

ERT 429/529 GITHUB INTRO

Course Platform Setup



Outline

- Set up your **GitHub repo** in the **GitHub organization**
 - Step-by-step instructions
- Get familiar with the **GitHub CodeSpace**
 - The coding interface – Microsoft VS Code
 - Jupyter Notebook
 - Terminal (folder structures)
- Course logistics
 - How can we do future lab sessions?
 - How can we submit homework?

By the end of this lab, you will need to know

1. Open ***Github CodeSpace***
2. Pull updates from ***the CourseMaterials26*** repo
 - Materials in labs will be published in ***CourseMaterials26***
3. Navigate yourself in VSCode, including creating folders and notebooks
4. Submit homework by ***pushing changes*** to your ***homework repo***

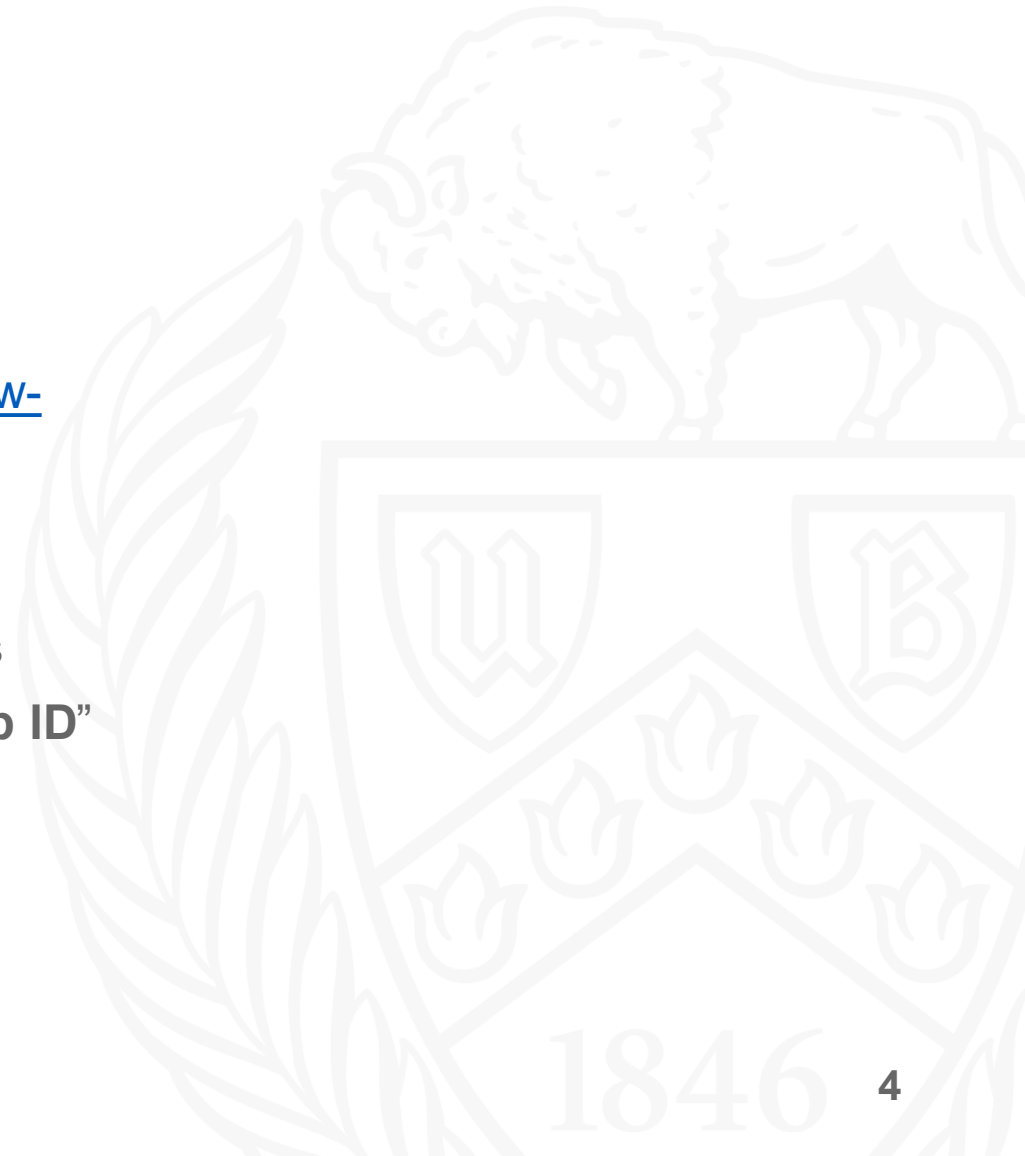
Organization

- <https://github.com/GeoData-Analysis-Spring-2026>



Sign up for GitHub account

- Instruction for signup
 - <https://docs.github.com/en/get-started/start-your-journey/creating-an-account-on-github#signing-up-for-a-new-personal-account>
- After signing up, please email your GitHub account ID to Yifan's email (ycheng46@buffalo.edu), email title **"ERT 429/529 Github ID"**



The screenshot shows a GitHub repository page for 'homework_template' under the user 'GeoData-Analysis-Spring-2026'. The repository is a public template generated from 'OS-Hydro-Analytics-Fall-2025/homework_template'. A dropdown menu is open next to the 'Use this template' button, showing three options: 'Use this template', 'Create a new repository', and 'Open in a codespace'. The repository has 0 watches, 0 forks, and 0 stars. The 'About' section indicates no description, website, or topics are provided. The file list shows an initial commit by 'act-hydro' with files: .devcontainer, homework_submissions, project_submissions, .gitignore, README.md, postbuild.sh, and pyproject.toml.

GeoData-Analysis-Spring-2026 / homework_template

<> Code Issues Pull requests Actions Projects Security Insights

homework_template Public template

generated from [OS-Hydro-Analytics-Fall-2025/homework_template](#)

Watch 0 Fork 0 Star 0

Use this template

Create a new repository

Open in a codespace

main

Go to file

act-hydro Initial commit bcb722 · 7 hours ago 1 Commit

.devcontainer	Initial commit	7 hours ago
homework_submissions	Initial commit	7 hours ago
project_submissions	Initial commit	7 hours ago
.gitignore	Initial commit	7 hours ago
README.md	Initial commit	7 hours ago
postbuild.sh	Initial commit	7 hours ago
pyproject.toml	Initial commit	7 hours ago

About

No description, website, or topics provided.

Readme

Activity

Custom properties

0 stars

0 watching

0 forks

Report repository

Releases

No releases published

Click “Create a new repository”

Create a new repository

Repositories contain a project's files and version history. Have a project elsewhere? [Import a repository](#).
Required fields are marked with an asterisk (*).

Start with a template

Templates pre-configure your repository with files.



GeoData-Analysis-Spring-2026/homework_template ▾

Include all branches

If enabled, all branches from the template repository will be included.

Off ☐

1 General

Owner *



GeoData-Analysis-Spring-2026 ▾

Repository name *

homework_YourUserName

✓ homework_YourUserName is available.

Great repository names are short and memorable. How about [symmetrical-pancake?](#)

Description

0 / 350 characters

2 Configuration

Choose visibility *

Choose who can see and commit to this repository



Private ▾

Create repository


Make sure to select “GeoData-Analysis-Spring-2026”

Create a new repository

Repositories contain a project's files and version history. Have a project elsewhere? [Import a repository](#).
Required fields are marked with an asterisk (*).

Start with a template

Templates pre-configure your repository with files.

 GeoData-Analysis-Spring-2026/homework_template ▾

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If enabled, all branches from the template repository will be included.

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✓ homework_YourUserName is available.

Great repository names are short and memorable. How about [symmetrical-pancake?](#)


Description

0 / 350 characters

2 Configuration

Choose visibility *

Choose who can see and commit to this repository

 Private ▾

Create repository

Make sure to select
“OS-Hydro-Analytics-
Fall-2025”


Name your repo as
“homework_YourUser
Name”

Create a new repository

Repositories contain a project's files and version history. Have a project elsewhere? [Import a repository](#).
Required fields are marked with an asterisk (*).

Start with a template

Templates pre-configure your repository with files.

 GeoData-Analysis-Spring-2026/homework_template ▾

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Great repository names are short and memorable. How about [symmetrical-pancake?](#)

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0 / 350 characters

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 Private ▾

Create repository

Make sure to select
“OS-Hydro-Analytics-
Fall-2025”

Name your repo as
“homework_YourUser
Name”


Choose visibility
“Private”

Create a new repository

Repositories contain a project's files and version history. Have a project elsewhere? [Import a repository](#).
Required fields are marked with an asterisk (*).

Start with a template

Templates pre-configure your repository with files.

 GeoData-Analysis-Spring-2026/homework_template ▾


Include all branches

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Off ☐

1 General

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 GeoData-Analysis-Spring-2026 ▾

Repository name *

homework_YourUserName

✔ homework_YourUserName is available.

Great repository names are short and memorable. How about [symmetrical-pancake?](#)


Description

0 / 350 characters

2 Configuration

Choose visibility *

Choose who can see and commit to this repository

 Private ▾

Create repository

Make sure to select
“OS-Hydro-Analytics-
Fall-2025”

Name your repo as
“homework_YourUser
Name”

Choose visibility
“Private”


Smash “Create repo”

Create a new repository

Repositories contain a project's files and version history. Have a project elsewhere? [Import a repository](#).
Required fields are marked with an asterisk (*).

Start with a template

Templates pre-configure your repository with files.

 GeoData-Analysis-Spring-2026/homework_template ▾


Include all branches

If enabled, all branches from the template repository will be included.

Off ☐

1 General

Owner *

 GeoData-Analysis-Spring-2026 ▾

Repository name *

homework_YourUserName

✓ homework_YourUserName is available.

Great repository names are short and memorable. How about [symmetrical-pancake?](#)


Description

0 / 350 characters

2 Configuration

Choose visibility *

Choose who can see and commit to this repository

 Private ▾

Create repository

By now, you should have your own homework directory

https://github.com/GeoData-Analysis-Spring-2026/homework_YourUserName



You will need to replace the highlighted part using your own username

GitHub CodeSpaces



homework_yifan Private

generated from [GeoData-Analysis-Spring-2026/homework_template](#)

main 1 Branch 0 Tags

Go to file t Add file <> Code

YifanCheng Initial commit

.devcontainer Initial commit

homework_submissions Initial commit

project_submissions Initial commit

.gitignore Initial commit

README.md Initial commit

postbuild.sh Initial commit

pyproject.toml Initial commit

README

homework_template

This is a template repository that will be set up for each student as a place to submit homeworks and projects.

Local Codespaces

Codespaces

Your workspaces in the cloud

No codespaces

You don't have any codespaces with this repository checked out

Create codespace on main

[Learn more about codespaces...](#)

Codespace usage for this repository is paid for by YifanCheng

About

No description, website, or topics provided.

Readme

Activity

Custom properties

0 stars

0 watching

0 forks

Releases

[Publish your first package](#)

Languages

Shell 100.0%

Smash “Create codespace on main” to create a CodeSpace

The screenshot displays the VS Code Web interface with the following components:

- Side Bar:** Located on the left, it contains the Explorer view showing the workspace structure:
 - WORKSPACES [CODESPACES: SUPER FIESTA]
 - .codespaces
 - .venv
 - CourseMaterials25
 - homework_yifan
 - pyproject.toml
 - uv.lock
- Editor:** The main workspace area displays the "Get Started with VS Code for the Web" walkthrough. It includes a "Choose your theme" section with a "Browse Color Themes" button and a tip about keyboard shortcuts. Four theme preview cards are shown: Dark Modern, Light Modern, Dark High Contrast, and Light High Contrast. A "See More Themes..." link is also present.
- Panel:** The bottom section shows the Terminal view with the following output:


```
+ websocket-client==1.8.0
+ widgetsnbextension==4.0.14
+ xarray==2025.8.0
+ xyzservices==2025.4.0
+ yarl==1.20.1
+ zarr==3.1.2
+ zipp==3.23.0
Cloning into 'CourseMaterials25'...
remote: Enumerating objects: 36, done.
remote: Counting objects: 100% (36/36), done.
remote: Compressing objects: 100% (27/27), done.
remote: Total 36 (delta 5), reused 31 (delta 3), pack-reused 0 (from 0)
Receiving objects: 100% (36/36), 5.41 MiB | 27.43 MiB/s, done.
Resolving deltas: 100% (5/5), done.
Outcome: success User: vscode WorkspaceFolder: /workspaces
devcontainer process exited with exit code 0
Finished configuring codespace.
```

The screenshot shows the VS Code Web interface. The left sidebar contains the Explorer view with a file tree for 'WORKSPACES [CODESPACES: SUPER FIESTA]'. The main editor area displays the 'Get Started with VS Code for the Web' tutorial, which includes a 'Choose your theme' section. The bottom panel shows the 'TERMINAL' view with a list of installed extensions and a log of the cloning process. Annotations with yellow boxes and text identify key components: 'Side Bar' points to the left sidebar; 'Editor' points to the main workspace area; 'Panel' points to the bottom terminal view; and 'Click + to open new terminals' points to the plus icon in the terminal panel's title bar.

workspaces [Codespaces: super fiesta]

EXPLORER

WORKSPACES [CODESPACES: SUPER FIESTA]

- .codespaces
- .venv
- CourseMaterials25
- homework_yifan
- pyproject.toml
- uv.lock

Get Started with VS Code for the Web

Customize your editor, learn the basics, and start coding

Editor

Choose your theme

The right theme helps you focus on your code, is easy on your eyes, and is simply more fun to use.

Browse Color Themes

Tip: Use keyboard shortcut `⌘K ⌘T`

Dark Modern

Light Modern

Dark High Contrast

Light High Contrast

See More Themes...

Code collects usage data. Read our [privacy statement](#) and learn how to [opt out](#).

PROBLEMS OUTPUT DEBUG CONSOLE **TERMINAL** PORTS 1

GitHub Codespaces: Details +

Panel

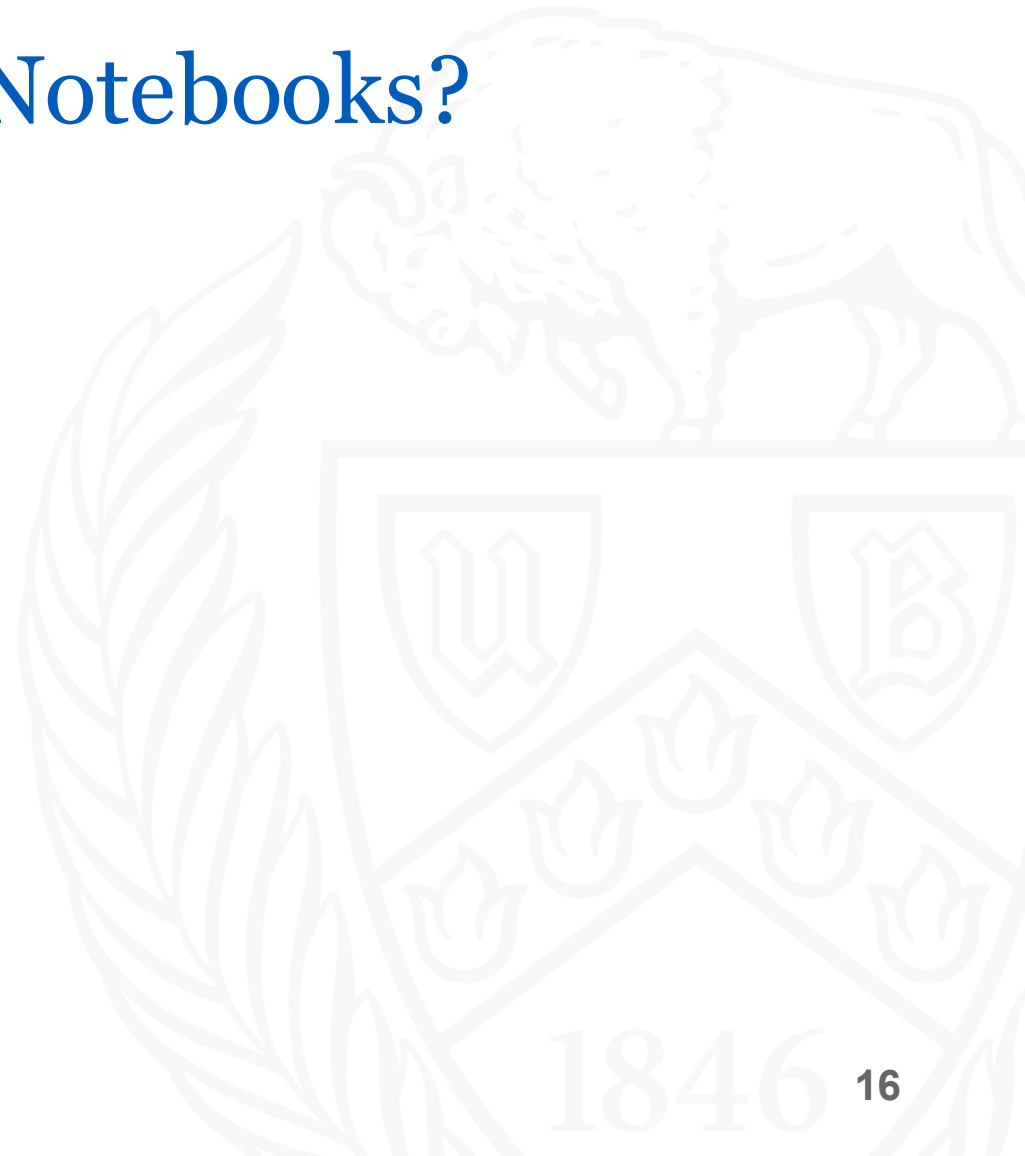
Click + to open new terminals

+ websocket-client==1.8.0
+ widgetsnbextension==4.0.14
+ xarray==2025.8.0
+ xyzservices==2025.4.0
+ yarl==1.20.1
+ zarr==3.1.2
+ zipp==3.23.0
Cloning into 'CourseMaterials25'...
remote: Enumerating objects: 36, done.
remote: Counting objects: 100% (36/36), done.
remote: Compressing objects: 100% (27/27), done.
remote: Total 36 (delta 5), reused 31 (delta 3), pack-reused 0 (from 0)
Receiving objects: 100% (36/36), 5.41 MiB | 27.43 MiB/s, done.
Resolving deltas: 100% (5/5), done.
Outcome: success User: vscode WorkspaceFolder: /workspaces
devcontainer process exited with exit code 0
Finished configuring codespace.

Codespaces: super fiesta homework_yifan main 0 0 1

Finish Setup Layout: U.S.

How to create folders & Jupyter Notebooks?





The screenshot shows the Visual Studio Code interface with a Jupyter Notebook open. A yellow callout box with the text "Click this to create new folder" points to a folder icon in the Explorer sidebar. The Explorer sidebar shows a workspace named "WORKSPACES [CODESPACES...]" with a folder structure including ".codespaces", ".venv", "CourseMat", "homework", ".devconta", "homewor", "hw1", ".hidden", "project_submissions", ".gitignore", "postbuild.sh", "pyproject.toml", "README.md", "pyproject.toml", and "uv.lock". The Jupyter Notebook has three cells: the first cell contains "%matplotlib inline", the second cell contains "import numpy as np", "import pandas as pd", "import xarray as xr", and "import matplotlib.pyplot as plt", and the third cell contains "print(1+2)". The output of the third cell is "3". The bottom status bar shows "Spaces: 4", "Finish Setup", "Cell 1 of 4", and "Layout: U.S."

workspaces [Codespaces: super fiesta]

EXPLORER

WORKSPACES [CODESPACES...]

.codespaces

.venv

CourseMat

homework

.devconta

homewor

hw1

.hidden

project_submissions

.gitignore

postbuild.sh

pyproject.toml

README.md

pyproject.toml

uv.lock

Click this to create new folder

homework1.ipynb

Generate + Code + Markdown | Run All | Clear All Outputs | Outline

Select Kernel

%matplotlib inline

Python

import numpy as np

import pandas as pd

import xarray as xr

import matplotlib.pyplot as plt

[2]

Python

print(1+2)

[3]

Python

3

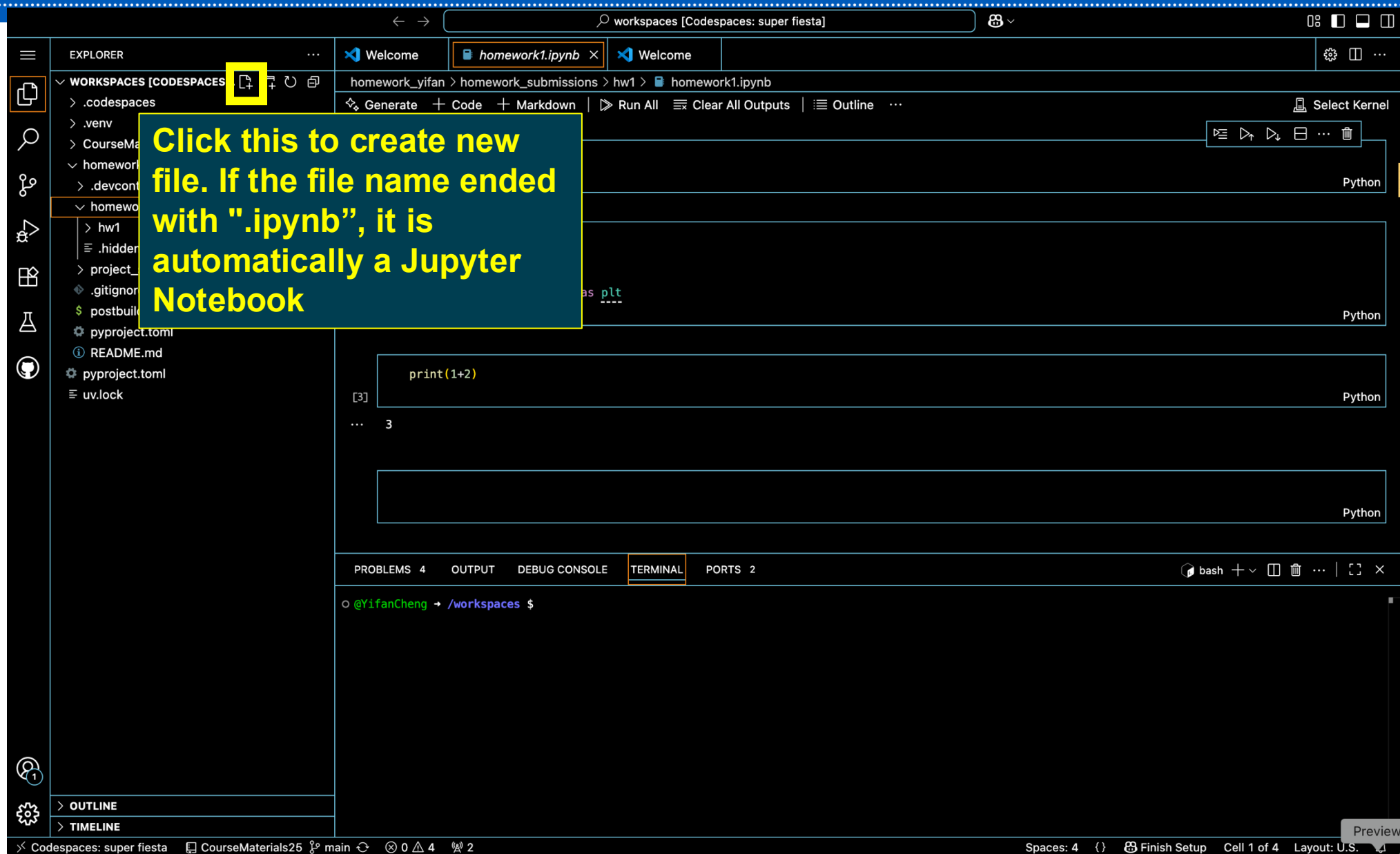
Python

PROBLEMS 4 OUTPUT DEBUG CONSOLE TERMINAL PORTS 2

bash

@YifanCheng → /workspaces \$

Spaces: 4 | Finish Setup | Cell 1 of 4 | Layout: U.S.



Click this to create new file. If the file name ended with ".ipynb", it is automatically a Jupyter Notebook

```
print(1+2)
```

[3]
... 3

PROBLEMS 4 OUTPUT DEBUG CONSOLE **TERMINAL** PORTS 2

@YifanCheng → /workspaces \$

How to open a Notebook and how to run a Jupyter Notebook?

1. Click filename to open the notebook

2. Click "Select Kernel"

3. Click "Python Environments"

```
import numpy as np
import pandas as pd
import xarray as xr
import matplotlib.pyplot as plt
```

```
def add_two_numbers(a,b):
    return a+b
```

Terminal: @YifanCheng → /workspaces \$

Select a Python Environment

- Create Python Environment
- ★ ert574 (Python 3.11.13) .venv/bin/python **Recommended**
- Python 3.11.13 /usr/local/bin/python **Global Env**
- Python 3.11.2 /bin/python3
- Python 3.11.2 /usr/bin/python3

Click "ert529"

This is the Python Virtual Environment that I specifically designed for this class.

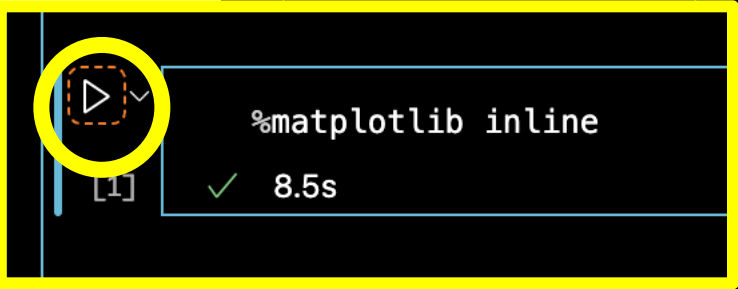
```
def add_two_numbers(a,b):  
    return a+b
```

PROBLEMS 4 OUTPUT DEBUG CONSOLE **TERMINAL** PORTS 3

@YifanCheng → /workspaces \$

Spaces: 4 {} Finish Setup Cell 2 of 5 Layout: U.S.

The screenshot shows a JupyterLab workspace named "workspaces [Codespaces: super fiesta]". The left sidebar displays the Explorer view with a file tree for "WORKSPACES [CODESPACES: SUPER FIESTA]". The main area shows a Jupyter notebook with several code cells. The first cell, highlighted with a yellow box, contains the code `%matplotlib inline` and has a success message "✓ 8.5s". A blue box with yellow text is overlaid on the notebook, stating "This is a code cell" and "You will be able to run each cell individually". Below this, another code cell is visible with the code `def add_two_numbers(a,b):` and a success message "✓ 0.2s". The bottom of the interface shows a terminal window with the prompt `@YifanCheng → /workspaces $`.



When moving your cursor to this cell, you can notice there is a triangle button popping up. Click that to run this cell.

workspaces [Codespaces: super fiesta]

EXPLORER Welcome homework1.ipynb M Welcome

Generate + Code + Markdown | Run All Restart Clear All Outputs | Jupyter Variables Outline ... ert574 (Python 3.11.13)

```
%matplotlib inline
```

✓ 8.5s Python

```
import numpy as np
import pandas as pd
import xarray as xr
lib.pyplot as plt
```

Python

Python

```
def numbers(a,b):
    return a+b
```

[4] ✓ 0.2s Python

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS 9 JUPYTER

@YifanCheng → /workspaces \$

Spaces: 4 Finish Setup Cell 5 of 5 Layout: U.S.

Practice #1

- Create a folder named “practice” under the folder “homework_submissions”
- Within the “practice” folder, create a Jupyter Notebook named “practice.ipynb”
- In “practice.ipynb”,
 - In one cell, write a function that adds up two variables, **a** and **b**, and assigns the sum to the variable **result**. You may seek help from *CoPilot*.
 - In another cell, assign **a**=3, **b**=2, print the sum of **a** and **b**



How can we “Submit” the homework?

“Submitting” means that your instructor will be able to access the Jupyter Notebook that you worked on.

We will need to

1. “commit” the changes locally in GitHub CodeSpaces
2. “push” the committed changes to GitHub

workspaces [Codespaces: super fiesta]

EXPLORER

WORKSPACES [CODESPACES: SUPER FIESTA]

- > .codespaces
- > .venv
- > CourseMaterials25
- homework_yifan
- .devcontainer
- homework_submissions
- hw1
 - homework1.ipynb
 - .hidden
 - project_submissions
 - .gitignore
 - postbuild.sh
 - pyproject.toml
 - README.md
 - pyproject.toml
 - uv.lock

homework_yifan > homework_submissions > hw1 > homework1.ipynb > empty cell

Generate + Code + Markdown | Run All | Restart | Clear All Outputs | Jupyter Variables | Outline ...

ert574 (Python 3.11.13)

[1] %matplotlib inline ✓ 8.5s Python

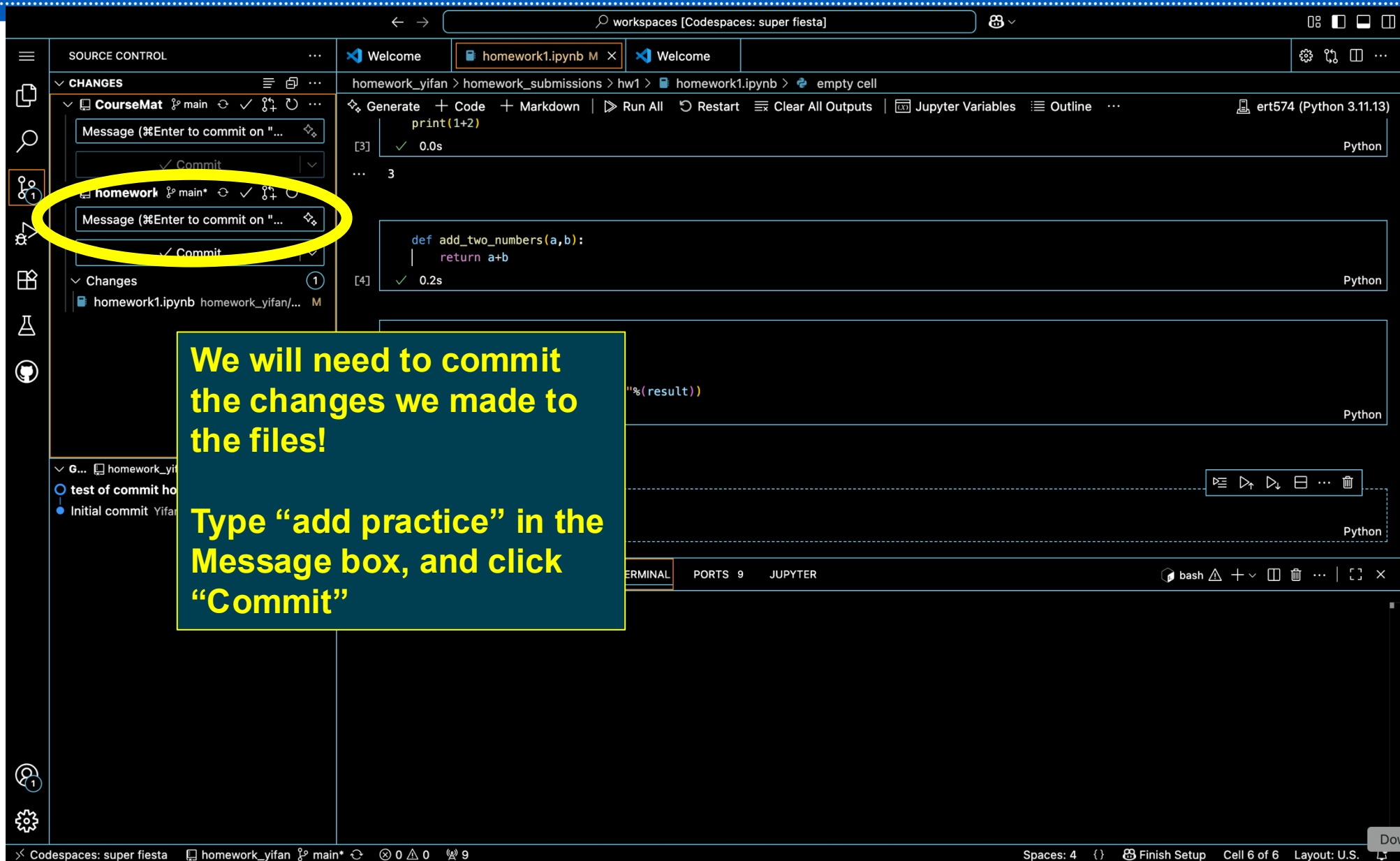
[2] import numpy as np
import pandas as pd
import xarray as xr
import matplotlib.pyplot as plt ✓ 5.3s Python

[4] return a+b ✓ 0.2s Python

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS 9 JUPYTER

@YifanCheng → /workspaces \$

Spaces: 4 Finish Setup Cell 5 of 5 Layout: U.S.



The screenshot shows a JupyterLab workspace with a dark theme. On the left, the 'SOURCE CONTROL' sidebar is open, showing a list of changes. Two changes are visible: one for 'CourseMat' and one for 'homework'. The 'homework' change is highlighted with a yellow circle. The main editor area shows a Jupyter notebook with two code cells. The first cell contains `print(1+2)` and has been executed, showing the output `3`. The second cell contains a function definition `def add_two_numbers(a,b):` and has also been executed, showing the output `0.2s`. At the bottom, there is a terminal window showing a `bash` prompt.

We will need to commit the changes we made to the files!

Type “add practice” in the Message box, and click “Commit”

workspaces [Codespaces: super fiesta]

SOURCE CONTROL

CHANGES

CourseMat main

Message (%Enter to commit on "...)

Commit

homework main

Message (%Enter to commit on "...)

Commit

Changes

homework1.ipynb

test of commit homework1.ipynb

Initial commit YifanChen

homework1.ipynb M

Generate + Code + Markdown | Run All | Restart | Clear All Outputs | Jupyter Variables | Outline

ert574 (Python 3.11.13)

Python

Python

Python

Python

bash

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS 9 JUPYTER

Codespaces: super fiesta homework_yifan main 0 0 9

Spaces: 4 {} Finish Setup Cell 6 of 6 Layout: U.S.

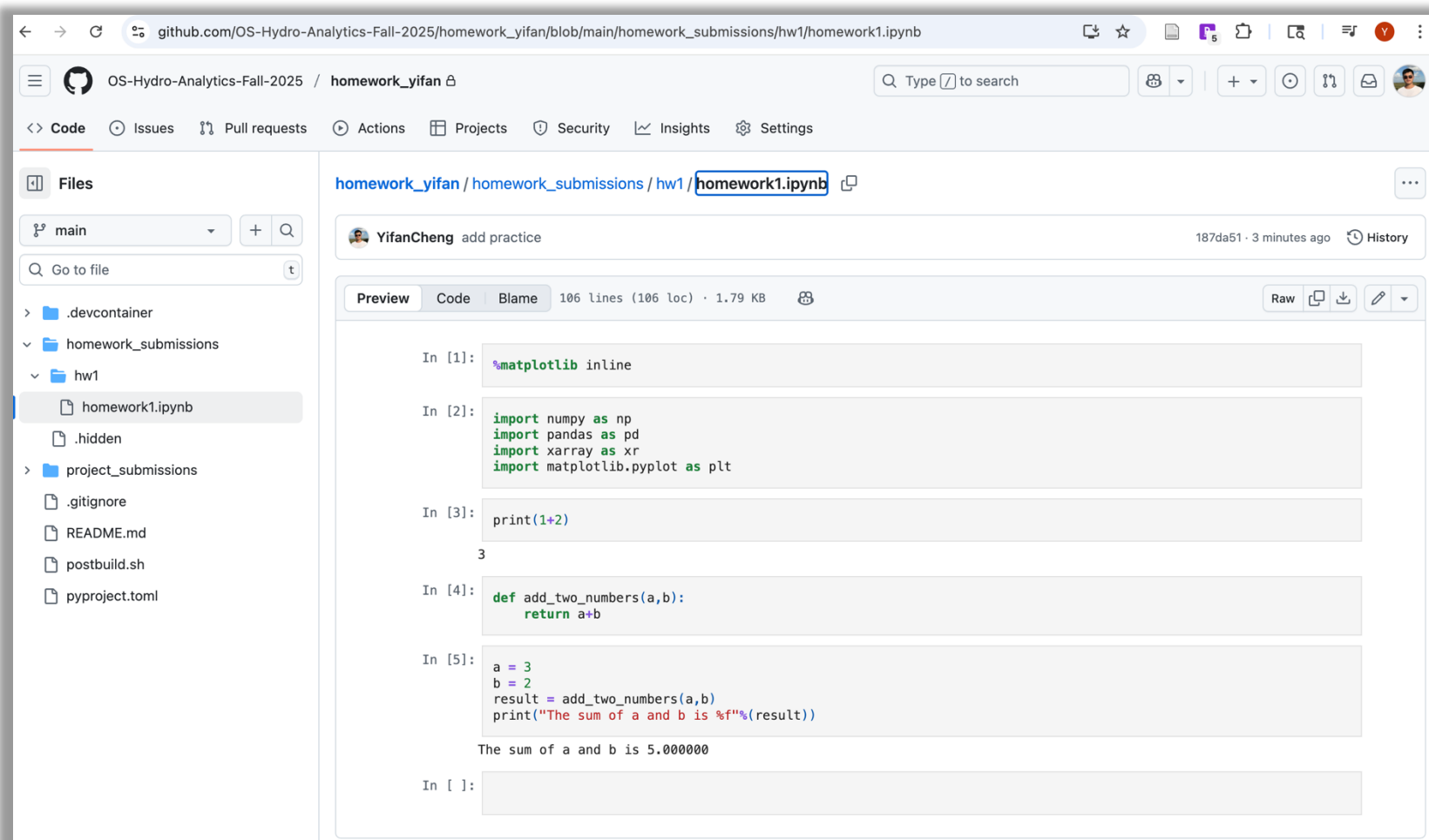
28

After we commit the changes, it means that the changes has been documented locally in CodeSpaces. We still need to “push” the changes to GitHub repo.

Click “Sync Changes”

When message pops up notifying you that this practice will “pull and push” to your GitHub repo, click “YES”!

Now, go to your homework repo



github.com/OS-Hydro-Analytics-Fall-2025/homework_yifan/blob/main/homework_submissions/hw1/homework1.ipynb

OS-Hydro-Analytics-Fall-2025 / homework_yifan

Code Issues Pull requests Actions Projects Security Insights Settings

Files

main

Go to file

homework_submissions

hw1

homework1.ipynb

hidden

project_submissions

.gitignore

README.md

postbuild.sh

pyproject.toml

homework_yifan / homework_submissions / hw1 / homework1.ipynb

YifanCheng add practice 187da51 · 3 minutes ago History

Preview Code Blame 106 lines (106 loc) · 1.79 KB

Raw

```
In [1]: %matplotlib inline

In [2]: import numpy as np
import pandas as pd
import xarray as xr
import matplotlib.pyplot as plt

In [3]: print(1+2)
3

In [4]: def add_two_numbers(a,b):
return a+b

In [5]: a = 3
b = 2
result = add_two_numbers(a,b)
print("The sum of a and b is %f"%(result))

The sum of a and b is 5.000000

In [ ]:
```

You should see that the edits you made in the Jupyter Notebooks have been updated to GitHub Page!

Practice #2

- Go to your CodeSpaces, find the “**README**” file under your own homework folder (the folder should have the name, i.e., “homework_YourUserName”)
- Edit the **README** file to include the following information
 - 1. Name
 - 2. Email address
 - 3. Your coding experiences
- After making the changes, push the changes to your GitHub repo.

