

A very brief introduction to Git

Jon Tjun Seng Lo Kim Lin
jlokimlin@math.ucsb.edu

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You broke the build! - **Anonymous**

Outline

- 1 Motivation
- 2 Where can I get Git?
- 3 Intro and basic commands
- 4 Remote repositories
- 5 Resources

What is the purpose of git?

- Suppose you're an exemplary grad student, working **very** diligently on your research.
- As you're progressing through your project, it is natural for you to experiment.
- Then you realize, your experiment/the direction you took went awry.
- You reach a point where you say **"D#@&\$....why did I not save that earlier version of my project!"**

Git comes to the rescue

- No more saving version1.f90, version2.f90, version3.f90, version4.f90, version5.f90,... of your code.
- Git will assist in tracking your revisions.
- More formally, Git is a **distributed version control (DVC)** and **source code management (SCM)** system.
- More importantly however, **Git is your new best friend!**

The basics of Git

- 1 Where can I get Git?
- 2 Intro and basic commands
- 3 Remote repositories
- 4 Resources

Where can I get Git?

Installing Git: You can either install it as a package or via another installer, or download the source code and compile it yourself.

Installing on Mac

- A Mac OS X Git installer is maintained and available for download at <http://git-scm.com/download/mac>, or better yet;
- **Homebrew**, the missing package manager for OS X, allows you to easily install hundreds of open-source tools, see: <https://brew.sh/>

With Homebrew, installing Git is as easy as this:

```
brew update  
brew install git
```

- For more detailed instructions, see: <http://kj-prince.com/install-git-mac-osx-homebrew/>.

Installing on Windows

Windows:<http://msysgit.github.io/>

Installing on GNU/Linux

Use the [package-manager](#) that comes with your distribution.

- If you're on a Debian-based distribution like Ubuntu, try `apt-get`:

```
$ sudo apt-get install git
```

- If you're on Fedora for instance, try `yum`:

```
$ sudo yum install git-all
```

For different Unix-like flavors, see:

<http://git-scm.com/download/linux>.

Basic commands

- `git init` - initializes a Git repository.
- `git add` - adds files to your repository.
- `git commit` - creates a commit. Commits allow Git to keep track of your revisions, similar to saving files.
- `git status` - shows the status of your Git repository (i.e. what files have been changed, what files are not accounted for, etc).

The basic Git workflow is

- **modify files** in your working directory.
- **stage files** you've worked on. This prepares a snapshot of the directory
- **commit the files** you've staged. This stores that snapshot in the git repository.

Initializing repositories

To initialize a new project, in the project directory, initialize the git repository with:

```
git init
```

The second way is:

```
git clone https://github.com/jlokimlin  
/intro\_to\_git.git
```

Warning: Each new repository should be in its own directory. One git repository should **not** be created or cloned in an **existing git repository**, i.e., a folder you've initialized a git repository and its subfolders.

Configuring Git

You will have to do this **once** per computer you use `git config --global`:

```
git config --global user.name "Your_Avatar"  
git config --global user.email you@domain.com''  
git config --global core.editor vim  
git config color.ui auto
```

You can check your configuration with:

```
git config --list
```

Working locally

Right now, nothing in the project is tracked. First let's create some directories and files in our directory.

```
touch README.md
```

First, you need to tell git this file exists:

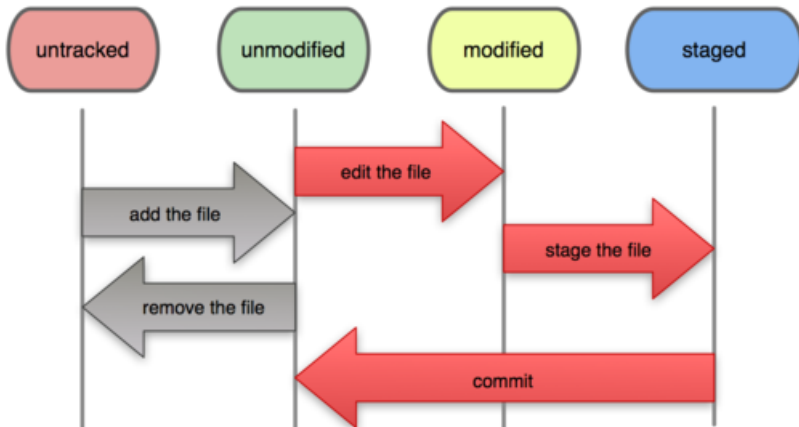
```
git add README.md
```

Now you can commit it:

```
git commit -m "Added a README file"
```

At this point, you have one tracked file, and an initial commit.

File Status Lifecycle



The git status command

The `git status` command will display all untracked files, and modified and staged files in your directory:

```
touch AUTHORS.txt  
git status
```

Now, try

```
git add AUTHORS.txt  
git status
```

`git add` is also used to stage file. In fact, running `git add` on an untracked file not only tracks it, but stages it.

```
git commit -m "Added the AUTHORS file"
```

And here is the second commit!

Tracking changes to a modified file

Sometimes, you may want to look at the changes you've made to a modified file:

```
git diff
```

To look at the changes you've made in the staged files, simply use:

```
git diff --cached
```

And to view the history of all commits:

```
git log
```

(Re)moving files

- **Deleting files:** Why use `git rm` to remove a file instead of `rm`?
 - If you just use `rm`, you will need to follow it up with `git add <fileRemoved>` The command `git rm` does both in one step.
 - You can also use `git rm --cached` which will remove the file from the index (staging it for deletion on the next commit), but keep your copy in the local file system.
- **Moving files:** In a similar fashion, `git mv` can be used to move a file in one step.

Canceling stages

Two scenarios may occur:

- 1 you staged a file you do not want to commit
- 2 you made some changes on a file you want to cancel.

First, let's assume you've staged a file you want to unstage:

```
touch myFile.tex  
git add myFile.tex
```

To unstage it, run:

```
git reset HEAD myFile.tex
```

Second, say you've modified a file and you want to cancel the changes.

```
git checkout myFile.tex
```

Remote repositories - Main competitors

- GitHub: <https://github.com/>
- Bitbucket: <https://bitbucket.org/>

Create your own remote repository

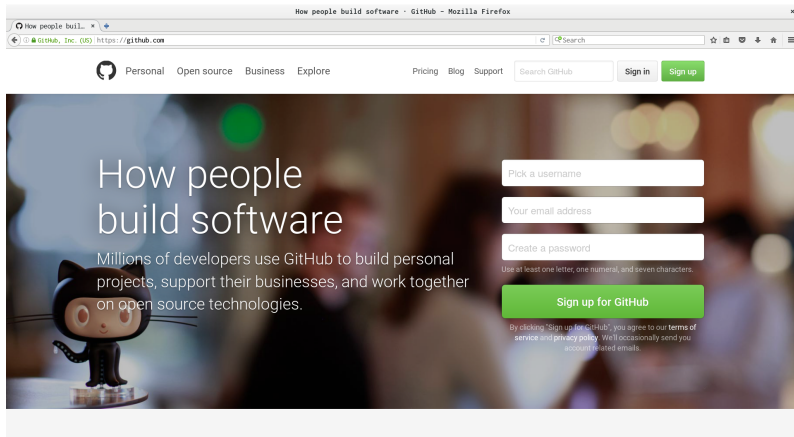
Create your own repository on [GitHub](#) (\$7 a month for private repo's) or [Bitbucket](#) (free unlimited private repo's).

This can be for an existing or a new project.

More commands:

- `git clone` - imports a remote repository.
- `git pull` - extracts most recent changes from a repository.
- `git push` - broadcast your changes to a repository.

A distant repository with GitHub



GitHub profile


jlokinlin (Jon Lo Kim Lin) - Mozilla Firefox

jlokinlin (Jon Lo Kim Lin) x

GitHub, Inc. (US) https://github.com/jlokimlin

Search

Contributions Repositories Public activity Edit profile



Jon Lo Kim Lin
jlokinlin

Goleta, California, United States
jlokinlin@gmail.com
Joined on Feb 26, 2015

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Popular repositories

- `array_passing_performance`
This project times the impact of various types o... 8 ★
- `cpu_timer`
An object-oriented approach for timing progra... 5 ★
- `lagrange_interpolator`
This Fortran project implements 1 and 2-dimen... 4 ★
- `gaussian_spherical_harmonic`
A object-oriented library in Fortran to perform s... 4 ★
- `stack_fortran`
This Fortran project implements the stack data ... 3 ★

Repositories contributed to

- `ruppeltog/quicksort`
Quicksort implemented in different languages 0 ★

Contributions

May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr

Summary of pull requests, issues opened, and commits. [Learn how we count contributions.](#)

Less More

Contributions in the last year
336 total
Apr 23, 2015 - Apr 23, 2016

Longest streak
8 days
March 28 - April 4

Current streak
0 days
Last contributed 4 days ago

Create new repository

Create a New Repository - Mozilla Firefox

Create a New Re... x

GitHub, Inc. (US) https://github.com/new

Search GitHub

Pull requests Issues Gist


🔔 + 🧑

Create a new repository

A repository contains all the files for your project, including the revision history.

Owner

Repository name

 jlokimlin / test ✓

Great repository names are short and memorable. Need inspiration? How about **solid-octo-bassoon**.

Description (optional)

A test repository for UCSB Hypatian Seminar

☒ Public

Anyone can see this repository. You choose who can commit.

☐ Private

You choose who can see and commit to this repository.

☐ Initialize this repository with a README

This will let you immediately clone the repository to your computer. Skip this step if you're importing an existing repository.

Add .gitignore: **None** | Add a license: **None** ⓘ

Create repository

Create a new repository (continued)

jlokimlin/test - Mozilla Firefox

jlokimlin/test [https://github.com/jlokimlin/test](#) Search

jlokimlin / test Unwatch 1 Star 0 Fork 0

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Quick setup — If you've done this kind of thing before
or [HTTPS](#) [SSH](#) <https://github.com/jlokimlin/test.git>

We recommend every repository include a [README](#), [LICENSE](#), and [.gitignore](#).

...or create a new repository on the command line

```
echo "# test" >> README.md
git init
git add README.md
git commit -m "first commit"
git remote add origin https://github.com/jlokimlin/test.git
git push -u origin master
```

...or push an existing repository from the command line

```
git remote add origin https://github.com/jlokimlin/test.git
git push -u origin master
```

...or import code from another repository
You can initialize this repository with code from a Subversion, Mercurial, or TFS project.

[Import code](#)

Create a new repository on the command line

```
mkdir /path/to/your/project
cd /path/to/your/project
echo "#_test" >> README.md
git init
git add README.md
git commit -m "first_commit"
git remote add origin
https://github.com/jlokimlin/test.git
git push -u origin master
```

Push an existing repository from the command line

```
mkdir /path/to/your/project  
cd /path/to/your/project  
git remote add origin  
https://github.com/jlokimlin/test.git  
git push -u origin master
```

Resources

- A personal favorite on Bitbucket for git:
<https://www.youtube.com/watch?v=BtEvnE79jxY>
- Everyday git with 20 commands:
<https://www.kernel.org/pub/software/scm/git/docs/everyday.html>
- Git tutorial:
<https://www.kernel.org/pub/software/scm/git/docs/gittutorial.html>
- The (overwhelming) Git manual page:
<https://www.kernel.org/pub/software/scm/git/docs/>

Thank you for your time