# ERT 429/529 GITHUB INTRO

Course Platform Setup

University at Buffalo The State University of New York

# 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 ***push***ing **changes** to your ***homework repo***

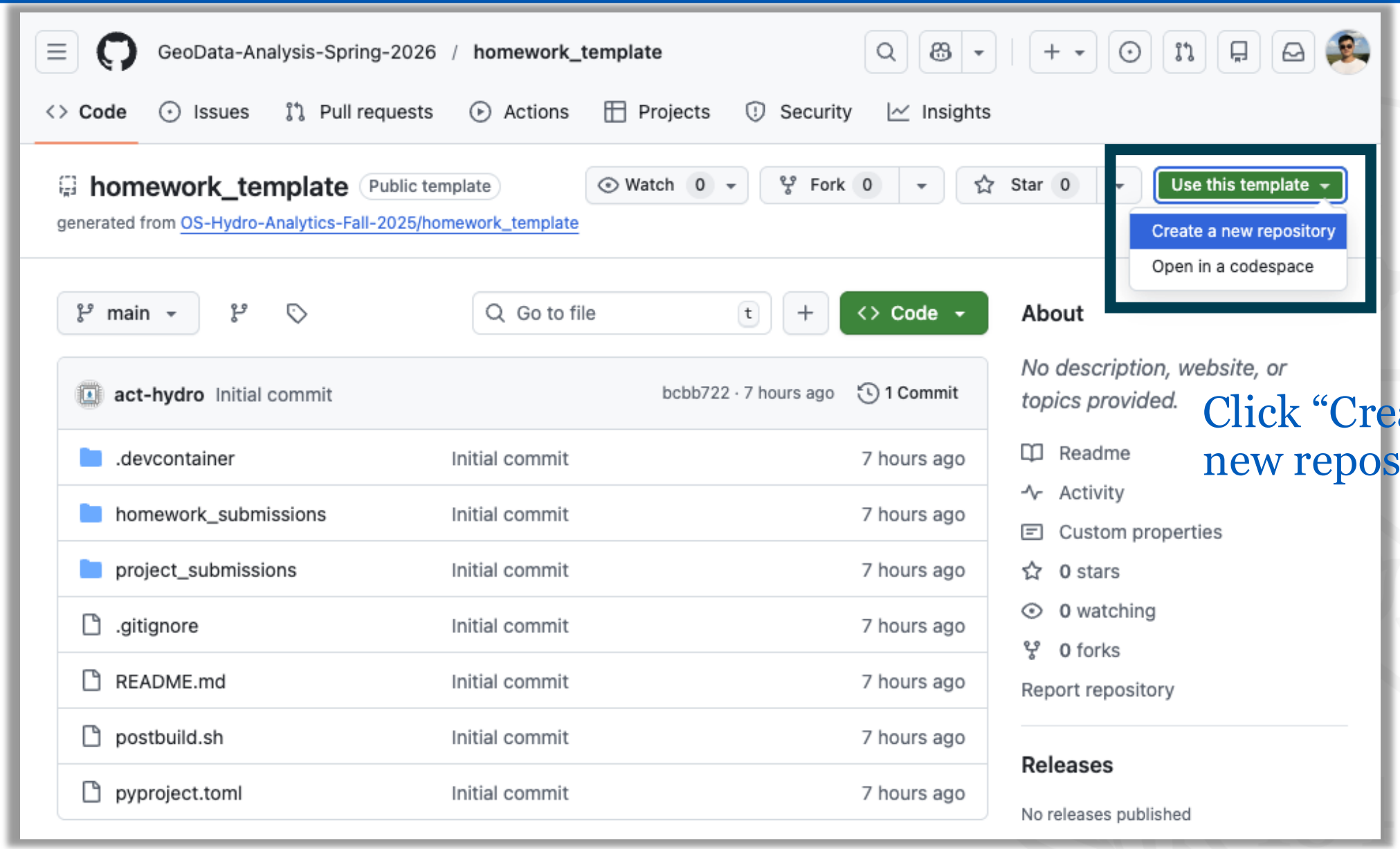
# Organization

- 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**"




Click “Create a new repository”

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# 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

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# 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 (*).*

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0 / 350 characters

2 **Configuration**

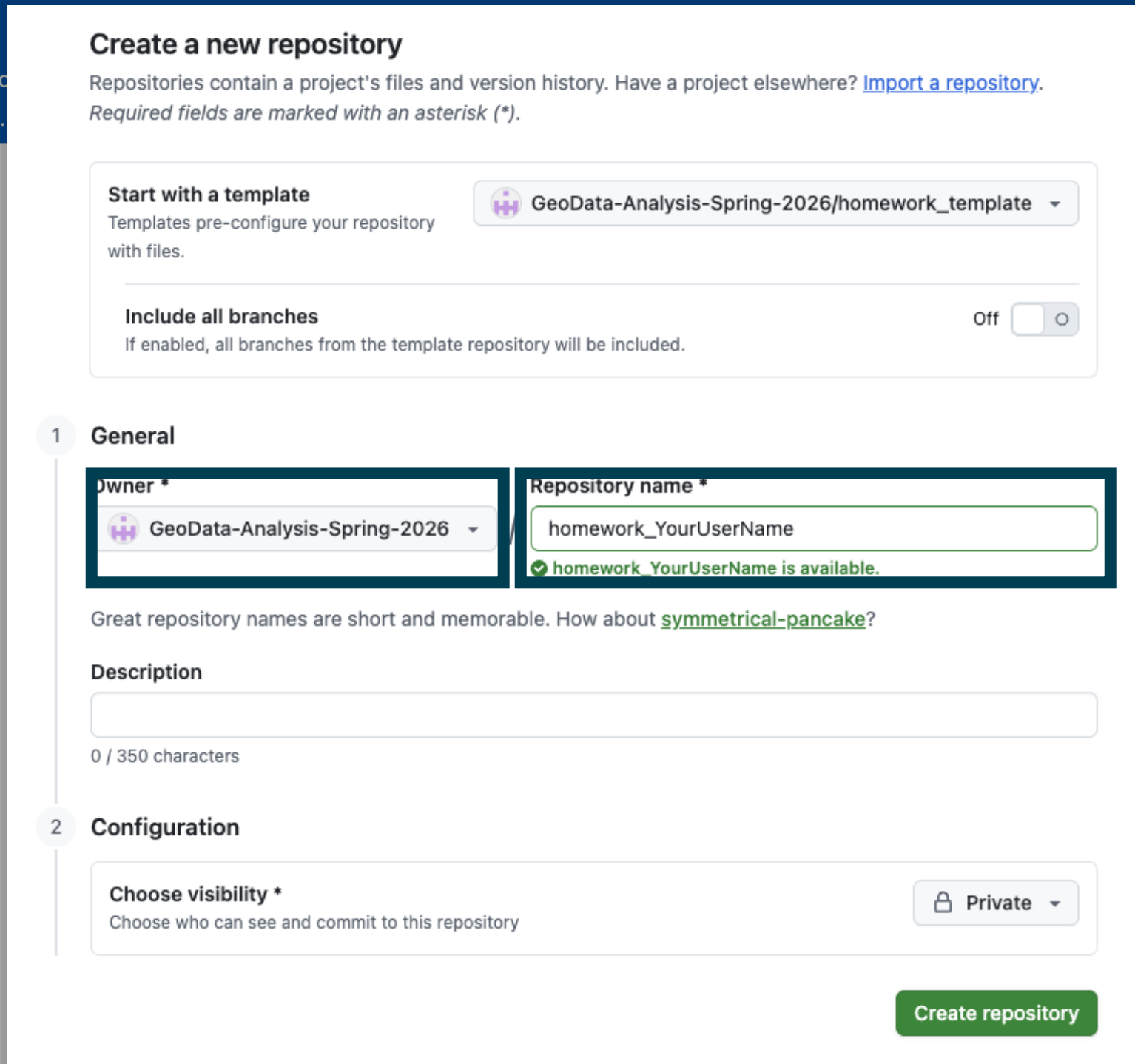
**Choose visibility ***
Choose who can see and commit to this repository

Private

Create repository

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

Name your repo as “homework_YourUser Name”

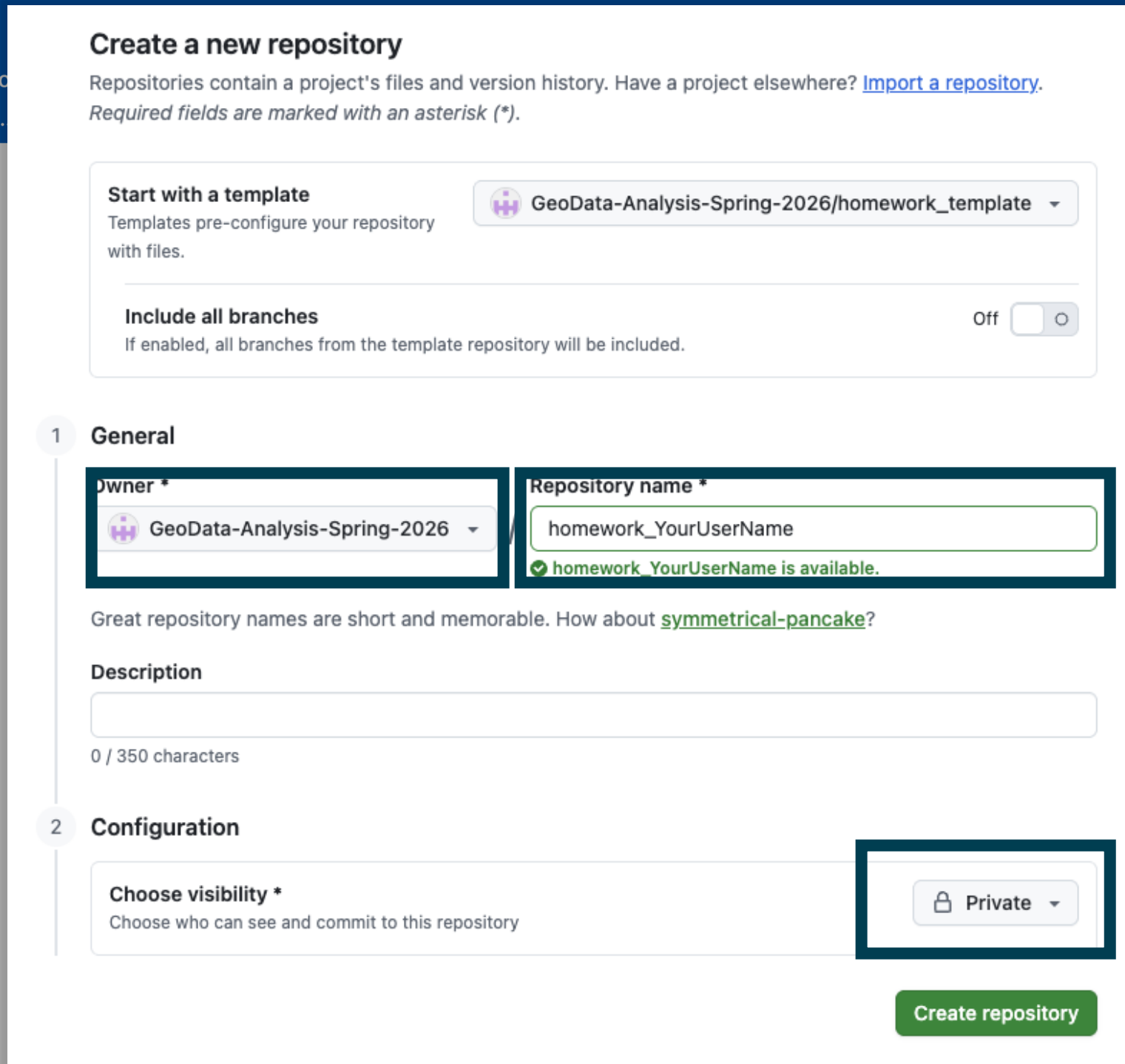


University at Buffalo The State University

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

Name your repo as “homework_YourUser Name”

Choose visibility “Private”



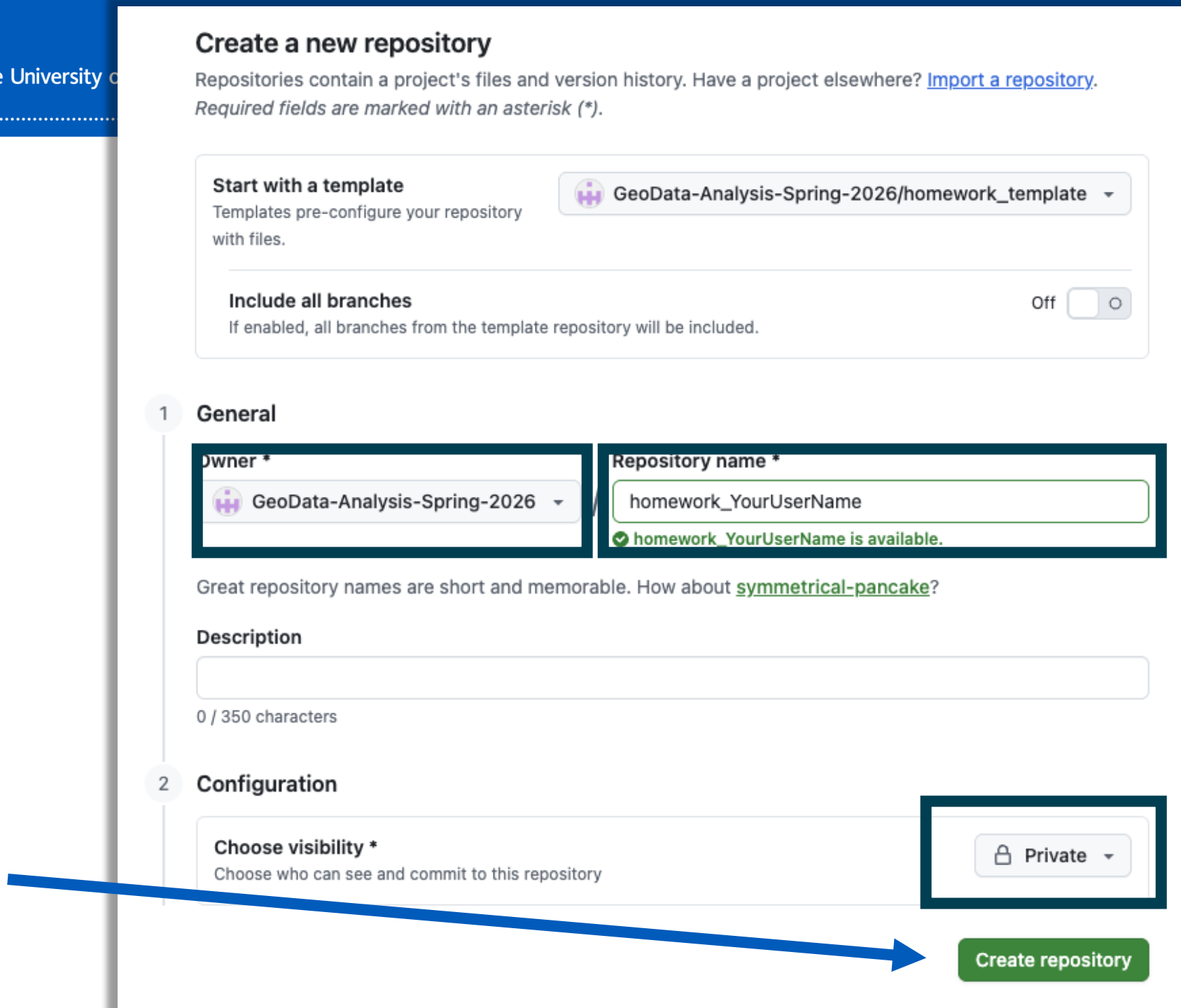
University at Buffalo The State University

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

Name your repo as “homework_YourUser Name”

Choose visibility “Private”

Smash “Create repo”

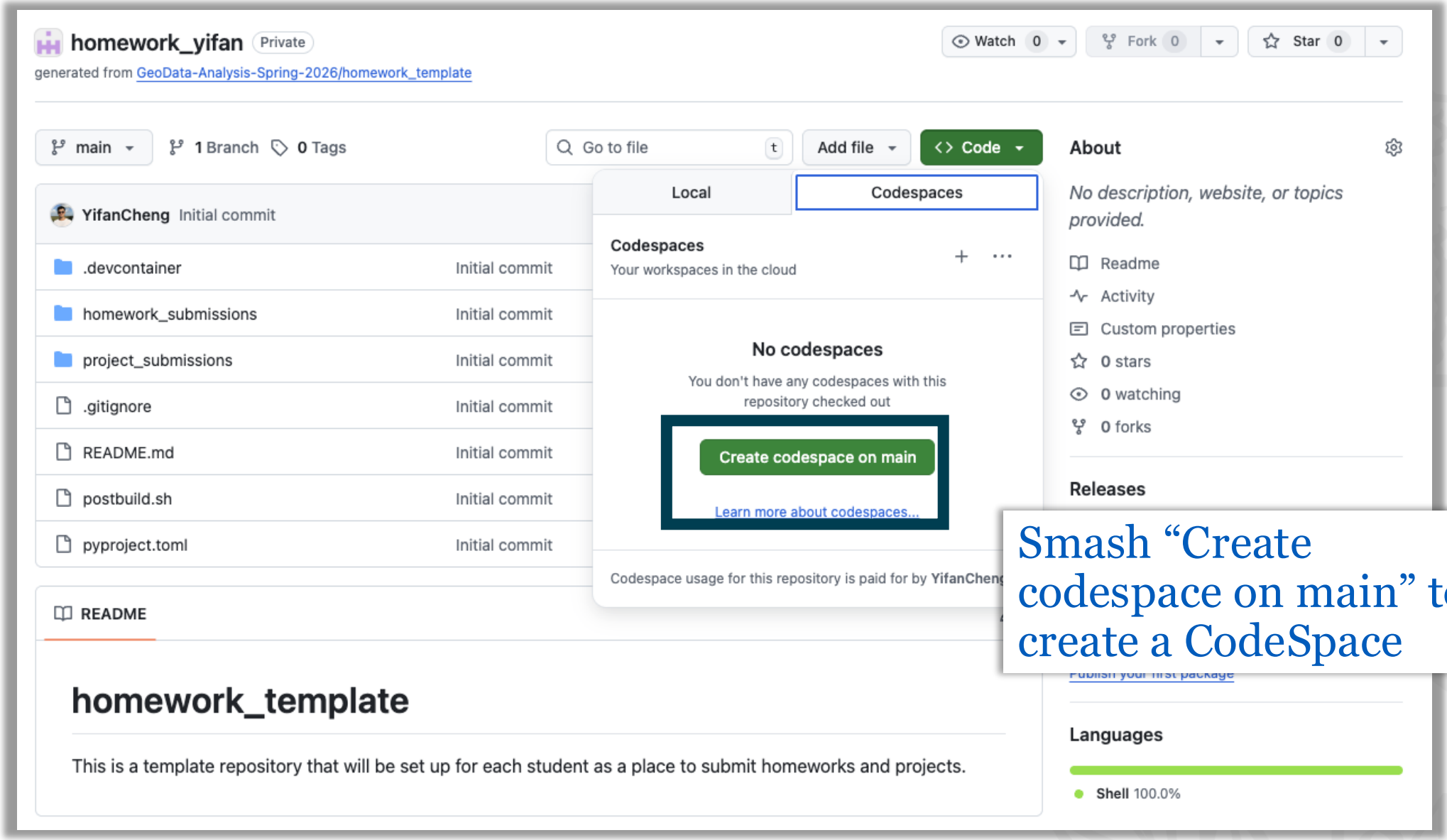


# By now, you should have your own homework directory

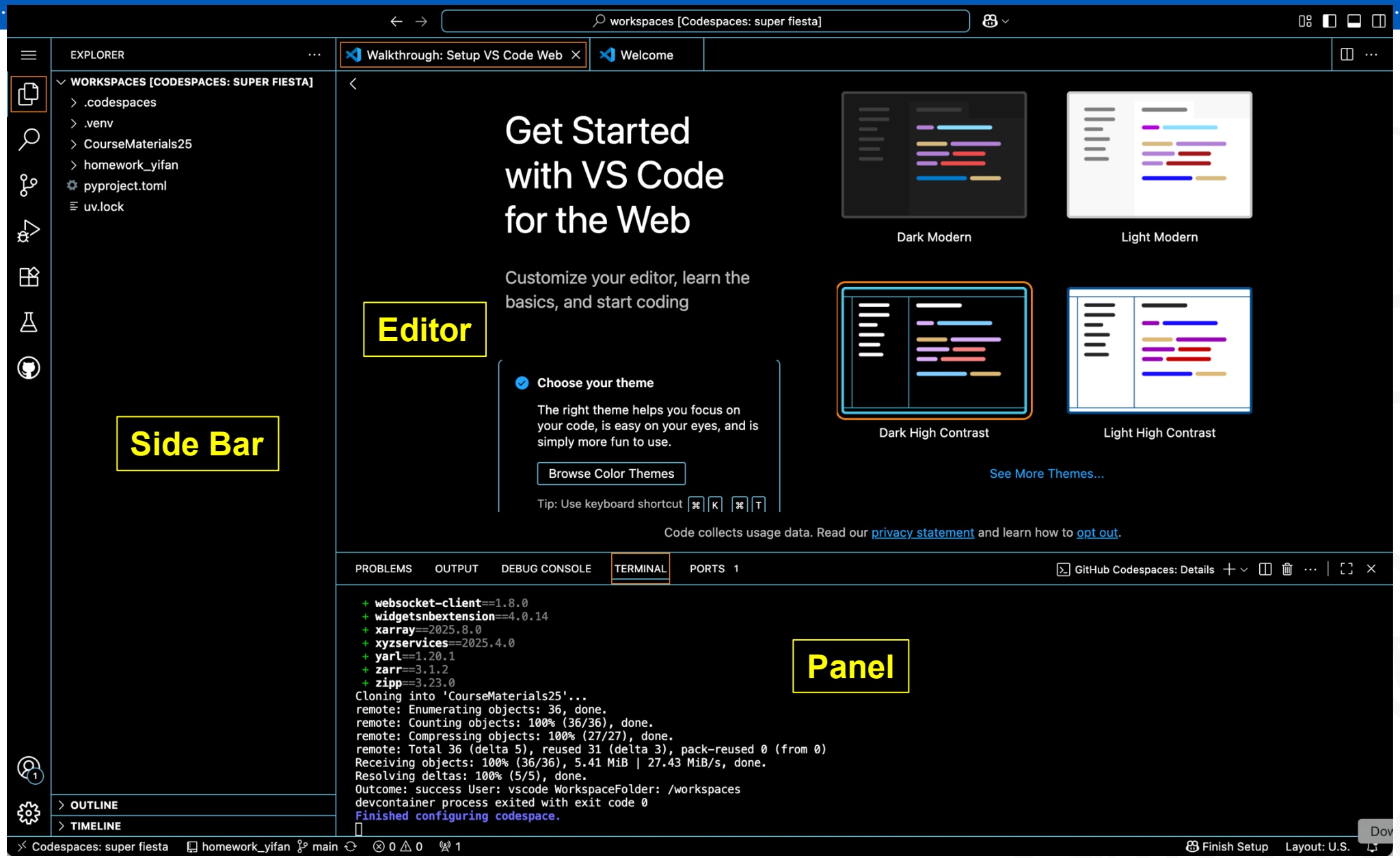
https://github.com/GeoData-Analysis-Spring-2026/homework_YourUserName

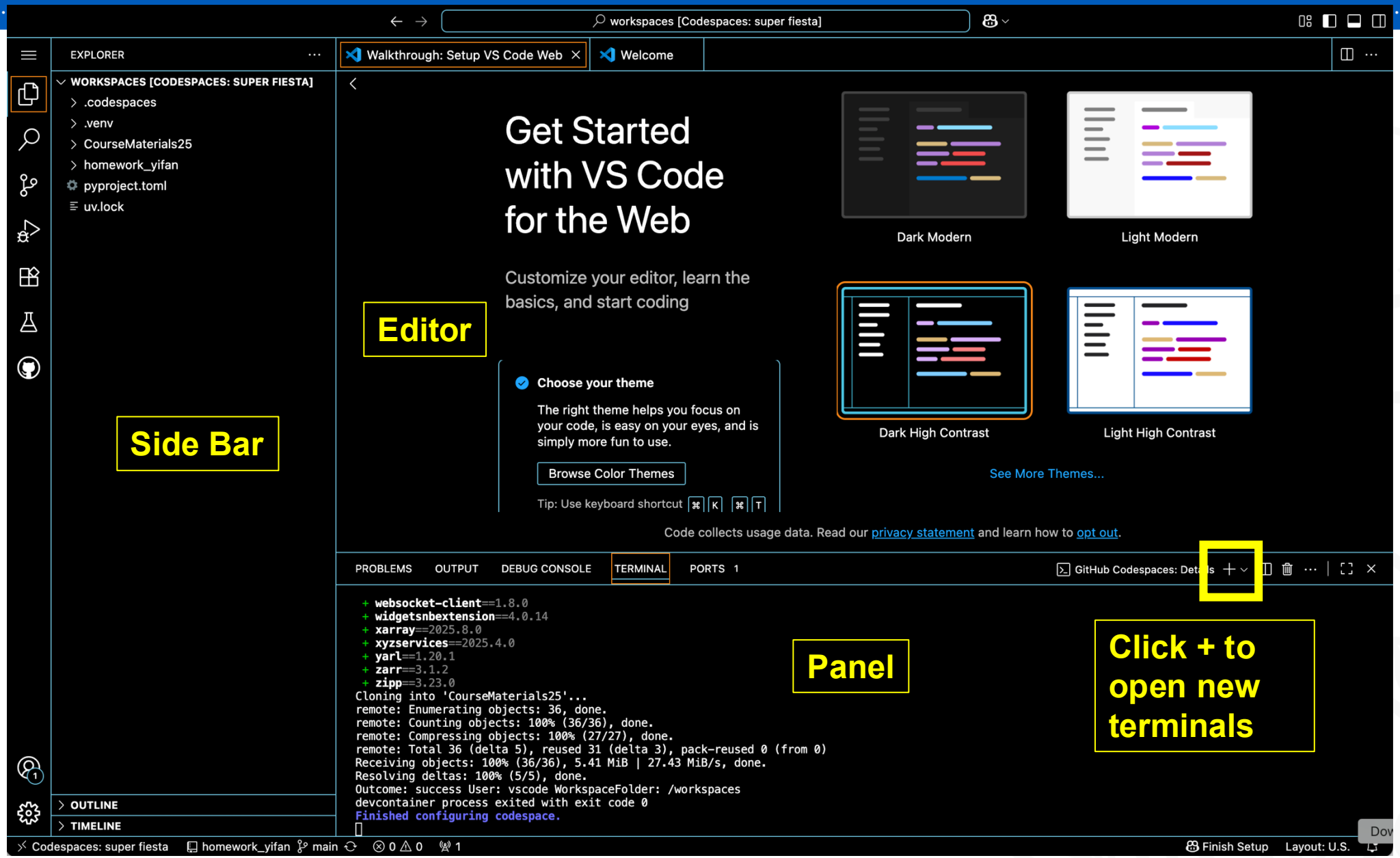
**You will need to replace the highlighted part using your own username**

# GitHub CodeSpaces




Smash "Create codespace on main" to create a CodeSpace


workspaces [Codespaces: super fiesta]
EXPLORER
Walkthrough: Setup VS Code Web
Welcome
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
Dark Modern
Light Modern
Dark High Contrast
Light High Contrast
See More Themes...
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
Code collects usage data. Read our privacy statement and learn how to opt out.
Editor
Side Bar
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS 1
GitHub Codespaces: Details
+ 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.
Panel
OUTLINE
TIMELINE
Codespaces: super fiesta
homework_yifan
main
Finish Setup
Layout: U.S.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Editor
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GitHub Codespaces: Details
+ websocket-client==1.8.0
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remote: Enumerating objects: 36, done.
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Outcome: success User: vscode WorkspaceFolder: /workspaces
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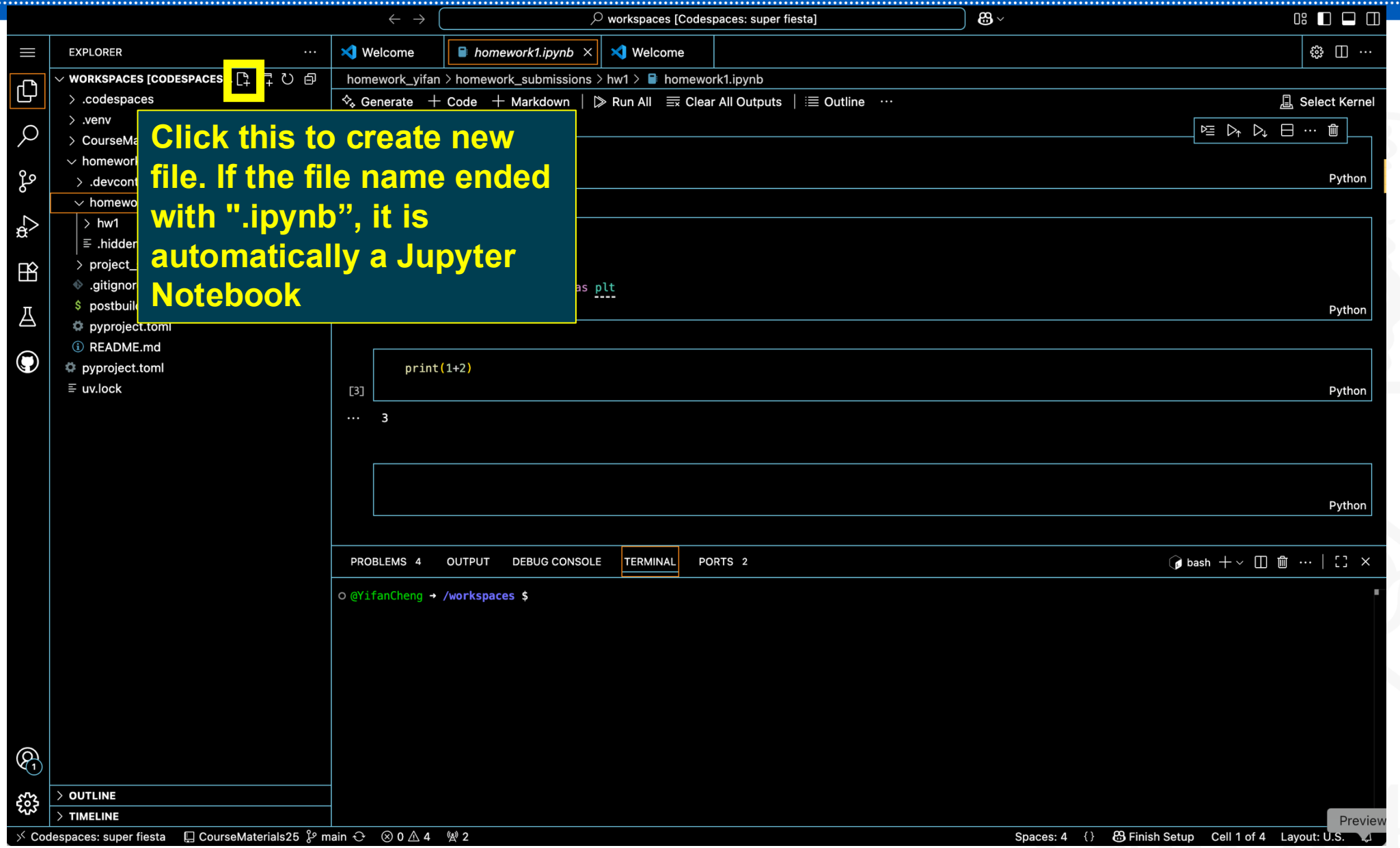
Finished configuring codespace.
Panel
Click + to open new terminals
OUTLINE
TIMELINE
Codespaces: super fiesta
homework_yifan
main
Finish Setup
Layout: U.S.

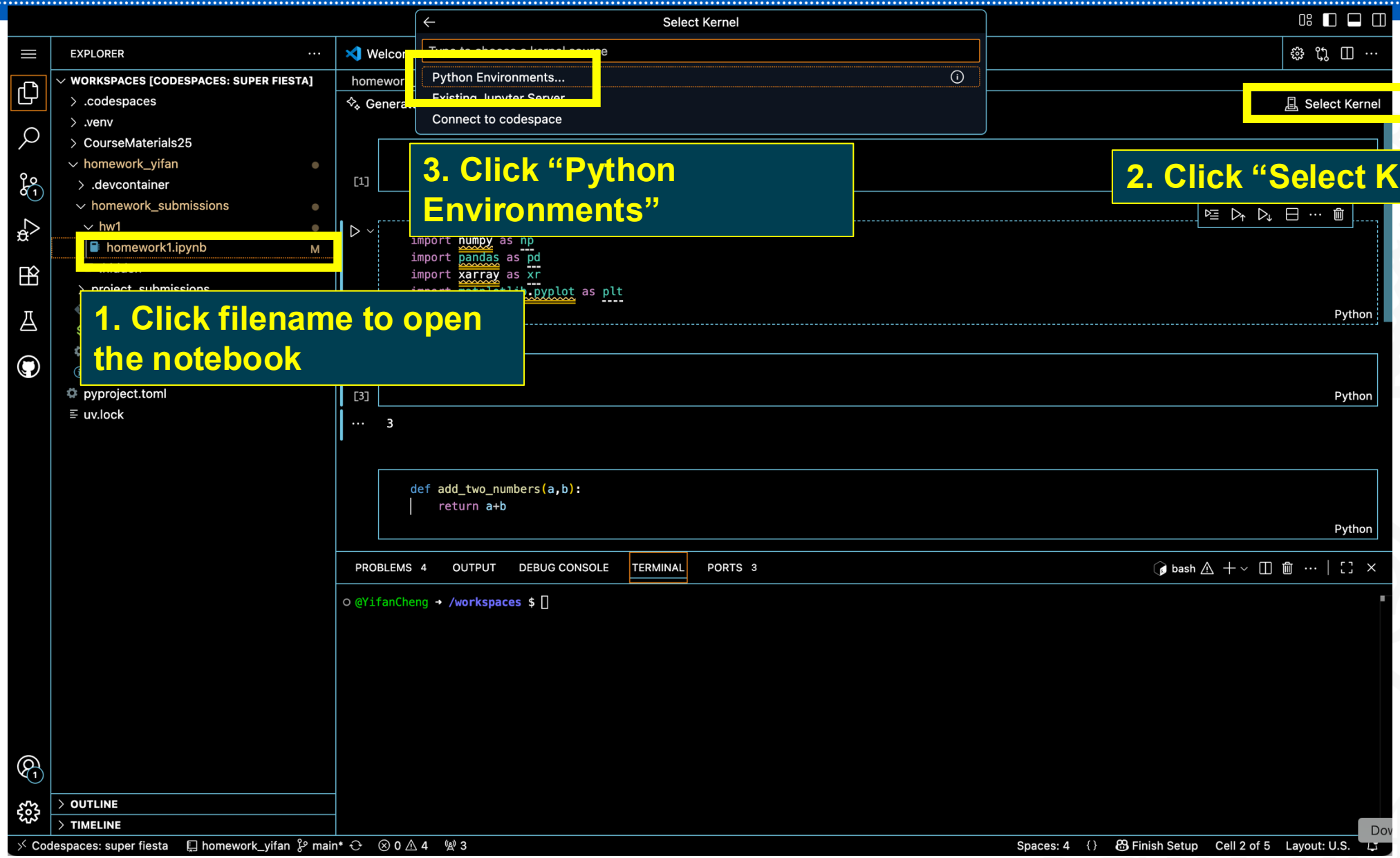
# How to create folders & Jupyter Notebooks?

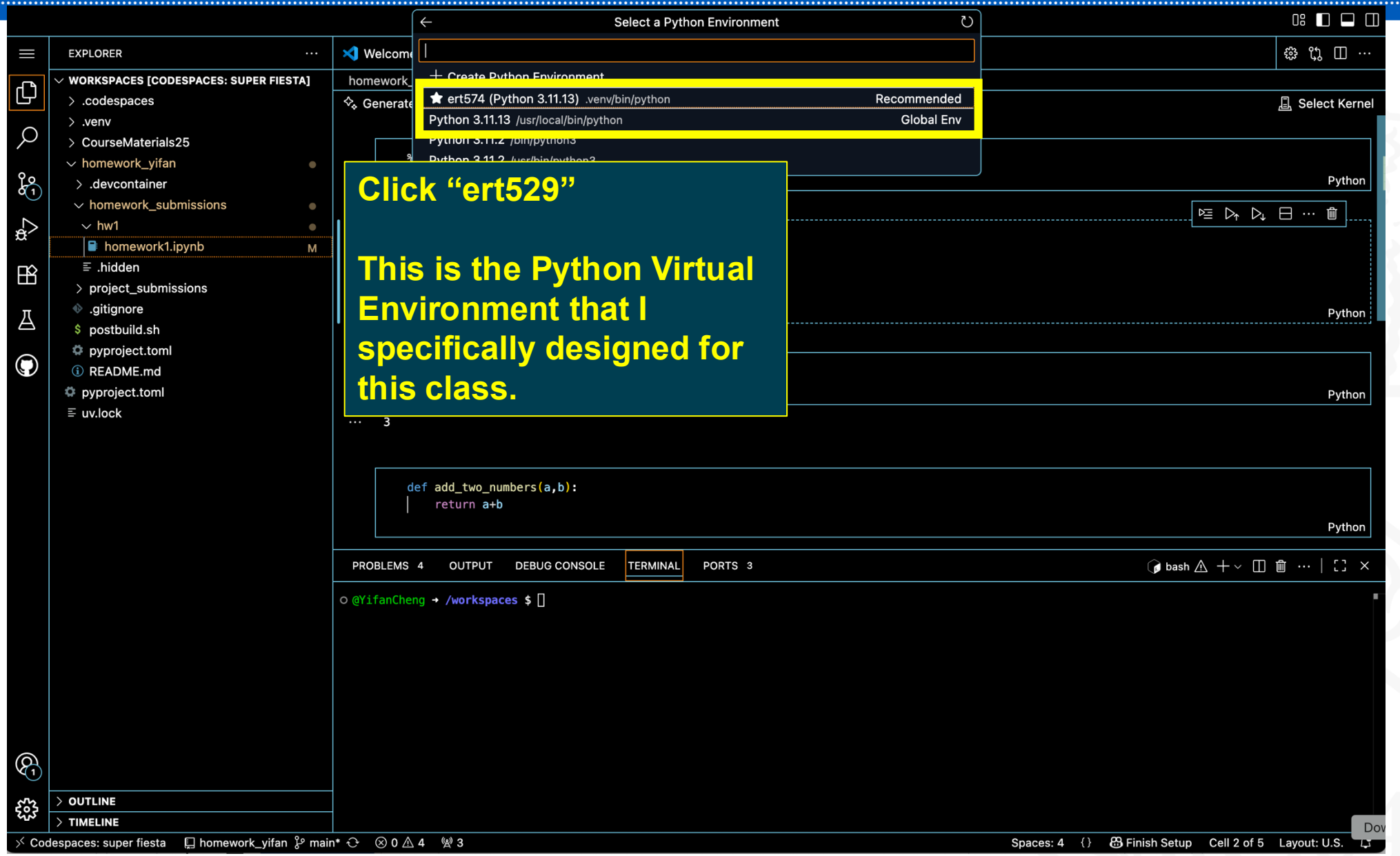

workspaces [Codespaces: super fiesta]
EXPLORER
WORKSPACES [CODESPACES...
.codespaces
.venv
CourseMat
homework_
.devconta
homewor
hw1
.hidden
project_submissions
.gitignore
postbuild.sh
pyproject.toml
README.md
pyproject.toml
uv.lock
Click this to create new folder
Welcome
homework1.ipynb
Welcome
homework_yifan > homework_submissions > hw1 > 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

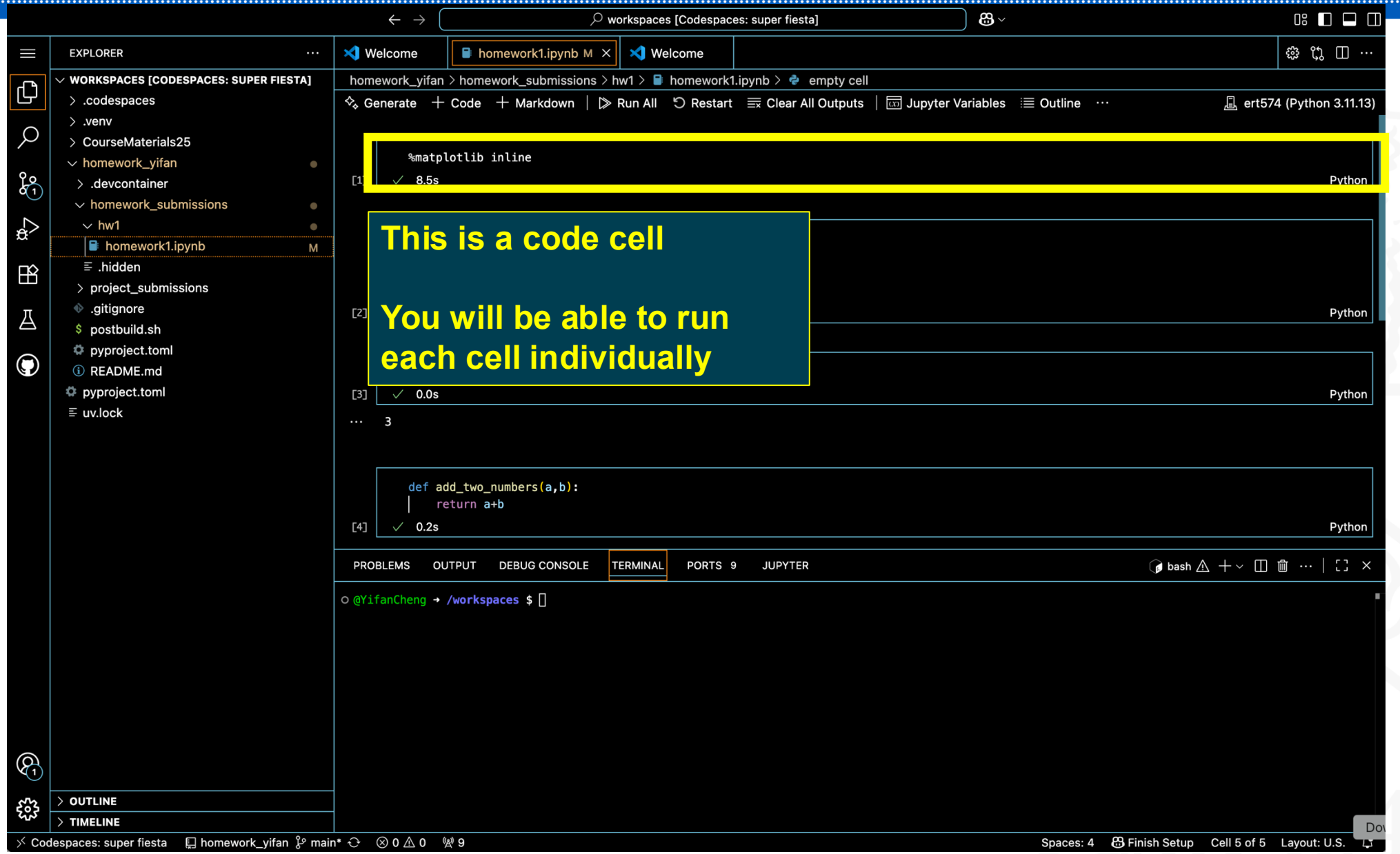



**Click this to create new file. If the file name ended with ".ipynb", it is automatically a Jupyter Notebook**

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


Select Kernel
Python Environments...
Connect to codespace
Select Kernel
3. Click “Python Environments”
2. Click “Select Kernel”
1. Click filename to open the notebook
EXPLORER
WORKSPACES [CODESPACES: SUPER FIESTA]
.codespaces
.venv
CourseMaterials25
homework_yifan
.devcontainer
homework_submissions
hw1
homework1.ipynb
pyproject.toml
uv.lock
OUTLINE
TIMELINE
import numpy as np
import pandas as pd
import xarray as xr
def add_two_numbers(a,b):
return a+b
Python
PROBLEMS 4
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS 3
@YifanCheng → /workspaces $
Codespaces: super fiesta
homework_yifan
main*
Spaces: 4
Finish Setup
Cell 2 of 5
Layout: U.S.


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
Select Kernel
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 $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WORKSPACES [CODESPACES: SUPER FIESTA]
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.venv
CourseMaterials25
homework_yifan
.devcontainer
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hw1
homework1.ipynb M
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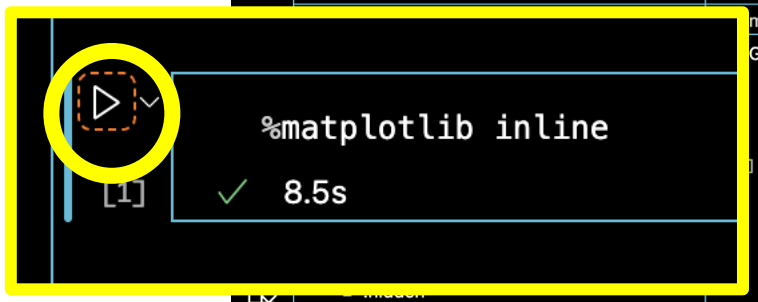
postbuild.sh
pyproject.toml
README.md
pyproject.toml
uv.lock
Welcome
homework1.ipynb M
Welcome
homework_yifan > homework_submissions > hw1 > homework1.ipynb > empty cell
Generate
Code
Markdown
Run All
Restart
Clear All Outputs
Jupyter Variables
Outline
ert574 (Python 3.11.13)
%matplotlib inline
[1] 8.5s Python
This is a code cell
You will be able to run each cell individually
[2] Python
[3] 0.0s Python
3
def add_two_numbers(a,b):
return a+b
[4] 0.2s Python
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS 9
JUPYTER
bash
@YifanCheng → /workspaces $
OUTLINE
TIMELINE
Codespaces: super fiesta
homework_yifan
main*
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.

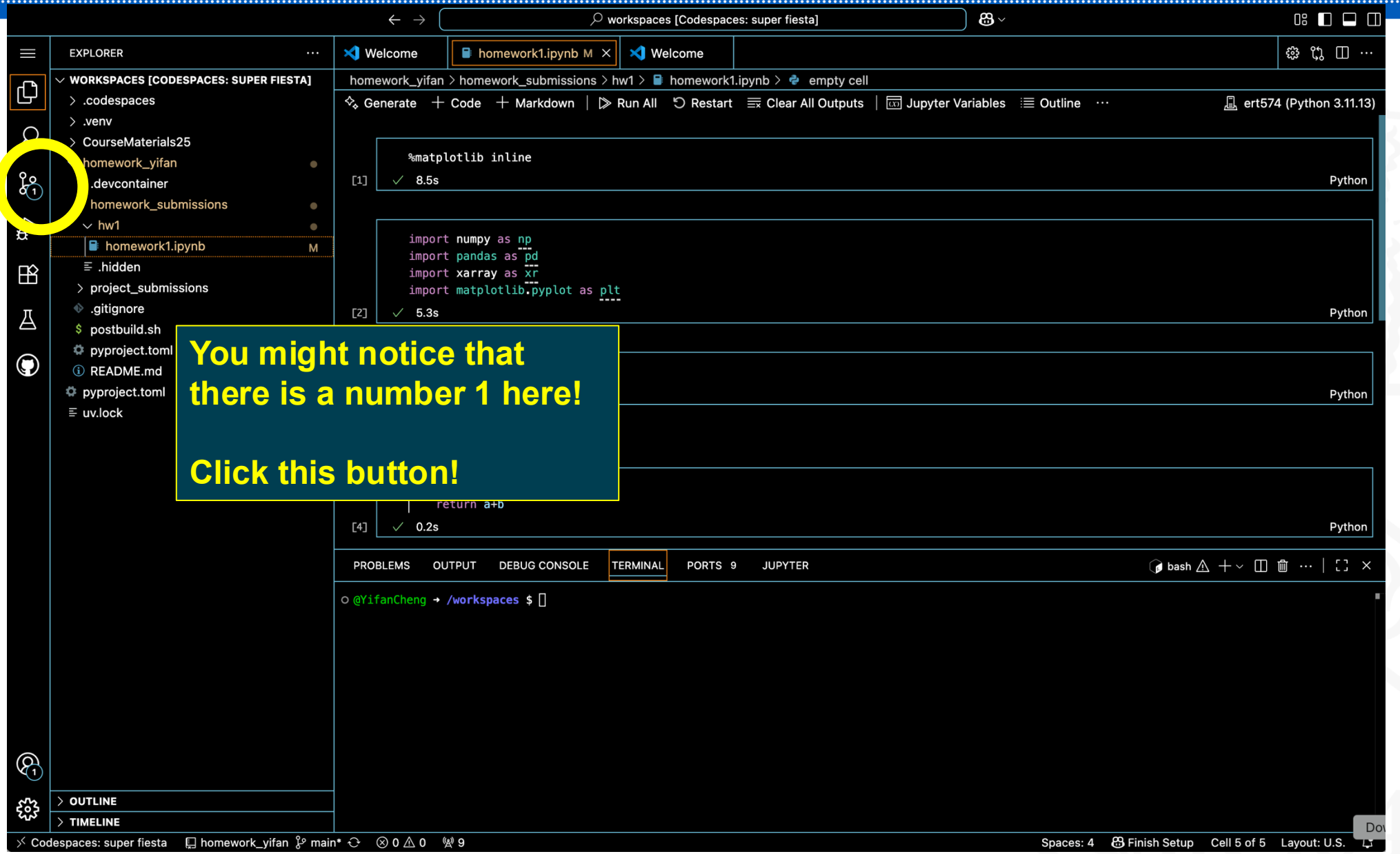
# Practice #1

- 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


workspaces [Codespaces: super fiesta]
EXPLORER
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README.md
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uv.lock
Welcome
homework1.ipynb M
Welcome
homework_yifan > homework_submissions > hw1 > homework1.ipynb > empty cell
Generate
Code
Markdown
Run All
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Clear All Outputs
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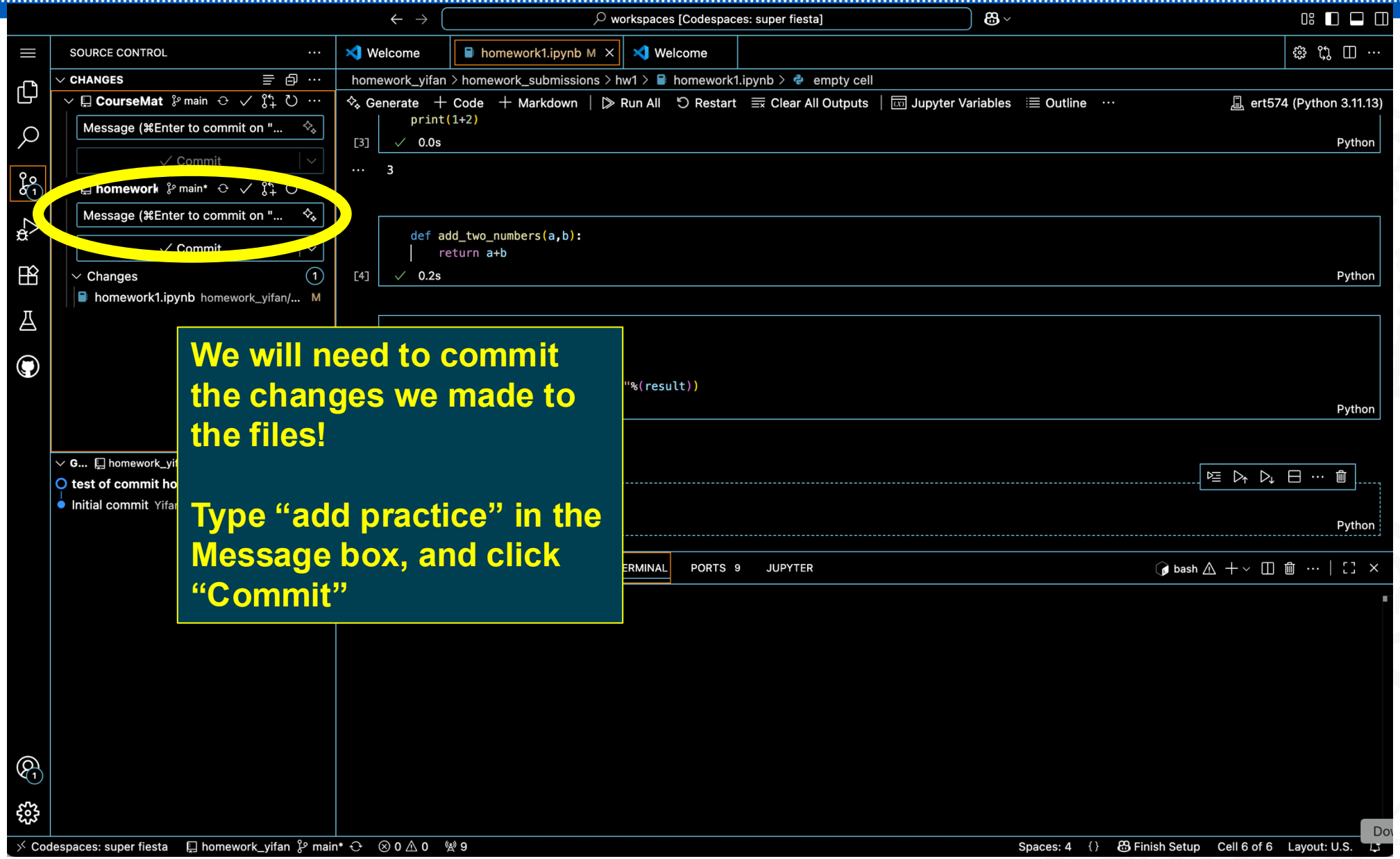
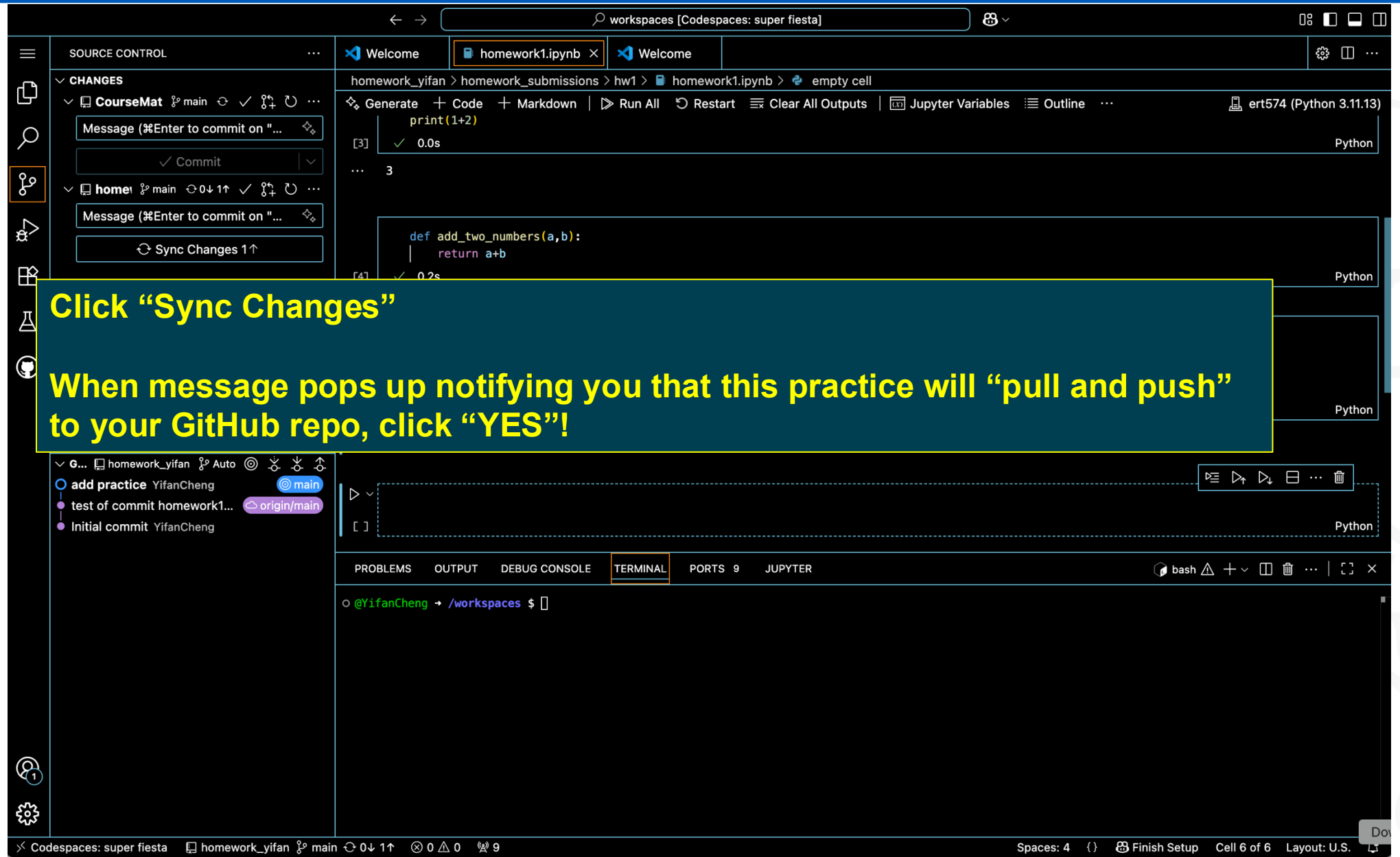
Outline
ert574 (Python 3.11.13)
%matplotlib inline
[1] 8.5s Python
import numpy as np
import pandas as pd
import xarray as xr
import matplotlib.pyplot as plt
[2] 5.3s Python
Python
return a+b
[4] 0.2s Python
You might notice that there is a number 1 here!
Click this button!
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS 9
JUPYTER
bash
@YifanCheng → /workspaces $
OUTLINE
TIMELINE
Codespaces: super fiesta
homework_yifan
main*
0 0
9
Spaces: 4
Finish Setup
Cell 5 of 5
Layout: U.S.


workspaces [Codespaces: super fiesta]
SOURCE CONTROL
CHANGES
CourseMat main
Message (⌘Enter to commit on "...
Commit
homework main*
Message (⌘Enter to commit on "...
Commit
Changes 1
homework1.ipynb homework_yifan/... M
Welcome
homework1.ipynb M
Welcome
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)
print(1+2)
[3] 0.0s Python
3
def add_two_numbers(a,b):
return a+b
[4] 0.2s Python
"%(result))
Python
Python
test of commit ho
Initial commit
PORTS 9 JUPYTER
bash
We will need to commit the changes we made to the files!
Type “add practice” in the Message box, and click “Commit”
Codespaces: super fiesta homework_yifan main* 0 0 9
Spaces: 4 Finish Setup Cell 6 of 6 Layout: U.S.


**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.**

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.


workspaces [Codespaces: super fiesta]
SOURCE CONTROL
CHANGES
CourseMat main
Message (⌘Enter to commit on "...
Commit
homer main 0↓ 1↑
Message (⌘Enter to commit on "...
Sync Changes 1↑
Welcome
homework1.ipynb
Welcome
homework_yifan > homework_submissions > hw1 > homework1.ipynb > empty cell
Generate
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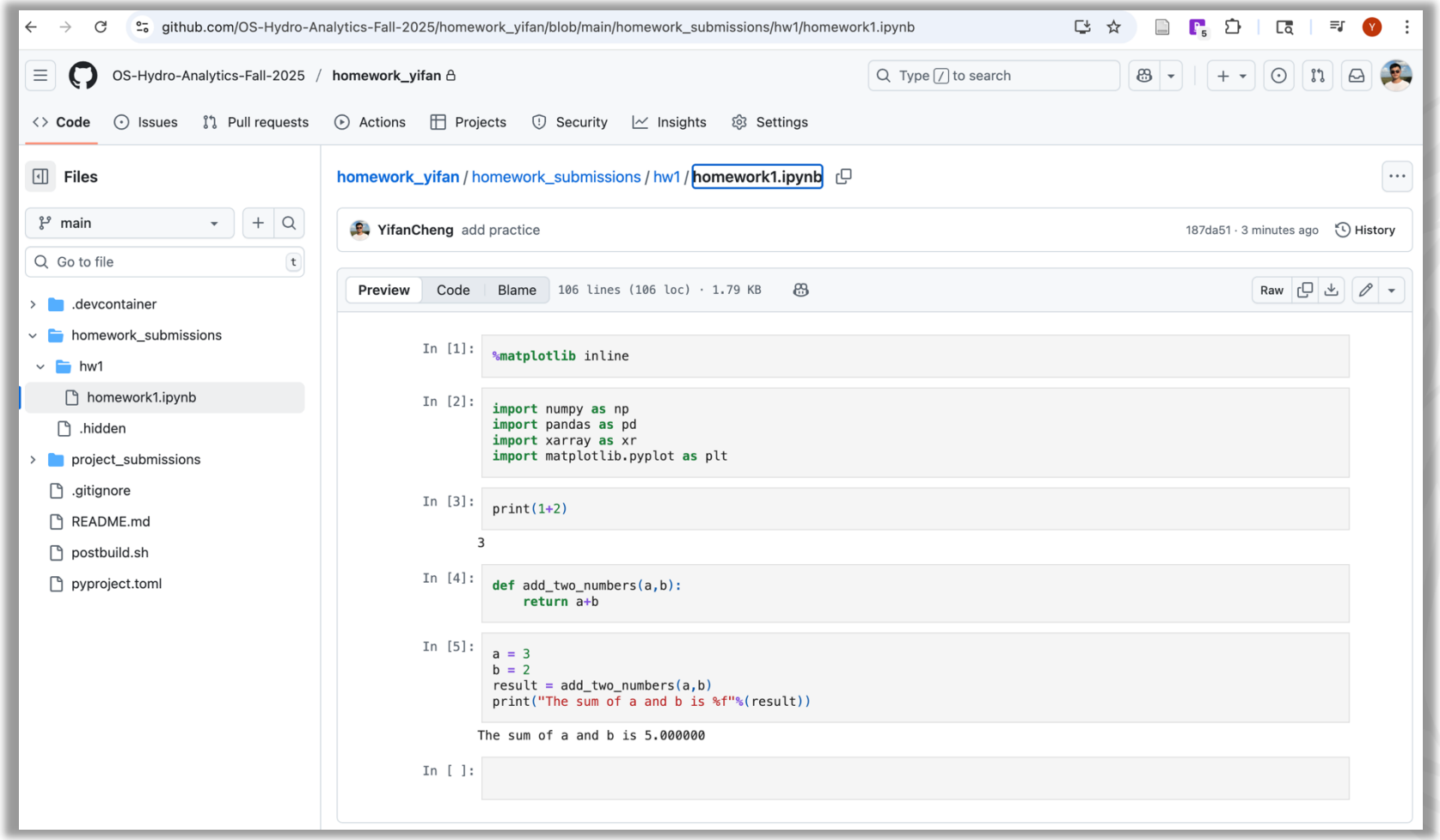
[3] 0.0s
Python
3
def add_two_numbers(a,b):
return a+b
[4] 0.2s
Python
Python
Click “Sync Changes”
When message pops up notifying you that this practice will “pull and push” to your GitHub repo, click “YES”!
G... homework_yifan Auto
add practice YifanCheng main
test of commit homework1... origin/main
Initial commit YifanCheng
[ ]
Python
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS 9
JUPYTER
bash
@YifanCheng → /workspaces $
Codespaces: super fiesta
homework_yifan main 0↓ 1↑
0 0
9
Spaces: 4
Finish Setup
Cell 6 of 6
Layout: U.S.

# Now, go to your homework repo




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.