A quick guide to GitHub
Software Engineering for Scientists

Jacob Stanley, Mary Allen

Version control is a system designed to manage changes to files for a project. The basic functionality of a version control system includes:

- keeping track of changes
- synchronizing code between developers and users
- allowing developers to test changes without losing the original
- reverting back to an old version
- tagging specific versions

Creating a repository

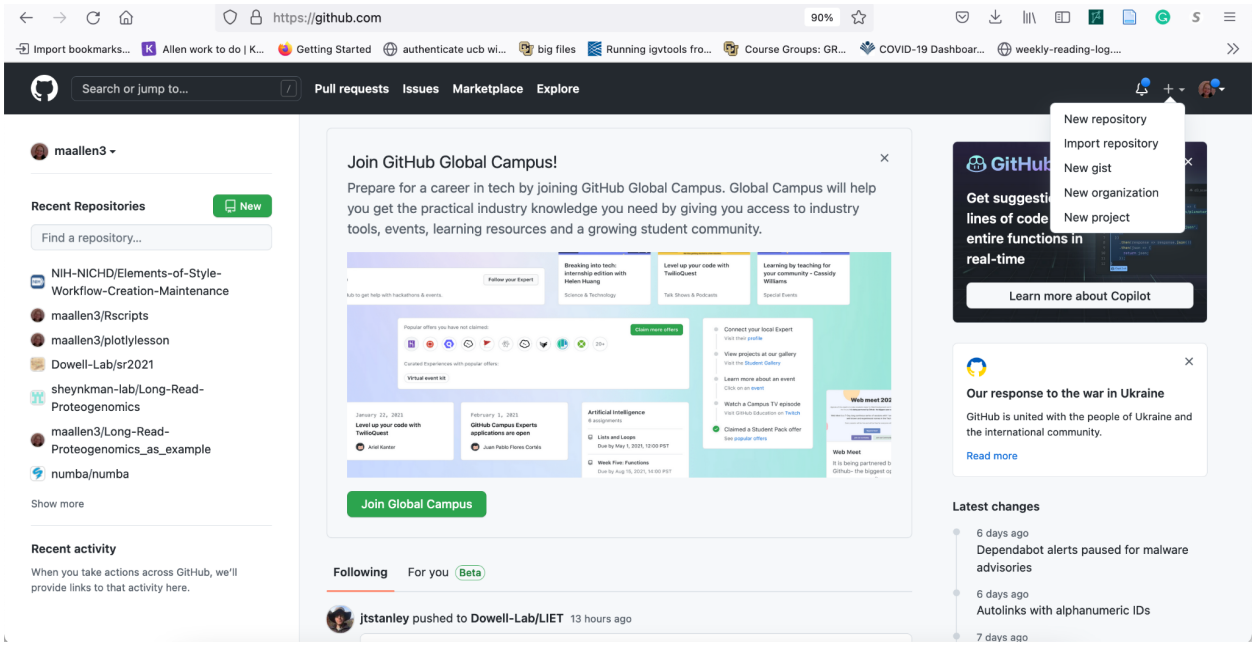
On your GitHub page if you select the “Repositories” tab, it will bring you to the list of your repos. At the top right you’ll see a green button “New”, which will bring up the “Create a new repository” page.

To create your new repository, specify a name, whether or not it’s public or private, and whether or not to include a README and a license.

It is recommended that you include a README. This file is a markdown file that will be displayed on your repo’s page, below all the files. These README are useful for providing information about the contents of your software and how it can be run.

The license is also important because it is required for a piece of software to be truly “open source.” For an explainer on the choice of licence, see here.

Once you have specified all the above information, click the green button “Create repository”


https://github.com
90%
Import bookmarks...
Allen work to do | K...
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authenticate ucb wi...
big files
Running igvtools fro...
Course Groups: GR...
COVID-19 Dashboar...
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New organization
New project
maallen3
Recent Repositories
New
Find a repository...
NIH-NICHD/Elements-of-Style-Workflow-Creation-Maintenance
maallen3/Rscripts
maallen3/plotlylesson
Dowell-Lab/sr2021
sheynkman-lab/Long-Read-Proteogenomics
maallen3/Long-Read-Proteogenomics_as_example
numba/numba
Show more
Recent activity
When you take actions across GitHub, we'll provide links to that activity here.
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jtstanley pushed to Dowell-Lab/LIET 13 hours ago
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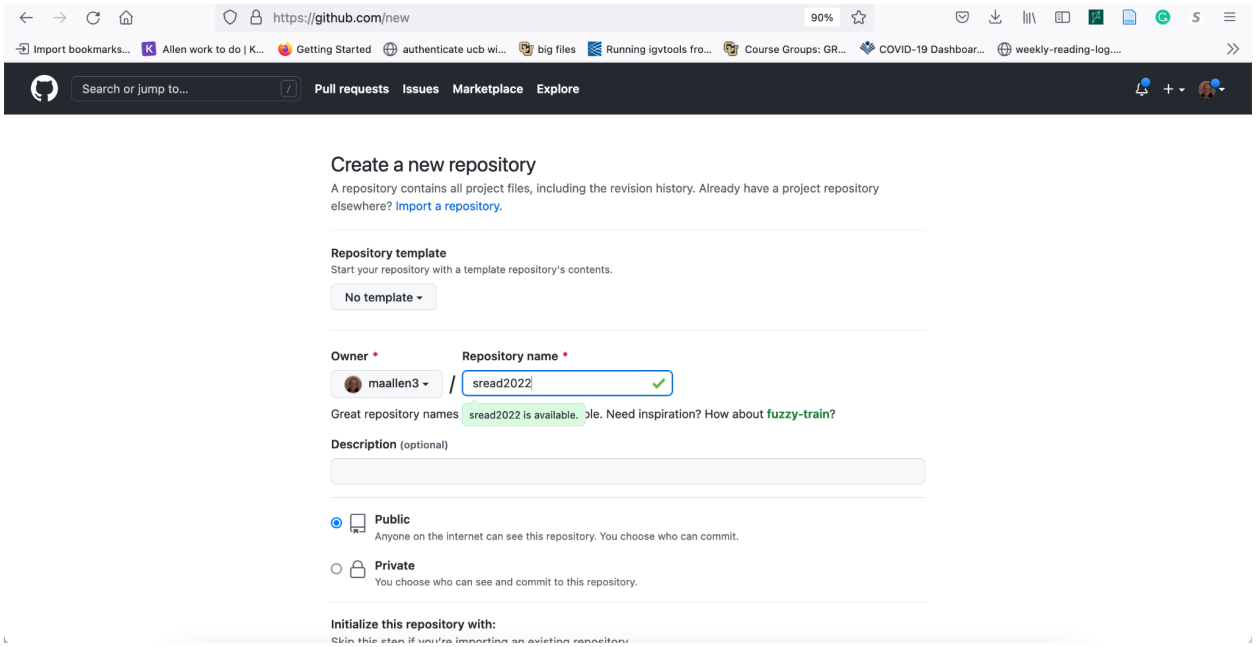
GitHub is united with the people of Ukraine and the international community.
Read more
Latest changes
6 days ago
Dependabot alerts paused for malware advisories
6 days ago
Autolinks with alphanumeric IDs
7 days ago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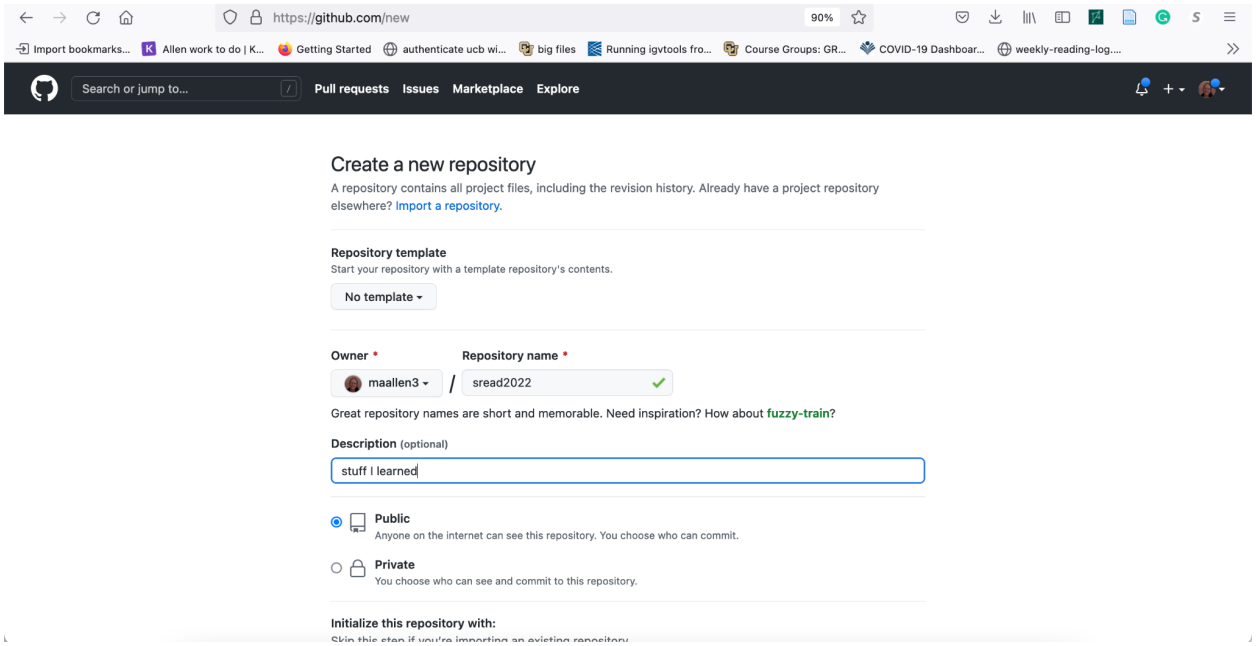
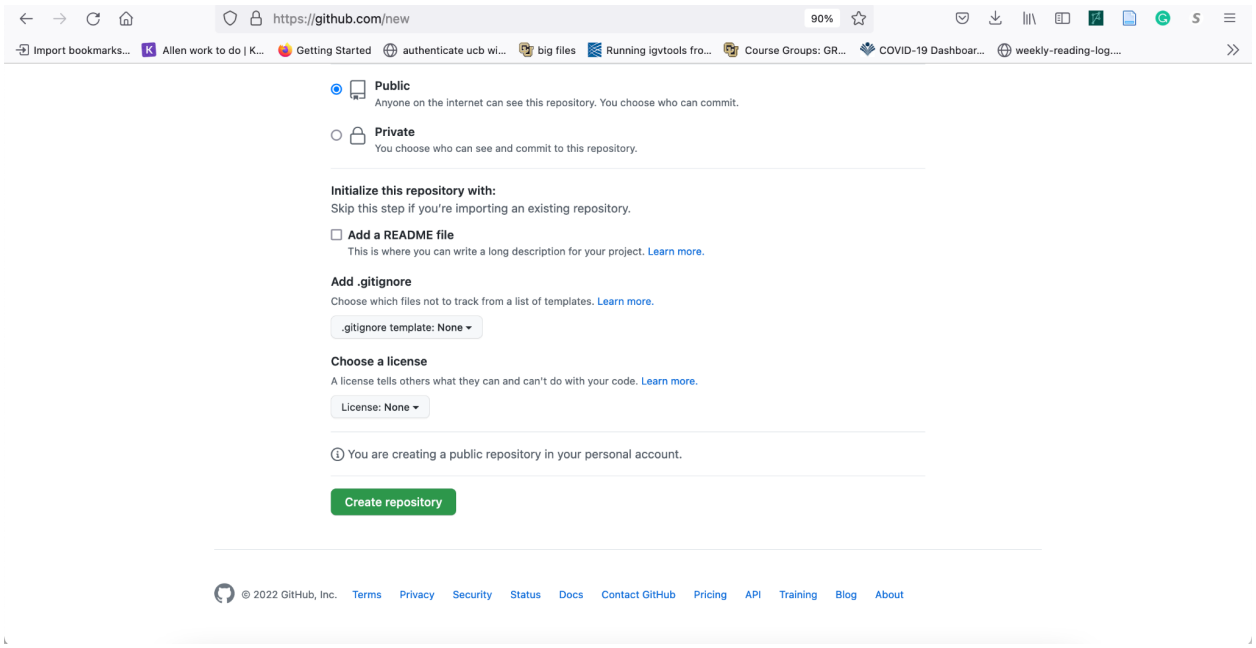
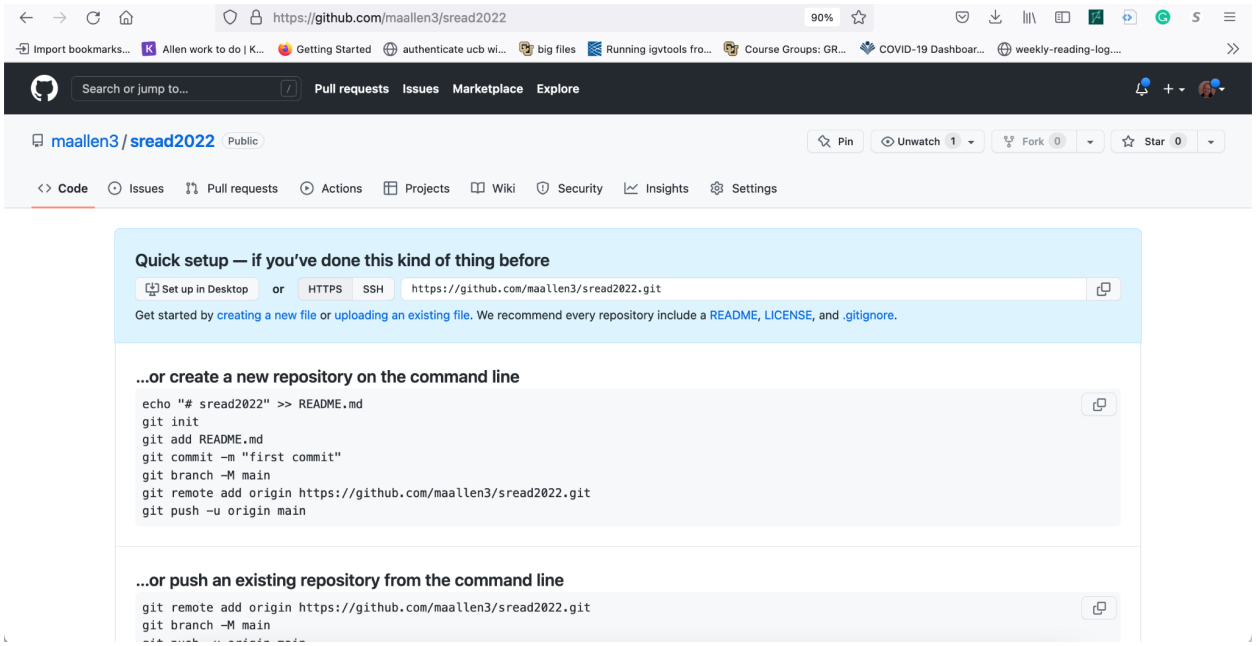
Create a new repository
A repository contains all project files, including the revision history. Already have a project repository elsewhere? Import a repository.
Repository template
Start your repository with a template repository's contents.
No template
Owner *
Repository name *
maallen3
sread2022
Great repository names sread2022 is available. Need inspiration? How about fuzzy-train?
Description (optional)
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:



Check add readme and chose a license. Then click create a repository.



You will get this page. Copy the address that ends in .git.



Clone the git repository

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Clone the repository

Now that you've created a *remote* repository on GitHub, you will have to run the "clone" command to create a copy of it *locally* on your computer. On the repo page click the green "Code" button which will bring up the clone menu. Copy the appropriate link.

Run `git clone` with the copied link. This will download the contents of the repo and create the local repo in the current directory in a folder with the name of the repo.

```
maryallen — maallen3@ip-172-31-18-92:~/sread2022 — ssh maallen3@3.136.149.251 — 162×26
[maallen3@ip-172-31-18-92 ~]$ pwd
/Users/maallen3
[maallen3@ip-172-31-18-92 ~]$ ls
[maallen3@ip-172-31-18-92 ~]$ git clone https://github.com/maallen3/sread2022.git
Cloning into 'sread2022'...
warning: You appear to have cloned an empty repository.
[maallen3@ip-172-31-18-92 ~]$ ls
sread2022
[maallen3@ip-172-31-18-92 ~]$ cd sread2022/
[maallen3@ip-172-31-18-92 sread2022]$ ls
```

But it's empty. Let's add a file.

```
[maallen3@ip-172-31-18-92 sread2022]$ scp /scratch/Shares/public/sread2022/scripts/day5/d5-fastq-to-bam.sbatch /Users/maallen3/sread2022/
[maallen3@ip-172-31-18-92 sread2022]$ s
bash: s: command not found...
[maallen3@ip-172-31-18-92 sread2022]$ ls
d5-fastq-to-bam.sbatch
[maallen3@ip-172-31-18-92 sread2022]$
```

Git pull and push

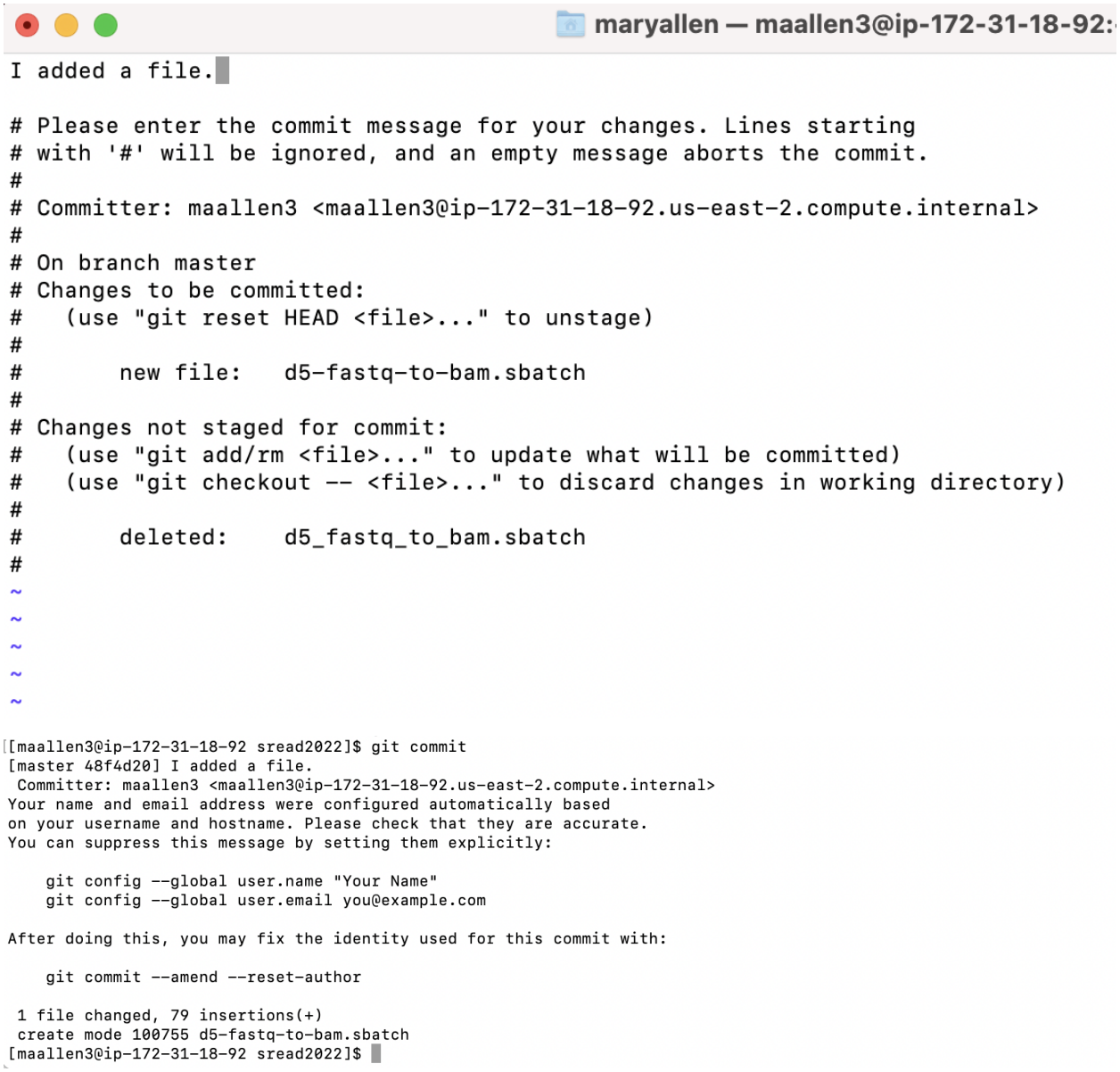
Now that we have added a file… we need to update the github repository. To do that we do

Git add <filename> #tell the code which files to add
Git commit #tell the code why you changed it
Git push #push it up to the internet

I'm going to add all files in the directory so I use *.

```
[maallen3@ip-172-31-18-92 sread2022]$ git add *
[maallen3@ip-172-31-18-92 sread2022]$ git commit
```

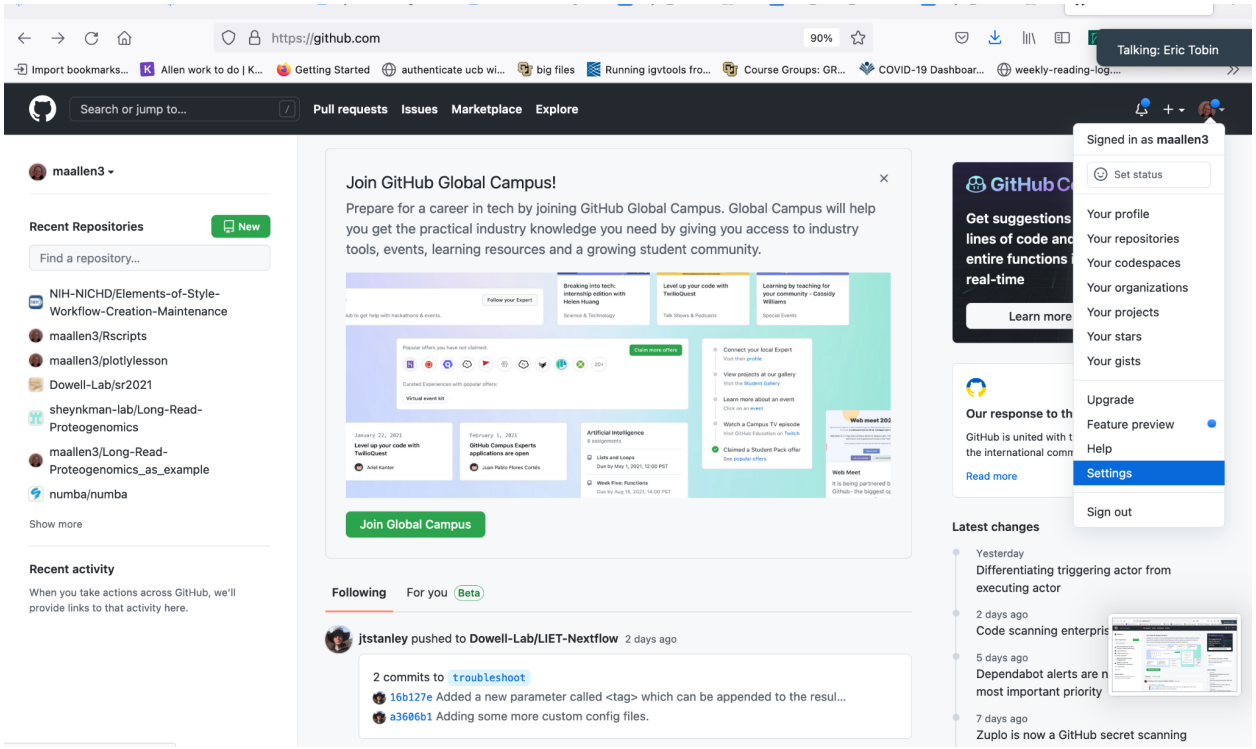
When you commit you will go to a new screen. This screen is running vim and wants you to write down what you did. What you put here will be forever on the internet. Check out https://twitter.com/gitlost?lang=en.



The first time you push you will get an error… But we are going to fix that later.

```
[maallen3@ip-172-31-18-92 sread2022]$ git push
warning: push.default is unset; its implicit value is changing in
Git 2.0 from 'matching' to 'simple'. To squelch this message
and maintain the current behavior after the default changes, use:

  git config --global push.default matching

To squelch this message and adopt the new behavior now, use:

  git config --global push.default simple

See 'git help config' and search for 'push.default' for further information.
(the 'simple' mode was introduced in Git 1.7.11. Use the similar mode
'current' instead of 'simple' if you sometimes use older versions of Git)

Username for 'https://github.com': maallen3
Password for 'https://maallen3@github.com':
No refs in common and none specified; doing nothing.
Perhaps you should specify a branch such as 'master'.
Everything up-to-date
[maallen3@ip-172-31-18-92 sread2022]$
```

The first time you push you need to enter a GitHub “password”. The weird thing is that when they say the password. They don’t mean your GitHub password. Github wants a “Personal Acces token. So you should go get one of those.



https://github.com/settings/profile 90%

Talking: Eric Tobin

Import bookmarks... Allen work to do | K... Getting Started authenticate ucb wi... big files Running igvtools fro... Course Groups: GR... COVID-19 Dashboar... weekly-reading-log....

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Dr. Mary Ann Allen
Your personal account Switch to another account

Go to your personal profile

- Public profile
- Account
- Appearance
- Accessibility
- Notifications

Access
- Billing and plans
- Emails
- Password and authentication
- SSH and GPG keys
- Organizations
- Moderation

Code, planning, and automation
- Repositories
- Packages
- GitHub Copilot
- Pages
- Saved replies

Public profile

Name
Dr. Mary Ann Allen
Your name may appear around GitHub where you contribute or are mentioned. You can remove it at any time.

Public email
Mary.A.Allen@colorado.edu Remove
You can manage verified email addresses in your email settings.

Bio
I am a scientist
You can **@mention** other users and organizations to link to them.

URL
http://dna.colorado.edu/

Twitter username

Company
Univeristy of Colorado - Boulder

Profile picture

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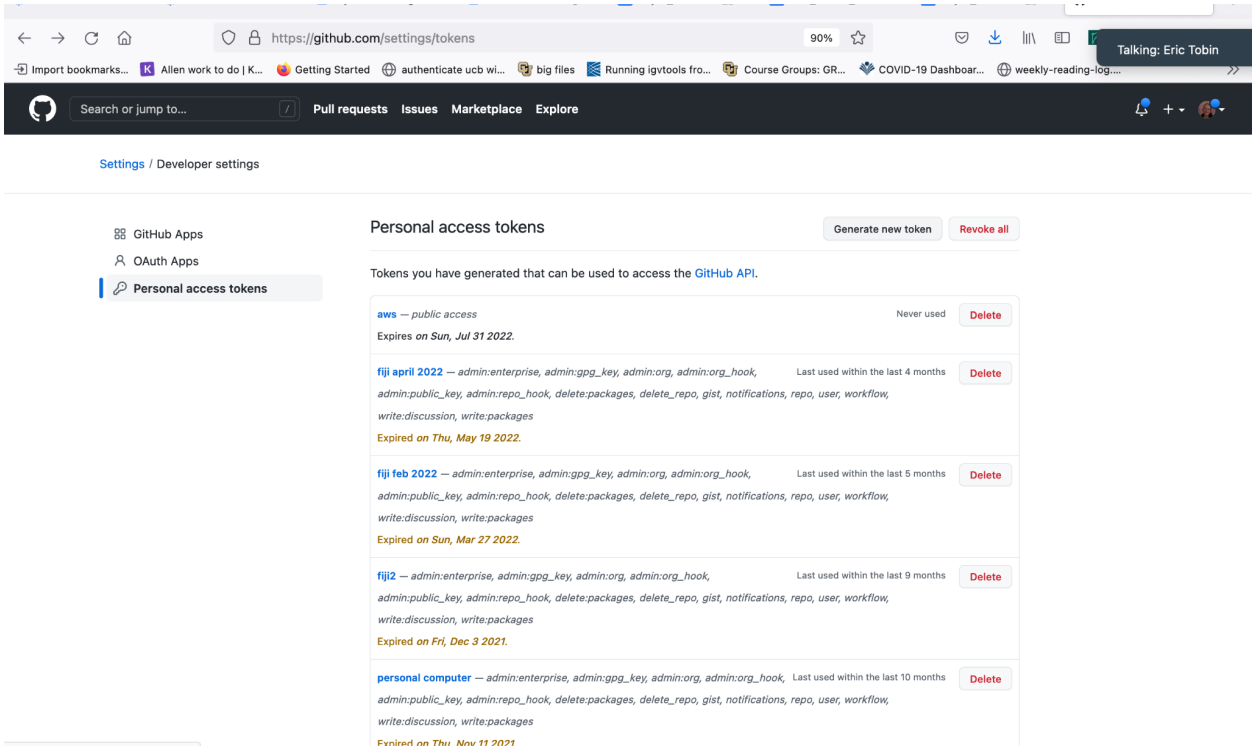
Settings / Developer settings

- GitHub Apps
- OAuth Apps
- Personal access tokens

GitHub Apps

New GitHub App

Want to build something that integrates with and extends GitHub? Register a new GitHub App to get started developing on the GitHub API. You can also read more about building GitHub Apps in our developer documentation.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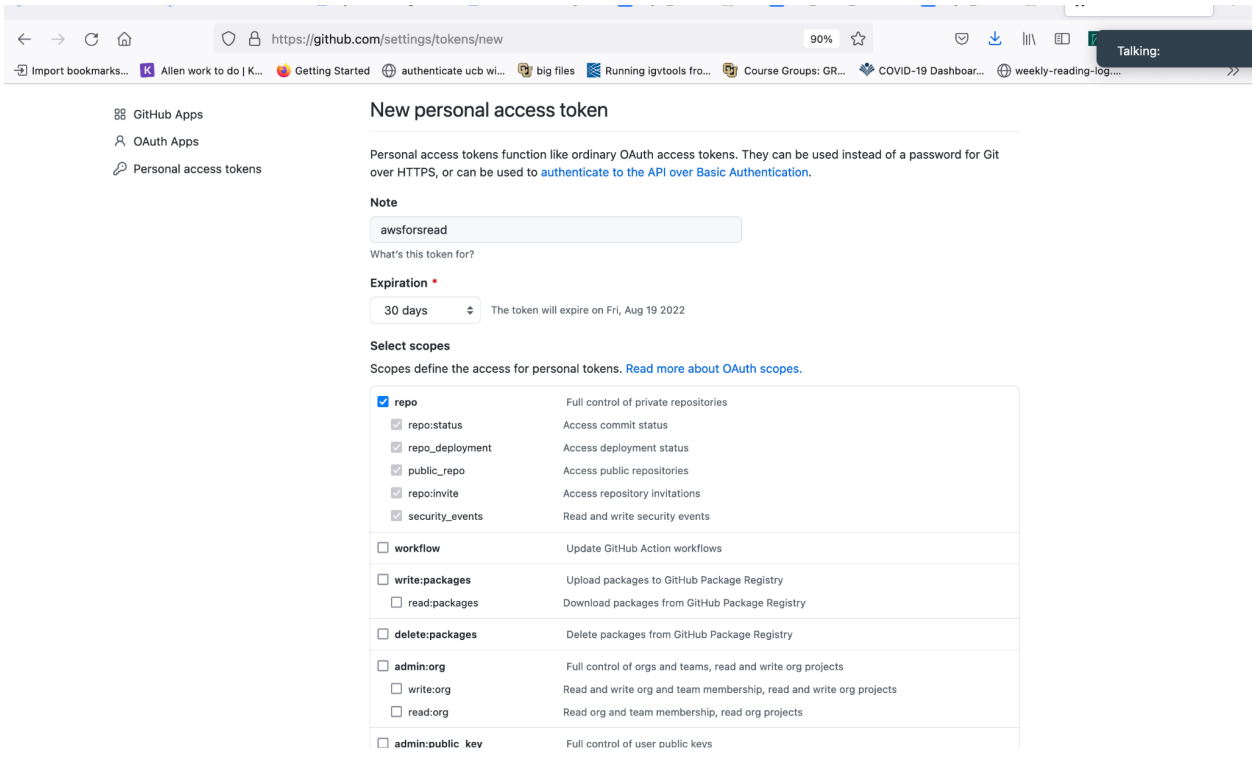
Personal access tokens
Personal access tokens
Generate new token
Revoke all
Tokens you have generated that can be used to access the GitHub API.
aws — public access
Never used
Delete
Expires on Sun, Jul 31 2022.
fiji april 2022 — admin:enterprise, admin:gpg_key, admin:org, admin:org_hook, admin:public_key, admin:repo_hook, delete:packages, delete_repo, gist, notifications, repo, user, workflow, write:discussion, write:packages
Last used within the last 4 months
Delete
Expired on Thu, May 19 2022.
fiji feb 2022 — admin:enterprise, admin:gpg_key, admin:org, admin:org_hook, admin:public_key, admin:repo_hook, delete:packages, delete_repo, gist, notifications, repo, user, workflow, write:discussion, write:packages
Last used within the last 5 months
Delete
Expired on Sun, Mar 27 2022.
fiji2 — admin:enterprise, admin:gpg_key, admin:org, admin:org_hook, admin:public_key, admin:repo_hook, delete:packages, delete_repo, gist, notifications, repo, user, workflow, write:discussion, write:packages
Last used within the last 9 months
Delete
Expired on Fri, Dec 3 2021.
personal computer — admin:enterprise, admin:gpg_key, admin:org, admin:org_hook, admin:public_key, admin:repo_hook, delete:packages, delete_repo, gist, notifications, repo, user, workflow, write:discussion, write:packages
Last used within the last 10 months
Delete


https://github.com/settings/tokens/new
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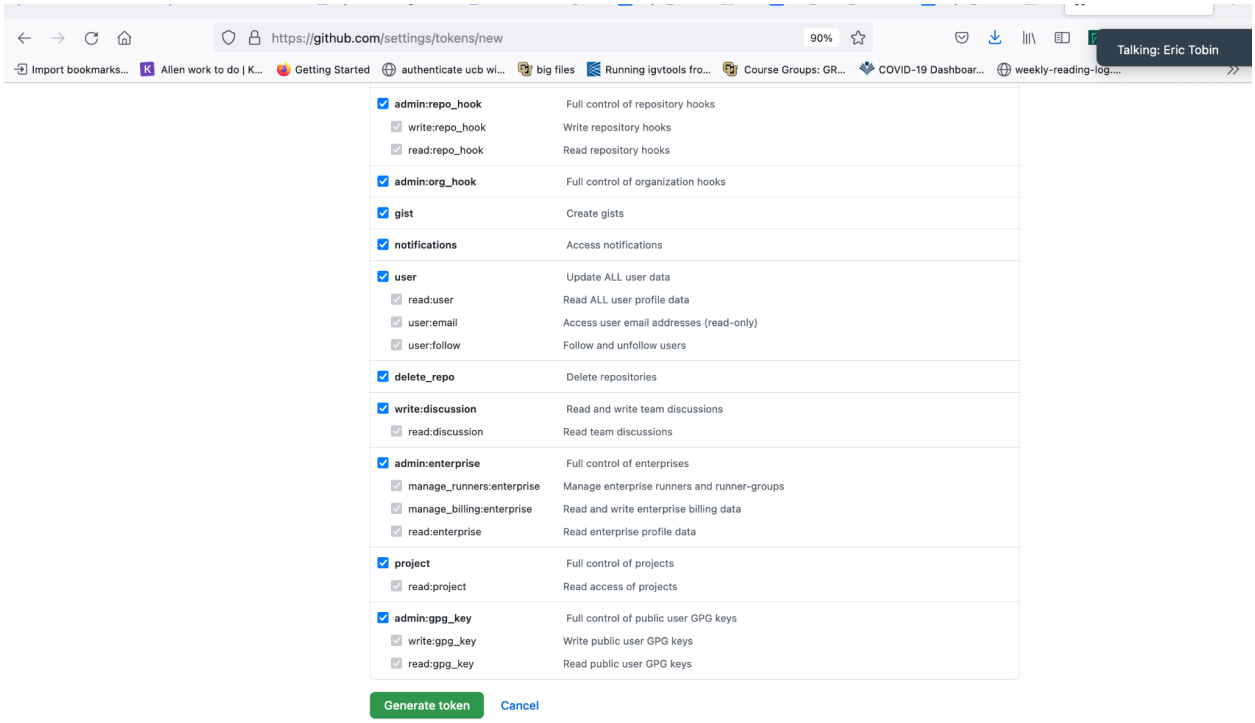
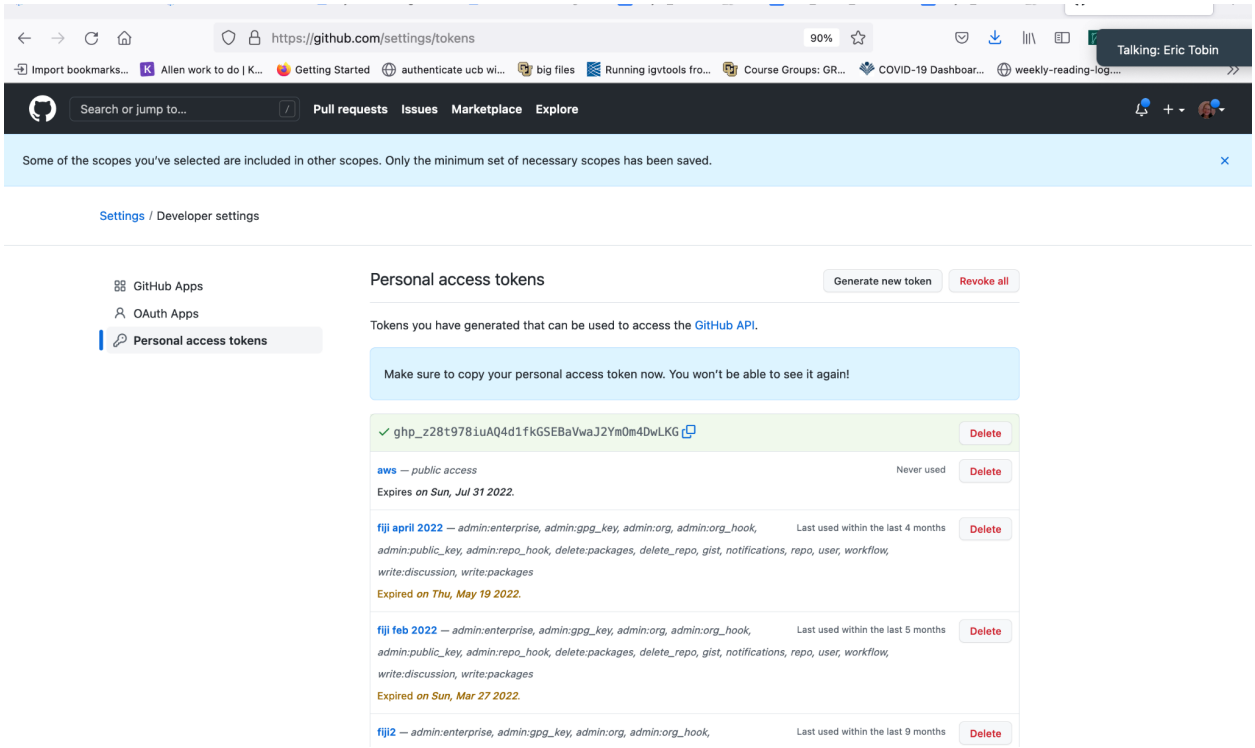
GitHub Apps
OAuth Apps
Personal access tokens
New personal access token
Personal access tokens function like ordinary OAuth access tokens. They can be used instead of a password for Git over HTTPS, or can be used to authenticate to the API over Basic Authentication.
Note
awsforsread
What's this token for?
Expiration *
30 days
The token will expire on Fri, Aug 19 2022
Select scopes
Scopes define the access for personal tokens. Read more about OAuth scopes.
repo
Full control of private repositories
repo:status
Access commit status
repo_deployment
Access deployment status
public_repo
Access public repositories
repo:invite
Access repository invitations
security_events
Read and write security events
workflow
Update GitHub Action workflows
write:packages
Upload packages to GitHub Package Registry
read:packages
Download packages from GitHub Package Registry
delete:packages
Delete packages from GitHub Package Registry
admin:org
Full control of orgs and teams, read and write org projects
write:org
Read and write org and team membership, read and write org projects
read:org
Read org and team membership, read org projects
admin:public_key
Full control of user public keys






```
[maallen3@ip-172-31-18-92 sread2022]$ git config --global push.default simple
```

```
[maallen3@ip-172-31-18-92 sread2022]$ git push
Username for 'https://github.com': maallen3
Password for 'https://maallen3@github.com':
Counting objects: 6, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (6/6), done.
Writing objects: 100% (6/6), 2.08 KiB | 0 bytes/s, done.
Total 6 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), done.
To https://github.com/maallen3/sread2022.git
 * [new branch]      master -> master
[maallen3@ip-172-31-18-92 sread2022]$
```

More information

https://docs.google.com/document/d/1ziARSvSyzSjTQXvMus5AstEBKsQa3t86/edit