

ERT 474/574 LAB #1

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 CourseMaterials25*** repo
 - Materials in labs will be published in ***CourseMaterials25***
3. Navigate yourself in VSCode, including creating folders and notebooks
4. Submit homework by ***pushing changes*** to your ***homework repo***

Organization

- <https://github.com/OS-Hydro-Analytics-Fall-2025>



The screenshot shows the GitHub interface for a repository named 'homework_template' under the organization 'OS-Hydro-Analytics-Fall-2025'. The repository is a public template. A callout box highlights the 'Use this template' button, which has opened a dropdown menu with the following options: 'Create a new repository' and 'Open in a codespace'.

Repository Details:

- Name: homework_template (Public template)
- Watch: 0
- Fork: 0
- Star: 0
- Language: Python

Files and Commits:

| File | Commit Message | Commit Hash | Time |
|----------------------|--------------------------------------|-------------|------------|
| act-hydro | update devcontainer and postbuild.sh | 4f04b72 | 3 days ago |
| .devcontainer | update devcontainer and postbuild.sh | | 3 days ago |
| homework_submissions | Add devcontainer stuff and scaffold | | last year |
| project_submissions | add project_submission | | 4 days ago |
| .gitignore | Initial commit | | last year |
| README.md | Initial commit | | last year |
| postbuild.sh | update devcontainer and postbuild.sh | | 3 days ago |
| pyproject.toml | update python packages | | 4 days ago |

Right Sidebar:

- About: No description, website, or topics provided.
- Readme
- Activity
- Custom properties
- 0 stars
- 0 watching
- 0 forks
- Report repository
- Releases: No releases published
- Packages: No packages 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.

 OS-Hydro-Analytics-Fall-2025/homework_template ▾


Include all branches

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

Off ☐

1 General

Owner *

 OS-Hydro-Analytics-Fall-2025 ▾

Repository name *

homework_YourUserName

✓ homework_YourUserName is available.

Great repository names are short and memorable. How about **fantastic-sniffle?**

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”

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

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0 / 350 characters

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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.

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Name”


Choose visibility
“Private”

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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.

 OS-Hydro-Analytics-Fall-2025/homework_template ▾


Include all branches

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

Off ☐

1 General

Owner *

 OS-Hydro-Analytics-Fall-2025 ▾

Repository name *

homework_YourUserName

 homework_YourUserName is available.

Great repository names are short and memorable. How about **fantastic-sniffle?**


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/OS-Hydro-Analytics-Fall-2025/homework_YourUserName



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

GitHub CodeSpaces



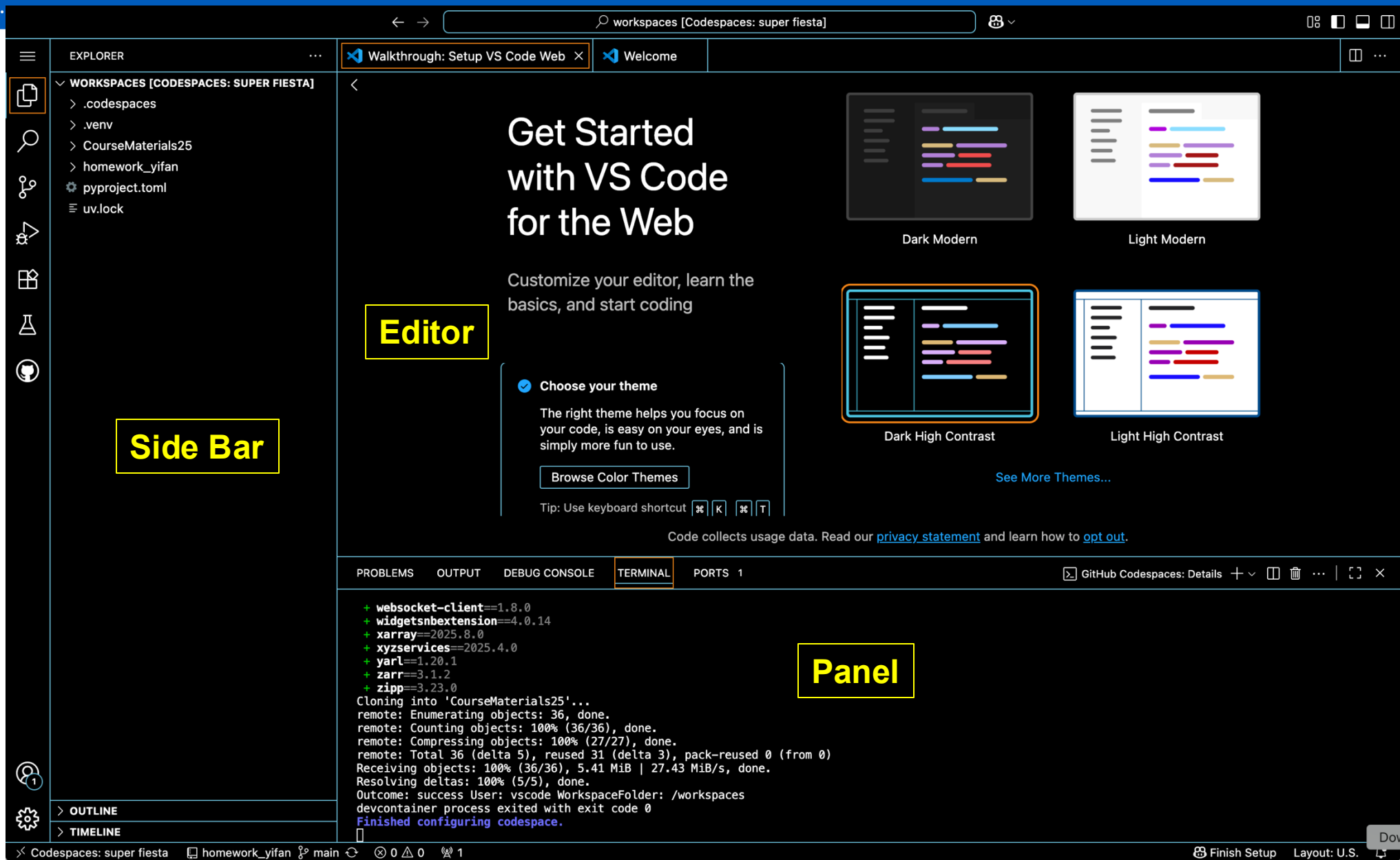
The screenshot shows the GitHub interface for a repository named 'homework_yifan' (Private). The repository was generated from 'OS-Hydro-Analytics-Fall-2025/homework_template'. A notification at the top states 'Codespace "glowing garbanzo" deleted.' The repository has 0 watches, 0 forks, and 0 stars. The file list on the left includes:

- .devcontainer (Initial commit)
- homework_submissions (test of commit hom)
- project_submissions (Initial commit)
- .gitignore (Initial commit)
- README.md (Initial commit)
- postbuild.sh (Initial commit)
- pyproject.toml (Initial commit)

 The 'About' section on the right notes 'No description, website, or topics provided.' and lists links for 'Readme', 'Activity', and 'Releases'. The 'Releases' section states 'No releases published' with a link to 'Create a new release'. The 'Packages' section is also visible.

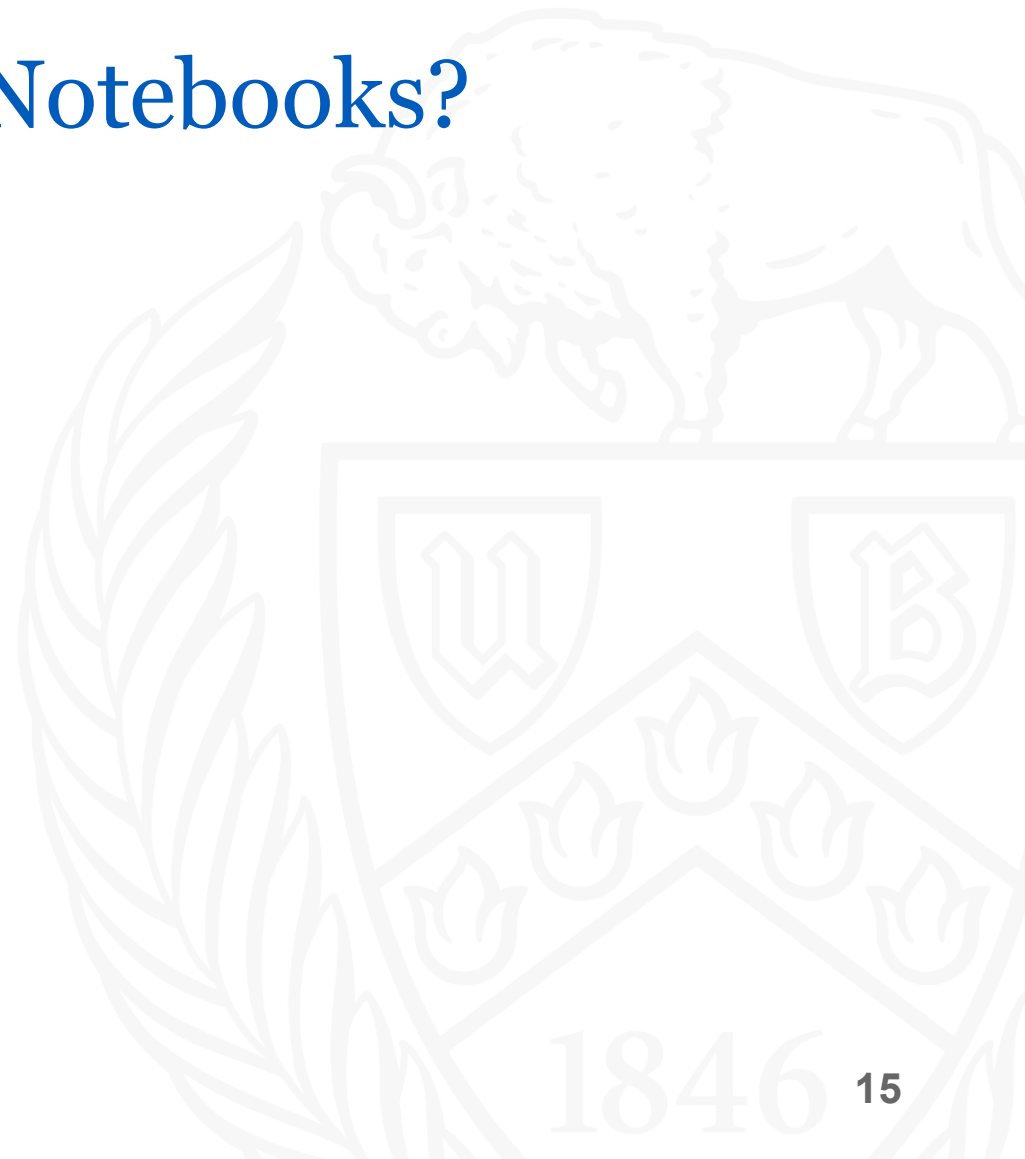
A modal window titled 'Codespaces' is open, showing 'No codespaces' and the message 'You don't have any codespaces with this repository checked out.' A green button labeled 'Create codespace on main' is highlighted with a red rectangle. Below this button is a link: [Learn more about Codespaces](#). At the bottom of the modal, it says 'Codespace usage for this repository is paid for by YifanCheng.'

Smash “Create codespace on main” to create a CodeSpace



The screenshot displays the VS Code Web interface. On the left, the **Side Bar** (Explorer) shows the workspace structure for 'WORKSPACES [CODESPACES: SUPER FIESTA]', including files like .codespaces, .venv, CourseMaterials25, homework_yifan, pyproject.toml, and uv.lock. The main **Editor** area features a 'Get Started with VS Code for the Web' tutorial. It includes a 'Choose your theme' section with a 'Browse Color Themes' button and a tip about keyboard shortcuts. Below the editor is the **Panel**, which contains a terminal window showing the output of a 'Finished configuring codespace' command. A yellow box highlights a '+' button in the terminal's title bar, with the text 'Click + to open new terminals'. The bottom status bar shows 'Codespaces: super fiesta' and 'homework_yifan'.

How to create folders & Jupyter Notebooks?



The screenshot shows a JupyterLab workspace titled "workspaces [Codespaces: super fiesta]". The Explorer sidebar on the left displays a file tree under "WORKSPACES [CODESPACES...]", including folders like ".codespaces", ".venv", "CourseMat", "homework", ".devconta", and "homewor". A yellow callout box with the text "Click this to create new folder" points to the "New Folder" icon (a folder with a plus sign) in the Explorer sidebar. The main editor area shows a Jupyter notebook with three cells. The first cell contains the code "%matplotlib inline". The second cell contains the code "import numpy as np", "import pandas as pd", "import xarray as xr", and "import matplotlib.pyplot as plt". The third cell contains the code "print(1+2)". The output of the third cell is "3". The bottom panel shows the "TERMINAL" tab with the prompt "@YifanCheng → /workspaces \$".

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 \$

OUTLINE

TIMELINE

Codespaces: super fiesta CourseMaterials25 main 0 4 2

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

Preview

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 \$

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

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

The screenshot shows the Visual Studio Code interface with the following elements:

- EXPLORER:** A sidebar on the left showing a file tree. The file `homework1.ipynb` is highlighted with a yellow box.
- Code Editor:** The main area shows the content of `homework1.ipynb`, which includes Python code for importing libraries and a function definition:

```
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:** A terminal window at the bottom shows the command prompt `@YifanCheng → /workspaces $`.
- Annotations:** Three yellow boxes with blue text provide instructions:
 - 1. Click filename to open the notebook** (pointing to `homework1.ipynb` in the Explorer)
 - 2. Click "Select Kernel"** (pointing to the `Select Kernel` button in the top right)
 - 3. Click "Python Environments"** (pointing to the `Python Environments...` option in the `Select Kernel` dropdown menu)

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 "ert574"

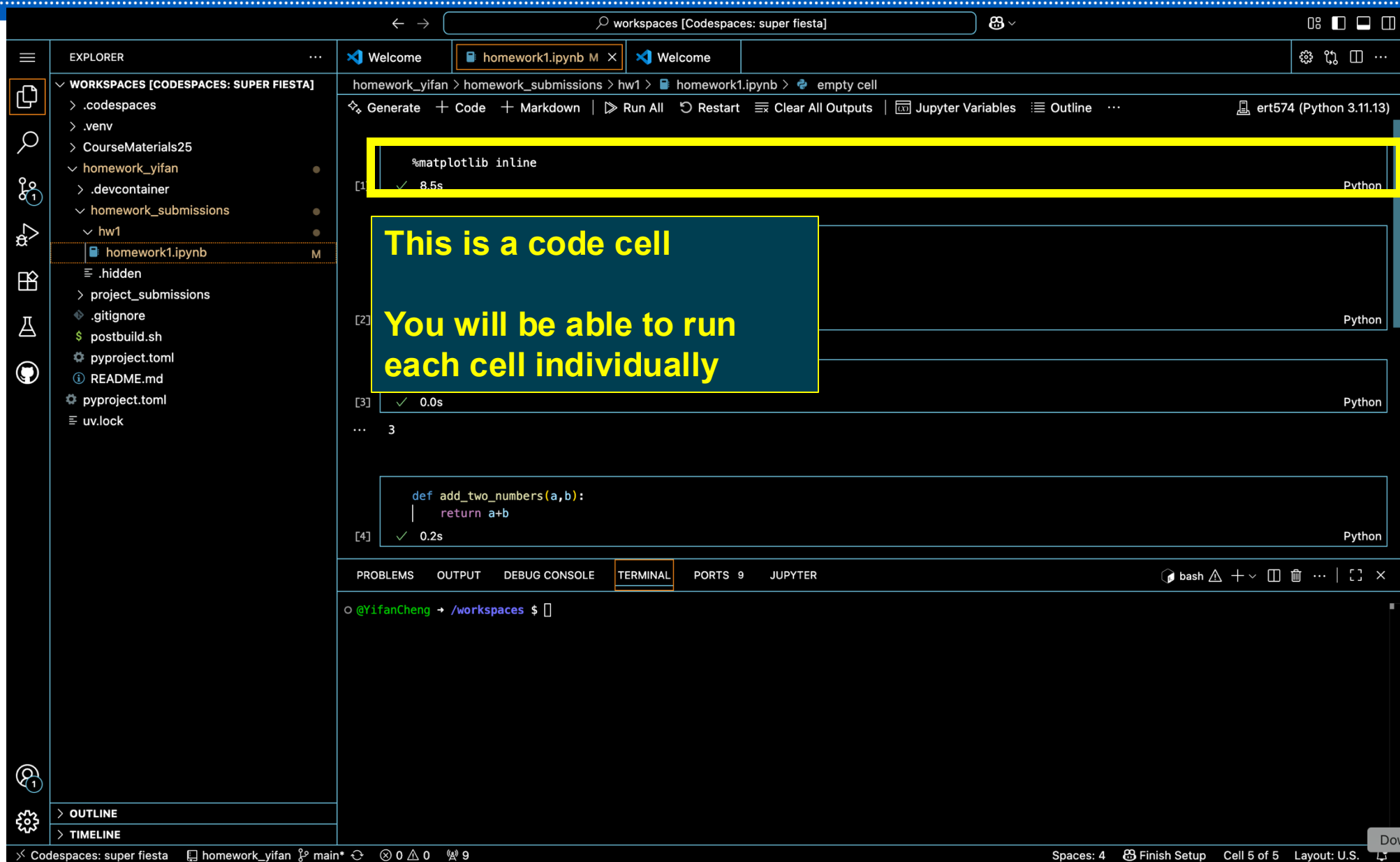
This is the Python Virtual Environment that I specifically designed for this class.

```
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 displays the JupyterLab interface within a Codespaces environment. The Explorer panel on the left shows the file structure of the workspace, including folders like `homework_yifan` and `homework_submissions`, and files like `homework1.ipynb`. The main editor area shows a Jupyter notebook with several code cells. The first cell, containing `%matplotlib inline`, is highlighted with a yellow border. A blue text 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, containing a function definition: `def add_two_numbers(a,b):` followed by `return a+b`. The bottom panel shows the terminal with the prompt `@YifanCheng → /workspaces $`. The status bar at the bottom indicates the current workspace and file.

workspaces [Codespaces: super fiesta]

EXPLORER

WORKSPACES [CODESPACES: SUPER FIESTA]

- > .codespaces
- > .venv
- > CourseMaterials25
- ✓ homework_yifan
 - > .devcontainer
 - ✓ homework_submissions
 - ✓ hw1
 - homework1.ipynb M
 - .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] ✓ 8.5s Python

This is a code cell

You will be able to run each cell individually

[2] Python

[3] ✓ 0.0s Python

... 3

[4] ✓ 0.2s Python

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

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS 9 JUPYTER

@YifanCheng → /workspaces \$

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

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

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

**You might notice that
there is a number 1 here!**

Click this button!

The screenshot shows a JupyterLab workspace with a dark theme. On the left, the 'SOURCE CONTROL' panel is open, showing a list of changes. A yellow circle highlights the 'Commit' button and the message input field. The main editor area displays a Python notebook with two 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`. The bottom status bar indicates the workspace is 'Codespaces: super fiesta' and the current file is 'homework1.ipynb'.

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

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)

Python

Python

Python

Python

Never Always Cancel Yes

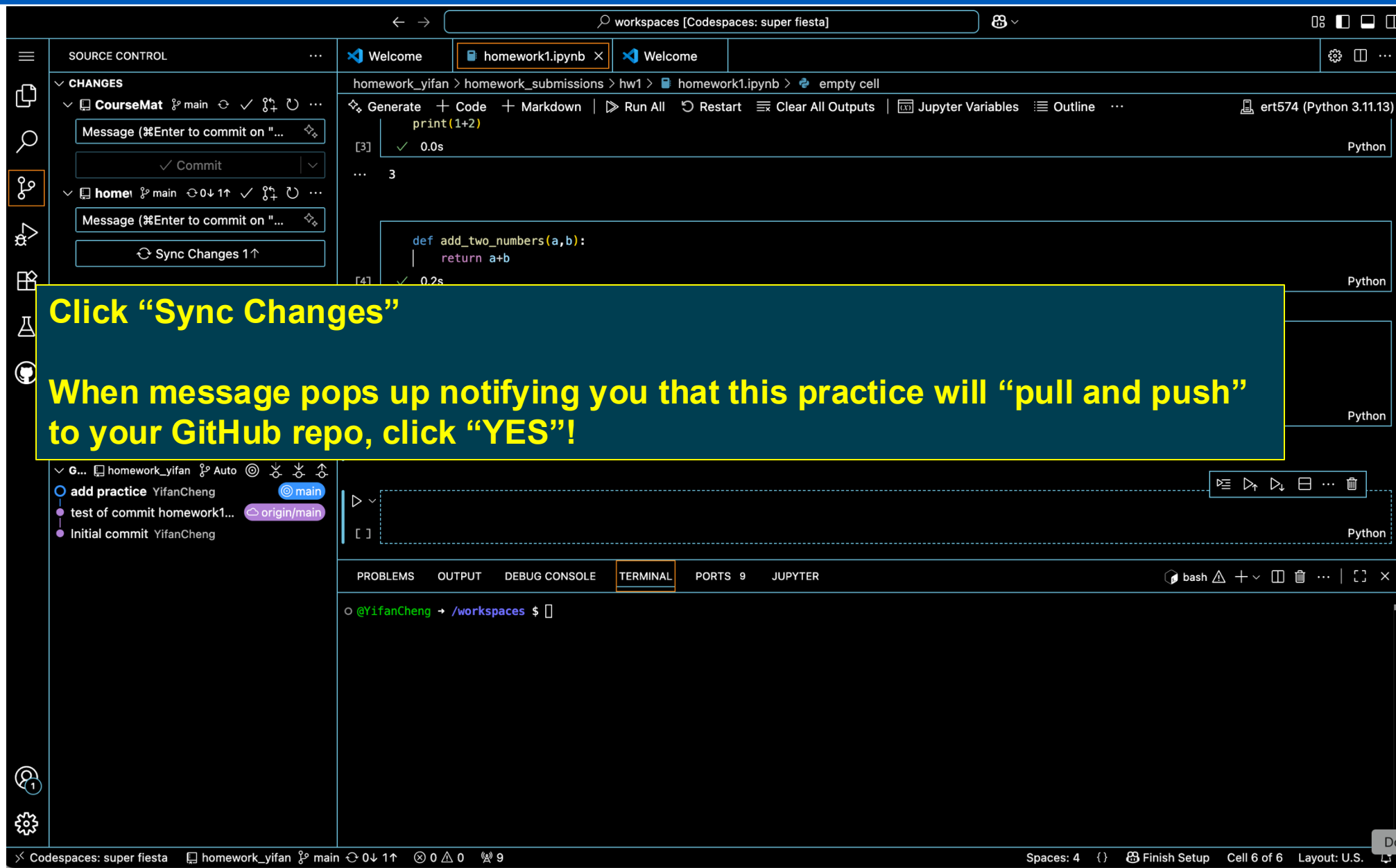
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS 9 JUPYTER

bash

After you clicked "Commit", a warning message pops up! This means that we combined two steps "stage change" and "commit change" into one step. Please click "Yes" there.

Codespaces: super fiesta homework_yifan main 0 0 9 Spaces: 4 {} Finish Setup Cell 6 of 6 Layout: U.S.

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.



The screenshot shows a JupyterLab workspace titled "workspaces [Codespaces: super fiesta]". The interface includes a left sidebar with "SOURCE CONTROL" and "CHANGES" sections. The "CHANGES" section shows a commit message "Message (%Enter to commit on \"...\"" and a "Commit" button. The "SOURCE CONTROL" section shows a list of commits: "add practice YifanCheng", "test of commit homework1...", and "Initial commit YifanCheng". The main editor area displays a Python file "homework1.ipynb" with two code cells. The first cell contains `print(1+2)` and the second cell contains `def add_two_numbers(a,b):` followed by `return a+b`. The bottom panel shows the "TERMINAL" tab with a bash prompt `@YifanCheng → /workspaces $`. A blue overlay box with yellow text is positioned over the "Sync Changes" button in the "SOURCE CONTROL" section.

Click "Sync Changes"

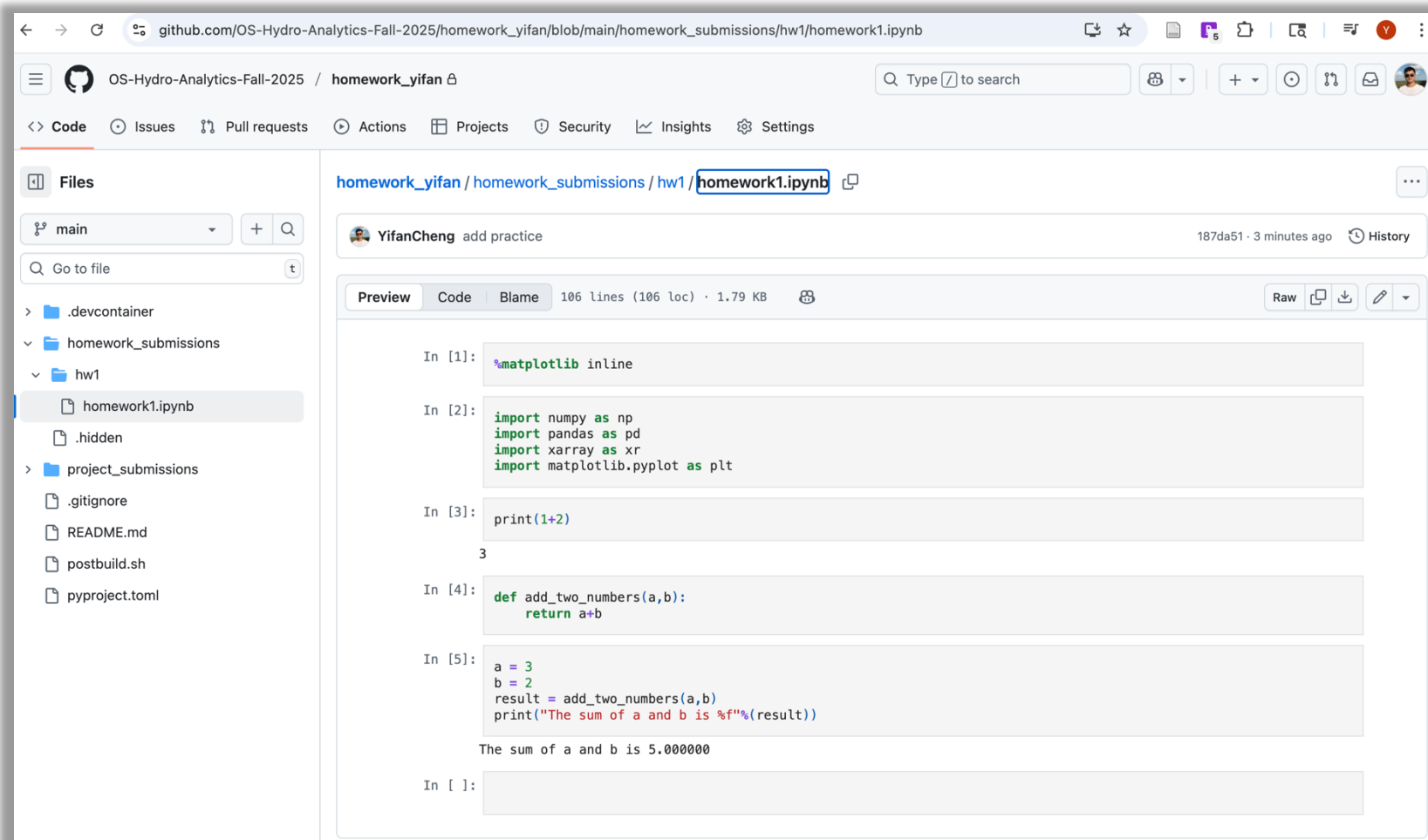
When message pops up notifying you that this practice will "pull and push" to your GitHub repo, click "YES"!

Codespaces: super fiesta | homework_yifan | main | 0 ↓ 1 ↑ | 0 △ 0 | 9 | Spaces: 4 | {} | Finish Setup | Cell 6 of 6 | Layout: U.S. | 29

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



The screenshot shows a GitHub repository for 'OS-Hydro-Analytics-Fall-2025' by user 'homework_yifan'. The file 'homework1.ipynb' is selected in the 'homework_submissions/hw1' directory. The notebook content is displayed in the 'Preview' tab, showing five input cells with Python code and output. The code includes importing libraries, a simple addition, and a function definition.

```
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.

