Git Tutorial

with GitKraken and GitHub

Setup

- If you haven't already, you need to:
  - Create a GitHub account (github.com)
  - Install GitKraken (gitkraken.com)

- You have ~5 minutes before we need it

Agenda

- Why version control?
- Using git locally
- Using GitHub
- Working collaboratively

Why Version Control?

- To save previous versions of your code (so you can go back if you make a mistake)
  - How many of you wish you could undo back to several days ago?
- To allow multiple people to collaborate on code
  - How many of you have been emailing projects/labs back and forth, or copying and pasting from a Google Doc, etc?

Version Control

- Projects with 10s of millions of lines code and 1000s programmers
- Not just for code!
  - I wrote a paper with 3 co-authors using a VCS (version control system)
  - A math textbook was written using a VCS

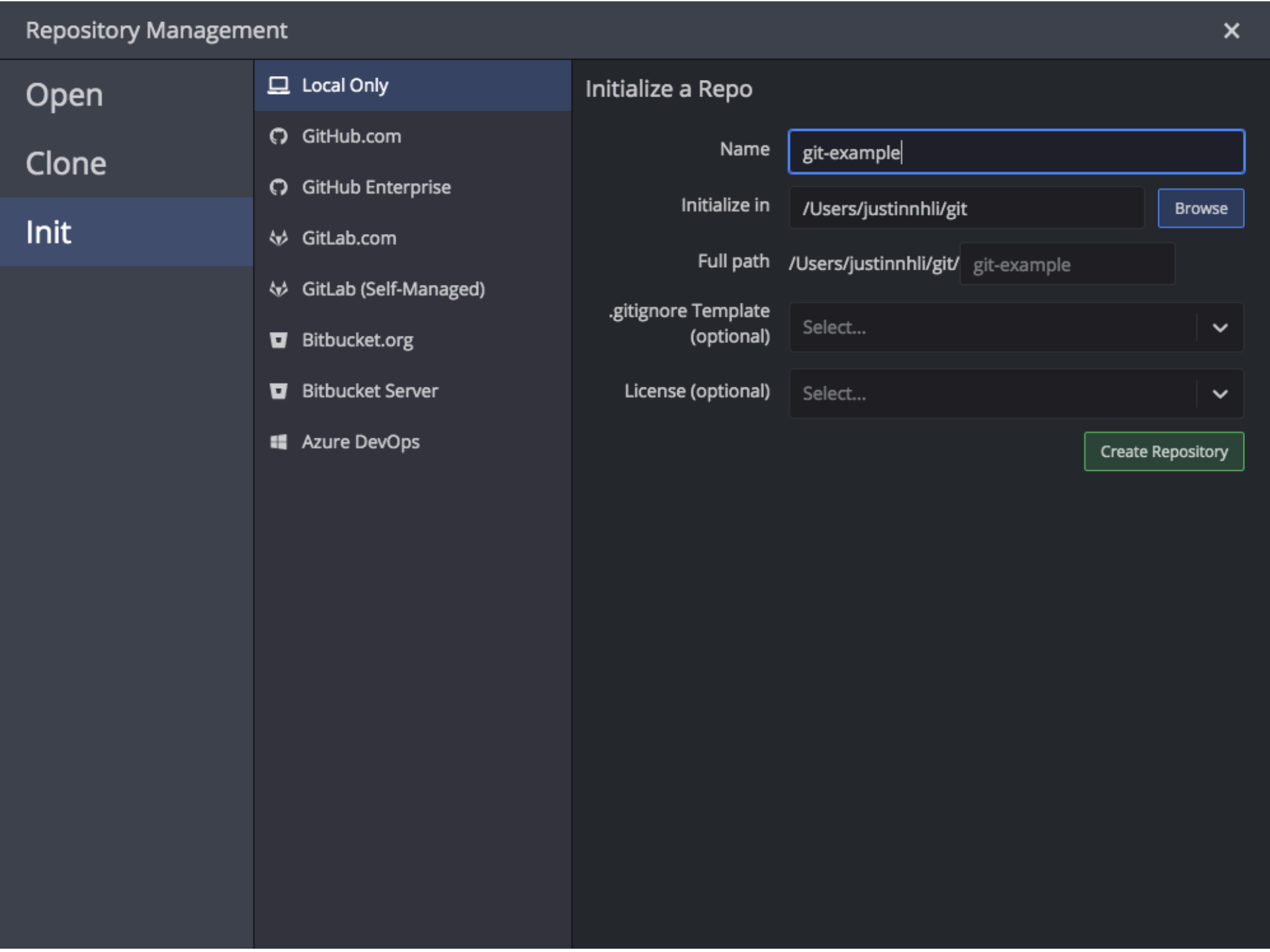
VCSs

- Many systems out there:
  - cvs
  - svn (subversion)
  - git
  - mercurial
- The basic idea is roughly the same

Getting Started with GitKraken

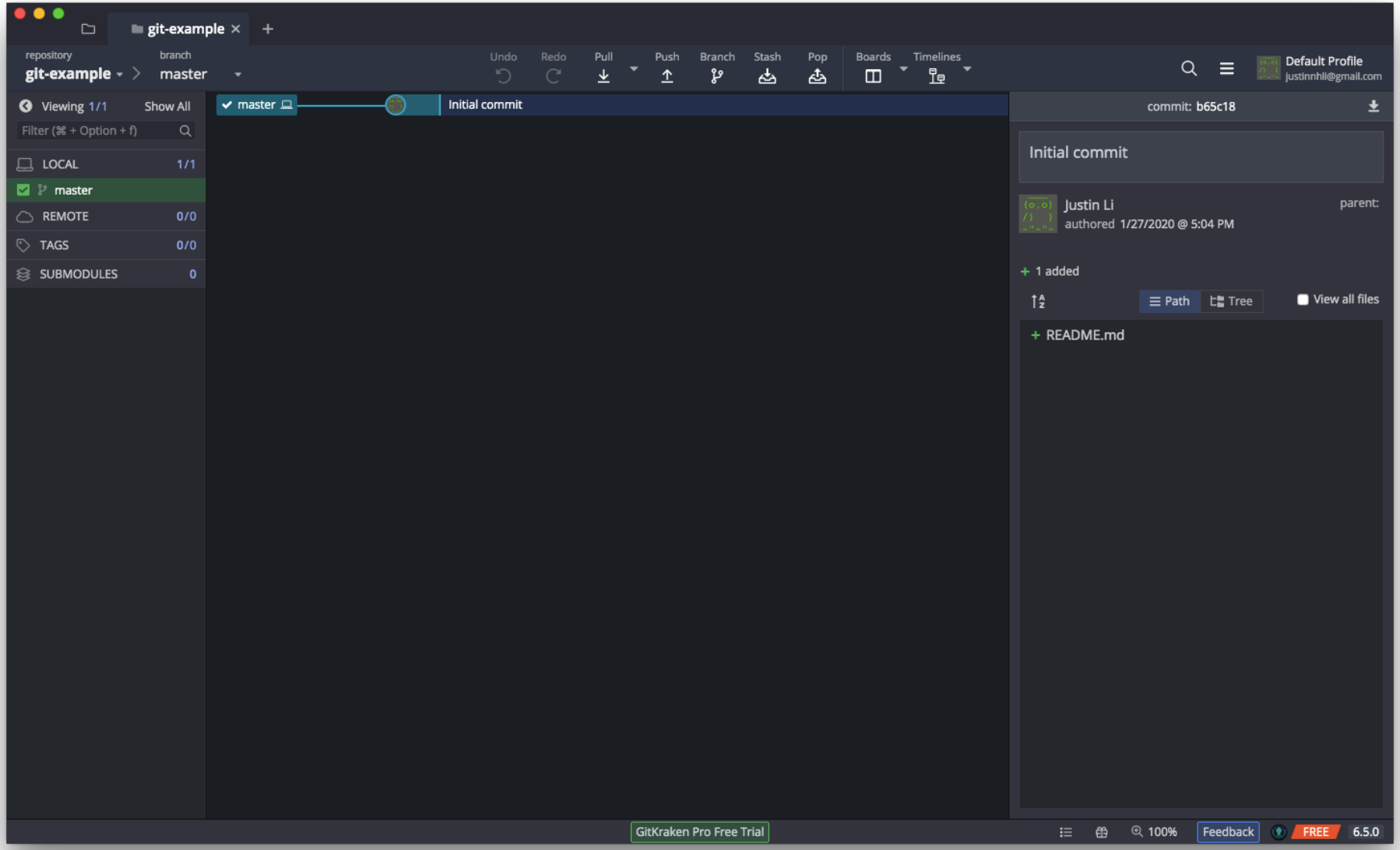
- Use our GitHub account to authenticate yourself to GitKraken

- In GitKraken, click Start a Local Repo
  - A *repository* or *repo* is a place where code is stored
  - *Local* here means it exists on your computer
- Make sure you know where the repo is recreated


Repository Management
Open
Clone
Init
Local Only
GitHub.com
GitHub Enterprise
GitLab.com
GitLab (Self-Managed)
Bitbucket.org
Bitbucket Server
Azure DevOps
Initialize a Repo
Name
git-example
Initialize in
/Users/justinnhli/git
Browse
Full path
/Users/justinnhli/git/
git-example
.gitignore Template (optional)
Select...
License (optional)
Select...
Create Repository

Getting Started with GitKraken

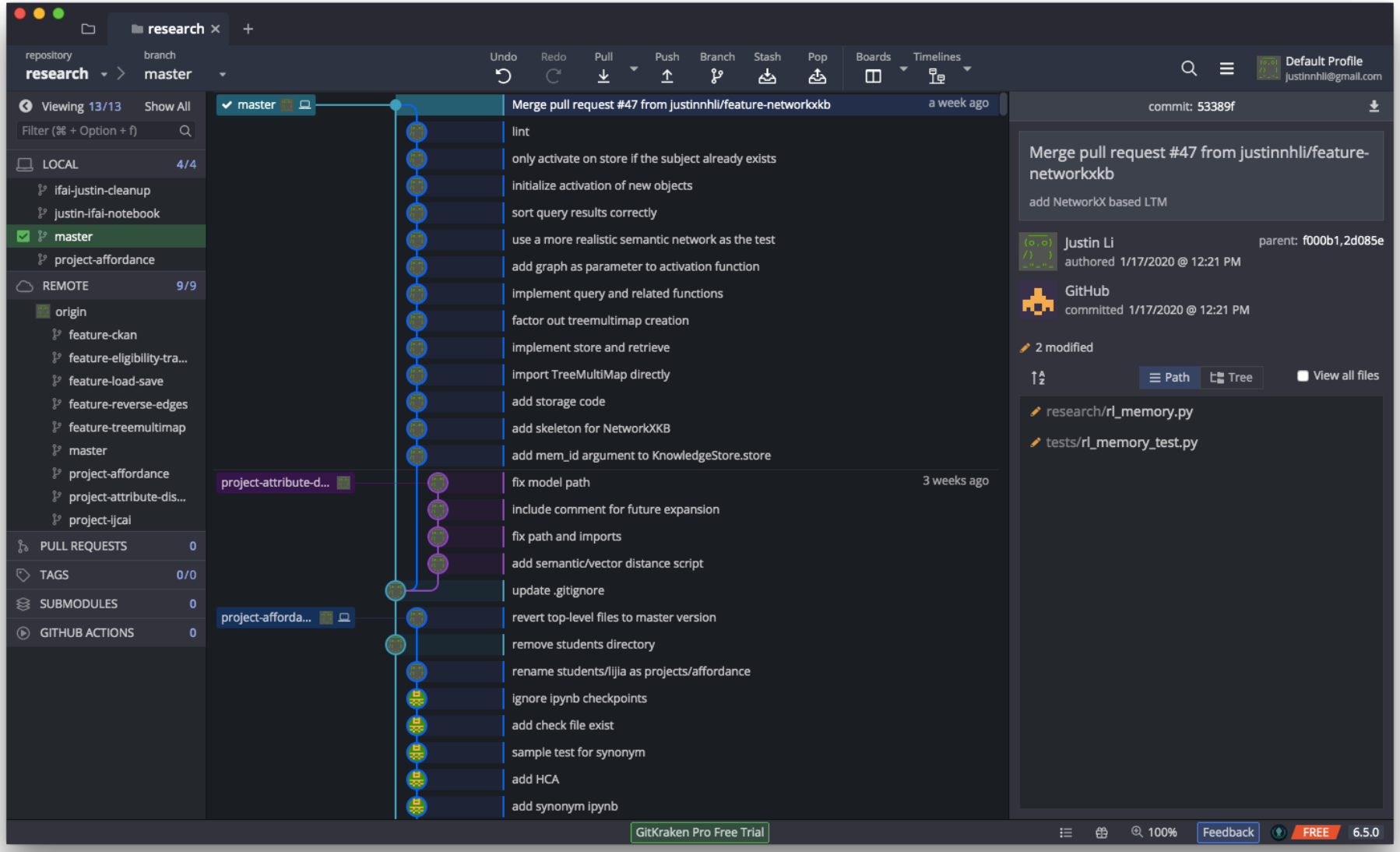
- When you create the repo, GitKraken should show something like this:


git-example
repository
git-example
branch
master
Undo
Redo
Pull
Push
Branch
Stash
Pop
Boards
Timelines
Default Profile
justinnhli@gmail.com
Viewing 1/1
Show All
Filter (⌘ + Option + f)
LOCAL 1/1
master
REMOTE 0/0
TAGS 0/0
SUBMODULES 0
master
Initial commit
commit: b65c18
Initial commit
Justin Li
authored 1/27/2020 @ 5:04 PM
parent:
+ 1 added
Path
Tree
View all files
+ README.md
GitKraken Pro Free Trial
100%
Feedback
FREE
6.5.0

GitKraken Intro

- The main window contains three panels
  - We will ignore the left panel for now
  - The center panel shows the history of your project
  - The right panel shows information about a specific part of that history

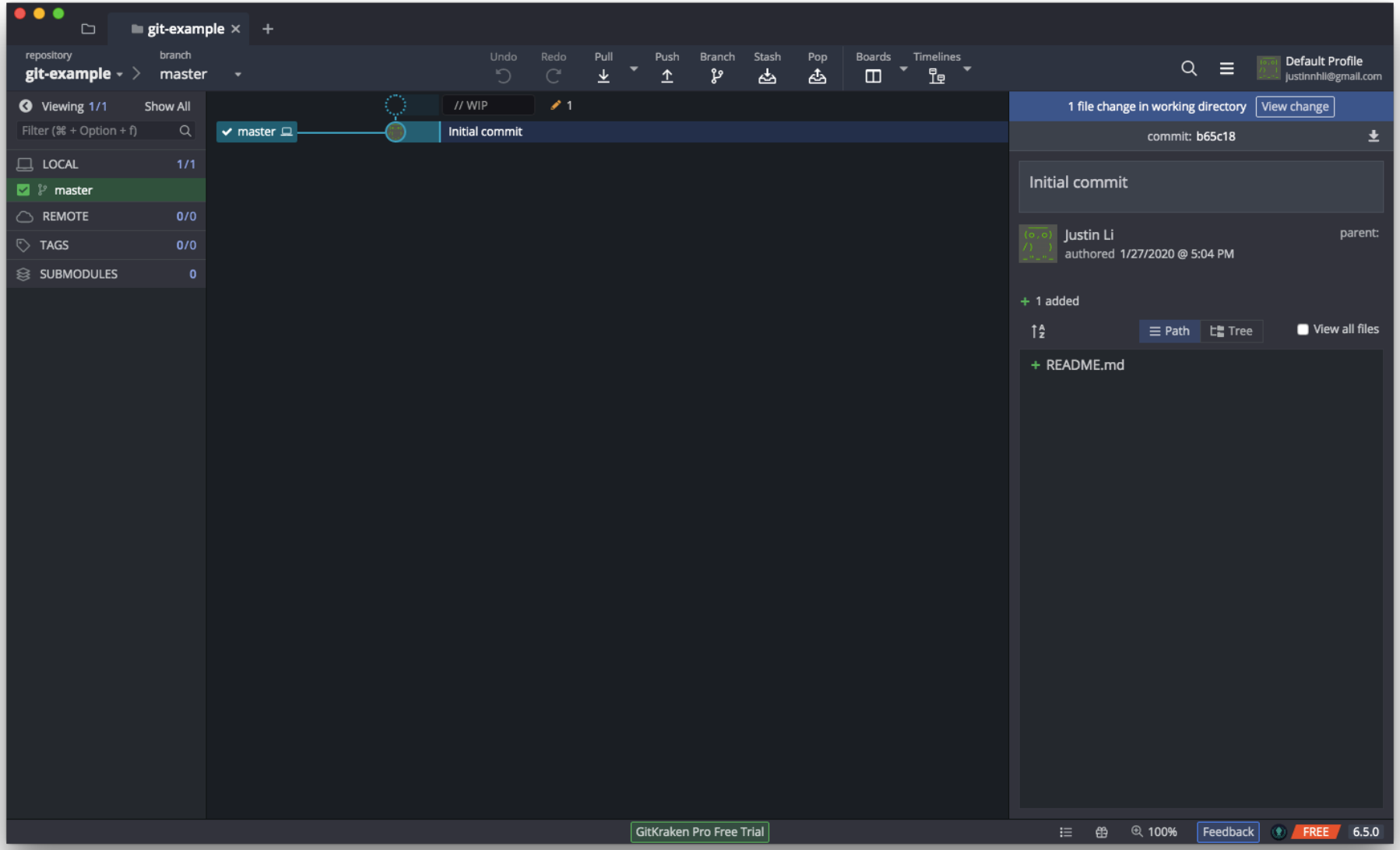
- Here is GitKraken on a more complicated project:


research
repository
research
branch
master
Undo
Redo
Pull
Push
Branch
Stash
Pop
Boards
Timelines
Default Profile
justinnhli@gmail.com
Viewing 13/13
Show All
Filter (⌘ + Option + f)
LOCAL 4/4
ifai-justin-cleanup
justin-ifai-notebook
master
project-affordance
REMOTE 9/9
origin
feature-ckan
feature-eligibility-tra...
feature-load-save
feature-reverse-edges
feature-treemultimap
master
project-affordance
project-attribute-dis...
project-ijcai
PULL REQUESTS 0
TAGS 0/0
SUBMODULES 0
GITHUB ACTIONS 0
master
Merge pull request #47 from justinnhli/feature-networkxkb
a week ago
lint
only activate on store if the subject already exists
initialize activation of new objects
sort query results correctly
use a more realistic semantic network as the test
add graph as parameter to activation function
implement query and related functions
factor out treemultimap creation
implement store and retrieve
import TreeMultiMap directly
add storage code
add skeleton for NetworkXKB
add mem_id argument to KnowledgeStore.store
project-attribute-d...
fix model path
3 weeks ago
include comment for future expansion
fix path and imports
add semantic/vector distance script
update .gitignore
project-afforda...
revert top-level files to master version
remove students directory
rename students/lijia as projects/affordance
ignore ipynb checkpoints
add check file exist
sample test for synonym
add HCA
add synonym ipynb
commit: 53389f
Merge pull request #47 from justinnhli/feature-networkxkb
add NetworkX based LTM
Justin Li
authored 1/17/2020 @ 12:21 PM
parent: f000b1, 2d085e
GitHub
committed 1/17/2020 @ 12:21 PM
2 modified
Path
Tree
View all files
research/rl_memory.py
tests/rl_memory_test.py
GitKraken Pro Free Trial
100%
Feedback
FREE
6.5.0

GitKraken Intro

- GitKraken automatically created a file called README.md for you
  - This file is used by GitHub as the front page of your repo

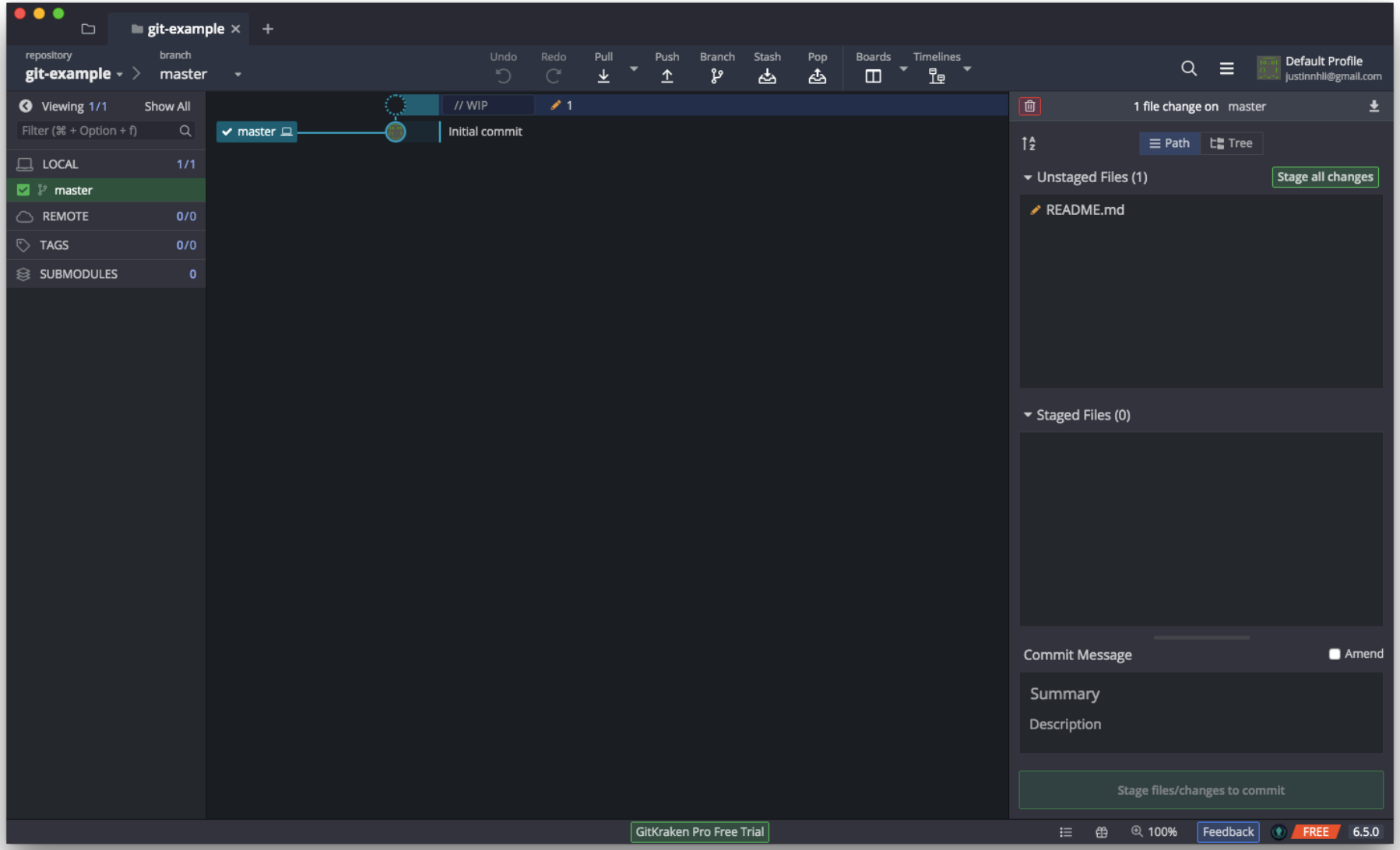
- Open this file with a text editor and add some text to it
- GitKraken should now look like this:


git-example
repository
git-example
branch
master
Undo
Redo
Pull
Push
Branch
Stash
Pop
Boards
Timelines
Default Profile
justinnhli@gmail.com
Viewing 1/1
Show All
Filter (⌘ + Option + f)
LOCAL 1/1
master
REMOTE 0/0
TAGS 0/0
SUBMODULES 0
// WIP
1
master
Initial commit
1 file change in working directory
View change
commit: b65c18
Initial commit
Justin Li
authored 1/27/2020 @ 5:04 PM
parent:
+ 1 added
Path
Tree
View all files
+ README.md
GitKraken Pro Free Trial
100%
Feedback
FREE
6.5.0

GitKraken Intro

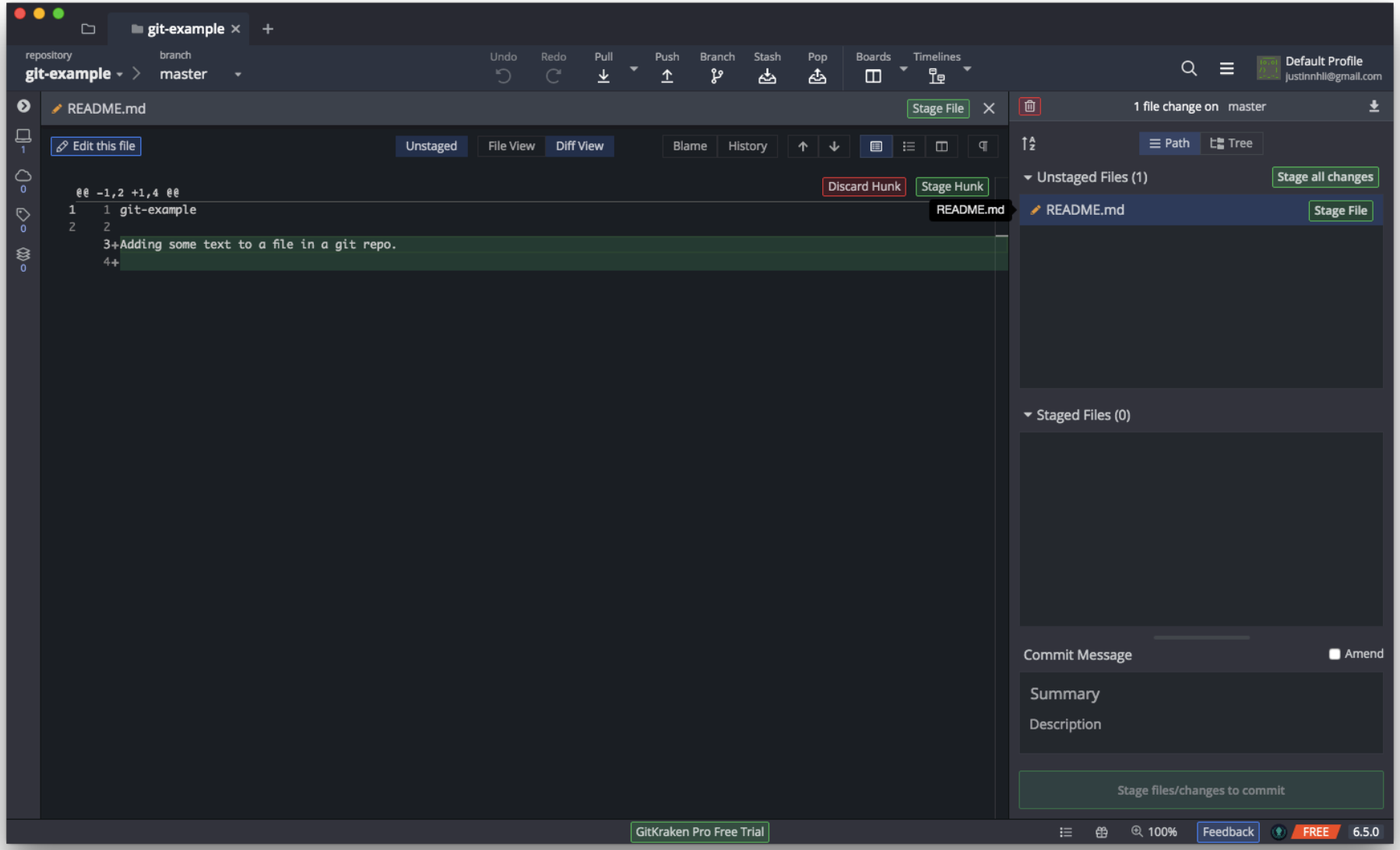
- Notice that there's a new row at the top of the middle panel

- Clicking on it shows what files have changed


git-example
repository
git-example
branch
master
Undo
Redo
Pull
Push
Branch
Stash
Pop
Boards
Timelines
Default Profile
justinnhli@gmail.com
Viewing 1/1
Show All
Filter (⌘ + Option + f)
LOCAL 1/1
master
REMOTE 0/0
TAGS 0/0
SUBMODULES 0
// WIP
1
master
Initial commit
1 file change on master
Path
Tree
Unstaged Files (1)
Stage all changes
README.md
Staged Files (0)
Commit Message
Amend
Summary
Description
Stage files/changes to commit
GitKraken Pro Free Trial
100%
Feedback
FREE
6.5.0

GitKraken Intro

- Notice that there's a new row at the top of the middle panel
- Clicking on it shows what files have changed
- You can further click on each file in the right panel to see the changes


git-example
repository
git-example
branch
master
Undo
Redo
Pull
Push
Branch
Stash
Pop
Boards
Timelines
Default Profile
justinnhli@gmail.com
README.md
Stage File
Edit this file
Unstaged
File View
Diff View
Blame
History
@@ -1,2 +1,4 @@
Discard Hunk
Stage Hunk
1 1 git-example
2 2
3+Adding some text to a file in a git repo.
4+
README.md
1 file change on master
Path
Tree
Unstaged Files (1)
Stage all changes
README.md
Stage File
Staged Files (0)
Commit Message
Amend
Summary
Description
Stage files/changes to commit
GitKraken Pro Free Trial
100%
Feedback
FREE
6.5.0

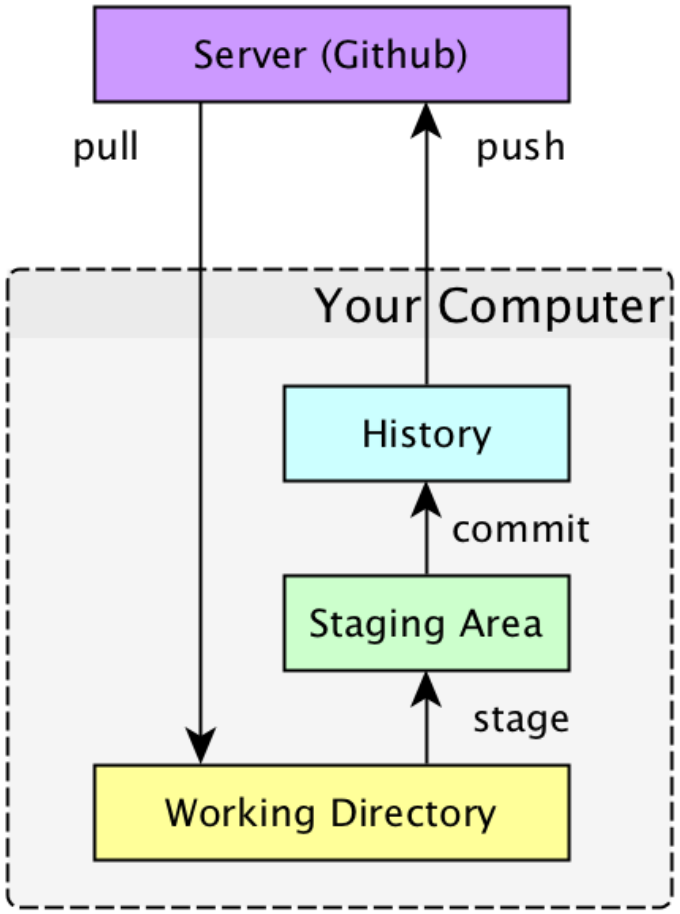
GitKraken Intro

- The green highlights are the lines you have added
- The red highlights (now shown) are the lines you have deleted

- Click the x at the top right of the middle panel to go back to the home screen

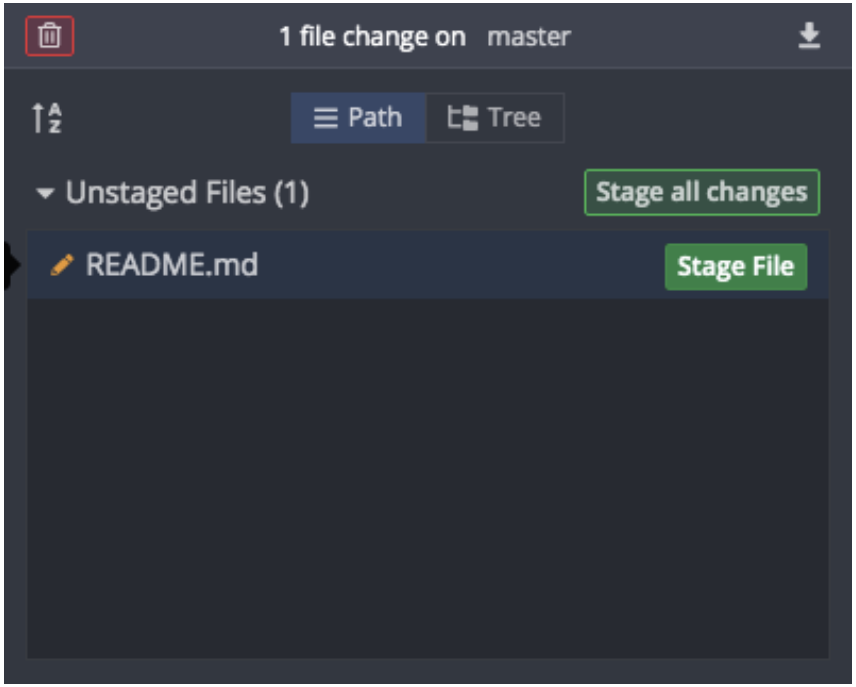
General Workflow

1. Init/Clone repo
   - You can initialize a new repo on Github
2. Write code
3. Prepare your work ("stage")
4. Save your work ("commit")
5. Share your work ("push")



Staging

- For now, we will prepare the entire file to be saved
  - (Git lets you only save some of the work you have done)

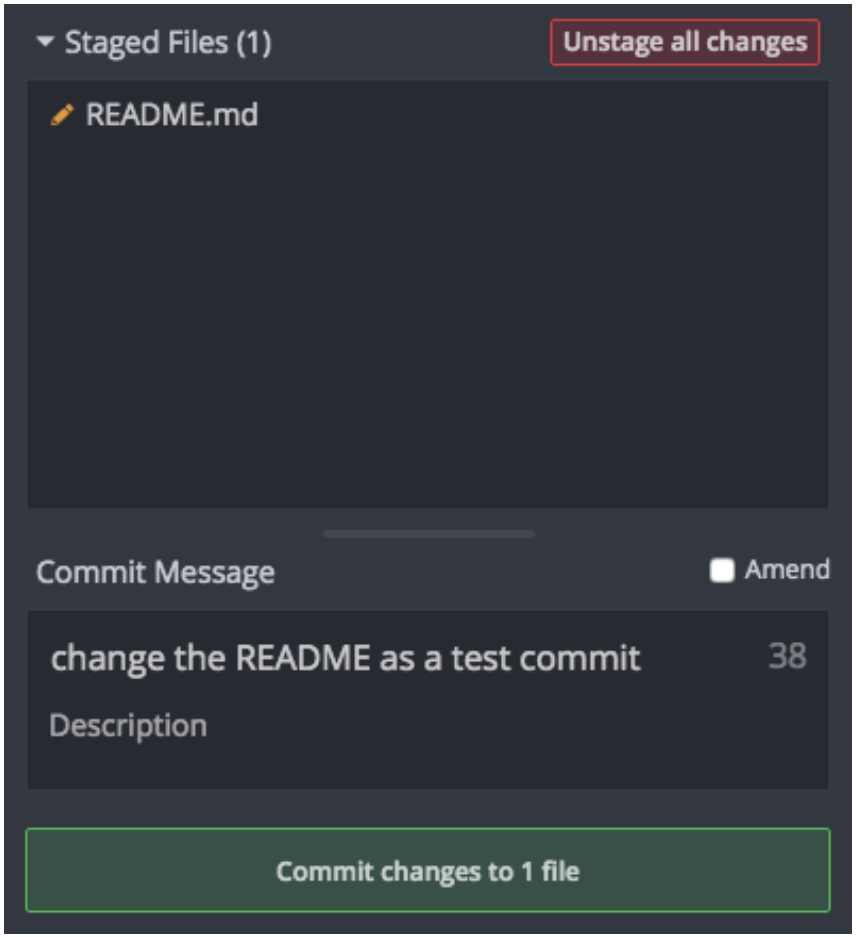


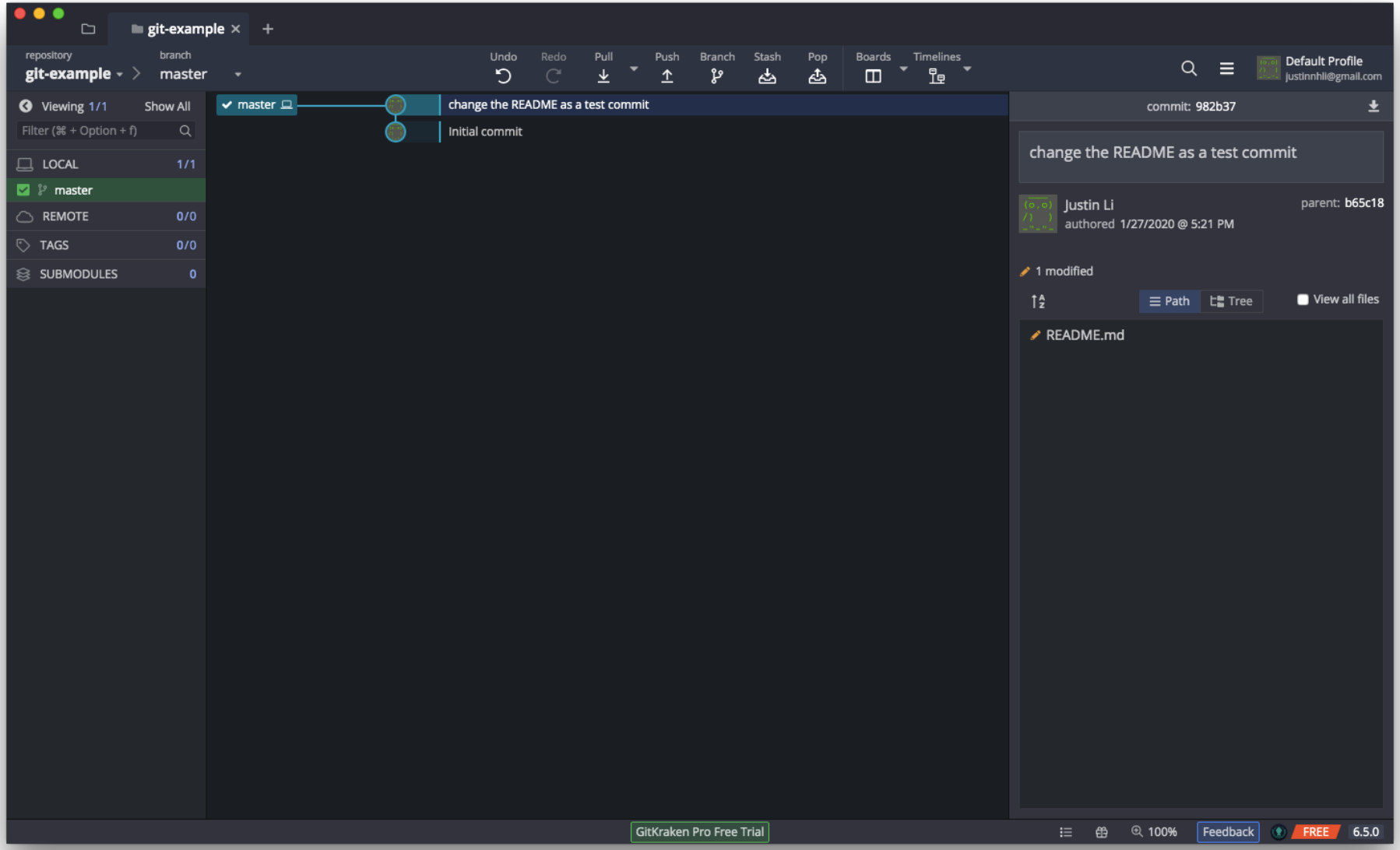
- On the right panel, hover over README.md and click Stage File
- The file should move down to the Staged Files area

Committing

- To save your work into the history of the project, you need to "commit" your changes

- In the bottom right box, type a descriptive summary of what you have just done
  - **This is really important**
  - This message is the main way to show what changed



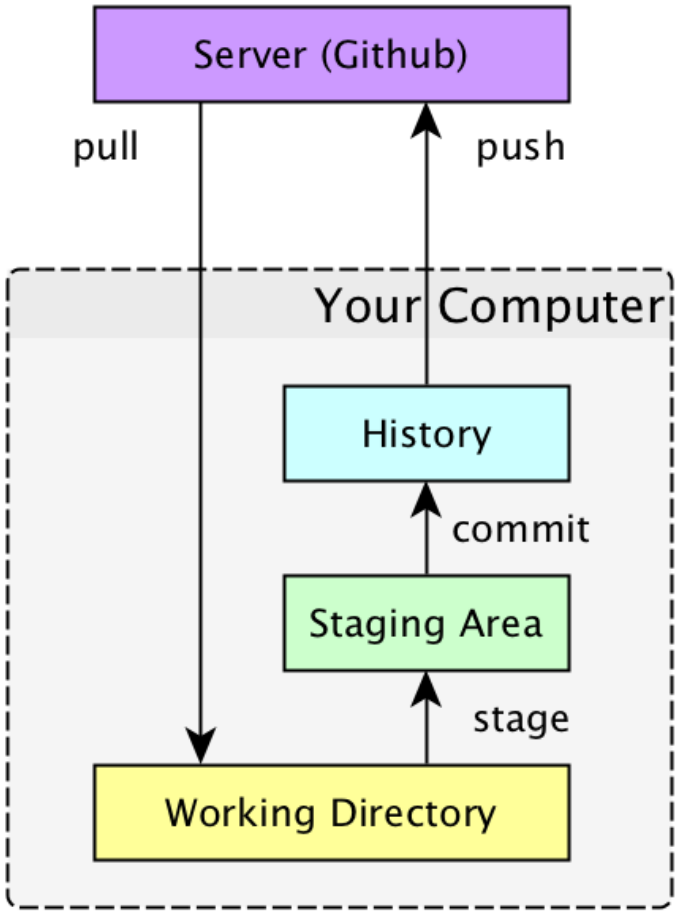

git-example
repository
git-example
branch
master
Undo
Redo
Pull
Push
Branch
Stash
Pop
Boards
Timelines
Default Profile
justinnhli@gmail.com
Viewing 1/1
Show All
Filter (⌘ + Option + f)
LOCAL 1/1
master
REMOTE 0/0
TAGS 0/0
SUBMODULES 0
master
change the README as a test commit
Initial commit
commit: 982b37
change the README as a test commit
Justin Li
authored 1/27/2020 @ 5:21 PM
parent: b65c18
1 modified
Path
Tree
View all files
README.md
GitKraken Pro Free Trial
100%
Feedback
FREE
6.5.0

First Commit

- Congratulations! You just made your first commit – you can now refer back to this version of the code while you keep working
- What you know is enough for you to start using git for personal projects
- But what about collaborating?

Pushing

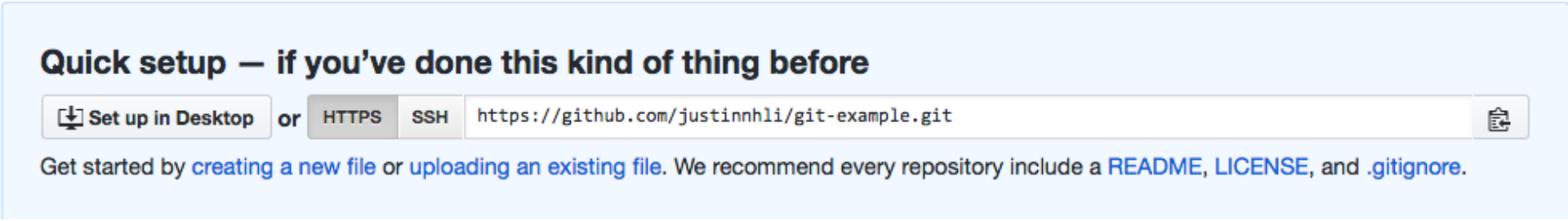
- You can share your code by *pushing* the repo to GitHub
- Other people can then download/*clone* it from GitHub
- This is also a good way to backup your code!



Pushing

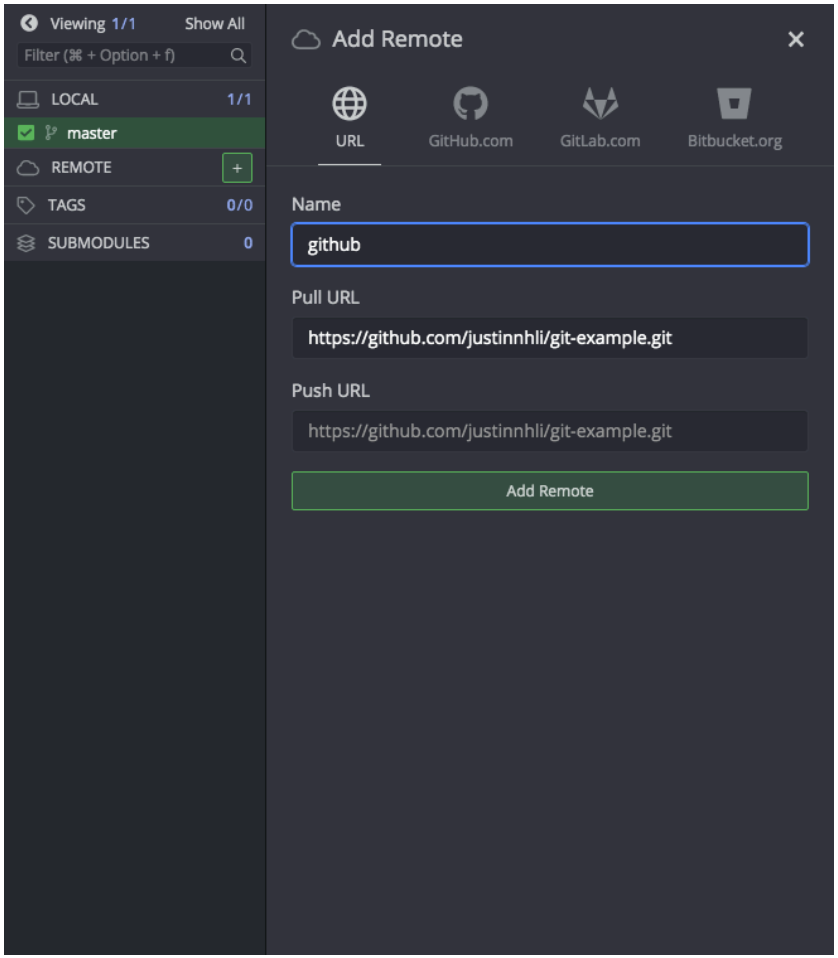
- First, create a repo on GitHub

- Then copy the URL at the top
  - You should use the HTTPS URL unless you know what you are doing



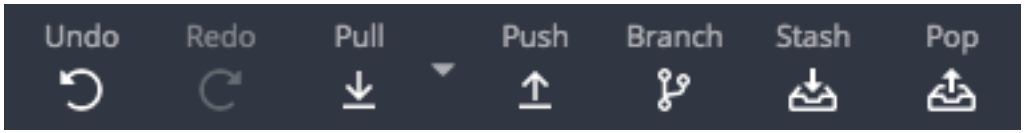
Pushing

- In GitKraken, on the left panel, click the + next to Remotes
  - A *remote*, as opposed to local, is a different computer that also has your code
- Paste the GitHub URL as the Pull URL
- Name the remote then click Add Remote



Pushing

- Now click Push at the top of GitKraken



- Go back to GitHub and refresh the page – your code should be available!

Making Changes on GitHub

Pulling

Collaborating in the Same Repo

- On GitHub, you can invite people to collaborate on your repo – they will get to push code to it

Merge Conflicts

Pull Requests

- But what if you don't want people to directly access your repository?
- GitHub allows you to *fork* (copy) a repo and to submit *pull requests* (suggested changes)
- In GitKraken, click on File > Clone Repo

Forking

- Go to my git tutorial repo:

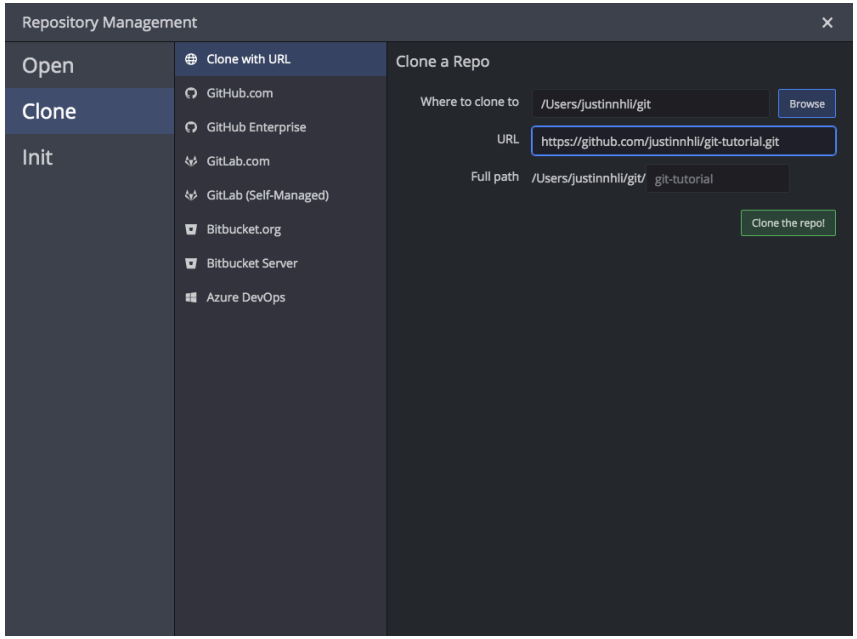
  https://github.com/justinnhli/git-tutorial

- Click on Fork on the upper right

- This will create a copy of my repo in your GitHub account

Cloning

- In GitKraken, click on File > Clone Repo
- Copy the HTTPS URL of your fork repo
- For the sake of this tutorial, go into the completed folder, and create a text file named



Creating a Pull Request

- For the sake of this tutorial, go into the completed folder, and create a text file named after your GitHub username
  - Eg. I would create a file called `justinnhli`
  - Add some content just for flavor

- Stage, commit, and push that file

Creating a Pull Request

- Go back to my git tutorial repo:

https://github.com/justinnhli/git-tutorial

- Click on the Create a Pull Request notification

Open a pull request

Create a new pull request by comparing changes across two branches. If you need to, you can also compare across forks.

base repository: **justinnhli/git-tutorial** | base: **master** | head repository: **Lijia-Li/git-tutorial** | compare: **master**

✓ **Able to merge.** These branches can be automatically merged.

adding Lijia folder

Write | Preview

Adding Lijia's Folder
- including a "Hello World" txt

Attach files by dragging & dropping, selecting or pasting them.

Allow edits from maintainers. Learn more

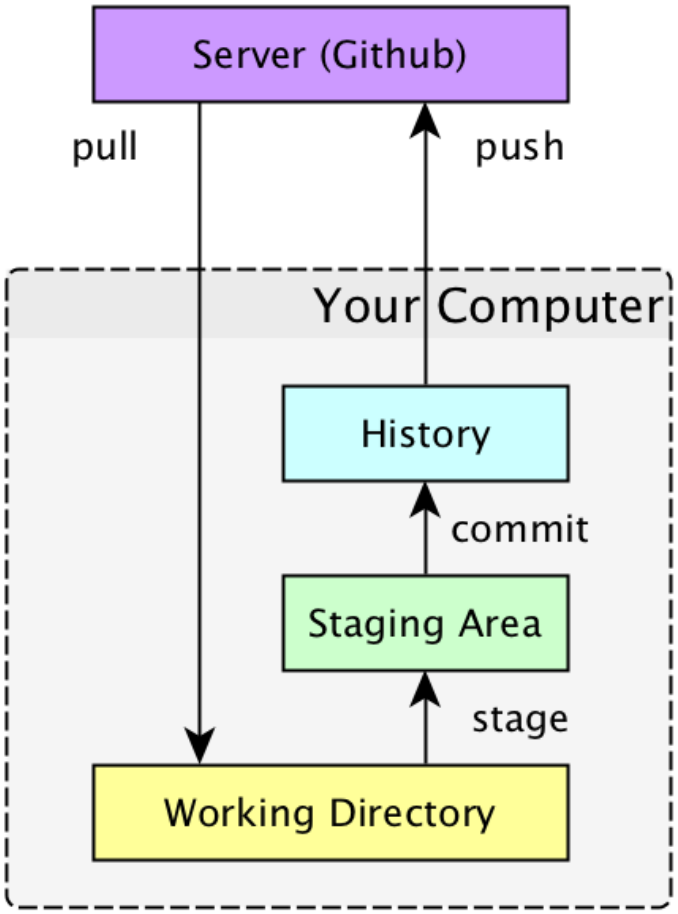
Create pull request

Creating a Pull Request

- A pull request (PR) is how you can contribute code to other projects
- Often there will be discussion of the code you added, and requests for changes

- But, if your code is good, at some point the PR will be *merged* into the main repo

Questions?


Server (Github)
pull
push
Your Computer
History
commit
Staging Area
stage
Working Directory