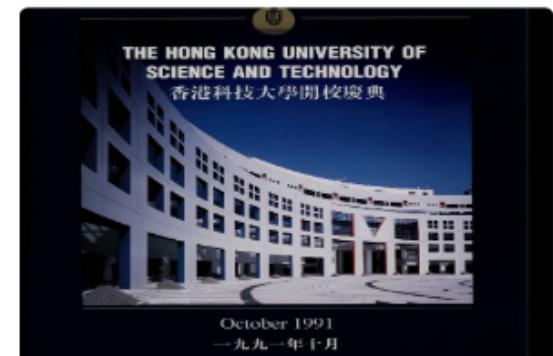
Chinese Books before 1949 (Thread Bound)



Chinese books before 1949



HKUST Library Artwork



HKUST Posters

OAI-PMH urls of our current collections

Open Archives Initiative - Protocol for Metadata Harvesting

- Return data in XML format
- URL pattern as below:

```
https://lbezone.hkust.edu.hk/rse/OAI/Server.php?  
verb=ListRecords&metadataPrefix=oai_dc&set=western_collection
```

- [antique_maps](#) = "Antique Maps of China"
- [ancient_east_asian_maps](#) = "Ancient East Asian Maps"
- [maps_china_late_qing](#) = "Maps of China, Late Qing Dynasty-1949"
- [rare_books](#) = "Rare Books on History of Science"
- [james_lee](#) = "James Lee Collection"
- [paul_soong](#) = "Paul Lin and Soong Ching-ling Correspondence"
- [shafei](#) = "Sha Fei Photographic Collection"
- [thread_bounds](#) = "Chinese books before 1949 (Thread Bound)"
- [artwork](#) = "HKUST Library Artwork"
- [posters](#) = "HKUST Posters"
- [chinese_collection](#) = "Chinese books before 1949"
- [western_collection](#) = "Western books about China before 1949"

This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
<OAI-PMH xmlns="http://www.openarchives.org/OAI/2.0/"  
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
  xsi:schemaLocation="http://www.openarchives.org/OAI/2.0/  
    http://www.openarchives.org/OAI/2.0/OAI-PMH.xsd">  
  <responseDate>2024-03-16T05:09:19Z</responseDate>  
  <request verb="ListRecords" metadataPrefix="oai_dc"  
    set="western_collection">https://lbezone.hkust.edu.hk/rse/OAI/Server</request>  
<ListRecords>  
  <record>  
    <header>  
      <identifier>oai:lbezone.ust.hk:b384524</identifier>  
      <datestamp>2018-06-13T09:17:58Z</datestamp>  
      <setSpec>western_collection</setSpec>  
    </header>  
    <metadata>  
      <oai_dc:dc xmlns:oai_dc="http://www.openarchives.org/OAI/2.0/oai_dc/"  
        xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-  
        instance" xsi:schemaLocation="http://www.openarchives.org/OAI/2.0/oai_dc/  
          http://www.openarchives.org/OAI/2.0/oai_dc.xsd">  
        <dc:title>An authentic account of an embassy from the King of Great Britain to the  
          Emperor of China</dc:title>  
        <dc:type>book</dc:type>  
        <dc:publisher>Printed for Robert Cambell by John Bioren</dc:publisher>  
        <dc:description>Taken chiefly from the papers of the Earl of Macartney Ambassador to  
          the Emperor of China ; Sir Erasmus Gower and other gentlemen of the  
          embassy</dc:description>  
        <dc:description>by Sir George Staunton</dc:description>  
        <dc:description>2 v. : illus. ; 22 cm</dc:description>  
        <dc:language>English</dc:language>  
        <dc:identifier>https://lbezone.hkust.edu.hk/bib/b384524</dc:identifier>  
        <dc:identifier>https://lbezone.hkust.edu.hk/thumb/thumb-b384524.jpg</dc:identifier>  
        <dc:identifier>Western books about China before 1949</dc:identifier>  
        <dc:identifier>b384524</dc:identifier>  
        <dc:identifier>https://doi.org/10.14711/spcol/b384524</dc:identifier>  
        <dc:date>1799</dc:date>  
        <dc:contributor>Staunton, George, Sir, 1737-1801</dc:contributor>  
        <dc:contributor>Macartney, George Macartney, Earl, 1737-1806</dc:contributor>  
        <dc:contributor>Gower, Erasmus, Sir, 1742-1814</dc:contributor>
```

The completed code for this demo session can be found here:

<https://github.com/hkust-dh/streamlit-demo-20240322>

The screenshot shows a GitHub repository page for "hkust-dh / streamlit-demo-20240322" and a Streamlit application window.

GitHub Repository:

- Code tab is selected.
- Branch: main
- 1 Branch, 0 Tags
- Commits:
 - hkust-dh Update requirements.txt - add openpyxl for reading ... 90f140e (Initial commit)
 - data
 - images
 - pages
 - DH March 22_do-it-before-class.pdf
 - Homepage.py
 - README.md
 - canva-preview1.jpg

Streamlit Application:

- Analysis and Display - Demo class
- https://hkust-dh-demo-20240322.streamlit.app/Analysis_and_Display
- Homepage
- Import Excel Data
- Import Data via API
- Analysis and Display** (selected)
- embed Tableau
- Timeline
- Count up (use Session to remember your...)
- Guess a number (Traditional Chatbot)

Analysis and Display Content:

- A pie chart showing language distribution: French (91.4%), German (3%), Dutch (1%), Chinese (1%).
- Using `for` loop to display thumbnails like catalog/gallery.
- Thumbnail cards for historical documents:
 - Year: 1799 | English
 - Title: EIGHTEEN CAPITALS OF CHINA WILLIAM EDGAR GEIL
 - Year: 1911 | English
 - Title: TRANSACTIONS OF THE HISTORICAL AND LITERARY COMMITTEE OF THE AMERICAN PHILOSOPHICAL SOCIETY FOR 1838
 - Year: 1838 | English
 - Title: GEZANTSCHAP Der Nederlandsche Oel-Indische Compagnie's GROTE TARTARISCHE CHAM, KEIZER VAN CHINA
 - Year: 1665 | Dutch
 - Title: TARTARISCHE CHAM, KEIZER VAN CHINA
 - Year: 1598 | English
 - Title: THE HISTORY Of The Great and Revered MONARCHY CHINA.
 - Year: 1655 | English
 - Title: THE HISTORY Of The Great and Revered MONARCHY CHINA.
- Links: <https://doi.org/10.1471> and <https://doi.org/10.1471>

Good references

- Streamlit functions: <https://docs.streamlit.io/library/api-reference>
- Components (third-party modules): <https://streamlit.io/components>
- Plotly charts: <https://plotly.streamlit.app/>

In the previous steps, you can now visit your website [locally on your own machine](#).

It's time to take your website online and making it available to everyone online.

We'll achieve this by using [GitHub](#) and [Streamlit Cloud](#).



Create .py files
in your computer

Upload the files to Github

Publish on Streamlit

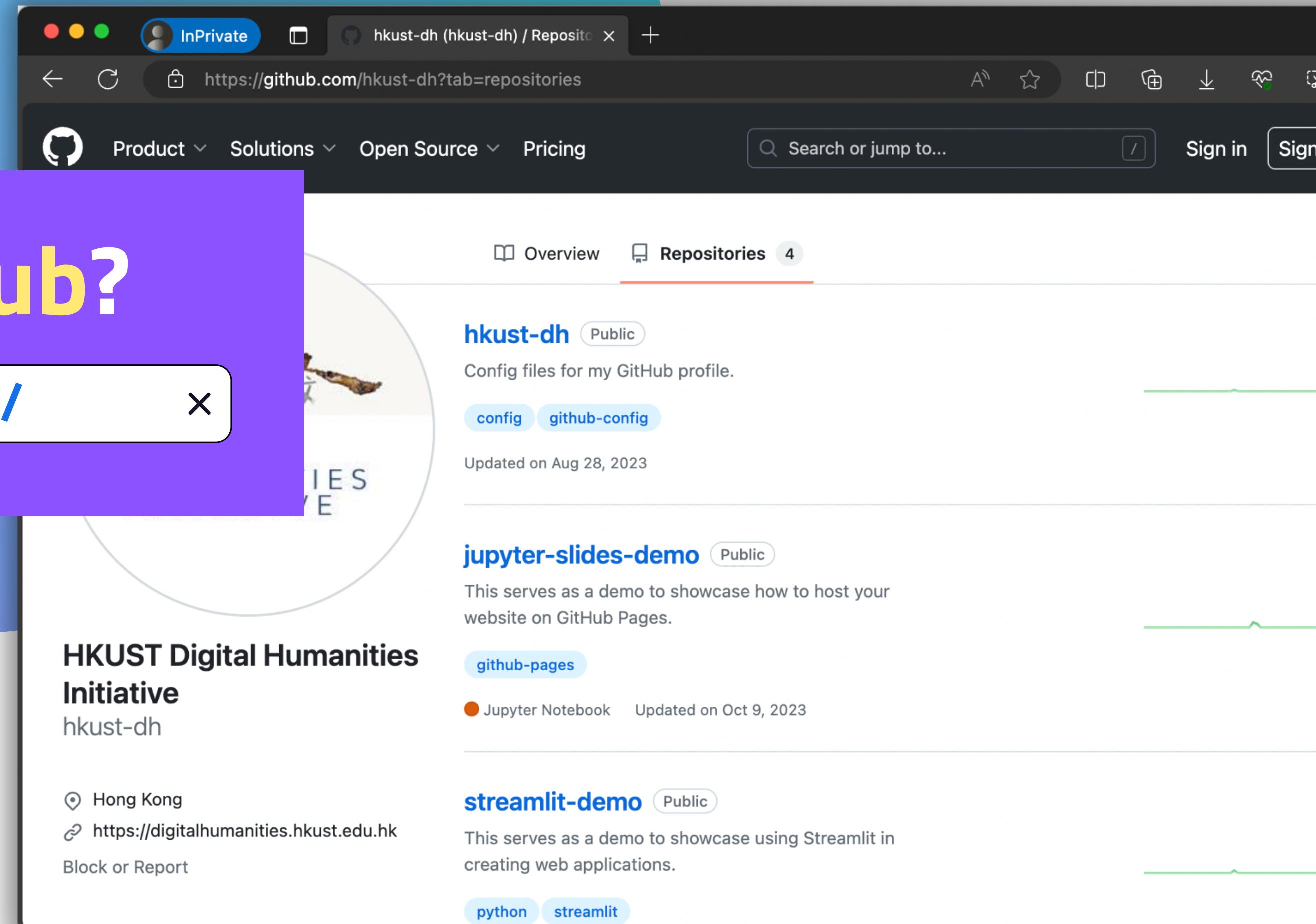
Your website is available online.
Everyone can visit your website now!

What is GitHub?

 <https://github.com/>

HKUST Digital Humanities
Initiative
hkust-dh

📍 Hong Kong
🔗 <https://digitalhumanities.hkust.edu.hk>
Block or Report



The screenshot shows a web browser window with the GitHub URL <https://github.com/hkust-dh?tab=repositories> in the address bar. The page displays four repository cards:

- hkust-dh** [Public]
Config files for my GitHub profile.
Tags: config, github-config
Updated on Aug 28, 2023
- jupyter-slides-demo** [Public]
This serves as a demo to showcase how to host your website on GitHub Pages.
Tags: github-pages
Type: Jupyter Notebook Updated on Oct 9, 2023
- streamlit-demo** [Public]
This serves as a demo to showcase using Streamlit in creating web applications.
Tags: python, streamlit

What can GitHub use for?

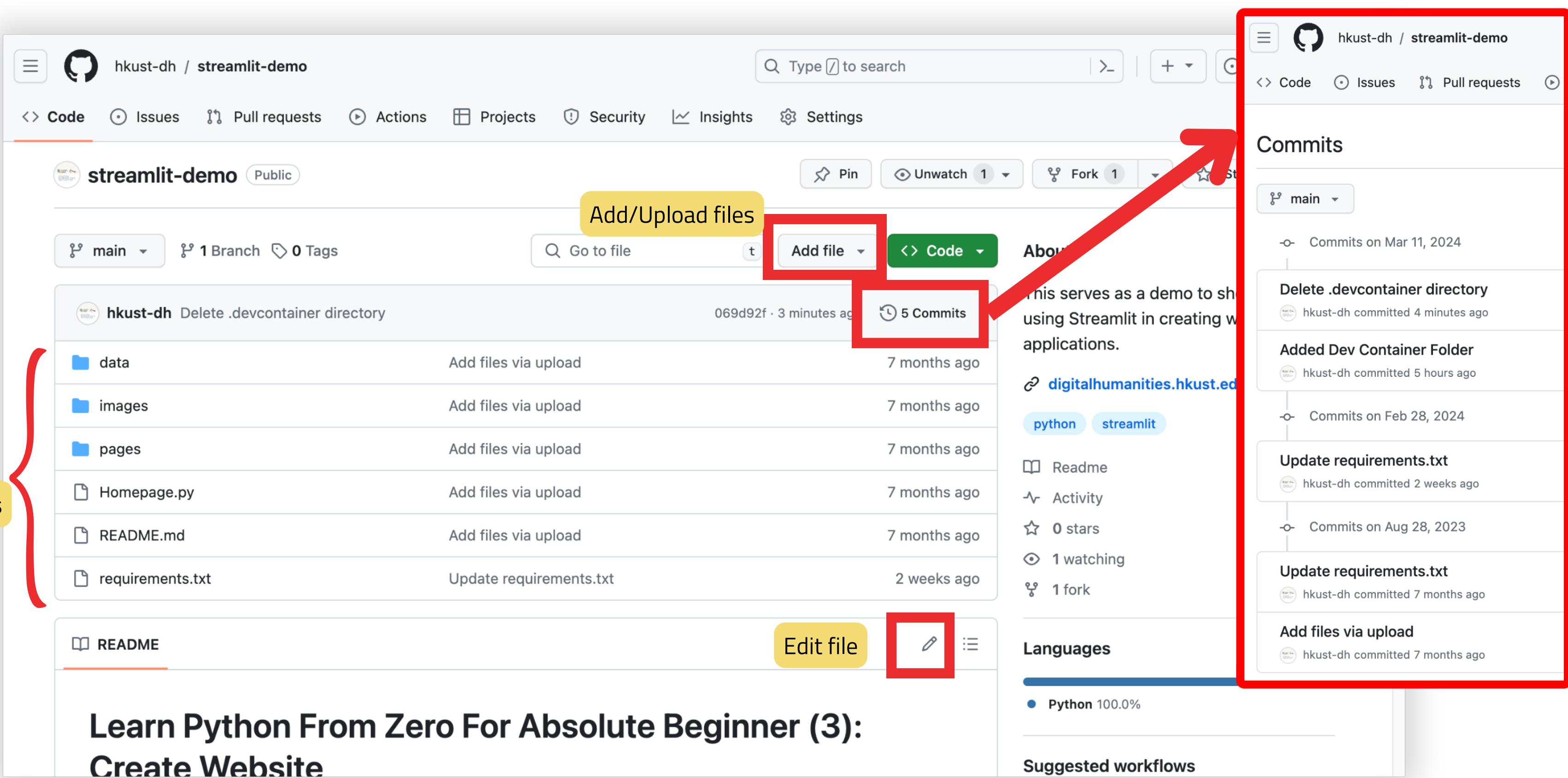
- Version Control
- Code Hosting
- Collaboration
- Open Source Community



Example of a Repository in GitHub

History of the commits

Can see who made the changes



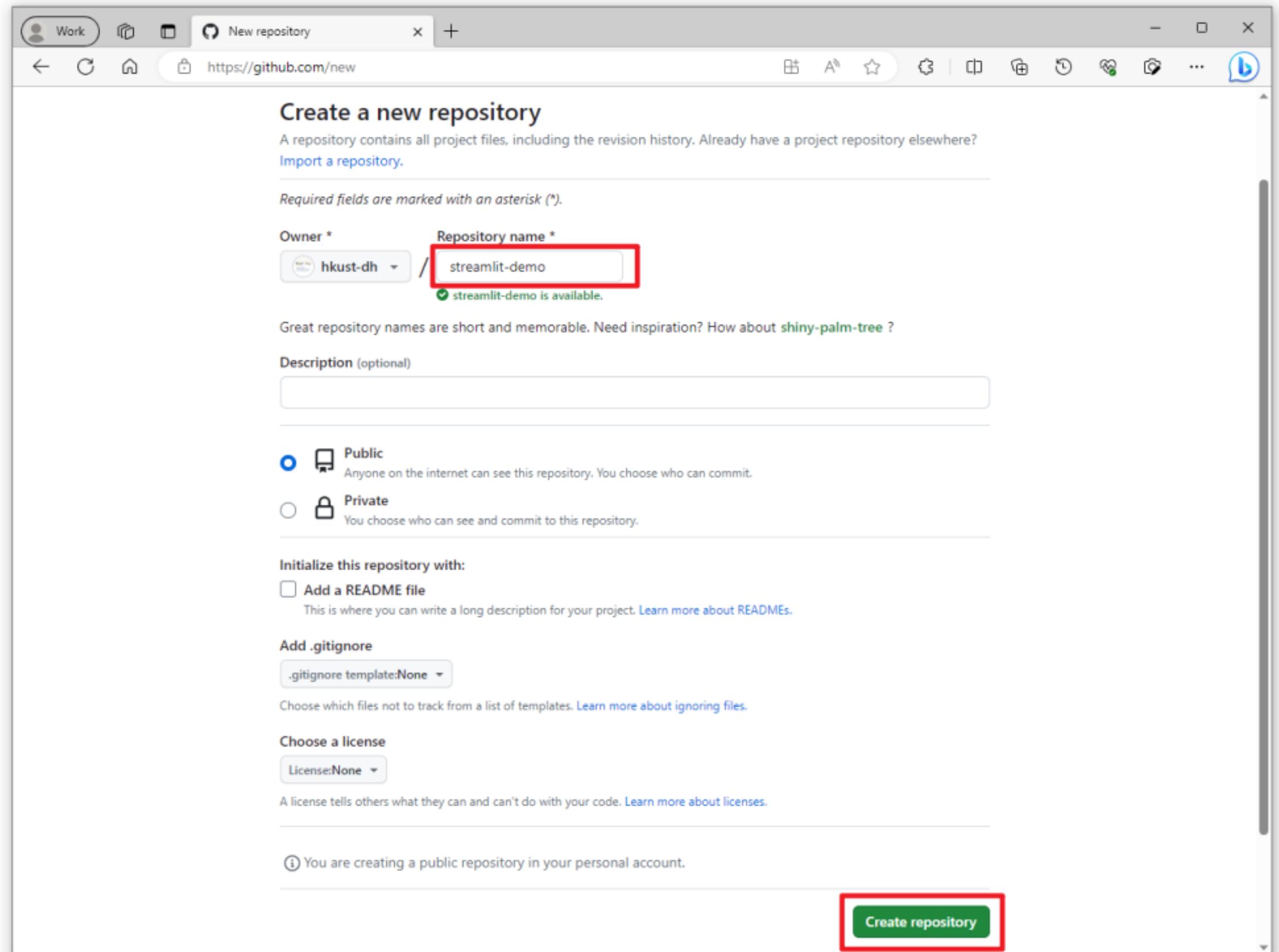


Now, let's upload the code to Github

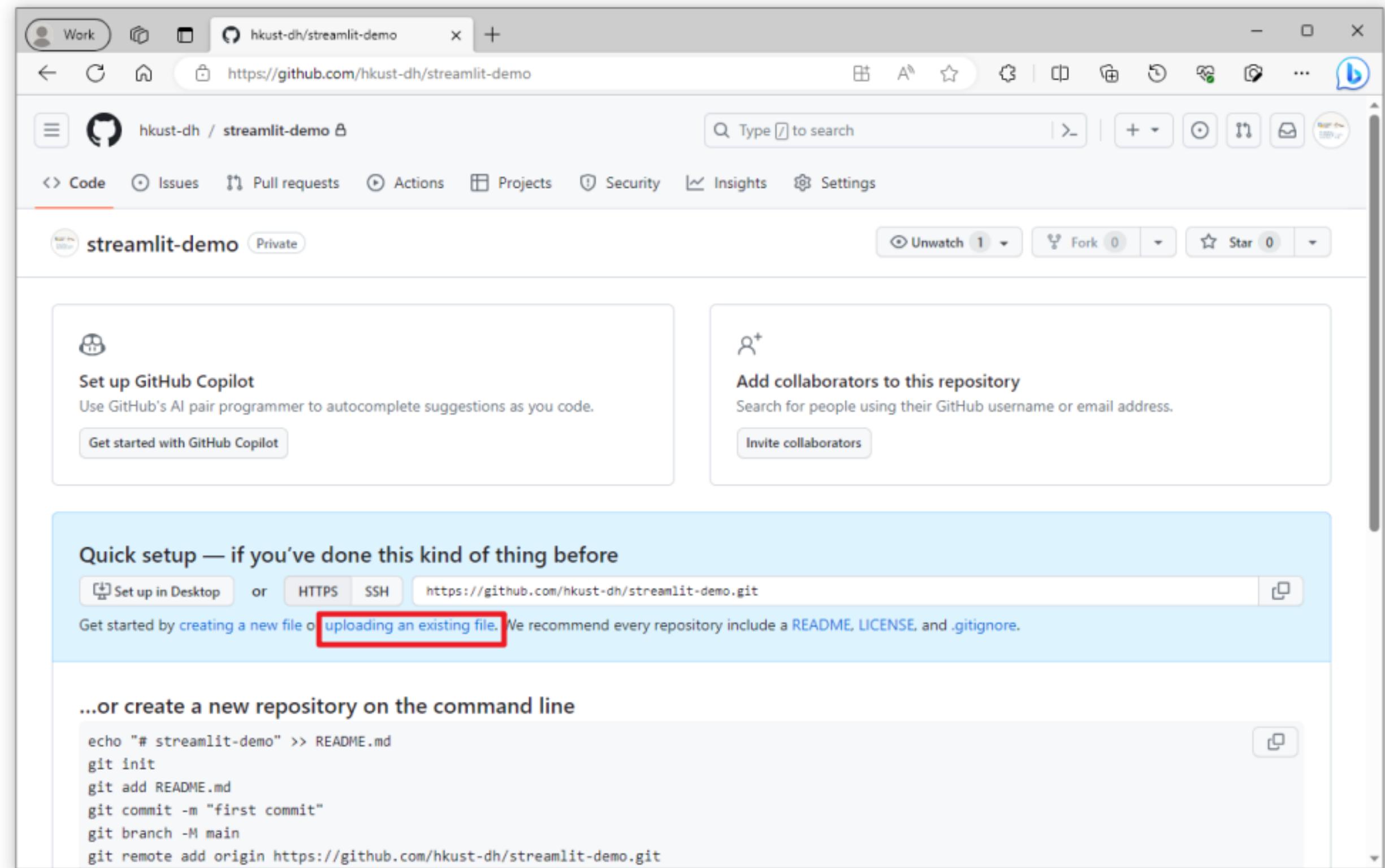


Upload the files to Github

Create a new repository in Github

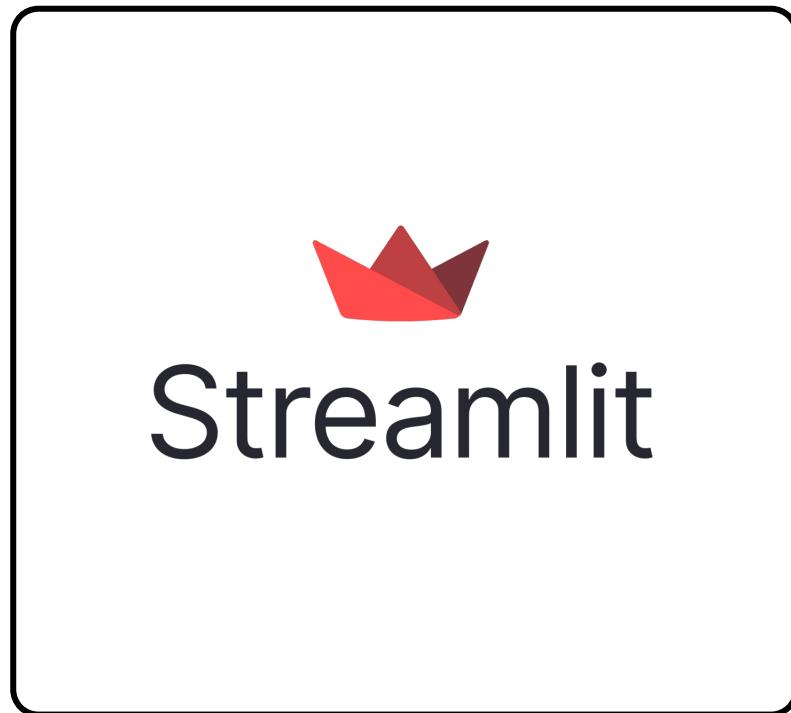


Upload files to GitHub



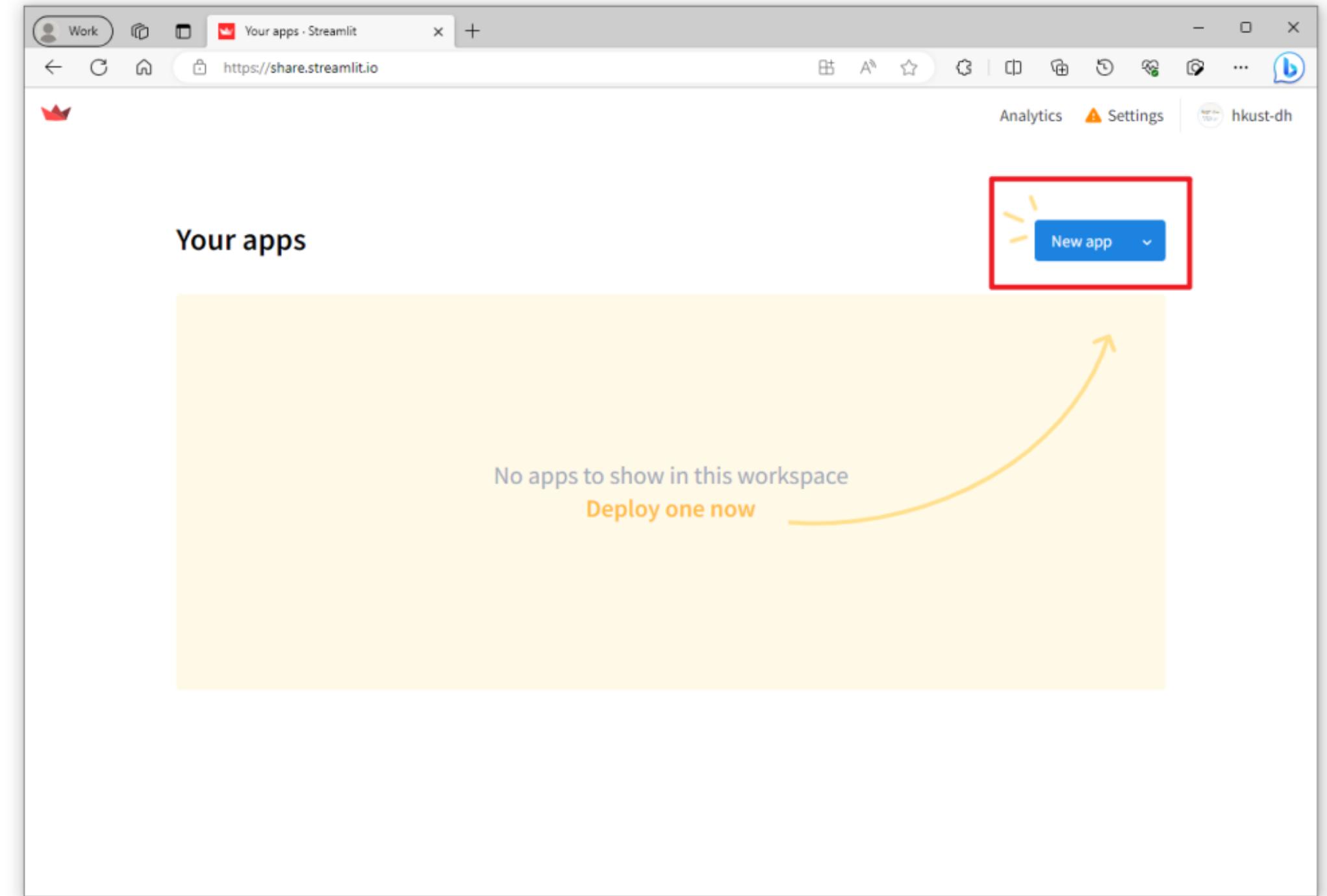


Now, let's deploy to Streamlit Cloud

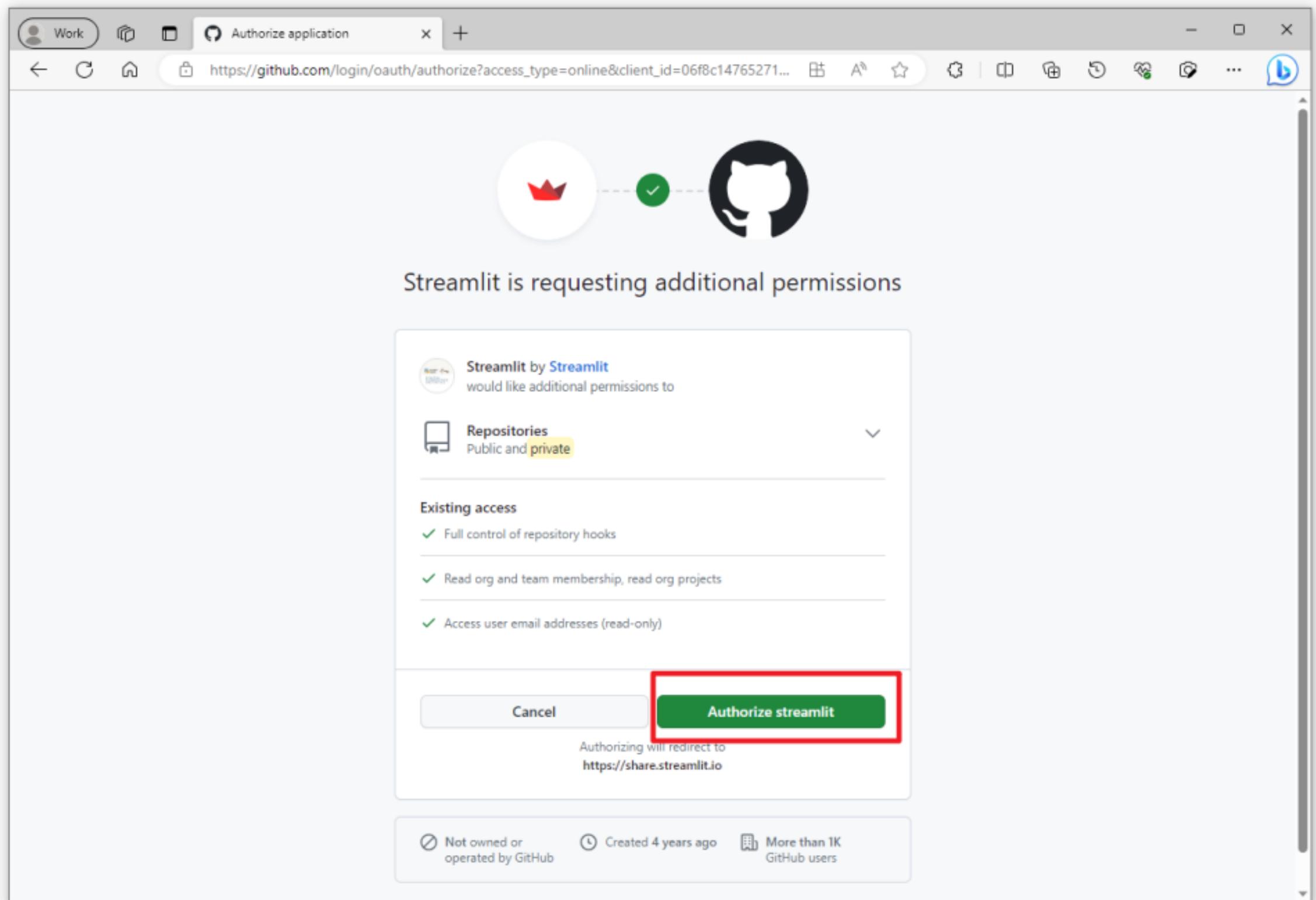


Publish on Streamlit

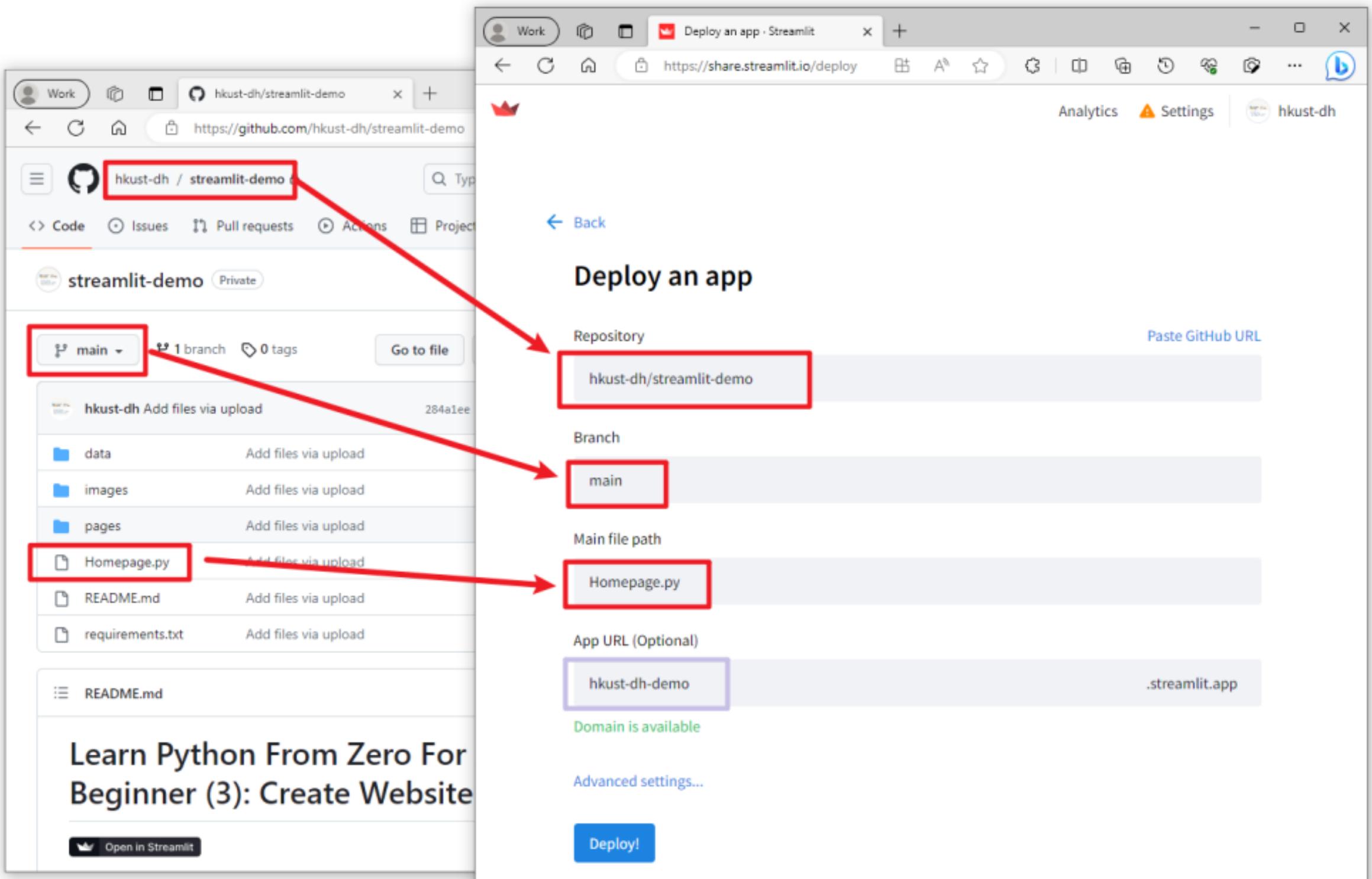
Go to
<https://share.streamlit.io/>
click the “New app” button



Authorize Streamlit to access your Github repositories

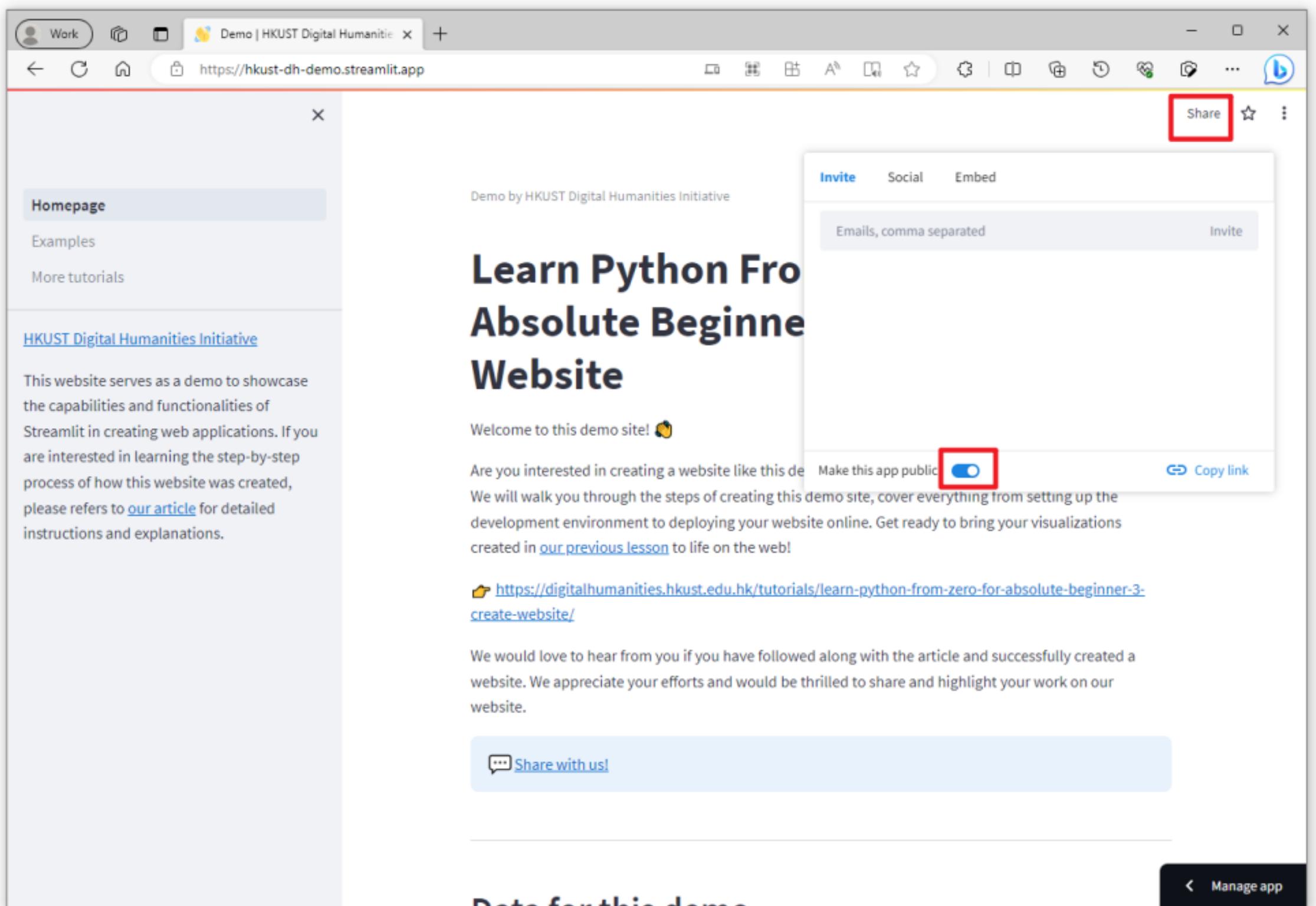


Select the Github repository Enter necessary information



Click “Share”

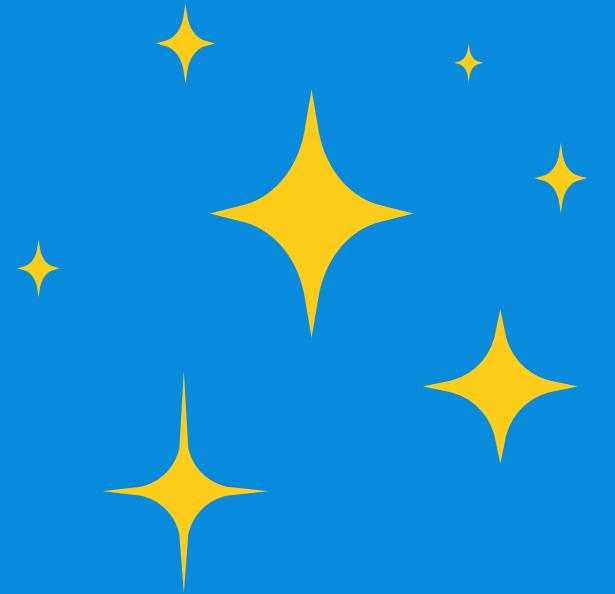
Enable “Make this app public”





Congratulations!

Your website is now accessible online for everyone!



Time to find your groupmates for your group project

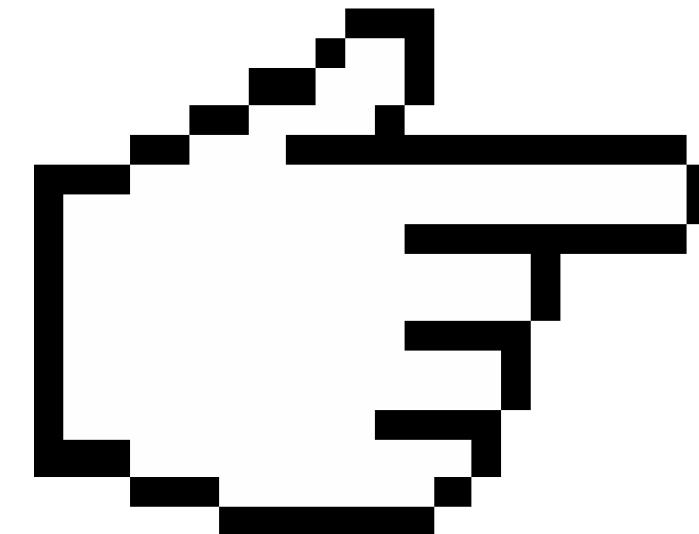
Once you have finalized your group members, please do the followings:

- **Sign the form “Permission for HKUST Library to Share Your Course Work”**
 - Your work will be shared here: <https://digitalhumanities.hkust.edu.hk/studentprojects/>
 - Your code will be open-sourced and your repository will be turned from private to public AFTER the submission deadline: <https://github.com/HUMA5630-Digital-Humanities>

Do the followings **after you finalized your group members**

Click the **GitHub Classroom Invitation Link**

in **Canvas** announcement



You will then be directed to this page.
Select yourself from the list.

GitHub Classroom

GitHub Education

Join the classroom:
2024-HUMA5630-Digital-Humanities

To join the GitHub Classroom for this course, please select yourself from the list below to associate your GitHub account with your school's identifier (i.e., your name, ID, or email).

Can't find your name? [Skip to the next step →](#)

Identifiers
2 [REDACTED]
20 [REDACTED]
20 [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

**Assign one of your group members to
“Create team” with the following name**

(will tell you your group number when
you sign the permission form)

- 2024-Group-1
 - 2024-Group-2
 - 2024-Group-3
 - 2024-Group-4
 - etc...

Afterwards, other group members please “Join” it from the existing team

GitHub Classroom

GitHub Education

2024-HUMA5630-Digital-Humanities

Accept the group assignment — project

Before you can accept this assignment, you must create or join a team. Be sure to select the correct team as you won't be able to change this later.

Join an existing team

A rectangular card with a thin gray border. The top half is light gray with the text "2024-Group-01" and "Join" in black. Below this, the bottom half is white with a small green icon representing a student.

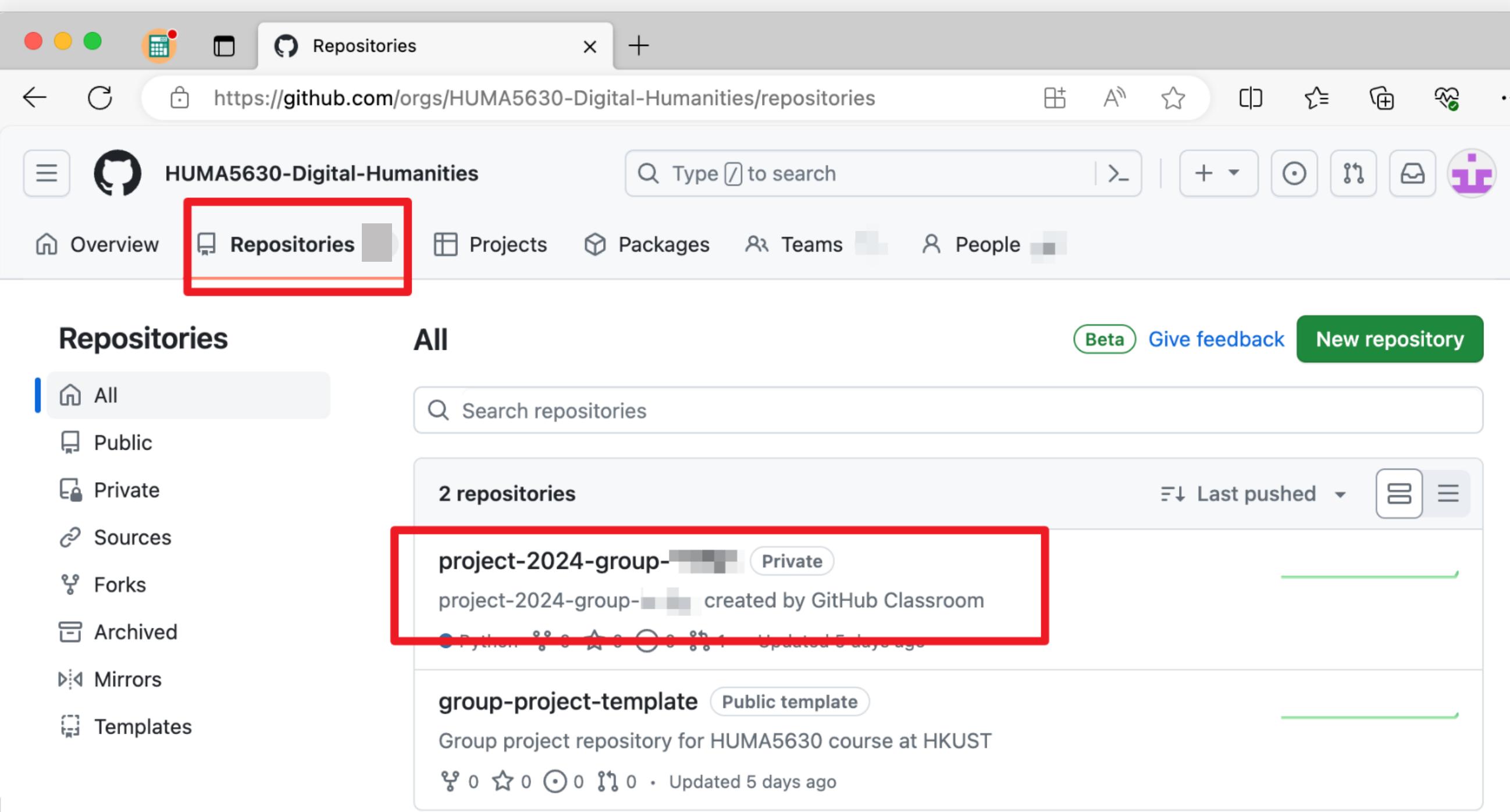
OR Create a new team

A text input field containing the text "2024-Group-1".

+ Create teamA green button with white text that says "+ Create team".

**A private repository should then be automatically created for your group.
Please make sure all your group members can access to the same repository.**

<https://github.com/orgs/HUMA5630-Digital-Humanities/repositories>



If you receive this email, please accept and join

[GitHub] You're invited to join the @HUMA5630-Digital-Humanities organization

GitHub <noreply@github.com> To [REDACTED]

Mon 2024-03-11 11:36 AM

You're invited to join the
@HUMA5630-Digital-Humanities organization

You're invited to join the HUMA5630-Digital-Humanities organization

Hi [REDACTED]

You're invited to join the @HUMA5630-Digital-Humanities organization on GitHub. Head over to <https://github.com/HUMA5630-Digital-Humanities> to check out @HUMA5630-Digital-Humanities's profile.

This invitation will expire in 7 days.

[Join @HUMA5630-Digital-Humanities](#)

HUMA5630-Digital-Humanities

Overview Repositories Projects Packages People

You've been invited to the [HUMA5630-Digital-Humanities](#) organization!

 Ask for a GitHub Copilot seat (optional)

Request a seat from your admin to get real-time AI code suggestions, improve code quality, and accelerate your workflow. [Learn more about GitHub Copilot.](#)

[Join HUMA5630-Digital-Humanities](#) [Decline](#)

 Owners of HUMA5630-Digital-Humanities may be able to see:

- If you have [two-factor authentication](#) enabled or not
- Your public profile information
- [Certain activity](#) within this organization
- Country of request origin
- Your access level to repositories within the organization
- Your IP address

[Opt out](#) of future invitations from this organization.

Please check your personal setting:

<https://github.com/settings/applications>

Applications

Installed GitHub Apps Authorized GitHub Apps **Authorized OAuth Apps**

You have granted 1 application access to your account.

Sort ▾ [Revoke all](#)

Application	Access	...
 Streamlit	Last used within the last week · Owned by streamlit	...

[Read more about connecting with Streamlit](#)

 Streamlit

Last used within the last week · Developed by [streamlit](#) · <https://streamlit.io>

The easiest way to share your Streamlit apps

Permissions

[Revoke access](#)

✓ Full control of repository hooks
✓ Full control of codespaces
✓ Read org and team membership, read org projects
✓ Full control of private repositories
✓ Access user email addresses (read-only)

Applications act on your behalf to access your data based on the permissions you grant them. Organizations control which applications are allowed to access their private data. Applications you authorize will always have access to public data in your organizations. [Read about third-party access.](#)

Organization access

 HUMA5630-Digital-Humanities ✓

Code, planning, and automation

Repositories Codespaces Packages Copilot Pages Saved replies

Security

Code security and analysis

Integrations

Applications

Scheduled reminders

Code, planning, and automation

Repositories Codespaces Packages Copilot Pages

You can now choose our organization repository that you have access to
in <https://share.streamlit.io>

The screenshot shows the Streamlit Share interface. At the top, there's a navigation bar with a user icon, the name "lbholly" with a warning icon, "My apps", "Explore", and "Create app". Below the navigation bar is a sidebar on the left containing "Settings" (with a warning icon), "Analytics", "Docs", and a section for "hkust-dh" which includes a repository named "huma5630-digital-humanities". This repository name is highlighted with a red rectangular border. At the bottom of the sidebar, there are "Sign out" and "github.com/lbholly" links. The main content area is titled "No apps to show in this workspace" and features a large orange button with the text "Deploy one now". A yellow arrow points upwards from the "Deploy one now" button towards the "New app" button in the top right corner of the main content area.

lbholly ⚠

My apps Explore Create app

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huma5630-digital-humanities

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For coding and technical questions, feel free to email me!



To: lbholly@ust.hk

cc : hmqzguo@ust.hk ; your groupmates' email (if necessary)

Subject: [HUMA5630] Group **xx** - Questions about

- Who are you (e.g. I'm XXX, student from HUMA5630 Group xx.....)
- Your questions
- Your attempts
 - your code
 - URLs that you've searched and referenced

In order to offer you more efficient assistance in resolving your inquiries, please describe your needs and share the attempts and efforts you have made in addressing your questions. This will enable me to provide more efficient guidance and support.

