INTRO TO GIT & GITHUB

https://github.com/Abertay-University-SDI/Github

Erin Michno Hughes
Lecturer Games Tech and Mathematics

AGENDA

Why?!?!

What is Git / Github

Installation(s) / student accounts

Create a repository

Push/Pull/Branch/Merge

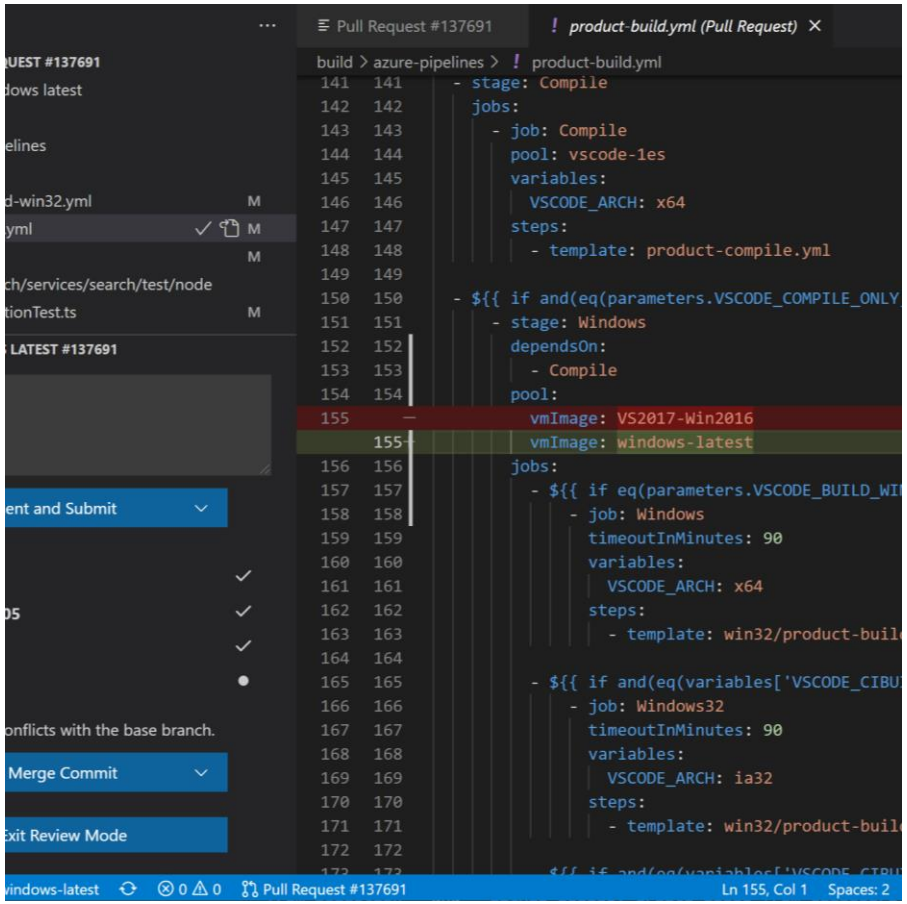
Extras!

Why are we talking source control?

- Access anywhere (potentially) with distributed source control
- Track changes
- Prevent conflicts
- Protect/Backup source code
- Improve collaboration
- Improve development

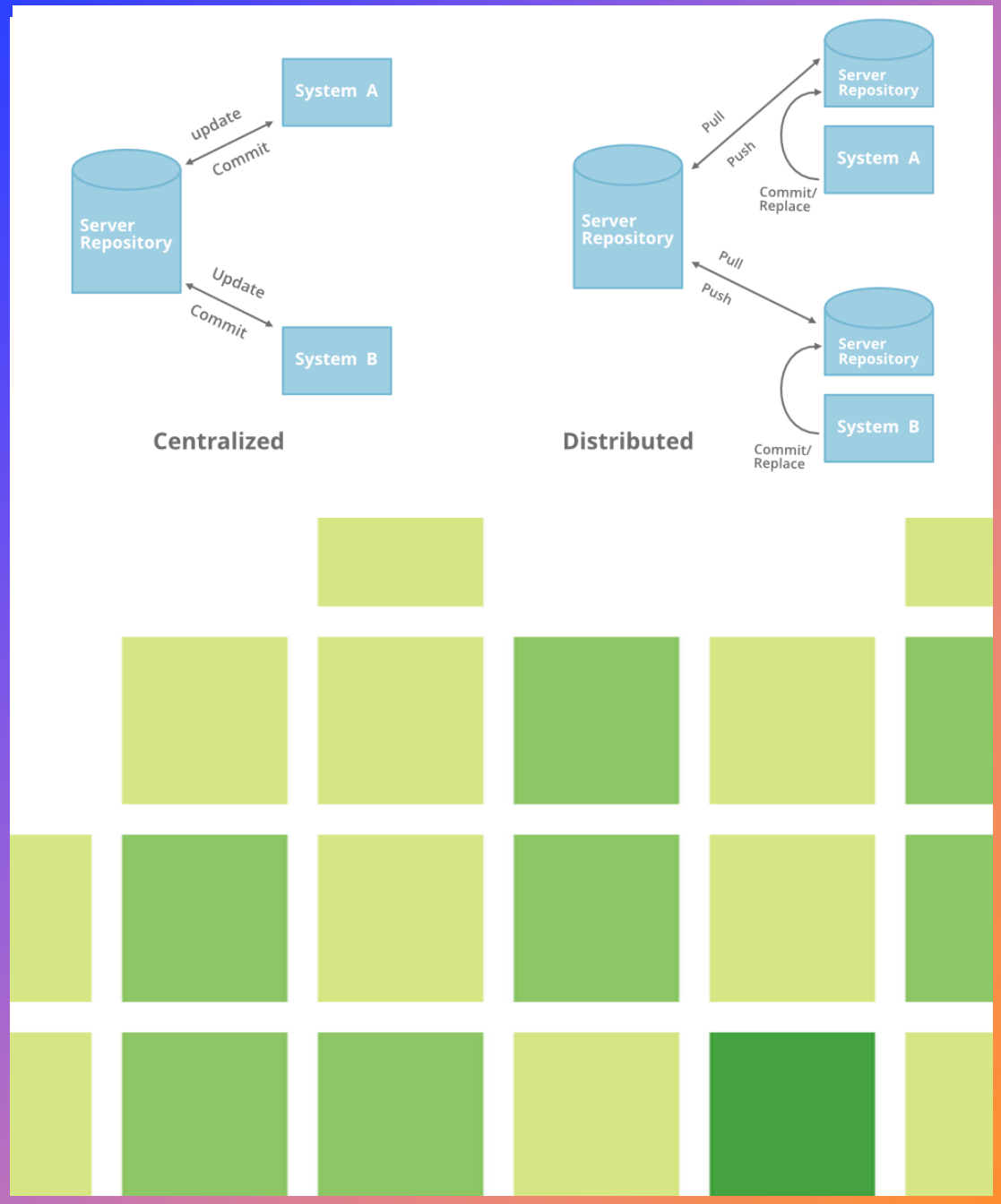
Don’t trust me – verify!

- https://www.freecodecamp.org/news/introduction-to-git-and-github/
- https://learn.microsoft.com/en-us/training/modules/introduction-to-github/
- https://product.hubspot.com/blog/git-and-github-tutorial-for-beginners
- https://github.com/skills/introduction-to-github
- https://docs.github.com/en/get-started/start-your-journey/hello-world
- https://github.com/education/students
- https://visualstudio.microsoft.com/vs/github/
- https://learn.microsoft.com/en-gb/visualstudio/version-control/git-with-visual-studio?view=vs-2022
- https://visualstudio.microsoft.com/vs/github/
- https://learn.microsoft.com/en-gb/visualstudio/version-control/git-resolve-conflicts?view=vs-2022
- https://www.datacamp.com/tutorial/github-and-git-tutorial-for-beginners
- https://www.datacamp.com/blog/what-is-github



GIT

Open Source Version Control



Git

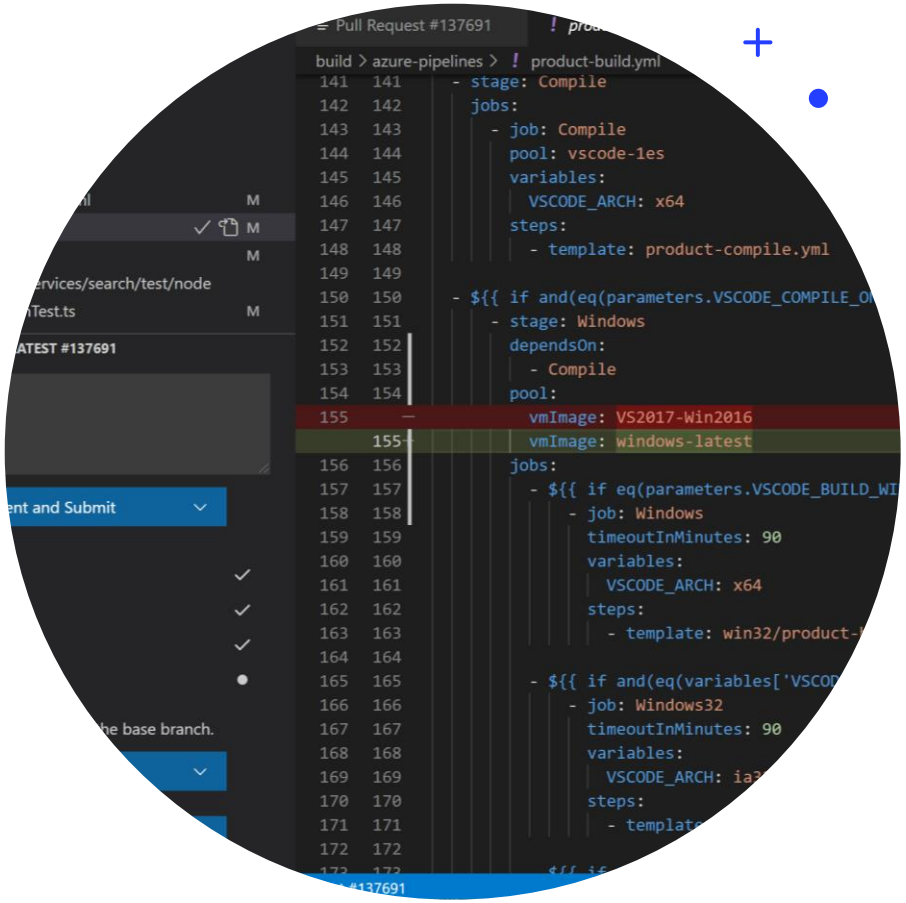
- Is a DVCS (Distributed Version Control System
- Distributed (not Centralized) allows for offline work
- Open source
- 2005 Linus Torvalds
- Tracks changes of files and is specialised for code and software projects
- Similar to the software that tracks changes in a shared google document but with many more features
- Easily have “branches” or different versions of the in progress software “repository” or data structure that stores the project

GITHUB

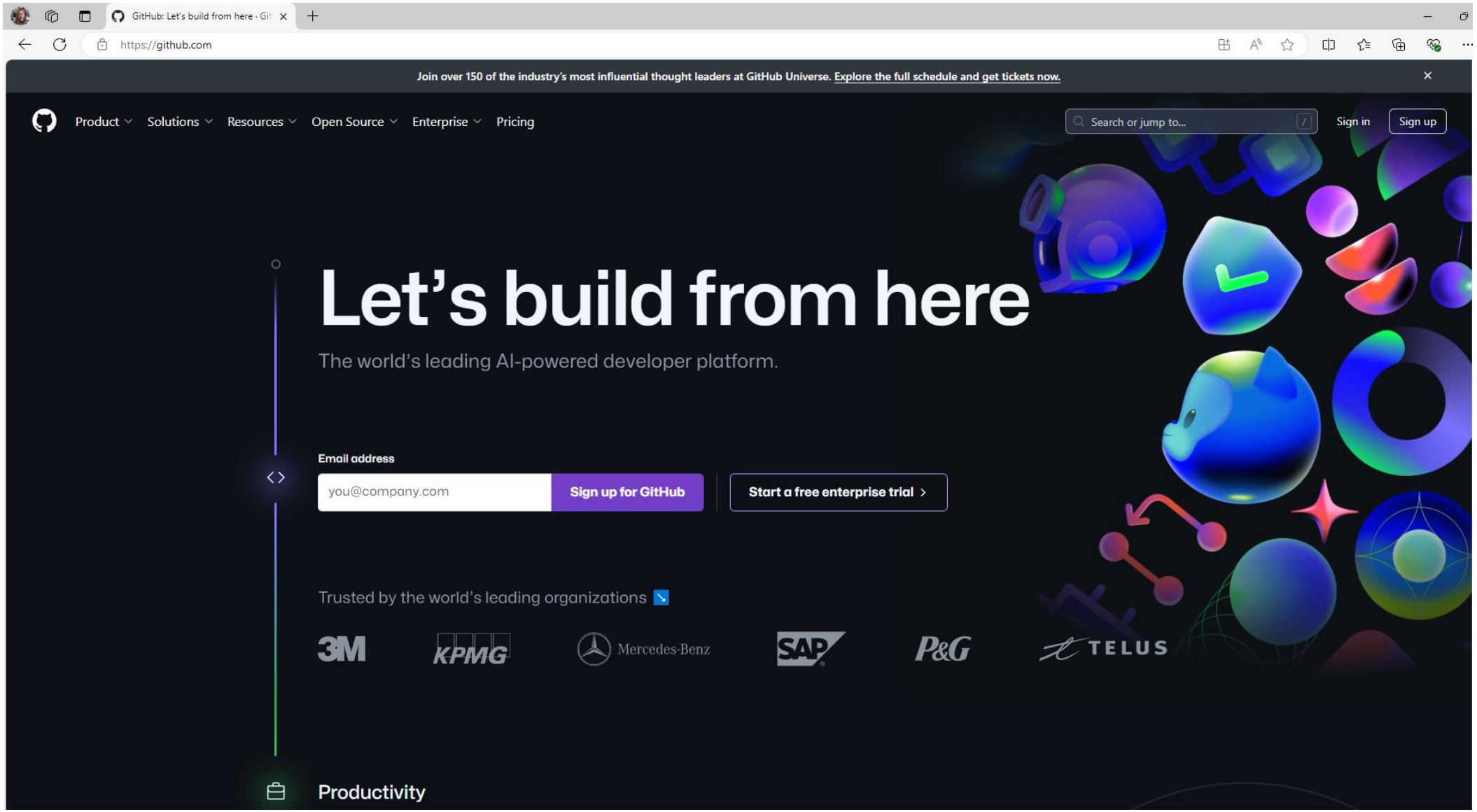
Website / Hosting Service / Microsoft

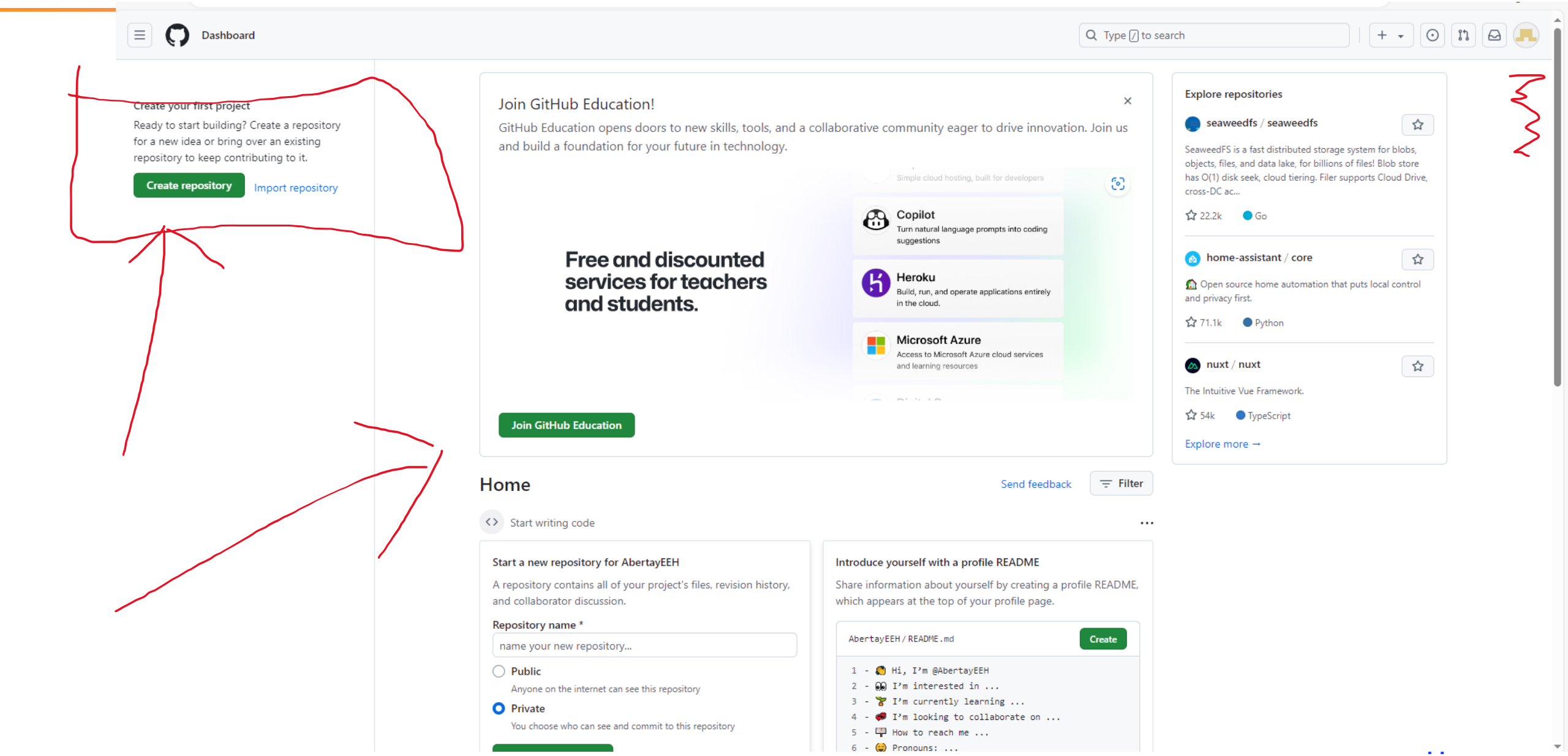
Github

- “a cloud-based platform”
- “allows users to store, share, and collaborate on code”
- “a developer platform to share code”
- It’s a website, with user accounts where you can upload code projects and share them or edit – not just your projects but other users too
- Think YouTube for code projects, but it’s not just the final project it’s the whole timeline of progress with edit privileges



- If you do not have an existing account
- Create one
- If you HAVE an existing account
- Think if you might want to have a “uni” based account that is linked to your student number / email and will be a clean portfolio


GitHub: Let's build from here · Gi
https://github.com
Join over 150 of the industry's most influential thought leaders at GitHub Universe. Explore the full schedule and get tickets now.
Product
Solutions
Resources
Open Source
Enterprise
Pricing
Search or jump to...
Sign in
Sign up
Let's build from here
The world's leading AI-powered developer platform.
Email address
you@company.com
Sign up for GitHub
Start a free enterprise trial
Trusted by the world's leading organizations
3M
KPMG
Mercedes-Benz
SAP
P&G
TELUS
Productivity


Dashboard
Type / to search
Create your first project
Ready to start building? Create a repository for a new idea or bring over an existing repository to keep contributing to it.
Create repository
Import repository
Join GitHub Education!
GitHub Education opens doors to new skills, tools, and a collaborative community eager to drive innovation. Join us and build a foundation for your future in technology.
Free and discounted services for teachers and students.
Copilot
Turn natural language prompts into coding suggestions
Heroku
Build, run, and operate applications entirely in the cloud.
Microsoft Azure
Access to Microsoft Azure cloud services and learning resources
Join GitHub Education
Explore repositories
seaweedfs / seaweedfs
SeaweedFS is a fast distributed storage system for blobs, objects, files, and data lake, for billions of files! Blob store has O(1) disk seek, cloud tiering. Filer supports Cloud Drive, cross-DC ac...
22.2k
Go
home-assistant / core
Open source home automation that puts local control and privacy first.
71.1k
Python
nuxt / nuxt
The Intuitive Vue Framework.
54k
TypeScript
Explore more →
Home
Send feedback
Filter
Start writing code
Start a new repository for AbertayEEH
A repository contains all of your project's files, revision history, and collaborator discussion.
Repository name *
name your new repository...
Public
Anyone on the internet can see this repository
Private
You choose who can see and commit to this repository
Introduce yourself with a profile README
Share information about yourself by creating a profile README, which appears at the top of your profile page.
AbertayEEH / README.md
Create
1 - Hi, I'm @AbertayEEH
2 - I'm interested in ...
3 - I'm currently learning ...
4 - I'm looking to collaborate on ...
5 - How to reach me ...
6 - Pronouns: ...

Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere?
Import a repository.

Required fields are marked with an asterisk (*).

Owner * / Repository name *

AbertayEEH / FirstRepo

FirstRepo is available.

Great repository names are short and memorable. Need inspiration? How about sturdy-potato ?

Description (optional)

my test repo

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:

Add a README file
This is where you can write a long description for your project. Learn more about READMEs.

Add .gitignore

.gitignore template: VisualStudio

Choose which files not to track from a list of templates. Learn more about ignoring files.

Choose a license

License: MIT License

A license tells others what they can and can't do with your code. Learn more about licenses.

This will set `main` as the default branch. Change the default name in your settings.

You are creating a public repository in your personal account.

Create repository

https://github.com/AbertayEEH/FirstRepo

AbertayEEH / FirstRepo

Type / to search

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

FirstRepo Public

Pin Unwatch 1 Fork 0 Star 0

main 1 Branch 0 Tags Go to file t Add file Code

AbertayEEH Initial commit

.gitignore	Initial commit
LICENSE	Initial commit
README.md	Initial commit

README MIT license

FirstRepo

my test repo

Local Codespaces

Clone

HTTPS SSH GitHub CLI

https://github.com/AbertayEEH/FirstRepo.git

Clone using the web URL.

Open with GitHub Desktop

Download ZIP

About

my test repo

Readme

Activity

0 stars

1 watching

0 forks

Releases

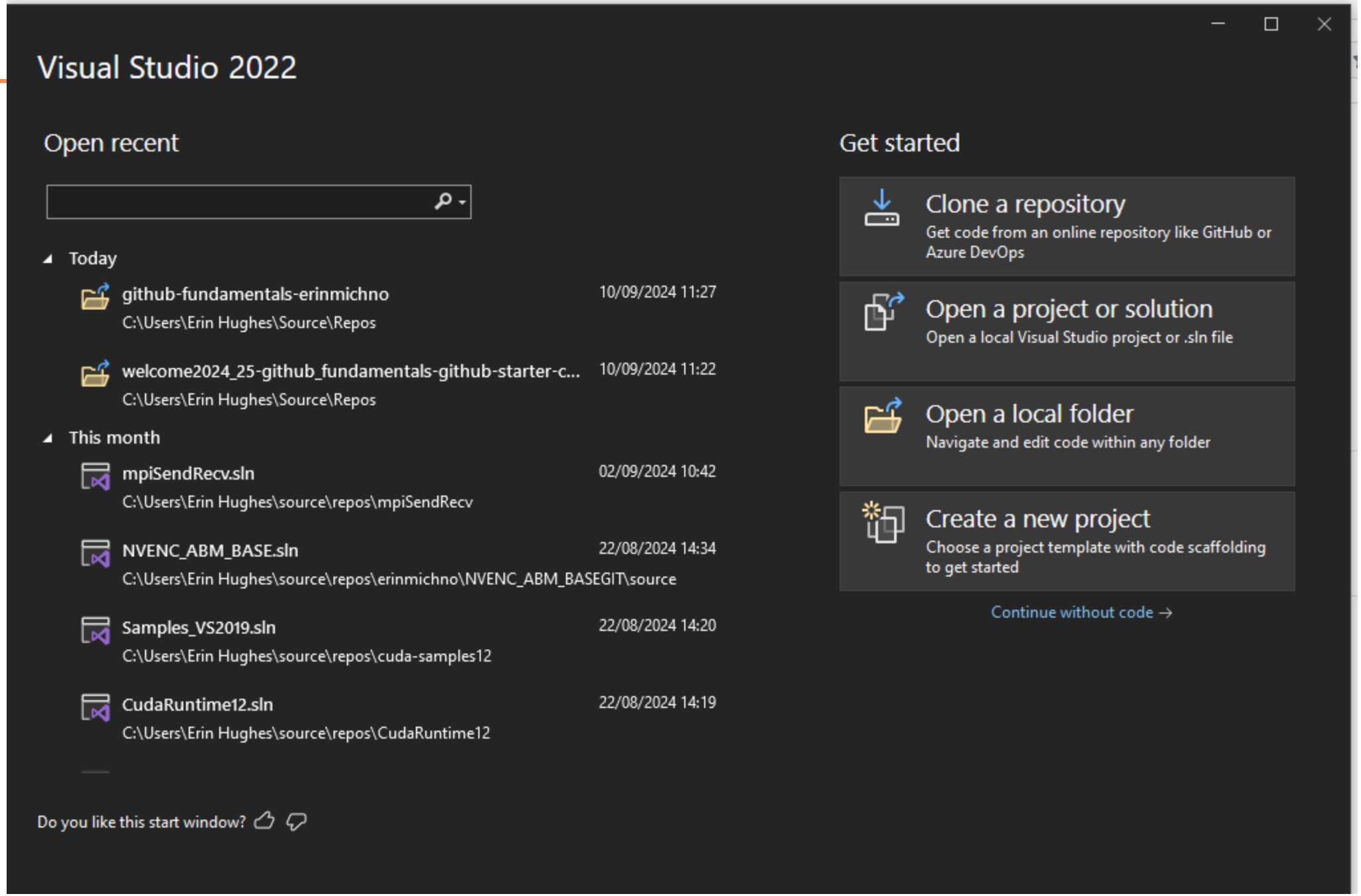
No releases published

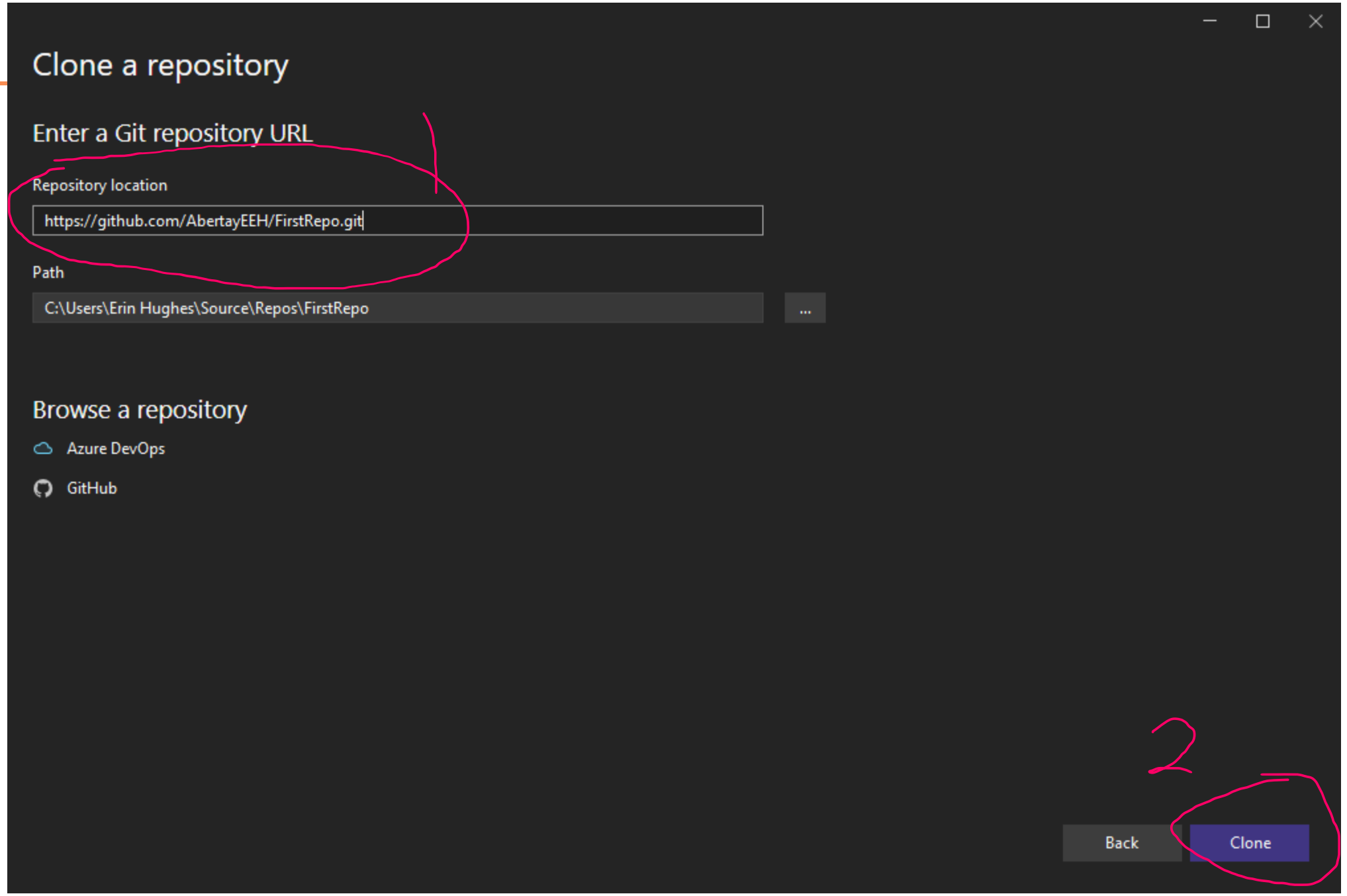
Create a new release

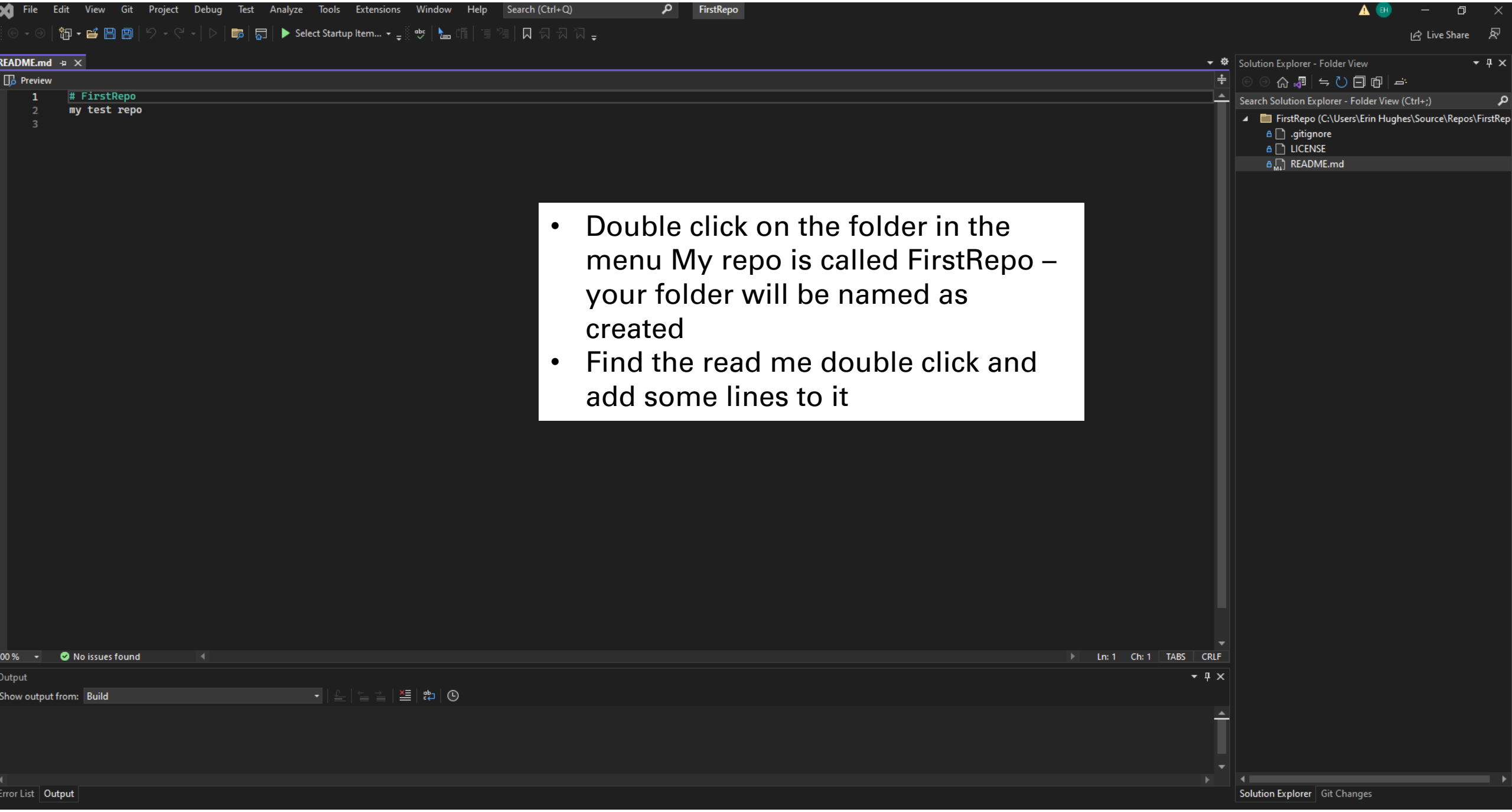
Packages

No packages published

Publish your first package


Visual Studio 2022
Open recent
Today
github-fundamentals-erinmichno
10/09/2024 11:27
C:\Users\Erin Hughes\Source\Repos
welcome2024_25-github_fundamentals-github-starter-c...
10/09/2024 11:22
C:\Users\Erin Hughes\Source\Repos
This month
mpiSendRecv.sln
02/09/2024 10:42
C:\Users\Erin Hughes\source\repos\mpiSendRecv
NVENC_ABM_BASE.sln
22/08/2024 14:34
C:\Users\Erin Hughes\source\repos\erinmichno\NVENC_ABM_BASEGIT\source
Samples_VS2019.sln
22/08/2024 14:20
C:\Users\Erin Hughes\source\repos\cuda-samples12
CudaRuntime12.sln
22/08/2024 14:19
C:\Users\Erin Hughes\source\repos\CudaRuntime12
Do you like this start window?
Get started
Clone a repository
Get code from an online repository like GitHub or Azure DevOps
Open a project or solution
Open a local Visual Studio project or .sln file
Open a local folder
Navigate and edit code within any folder
Create a new project
Choose a project template with code scaffolding to get started
Continue without code →


Clone a repository
Enter a Git repository URL
Repository location
https://github.com/AbertayEEH/FirstRepo.git
Path
C:\Users\Erin Hughes\Source\Repos\FirstRepo
...
Browse a repository
Azure DevOps
GitHub
2
Back
Clone



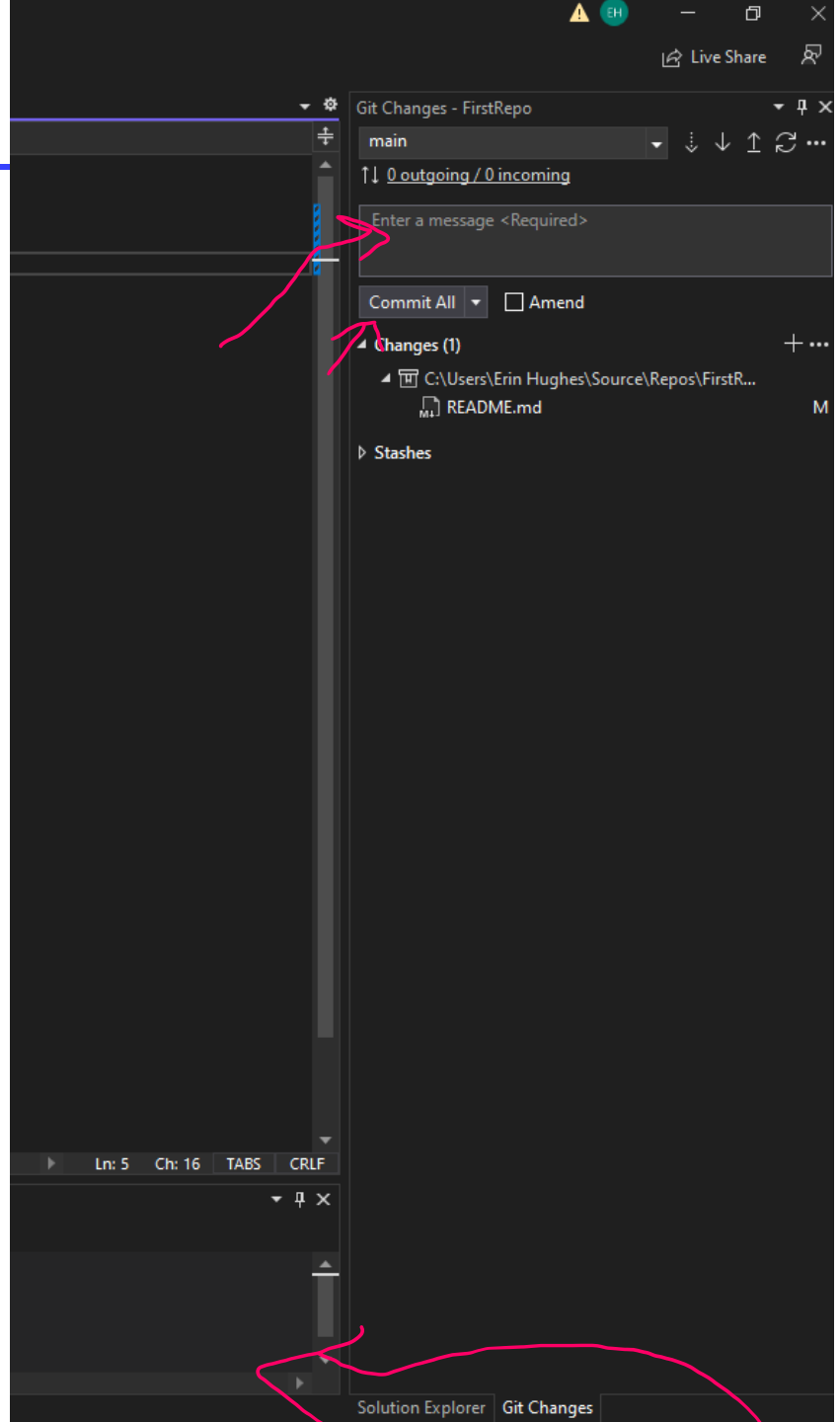
- Double click on the folder in the menu My repo is called FirstRepo – your folder will be named as created
- Find the read me double click and add some lines to it

- After adding some text to the Readme save it
- See how the lock symbol has changed to a red check – this means changes have been made
- Find the git changed tab or from the top menu View->Git Changes
- Also check out View->Git Repository

- We SHOULD see that readme file is in the change list

- Write a small message to let yourself and others know what the change is in the message box such as “edited readme file”

- Then click commit all button



Link!

- https://learn.microsoft.com/en-us/visualstudio/ide/work-with-github-accounts?view=vs-2022

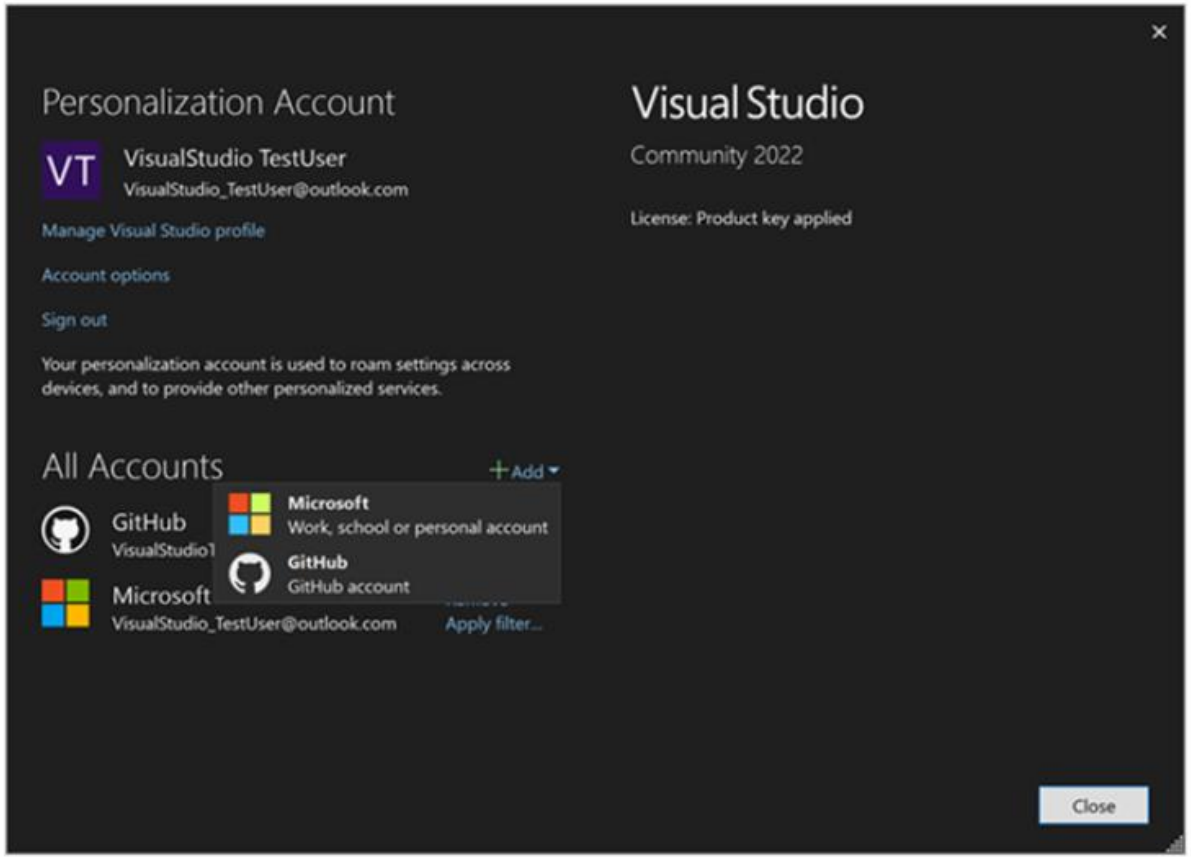
- You will need to add your account to push your work up to your account on github.com

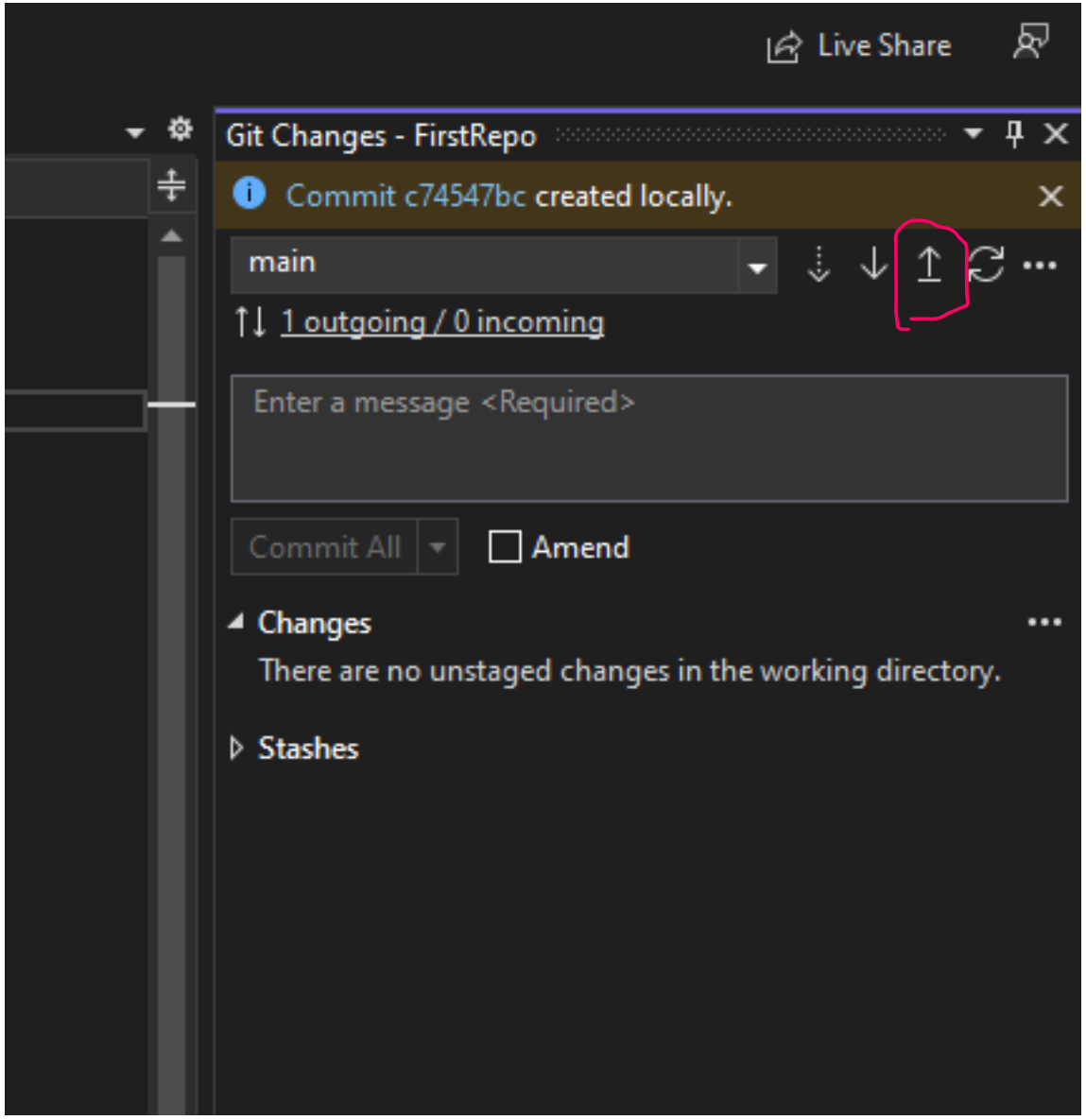
Adding public GitHub accounts

You can add your public GitHub account at any point, even if you haven't signed into Visual Studio with a Microsoft account, work account, or school account.

Add a GitHub account from the Account settings dialog:

1. Open the Account Settings dialog by going to **File** > **Account Settings...**.
2. From the **All Accounts** submenu, select + **Add** to add an account, and then select **GitHub**.





- Notice the new information
- A “commit” or snapshot has been created locally
- Locally means only on the current machine – it’s not up on the server yet

- We need to push it to the server
- In our case github.com is our server

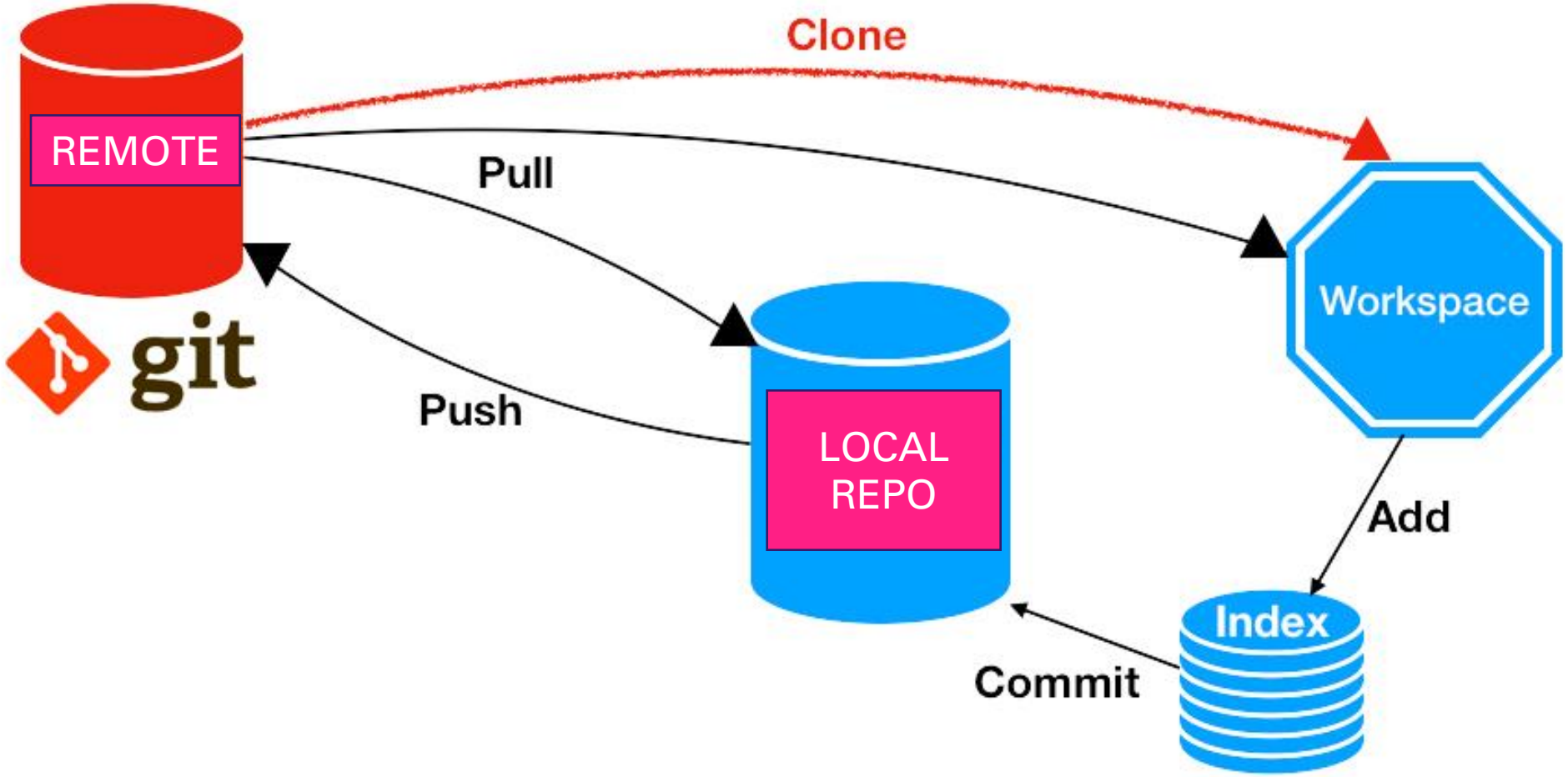
- Find the push button (up arrow with a ground line) and push your code change up so it is available to anyone with the repo link

- Follow up – find the symbols for fetch, pull and sync search the resources to see what/when/why to use these commands
- Go to github.com page to check if it’s uploaded!

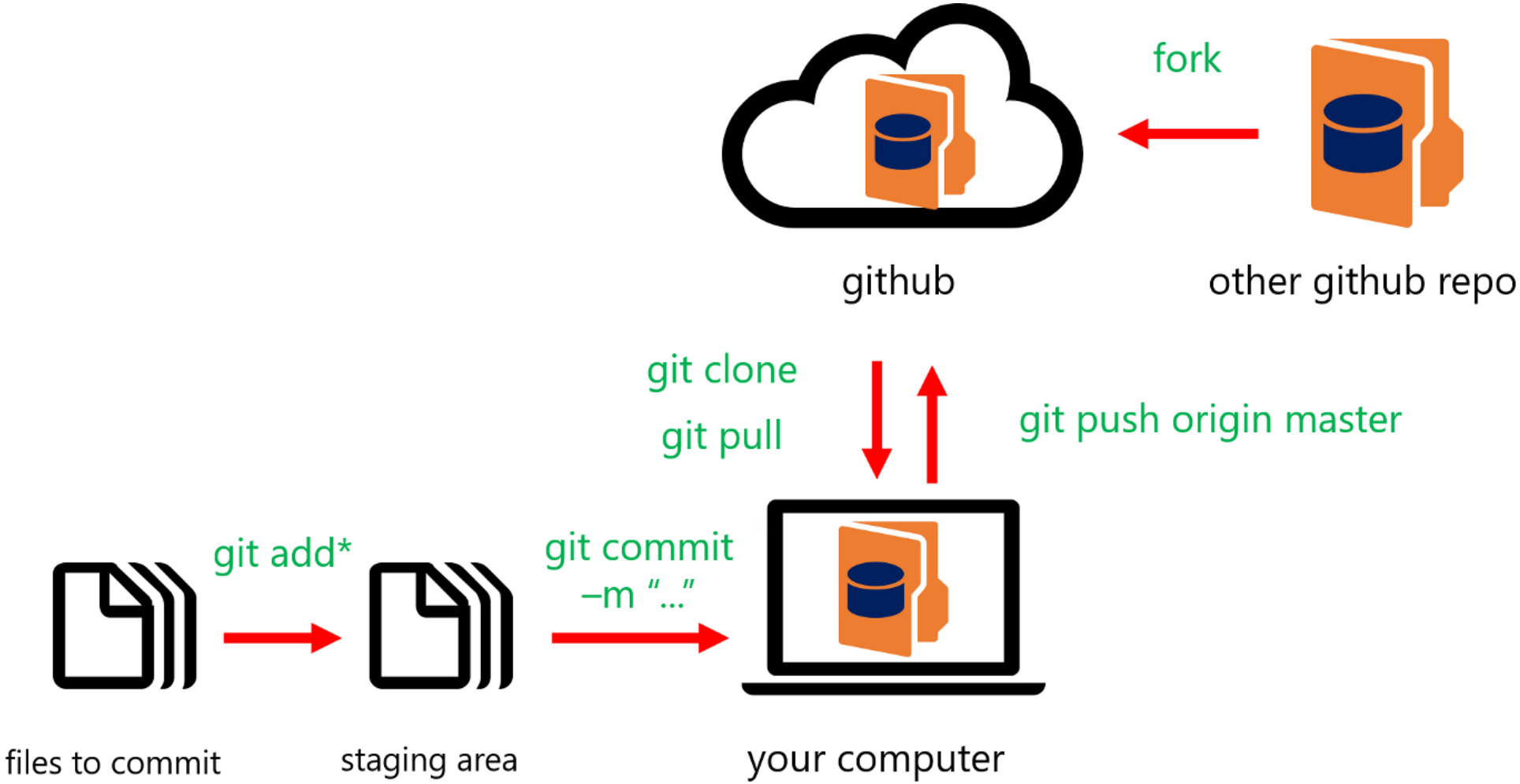
Success!

Your authorization was successful. You can now return to Visual Studio.

Why commit and push?



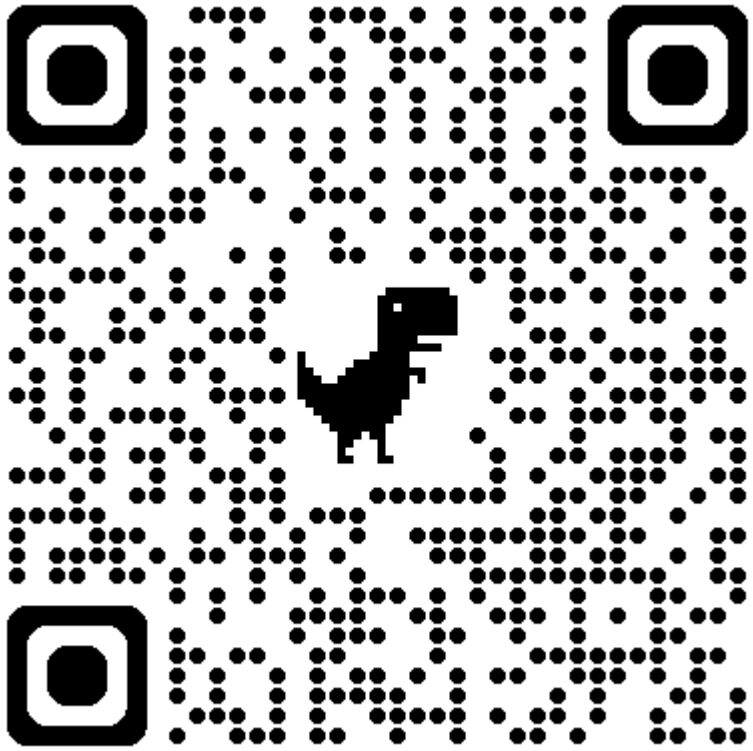
Why commit and push?



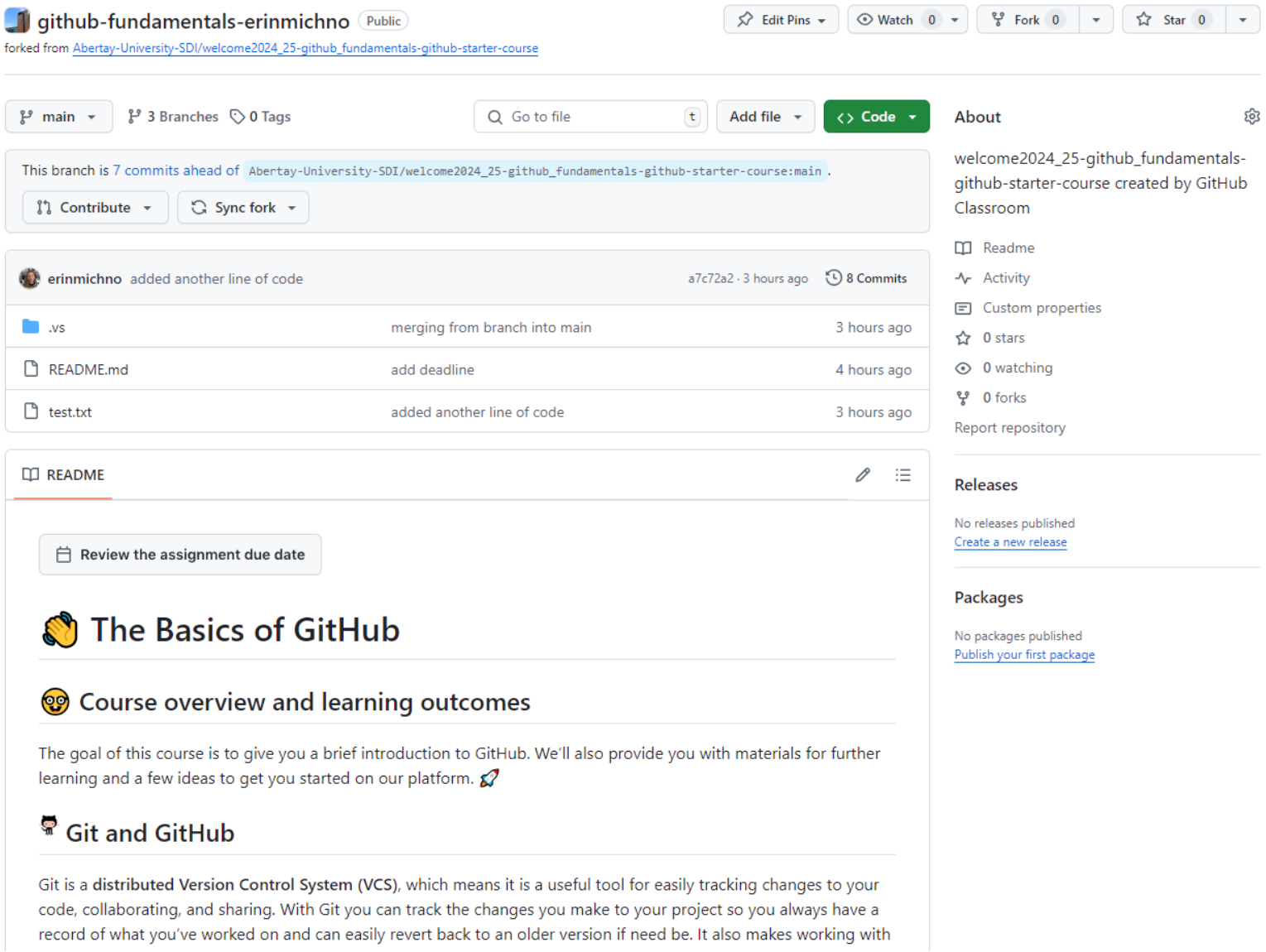
Cheat sheet!

- There are lots of commands and we will practice a few more
- But: https://education.github.com/git-cheat-sheet-education.pdf has a great list
- You should have a physical print out of this to take away

GITHUB CLASSROOM LINK

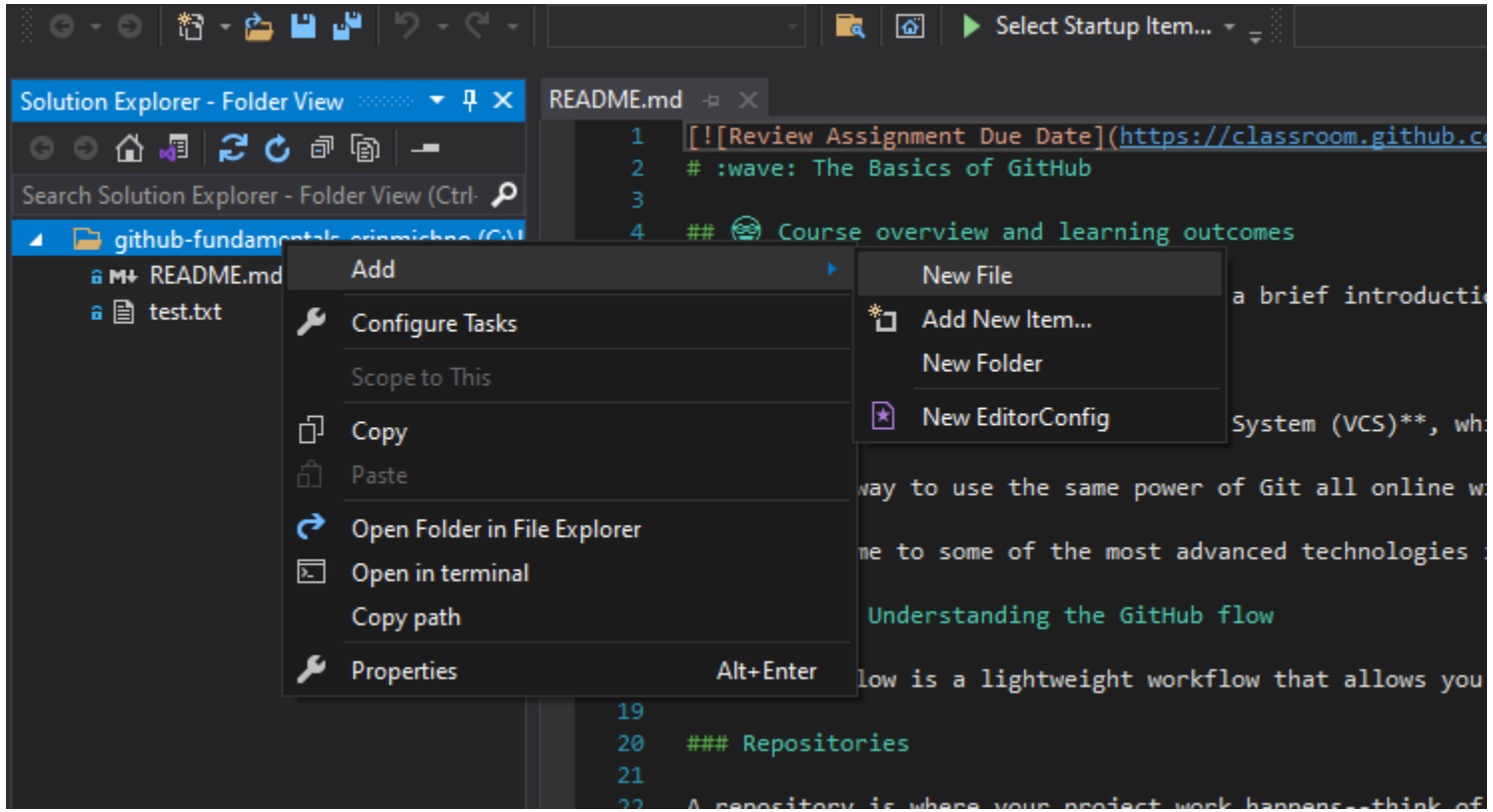


https://classroom.github.com/a/4qIlgOjW

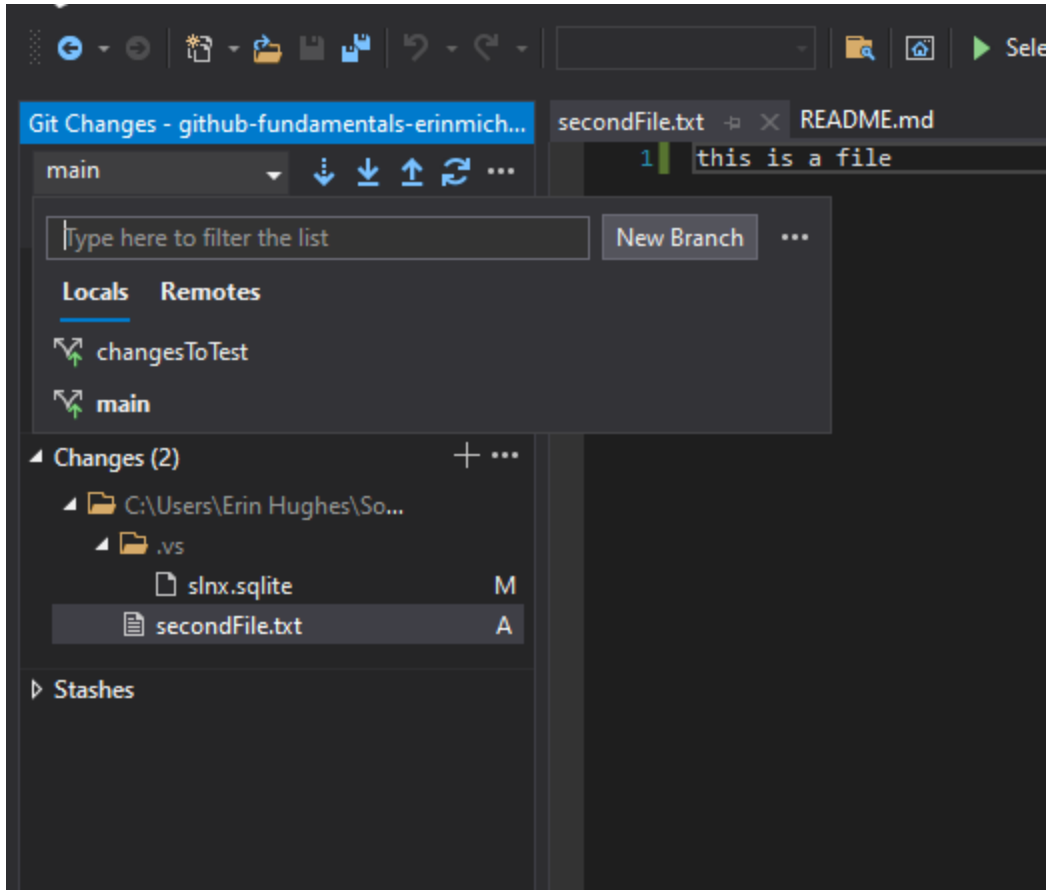


- Add your student id to the list if it is not there
- Accept the assignment
- Read the ReadMe it has the basics of Github right there!
- Click on the green code button and copy the repo git location as we did before or select open with visual studio

Add a new file – add some text

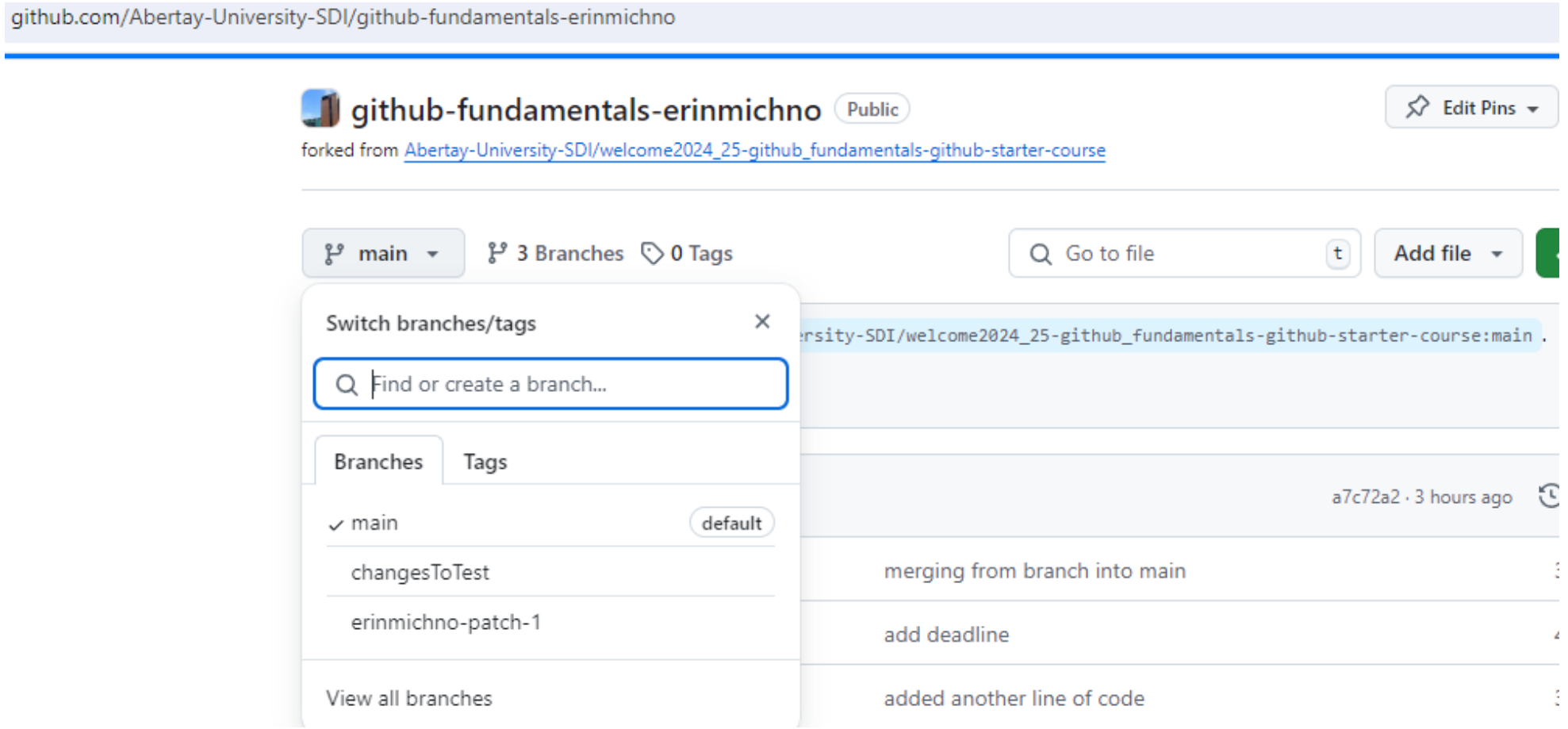


Create a branch

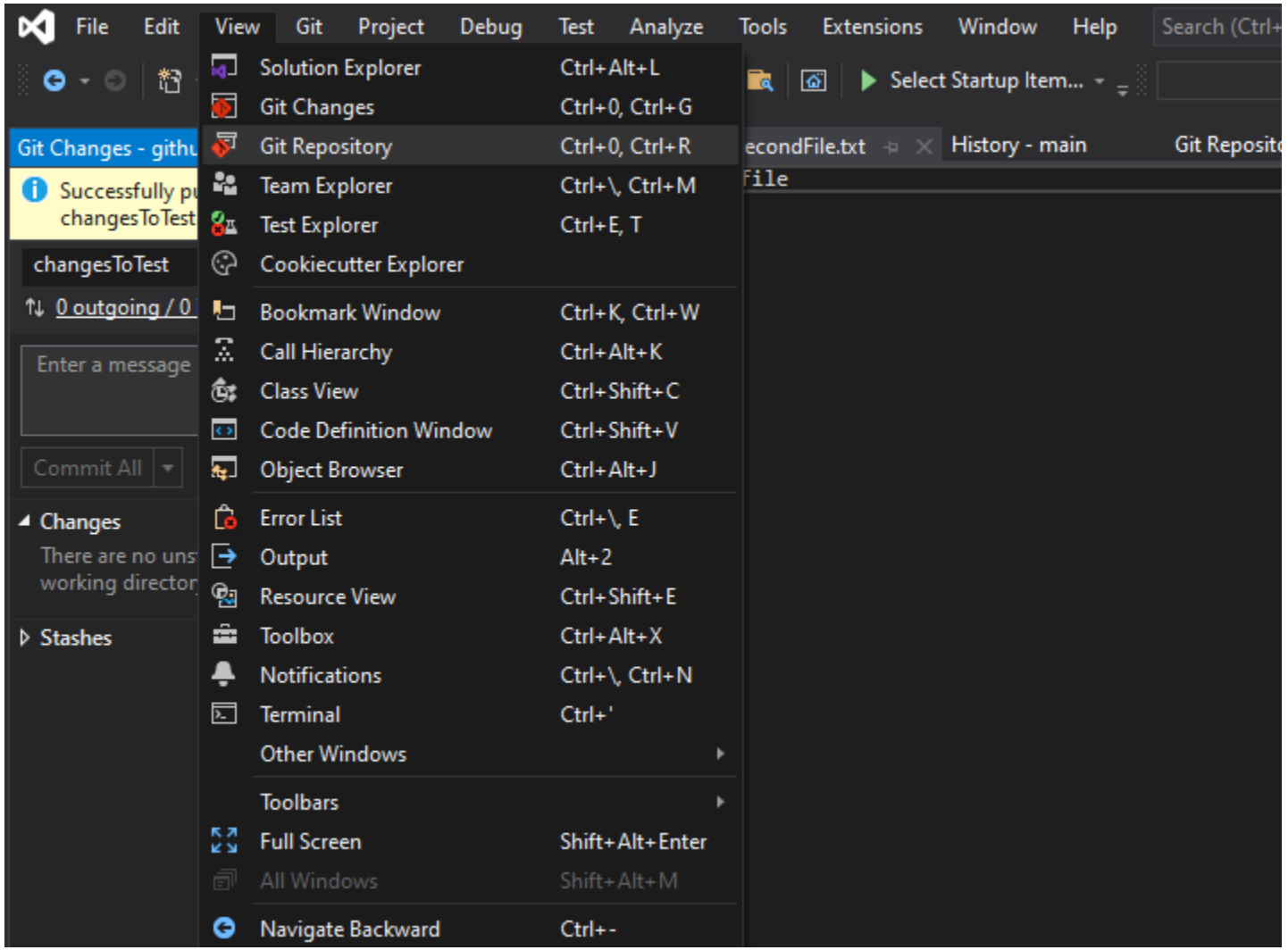


- Find the “main” drop down text – this is the branch you are working on at first there is only one
- Create a new branch – this is a new timeline
- Commit and push the new file and new work to this new branch
- Check it is there on github.com
- See if you can see both branches

On server – after commit and PUSH!

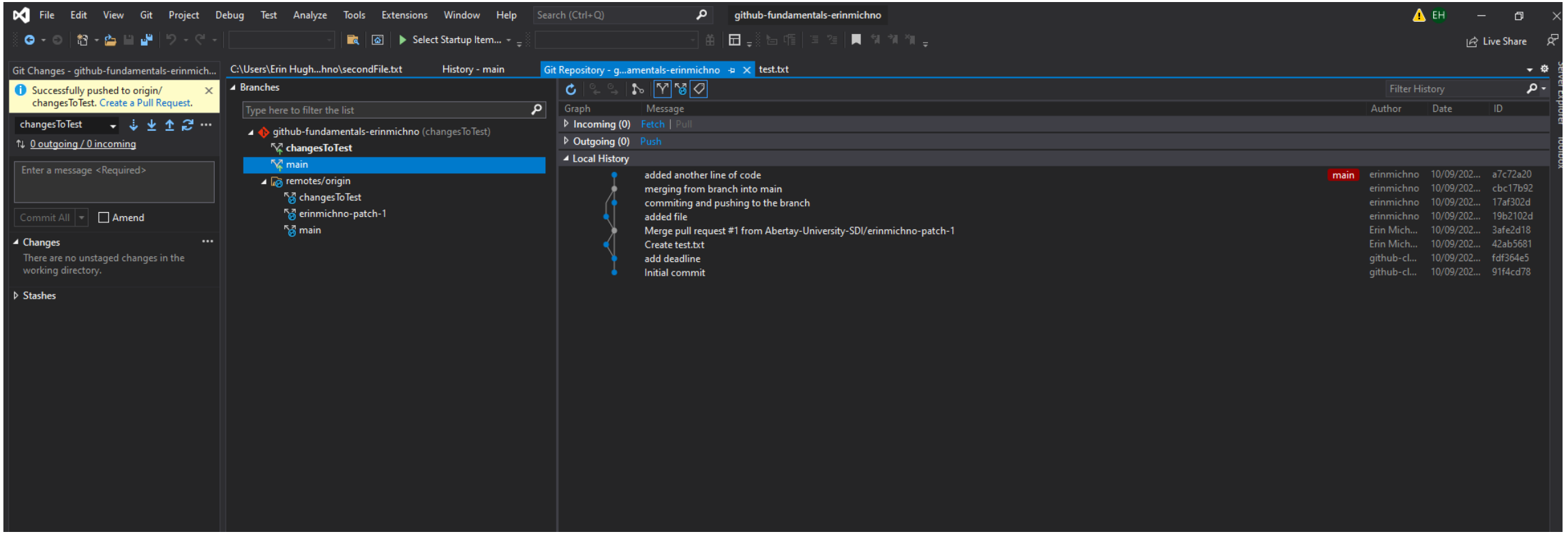


On Local machine VisualStudio

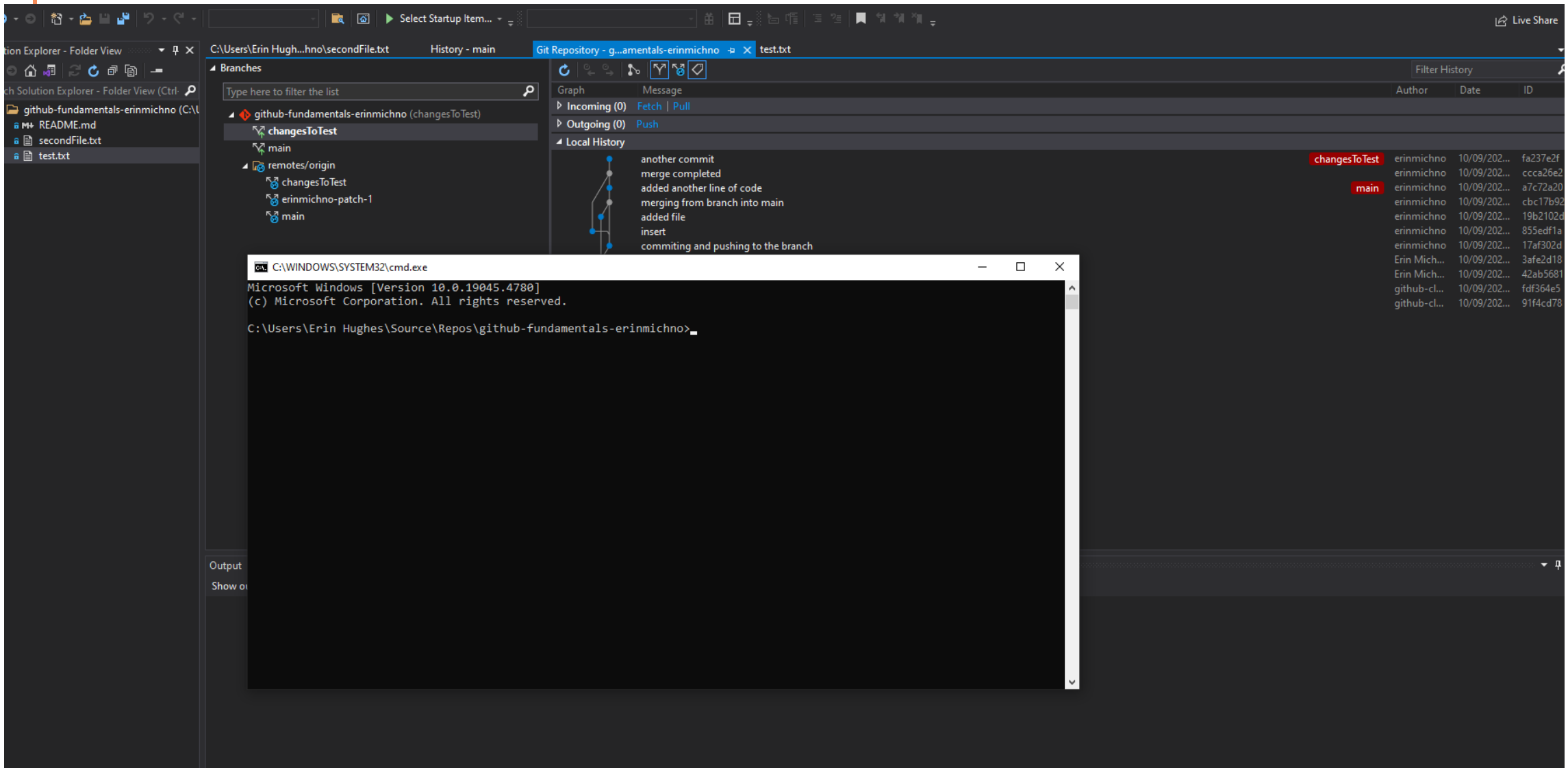


- Let's look at the branches on Git Repository view

Timeline / History



Git -> Open In Command Prompt



git <command> <params>

C:\WINDOWS\SYSTEM32\cmd.exe

```
Microsoft Windows [Version 10.0.19045.4780]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Erin Hughes\Source\Repos\github-fundamentals-erinmichno>git branch
* changesToTest
  main

C:\Users\Erin Hughes\Source\Repos\github-fundamentals-erinmichno>git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.

C:\Users\Erin Hughes\Source\Repos\github-fundamentals-erinmichno>git merge changesToTest
Updating a7c72a2..fa237e2
Fast-forward
 .vs/VSWorkspaceState.json                    |   7 +++++++
 .vs/github-fundamentals-erinmichno/v16/.suo | Bin 0 -> 21504 bytes
 .vs/slnx.sqlite                              | Bin 90112 -> 90112 bytes
 secondFile.txt                               |   1 +
 test.txt                                     |   1 +
 5 files changed, 9 insertions(+)
 create mode 100644 .vs/VSWorkspaceState.json
 create mode 100644 .vs/github-fundamentals-erinmichno/v16/.suo
 create mode 100644 secondFile.txt

C:\Users\Erin Hughes\Source\Repos\github-fundamentals-erinmichno>git push origin main
Total 0 (delta 0), reused 0 (delta 0)
To https://github.com/Abertay-University-SDI/github-fundamentals-erinmichno.git
   a7c72a2..fa237e2  main -> main

C:\Users\Erin Hughes\Source\Repos\github-fundamentals-erinmichno>
```

Try a few commands from the command line

git branch

git checkout main

git merge MyOTHERbranch

git push origin

Most commands will have a button / visual counter part in VISUAL studio – but note all commands can be handled from command prompt and may be faster as you level up

BRANCHING

Wait haven’t we already made a branch?

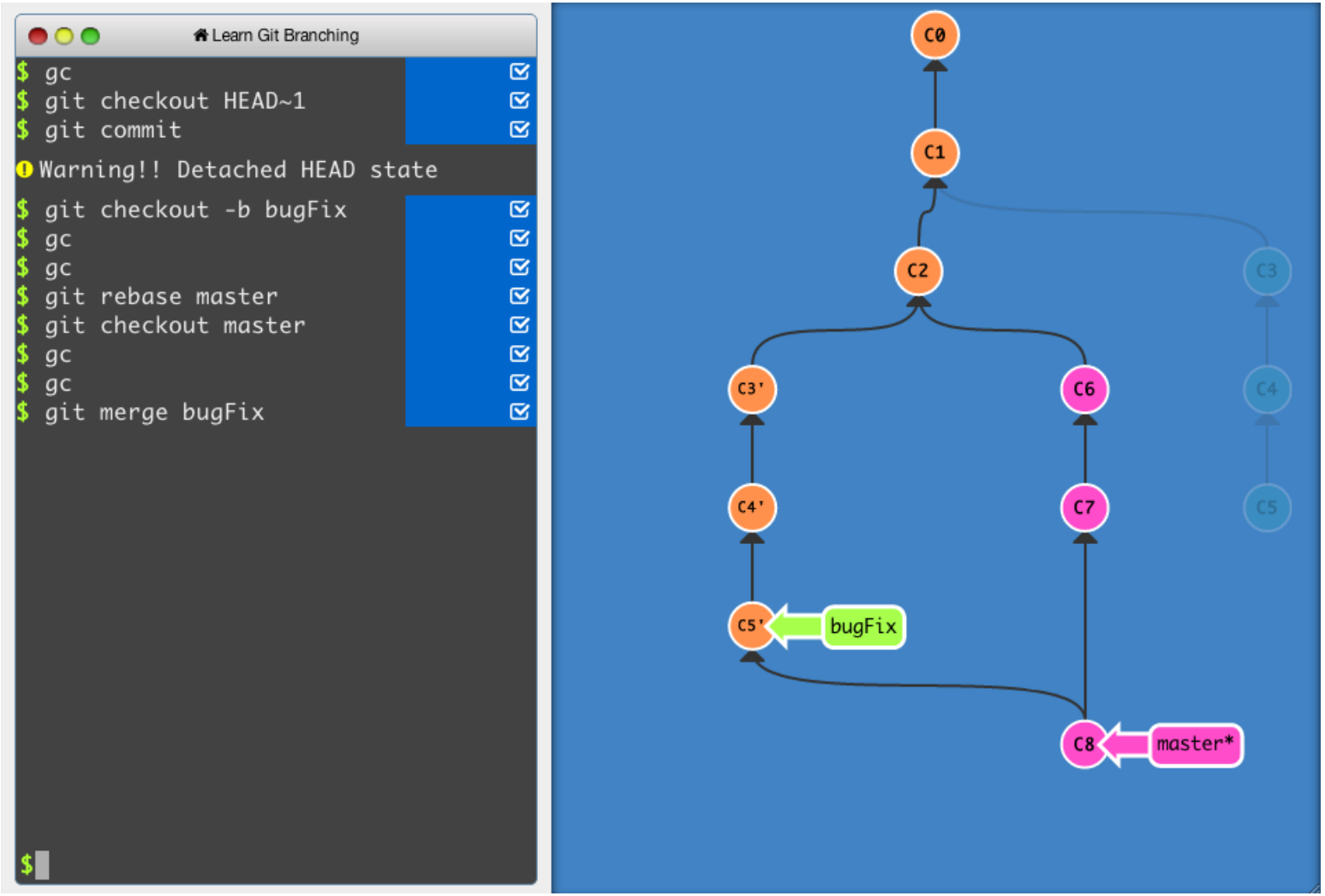
Branches

- In Git, a branch is a new/separate version of the main repository. It has all the dependencies and can switch between versions with a single command all while ensuring not files get muddled or missed and can keep feature development separate and safe!
- Branches allow you to develop features, fix bugs, or safely experiment with new ideas in a contained area of your repository.
- You always create a branch from an existing branch. Typically, you might create a new branch from the default branch of your repository.

LEARN GIT BRANCHING

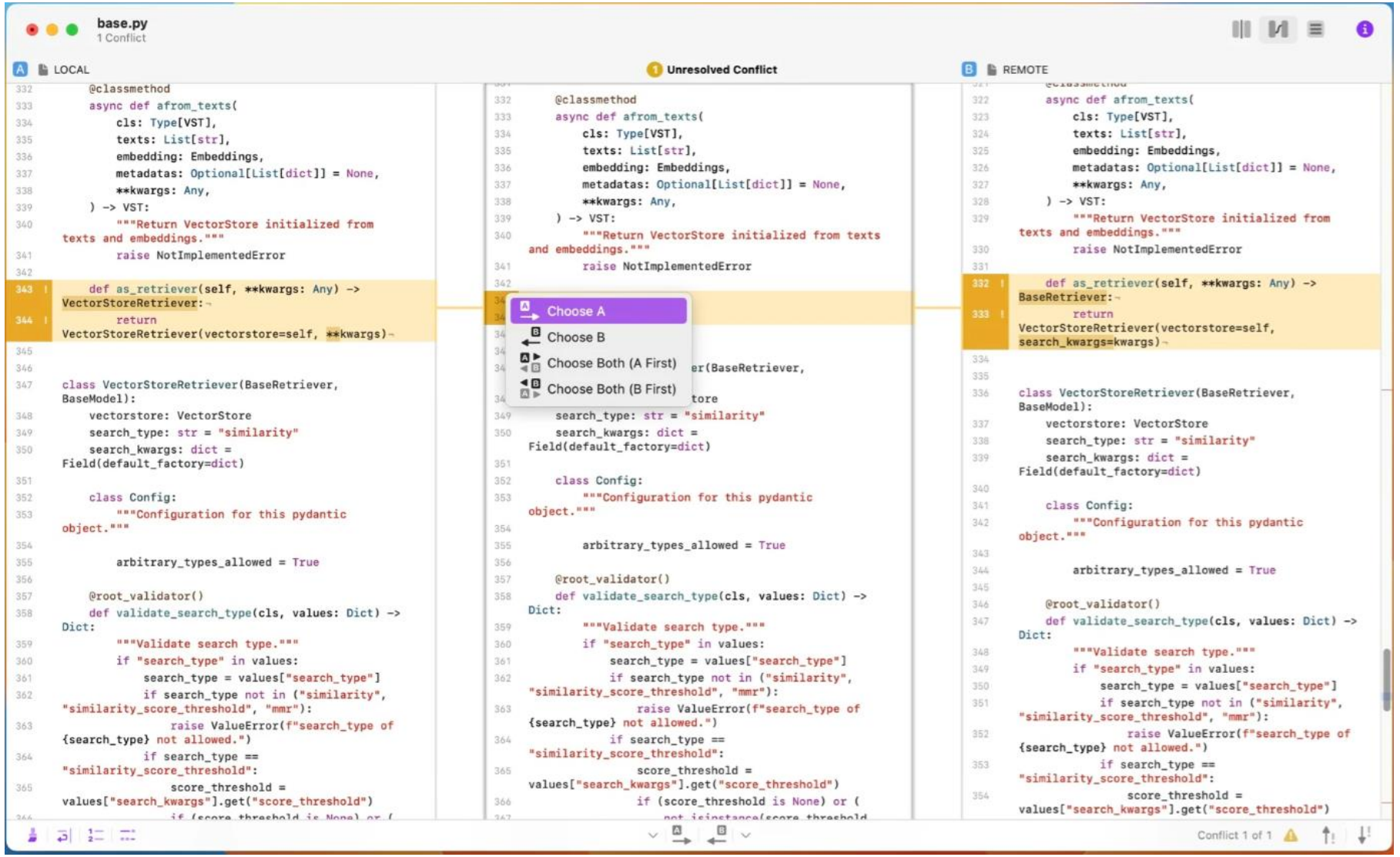
https://learngitbranching.js.org/

Try lots of combinations



EXTRAS

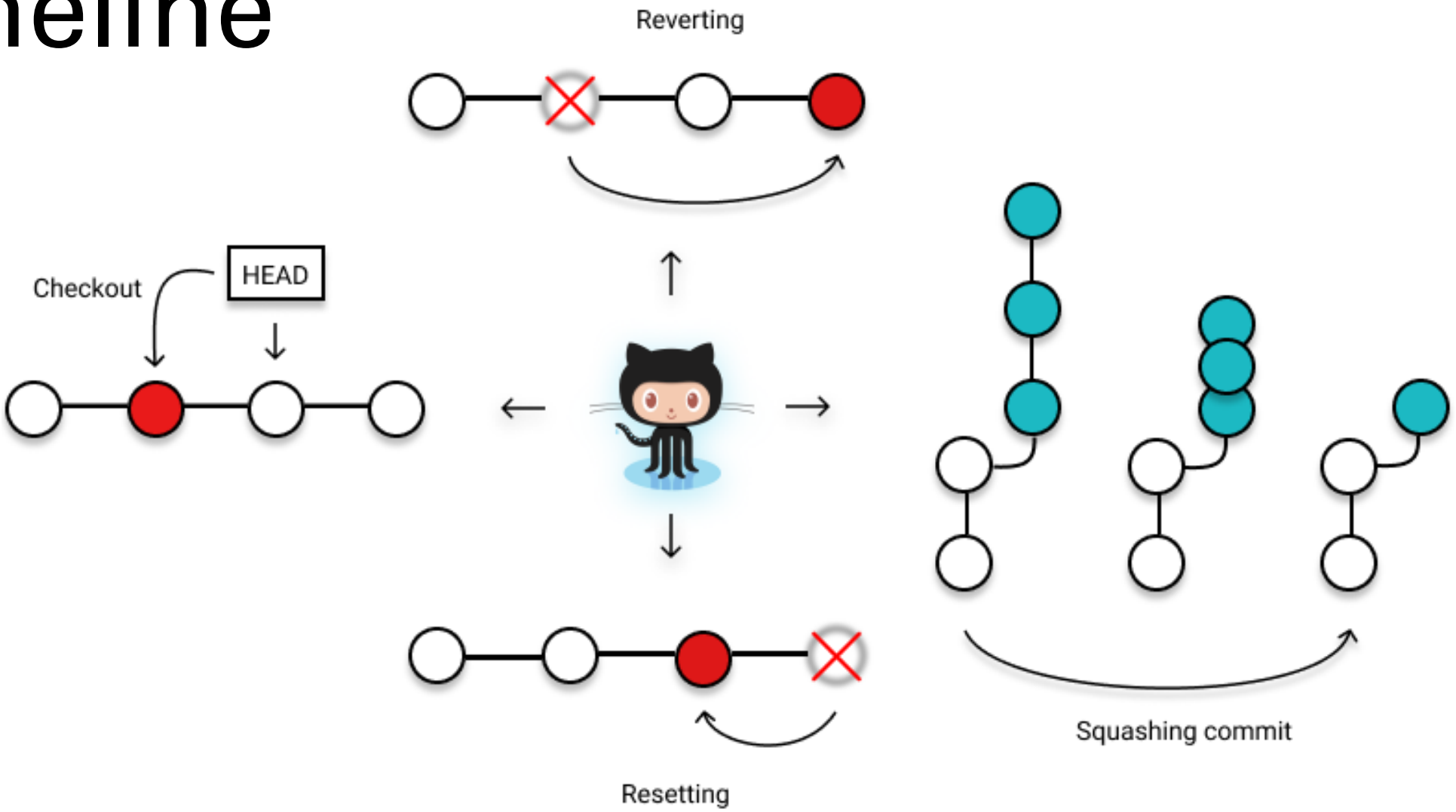
Diff Tools and Merge Conflicts



Undo Mistakes: Yours or others!

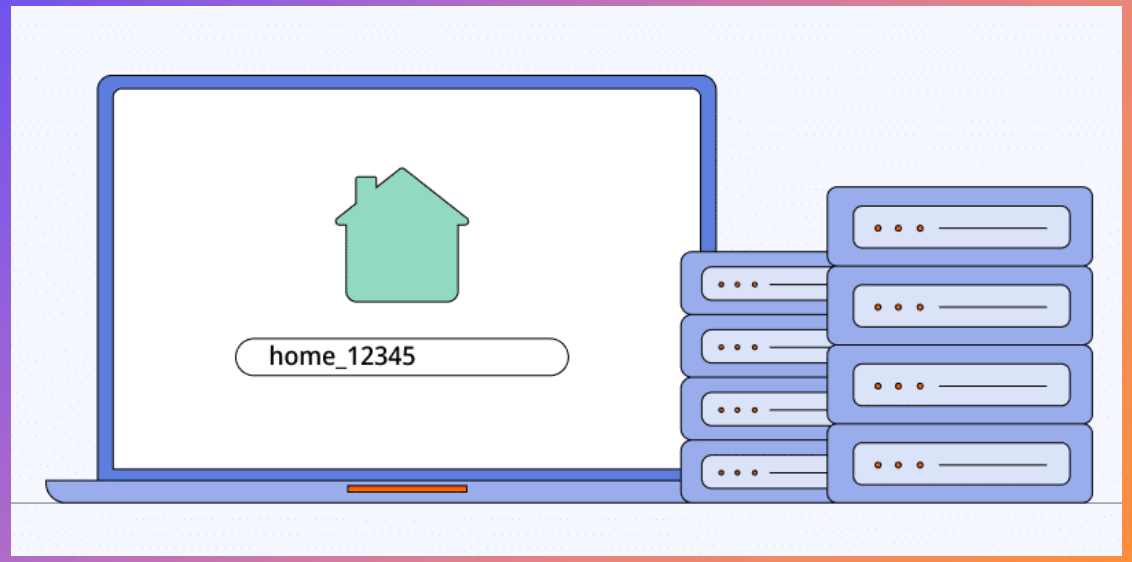
- Checkout different commits
- Revert changes that have already been committed
- Git reset HEAD will undo uncommited changes
- Stash allows you to hide away stuff you’re working on that might be not ready to commit so you can grab or show off other work then return the stash to your working code later

Timeline



Hosting

- You may not want to use a Microsoft based service to host your own code
- You might want to host your own code
- Upside: Unlimited Power/Control
- Downside: reliability / maintenance – knowledge base

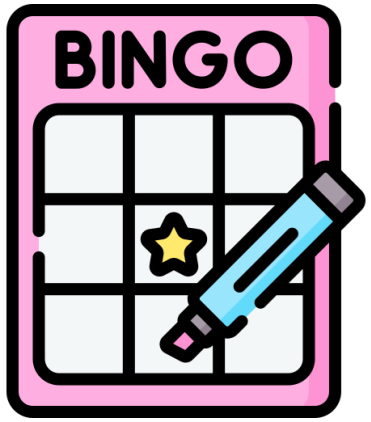


- https://github.com/PowerShell/Win32-OpenSSH/wiki/Setting-up-a-Git-server-on-Windows-using-Git-for-Windows-and-Win32_OpenSSH

- https://www.linuxfoundation.org/blog/blog/classic-sysadmin-how-to-run-your-own-git-server

Swag! Get free stuff

https://education.github.com/pack



THANK YOU

Erin Michno Hughes
e.hughes@abertay.ac.uk