This document is for the hands-on part of the workshop series: Working with Command Line and Collaborating with Git

Part 1. Introduction to Git and GitHub

Slides

Please download or view slides following this link: https://docs.google.com/presentation/d/1QG-Ax-jETaHD0DL9wdzZcuMNdT7REQnuPCX2i9AKETI/edit?usp=sharing

Outline:

Session 1: [Bash] Introduction, fundamentals

- How computer interfaces have changed over time
- Start moving around your computer's folders in the terminal
- Create files, folders and placeholders
- How to search for files

Session 2: [Bash] Working with files, intro to loops and shell scripting

- Inspect and transform files
- How to write loops
- Create a runnable script

Session 3: [Git] Introduction to Git and GitHub

- Understand version control, Git, and GitHub
- Build a mental model of the Git system
- Learn and practice basic Git commands

Session 4: [Bash] Loops recap + Bash scripting for Research tasks automation

- Write scripts that process multiple files
- Run or schedule scripts for data processing or analysis
- Use AI-powered chatbots to design and write bash scripts

Session 5: [Git] Collaborating on GitHub

- Understand basic collaboration workflows using Git and GitHub
- Apply Git commands and workflows in a demo repository
- Learn best practices for collaboration with Git

Hands-on

Important note: Please follow these instructions to **install Bash Shell and Git** ahead of time, especially if you are using a Windows computer. Make sure to download the file (cookie_recipes.txt) that we will be using during the workshop.

Refresher: Manipulate files with Bash commands

Create a new directory called `cookbook` for the project in `Desktop`; enter that directory; and check that you are in the right directory.

```
$ mkdir ~/Desktop/cookbook
$ cd ~/Desktop/cookbook/
$ pwd
$ ls -a
```

Move downloaded file to the newly created directory

```
$ mv ~/Downloads/cookie_recipes.txt .
$ ls
```

Open file to edit

```
$ open cookie_recipes.txt
```

Or

```
$ nano cookie_recipes.txt
```

Creating Git repository

Now, let's convert this project (the `cookbook` directory) into a git repository.
Before we do that, let's make sure out git is set up properly.

```
$ pwd
$ ls -a
$ git --version    # check that git is installed, and the version installed
```

```
$ git status
"fatal: not a git repository (or any of the parent directories): .git"

$ git init
Initialized empty Git repository in /Users/huajinw/Desktop/cookbook/.git/
```

What's happening?

```
$ ls -a
$ ls -F .git
```

```
bash-3.2$ ls -a
.                       .git
..                      cookie_recipes.txt
bash-3.2$ ls -F .git
COMMIT_EDITMSG  description     hooks/          info/           objects/
config          HEAD            index           logs/           refs/
```

.git is a hidden folder that is the core of the Git project. It's the **local repository** that stores all the metadata, history, configuration, and objects (files and changes) for the project.

Tracking changes

```
$ git status
```

```
On branch main

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        cookie_recipes.txt

nothing added to commit but untracked files present (use "git add" to track)
```

At this step git repository empty, meaning that it's not tracking / indexing any files.
Now let's tell Git what files to keep track of, and commit the change.

```
$ git add cookie_recipes.txt    # add files to the staging area
$ git status
```

```
On branch main

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   cookie_recipes.txt
```

```
$ git commit –m "add cookie_recipes file"
$ git status
```

```
bash-3.2$ git status
On branch main
nothing to commit, working tree clean
```

Examining changes

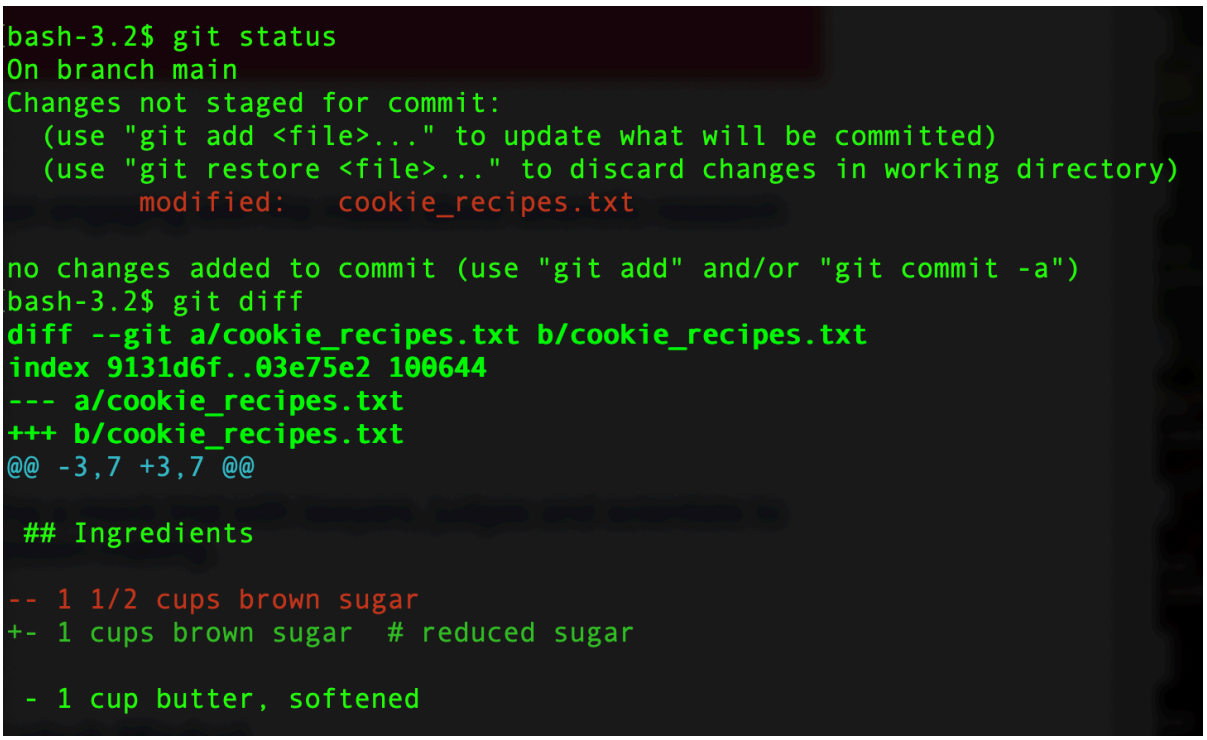
Now, let's make some changes to the `cookie_recipes.txt` file, and see how Git handles these changes.

First, use nano or any other text editor to change sugar amount from 1 1/2 cups to 1 cup. Save changes.

```
$ nano cookie_recipes.txt
$ cat cookie_recipes.txt
```

```
$ git status
$ git diff
```

`git diff` shows the differences between the current state of the file and the most recently saved version




```
$ git add .
$ git commit –m "reduce sugar content for the kids"
```

Exploring history

```
$ git status
$ git log
```

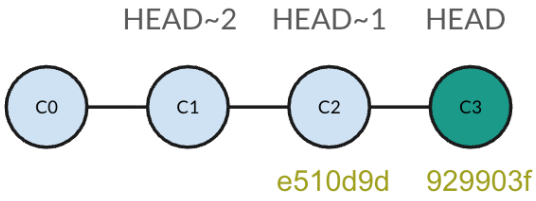
`git log` lists all commits made to a repository in reverse chronological order.

```
bash-3.2$ git log
commit 929903f06d85b17c49bc86a4c0786daa46350ff7 (HEAD -> main)
Author: Huajin Wang <23021719+huajinw@users.noreply.github.com>
Date:   Mon Feb 9 13:39:31 2026 -0500

    reduce sugar content for the kids

commit e510d9d8c042b076836f21c90f95575b45e93354
Author: Huajin Wang <23021719+huajinw@users.noreply.github.com>
Date:   Sat Feb 7 22:06:11 2026 -0500

    add cookie_recipes file
```




```
$ git diff HEAD~1 cookie_recipes.txt

$ git diff e510d9 cookie_recipes.txt
```

You can use `checkout` to restore to a previous commit.

```
$ git checkout HEAD~1 cookie_recipes.txt
$ cat cookie_recipes.txt
$ git status
```

```
bash-3.2$ git status
On branch main
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   cookie_recipes.txt
```

Caution: Don’t Lose Your HEAD

Don't forget to include the file name when you checkout, otherwise Git would think that you want to move the HEAD position.

```
$ git checkout HEAD~1  # Caution! this line leads to detached head.
```

To recover / reattached the head:

```
$ git switch -
or
$ git checkout main
```