

WORKFLOW

an opinionated discussion

Shreyas

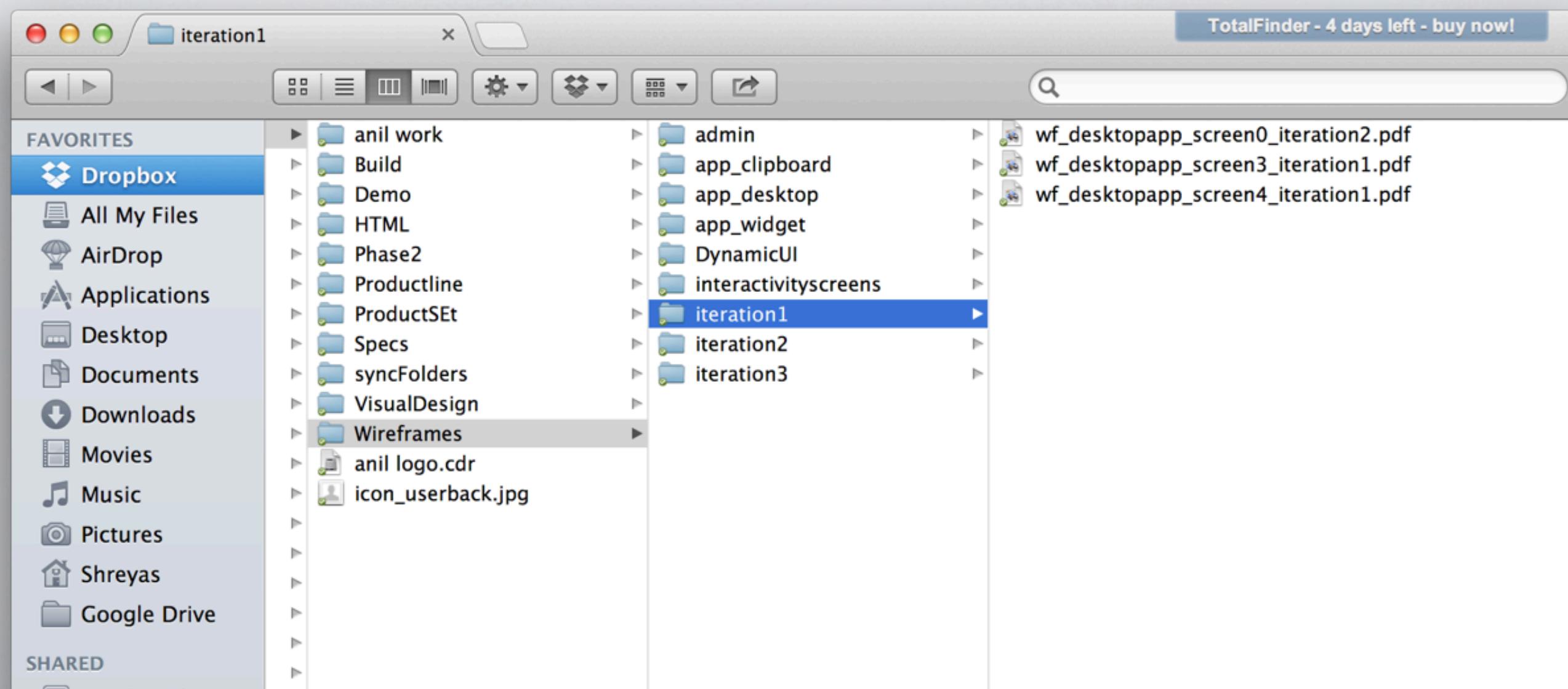
Grad Student, MIMS'14



seekshreyas

some slides adopted from and inspired by Scott Schacon's <https://github.com/schacon/git-presentations>

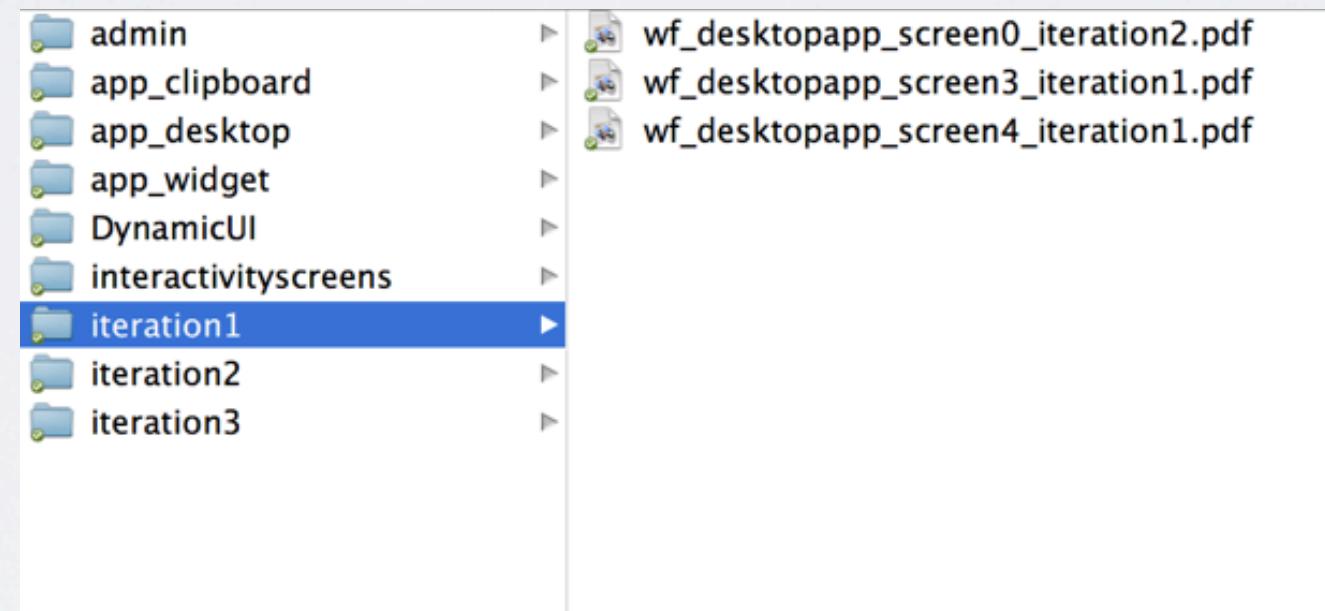
We've all been here ...



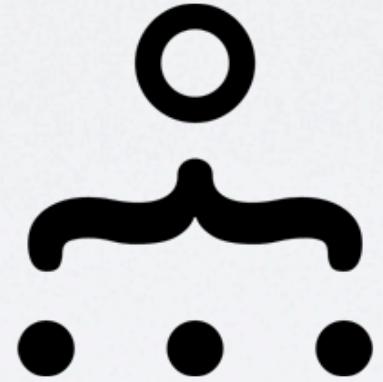
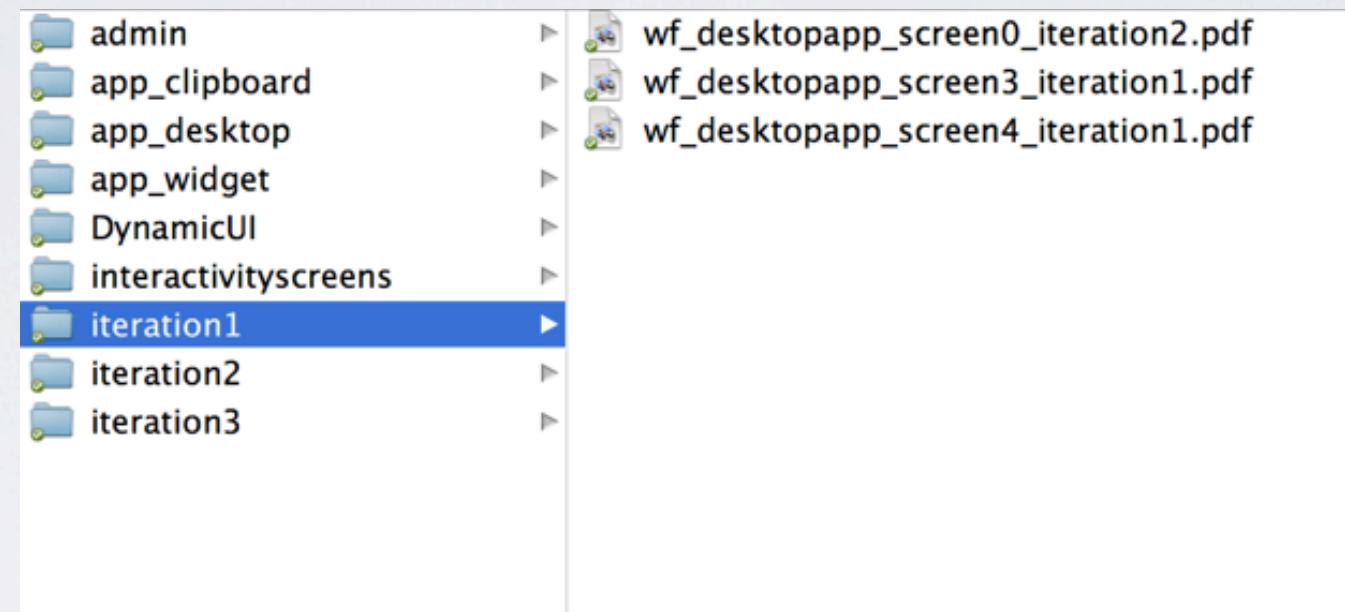
Monday, January 28, 13

we start off a project having a fair idea of what we are going to do ...

We've all been here ...

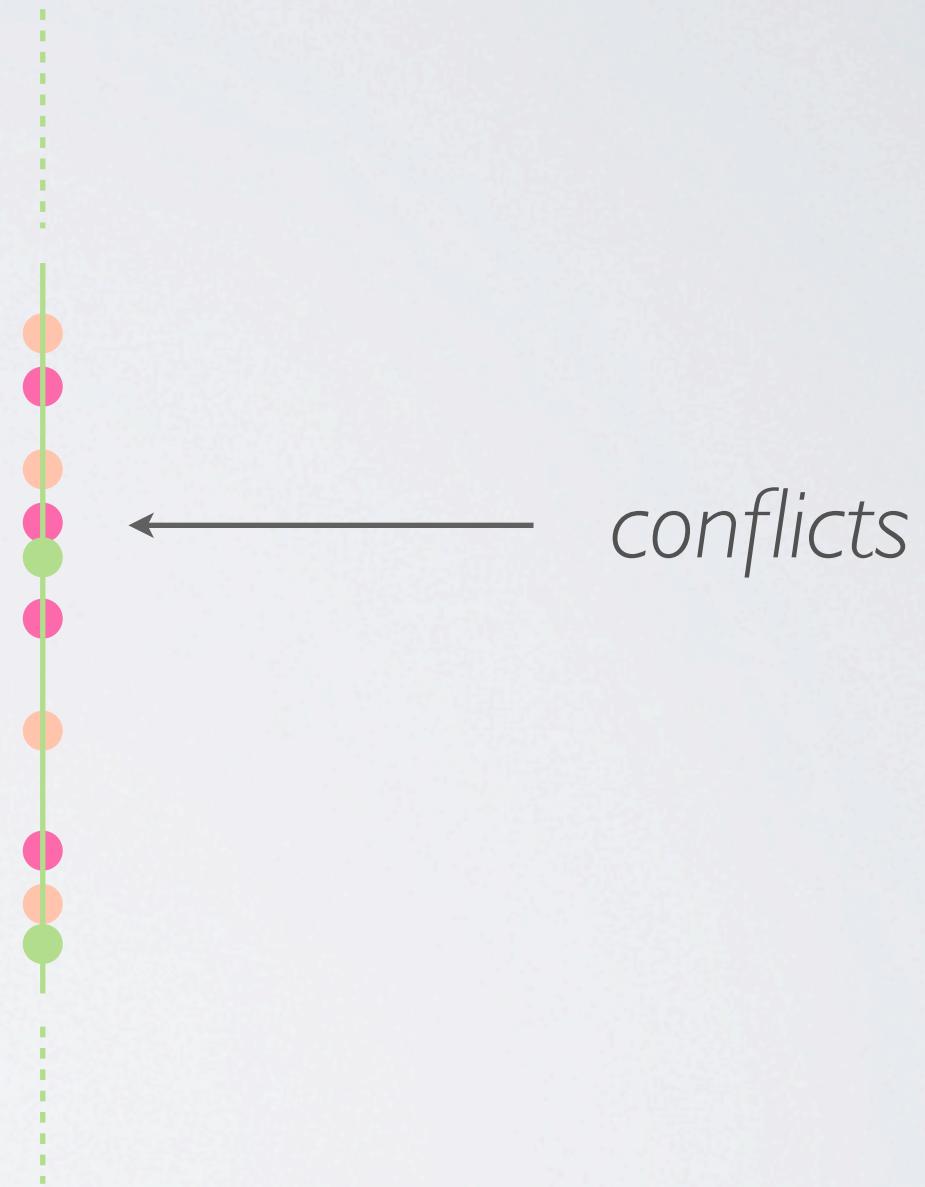


We've all been here ...



Problems

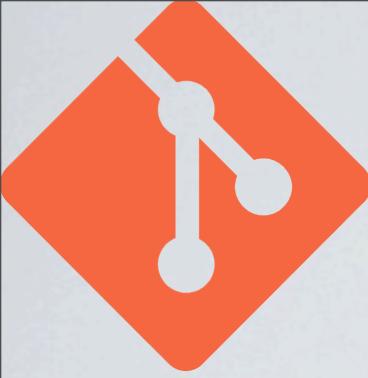
- multiple versions
- many contributors
- ...





GIT + GITHUB

a better workflow



git

git is an open source, distributed
version control system designed
for speed and efficiency



git

git is an open source, distributed
version control system designed for
speed and efficiency





git

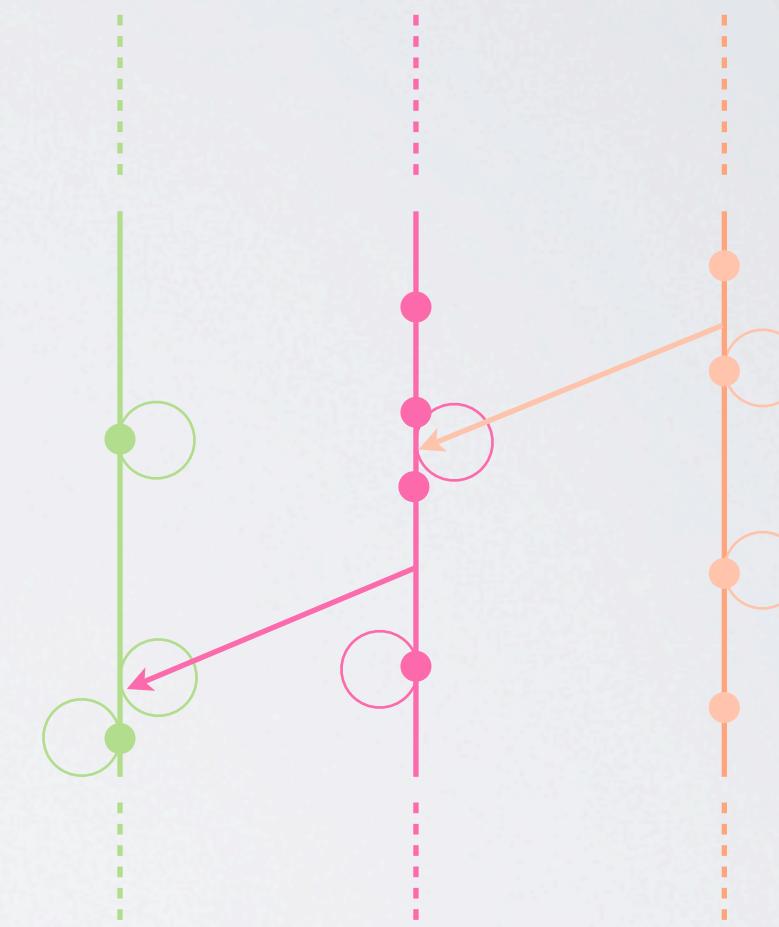
git is an open source, *distributed* version control system designed for speed and efficiency



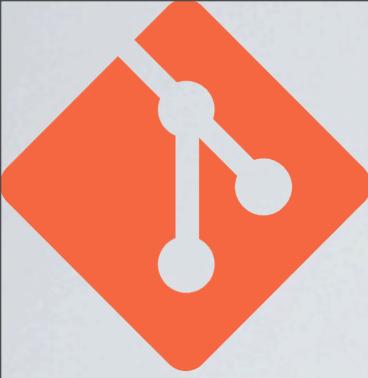


git

git is an open source, distributed
version control system designed
for *speed and efficiency*

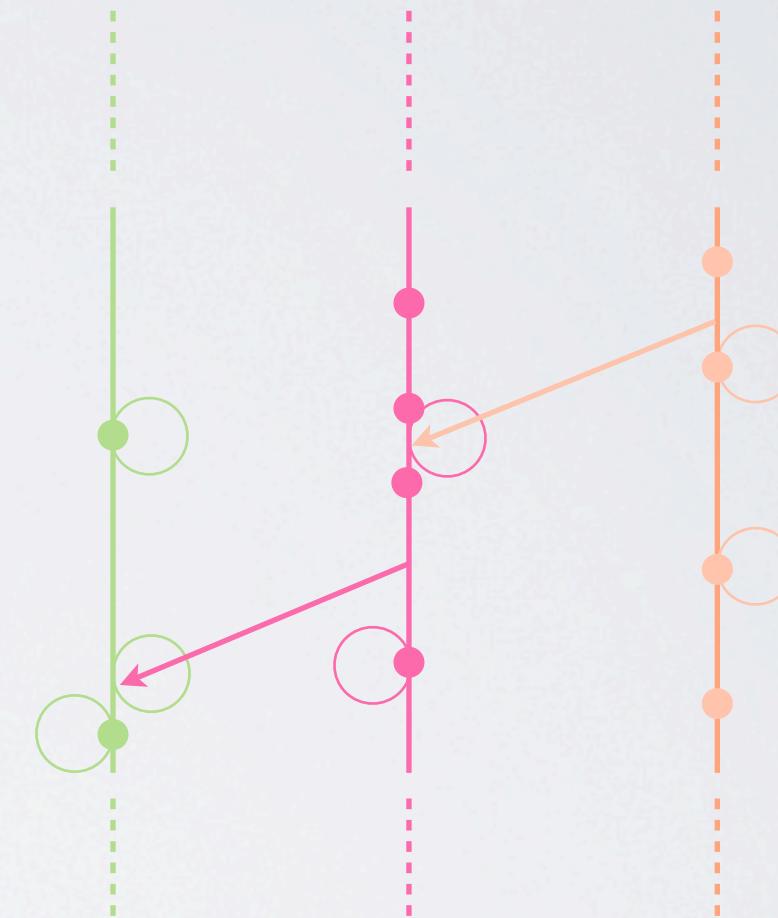


(almost) everything is local



No Network needed for

- Performing a diff
- Viewing file history
- Committing changes
- Merging branches
- Obtaining any other revision of a file
- Switching branches

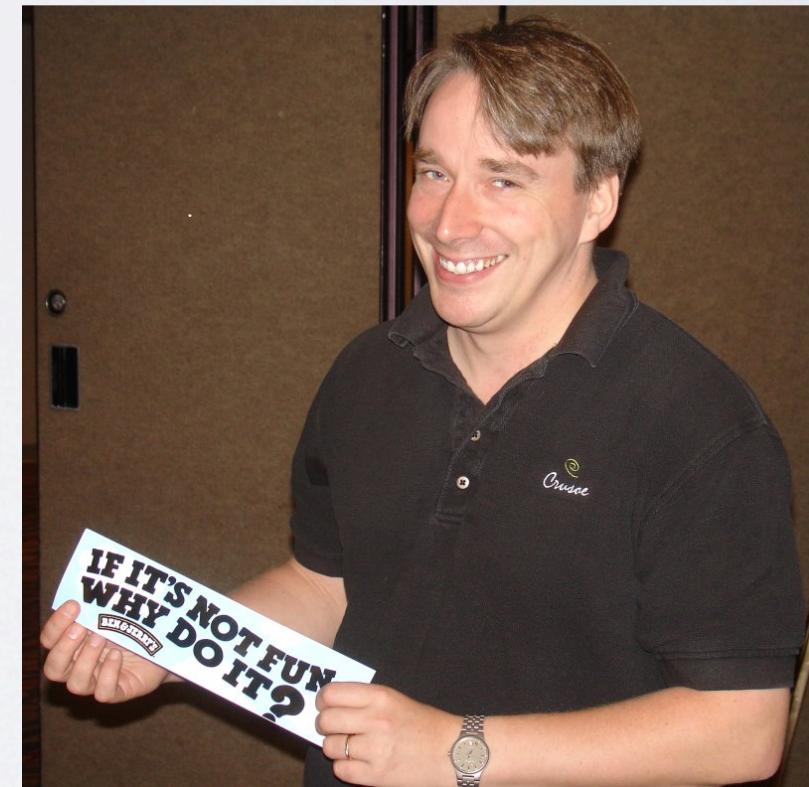


(almost) everything is local



git

git is an *open source*, distributed version control system designed for speed and efficiency



More Advantages

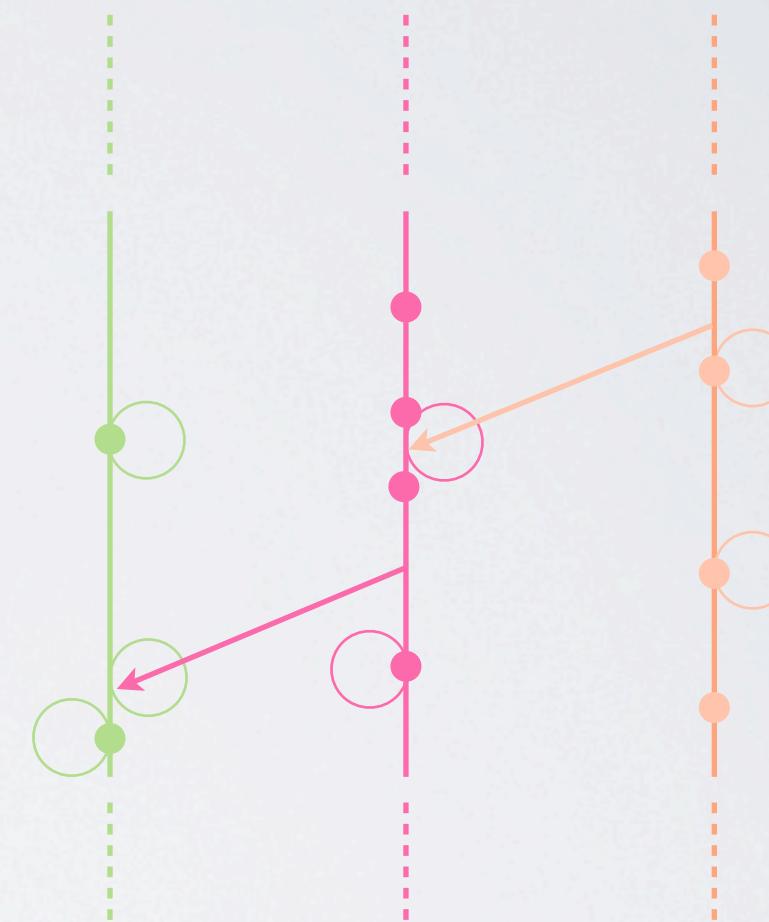
<http://bit.ly/git-advantages>

<http://bit.ly/git-linus-intro>



.. and

- No .svn directories
- Independence





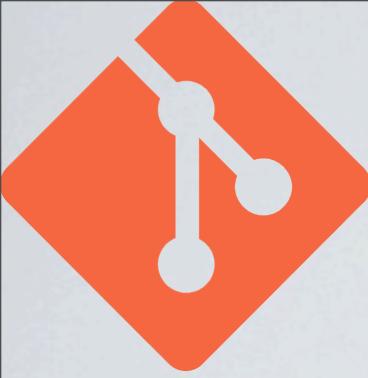
installing git

<http://git-scm.com/downloads>

The screenshot shows a web browser window with the title "Git - Downloads". The address bar contains "git-scm.com/downloads". The page itself is the "Downloads" section of the Git website. At the top left is the Git logo. To the right is a search bar with the placeholder "Search entire site...". On the left sidebar, there are links for "About", "Documentation", "Downloads" (which is highlighted in red), and "Community". Below the sidebar, a box mentions the "Pro Git book" by Scott Chacon. The main content area has a large heading "Downloads" and four download links: "Mac OS X", "Windows", "Linux", and "Solaris". To the right of these links is a large image of a Mac monitor displaying the text "Latest stable release 1.8.1.1 Release Notes (2013-01-14) Download for Mac". Below this, there's a section for "Older releases" and a link to the "Git source repository" on GitHub. At the bottom left is a "GUI Clients" section with a link to "View GUI Clients →". At the bottom right is a "Logos" section with a link to "View Logos →".

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We'll be using the git command line interface, but feel free to choose your preferred solution GUIs, Editor Extension etc



getting setup ...

```
$ git config --global user.name "<YOUR_NAME>"
```

```
$ git config --global user.email "<YOUR_EMAIL>"
```

or edit them in `~/.gitconfig`



lets dive in..

gitref.org/

- Creating New Repo
- Committing
- Branching/Merging
- Inspection
- Cloning a Repo
- Updating

The screenshot shows a Mac OS X desktop with a window titled "Git - Reference" displaying the "Git Reference" website at gitref.org/about.html. The browser has several tabs open, including "Fontello - icon fonts", "schacon/git-present", ".gitconfig - Google", and "location - Where". The main content area features a large title "Git Reference" and a navigation bar with links for "Reference", "About", "Site Source", and "WHO DID THIS?". The "WHO DID THIS?" section contains the text "The Git Reference site was put together by the GitHub team." Below this, there are five sections with lists of Git commands:

- Getting and Creating Projects**: init, clone
- Basic Snapshotting**: add, status, diff, commit, reset, rm, mv, stash
- Branching and Merging**: branch, checkout, merge, log, tag
- Sharing and Updating Projects**: fetch, pull, push, remote
- Inspection and Comparison**: log, diff



lets dive in..

<http://git-scm.com/docs>

- Creating New Repo
- Committing
- Branching/Merging
- Inspection
- Cloning a Repo
- Updating

The screenshot shows a Mac OS X desktop with a window titled "Git - Reference" displaying the git-scm.com/docs website. The browser's address bar also shows "git-scm.com/docs". The page content includes the Git logo and the tagline "--fast-version-control". On the left, there's a sidebar with links for "About", "Documentation" (which is currently selected), "Reference", "Downloads", and "Community". The main content area is titled "Reference" and lists various Git commands categorized under sections like "Setup and Config", "Getting and Creating Projects", "Basic Snapshotting", "Branching and Merging", "External Systems", and "Administration". A search bar at the top right says "Search entire site...". The browser's toolbar and menu bar are visible at the top.

git --fast-version-control

About

Documentation

Reference

Book

Videos

External Links

Downloads

Community

Reference

Quick reference guides: [Heroku Cheat Sheet \(PDF\)](#) | [Visual Git Cheat Sheet \(SVG | PNG\)](#)

Setup and Config

config

help

Getting and Creating Projects

init

clone

Basic Snapshotting

add

status

diff

commit

reset

rm

mv

Branching and Merging

branch

checkout

External Systems

svn

fast-import

Administration

clean

gc

fsck

Search entire site...



Git Commands

- Creating New Repo
- Committing
- Branching/Merging
- Inspection
- Cloning a Repo
- Updating

```
$ git init
```

```
$ mkdir workspace
```

```
$ cd workspace
```

```
$ ls -al
```

```
$ git init
```

```
$ ls -al
```

Initialized empty Git repository in .../workspace/.git/

```
drwxr-xr-x 10 Shreyas staff 340 Jan 15 17:22 .git
```



Git Commands

- Creating New Repo

- Committing

- Branching/Merging

- Inspection

- Cloning a Repo

- Updating

```
$ cd .git
```

```
$ tree -a
```

```
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace/.git
$ tree -a
.
├── HEAD
├── branches
├── config
├── description
└── hooks
    ├── applypatch-msg.sample
    ├── commit-msg.sample
    ├── post-update.sample
    ├── pre-applypatch.sample
    ├── pre-commit.sample
    ├── pre-rebase.sample
    ├── prepare-commit-msg.sample
    └── update.sample
├── info
│   └── exclude
└── objects
    ├── info
    │   └── pack
    └── refs
        ├── heads
        └── tags

9 directories, 12 files
```



Git Commands

- Creating New Repo
- Committing
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- Inspection
- Cloning a Repo
- Updating

```
$ cd ..  
$ touch testfile.md
```

\$ git status

branch name →

staging area →

```
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace  
$ git status  
# On branch master  
#  
# Initial commit  
#  
# Untracked files:  
#   (use "git add <file>..." to include in what will be committed)  
#  
#       testfile.md  
nothing added to commit but untracked files present (use "git add" to track)  
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace
```



Git Commands

- Creating New Repo
- **Committing**
- Branching/Merging
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- Updating

\$ git add <filename>

\$ git status

staging area →

```
$ git add testfile.md
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace
$ git status
# On branch master
#
# Initial commit
#
# Changes to be committed:
#   (use "git rm --cached <file>..." to unstage)
#
#       new file:   testfile.md
#
```



Git Commands

- Creating New Repo
- **Committing**
- Branching/Merging
- Inspection
- Cloning a Repo
- Updating

\$ git commit

\$ git status

your commit msg →

```
0 Sachin guide me
1 # Please enter the commit message for your changes. Lines starting-
2 # with '#' will be ignored, and an empty message aborts the commit.-
3 # On branch master-
4 #
5 # Initial commit-
6 #
7 # Changes to be committed:-
8 #   (use "git rm --cached <file>..." to unstage)-
9 #
10 # new file: testfile.md-
11 #
```



Git Commands

- Creating New Repo
- **Committing**
- Branching/Merging
- Inspection
- Cloning a Repo
- Updating

\$ git reset

(undo add)

changes staged →

changes unstaged →

```
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master*
$ git add testfile.md
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master*
$ git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   testfile.md
#
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master*
$ git reset
Unstaged changes after reset:
M      testfile.md
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master*
$ git status
# On branch master
# Changes not staged for commit:
#   (use "git add <file>..." to update what will be committed)
#   (use "git checkout -- <file>..." to discard changes in working directory)
#
#       modified:   testfile.md
#
no changes added to commit (use "git add" and/or "git commit -a")
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master*
```



Git Commands

- Creating New Repo
- **Committing**
- Branching/Merging
- Updating
- Inspection
- Cloning A Repo

\$ git reset --soft HEAD^

(undo a commit and redo)

\$ git reset --hard HEAD~3

Rewind the branch to get rid of last three commits

learn more here :

<http://git-scm.com/docs/git-reset>

also refer

git revert : <http://git-scm.com/docs/git-revert.html>

git stash : <http://git-scm.com/docs/git-stash>



Git Commands

- Creating New Repo
- **Committing**
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`$ git rm <filename>`

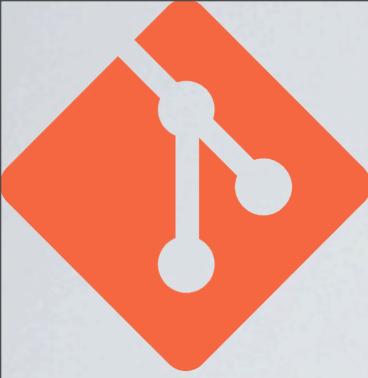
remove a file from the repo

as expected, you will need to commit the change

`$ git mv <filename>`

move/rename a file from the repo

as expected, you will need to commit the change



Git Commands

- Creating New Repo
- Committing
- **Branching/Merging**
- Inspection
- Cloning a Repo
- Updating

```
$ git branch
```

list of branches

```
$ git branch <branchname>
```

new branch

```
$ git checkout <branchname>
```

switch



Git Commands

- Creating New Repo
- Committing
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- Updating

```
branch list → Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master*
$ git branch
* master

new branch dev → Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master*
$ git branch dev
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master*
$ git branch
  dev
* master

switch branch → Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master*
$ git checkout dev
M      testfile.md
Switched to branch 'dev'
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on dev*
$ git branch
* dev
  master

Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on dev*
```



Git Commands

- Creating New Repo
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\$ git merge <branchname>

merge branches

branch merge →

```
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on dev
$ ls
anotherfile.md testfile.md
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on dev
$ git branch
* dev
  master
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on dev
$ git checkout master
Switched to branch 'master'
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master
$ ls
testfile.md
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master
$ git merge dev
Updating e63df69..d0f3f3f
Fast-forward
  testfile.md |  3 ++
  1 file changed, 2 insertions(+), 1 deletion(-)
  create mode 100644 anotherfile.md
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master
$ ls
anotherfile.md testfile.md
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master
```



Git Commands

- Creating New Repo
- Committing
- Branching/Merging
- **Inspection**
- Cloning a Repo
- Updating

```
$ git log  
--graph  
--decorate  
--abbrev-commit  
--all  
--pretty=oneline
```

text-based graph :)

```
$ git log --graph --decorate --abbrev-commit --all -  
* 1fd3b2d (origin/native-dev) Merge branch 'native-  
| \ * 3a17e61 pointing hand cursor set for close  
| \ * 29fe5e3 filter label made more interactive.  
| \ * d321ff7 close button added for search context.  
* | a3f3a81 Wit Usage graph and Time saved graph add  
| /  
* 2cacb88 Tag search results are listed properly on  
* 6d9e2b3 (origin/qa) Tag filter is working in advna  
* f440164 QA release 0.2.4.0  
* 77e05c8 Merge remote-tracking branch 'origin/nat  
| \ * 1843b03 Dashboard wit usage widget improved  
| \ * 737a64e Merge branch 'native-dev' of https://g  
| /  
* 664abf0 side bar made similar to ui concepts  
* f0ea951 fixed issue for coming back from search  
* cbfa98a Merge branch 'native-dev' of https://g  
| \ * 030f2b2 dosearch  
* | 3e5c533 Top 5 wits graph is implemented  
| /  
| /  
* | 4fed3cb Tags added in wit search result  
* | 94881c7 First level of advance search integrat  
* | 61399e3 Merge branch 'native-dev' of https://g  
| /  
| /
```



Git Commands

- Creating New Repo
- Committing
- Branching/Merging
- **Inspection**
- Cloning a Repo
- Updating

`~/.gitconfig`
[alias]
`l = log --pretty=oneline -n 20 --graph`

```
.gitconfig
1 [alias]
2   # View the SHA, description, and history graph of the latest 20 commits
3   l = log --pretty=oneline -n 20 --graph
4
```

```
$ git l
* 883567e70d3325eb566c15bcf743200d8d5a572a Merge branch 'qa'
* d603345f32fcf4b53325311ccf284f88750a28d6 Merge branch 'wp-dev' of github.c
| \
| * e1d9cd4da0e42a03c95c599baa0d1939db924586 Read file icon association from 0
| * aaa61ad3c87d0422876971e16dec6b60a5363021 Search animation done
| * aa359488a3bac15e1a1ed8da350eff28cc89fe90 Merge branch 'wp-dev' of https:
| * daa54ce681898aa53b3cdc49e8e09ffb73fcb8c8 Search bar implemented
| * 6d8f2d261d94a4c24ce27296dd909ff86d6fe15f new api modifications
| /|
| /| 70bcbb0acd1b3ec7a1e31e1972c11d9fb70cda9 search query clear images added
```



Git Commands

- Creating New Repo
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\$ gitk

The screenshot shows the gitk graphical interface for a Git repository named 'Acrowit-Desktop-Widget'. The interface displays a timeline of commits on the left, a detailed commit log in the center, and a list of commits on the right.

Commit Timeline:

- master branch
- remotes/origin/master branch
- Merge branch 'qa'
- Merge branch 'wp-dev' of https://github.com/Acrowit/Acrowit-Desktop-Widget into wp-dev
- Read file icon association from OS and applied in wit detail
- Search animation done
- Merge branch 'wp-dev' of https://github.com/Acrowit/Acrowit-Desktop-Widget into wp-dev
- Search bar implemented
- new api modifications
- search query clear images added
- missing images for widget
- sync states images
- Toolbar implemented
- Merge branch 'wp-dev' of https://github.com/Acrowit/Acrowit-Desktop-Widget into wp-dev
- Merge branch 'wp-dev' of https://github.com/Acrowit/Acrowit-Desktop-Widget into wp-dev
- Title implemented with pattern
- missing text hover for dusk theme added
- 4 dot image for drag pattern
- Merge branch 'wp-dev' of https://github.com/Acrowit/Acrowit-Desktop-Widget into wp-dev
- Drag text and drag attachment icons are implemented for all themes and all events
- Merge branch 'wp-dev' of https://github.com/Acrowit/Acrowit-Desktop-Widget into wp-dev
- Added dusk images
- dusk attachment hover modification
- more olive images
- Merge branch 'wp-dev' of https://github.com/Acrowit/Acrowit-Desktop-Widget into wp-dev
- Merge branch 'wp-dev' of https://github.com/Acrowit/Acrowit-Desktop-Widget into wp-dev
- removed old images and image path is fetched from theme object

Commit Log (SHA1 ID: 40ebc7df1178c2ac1f0d82225da0598b78948987):

Author: Shreyas <shreys.unc@gmail.com> 2012-06-08 03:07:55
Committer: Shreyas <shreys.unc@gmail.com> 2012-06-07 06:37:59
Parent: 51961118e7cc46ca317a34b777fcc895e277a634 (4 dot image for drag pattern)
Child: 2169a962764a9ec03c782af84d41093837b90a5 (Merge branch 'wp-dev' of https://github.com/Acrowit/Acrowit-Desktop-Widget into wp-dev)
Branches: master, remotes/origin/dev, remotes/origin/master, remotes/origin/native-dev,
Follows:
Precedes: v0.1.2.0

Comments:
Acrowit-Widget/widgetimages/dusk/icon_32_witdrag_text_hover_itself.png

Search and Filter Options:

- Find, next, prev, commit, containing: [text input]
- Search [text input]
- Patch (radio button)
- Tree (radio button)
- Diff (radio button) (selected)
- Old version (radio button)
- New version (radio button)
- Lines of context: [3] (dropdown)
- Ignore spaces (checkbox)



Working with others...

- Creating New Repo
- Committing
- Branching/Merging
- Inspection
- **Cloning a Repo**
- Updating

github





GitHub

- Creating New Repo
- Committing
- Branching/Merging
- Inspection
- Cloning a Repo
- Updating

create an account

www.github.com/edu

A screenshot of a web browser window showing the GitHub Education landing page. The URL in the address bar is https://github.com/edu. The page title is "Request an educational account". It asks if you are a student, teacher or school administrator. There are three sections: "I'm a student" (for class projects, thesis, or research), "I'm a teacher or student organization" (for students in my class or a student organization), and "I'm an administrator" (for discounts). A GitHub cat wearing glasses and holding an apple is on the right side of the page.

GitHub, Inc. [US] https://github.com/edu

Stock photos Favs Prototyping Web Usability Useful Sites OS Platforms Projects Awesome Berkeley Tools

seekshreyas

Request an educational account

Are you a student, teacher or school administrator looking to use GitHub? We'd love to help.

I'm a student
I'd like a **free micro plan** to use for my class projects, thesis, or research towards a degree.

I'm a teacher or student organization
I'm a teacher and would like a **free Organization account** for my students to use in my class, or I am the sponsor of a student organization such as a campus newspaper or robotics club.

If you're a student and need repositories for a group project, please request a student account above.

I'm an administrator
I'd like a discount on a GitHub plan.



GitHub

- Creating New Repo
- Committing
- Branching/Merging
- Inspection
- **Cloning a Repo**
- Updating

add ssh key

www.github.com/edu

A screenshot of a web browser showing the GitHub SSH Keys settings page. The URL in the address bar is <https://github.com/settings/ssh>. The page displays a sidebar with options like Profile, Account Settings, Emails, Notification Center, Billing, Payment History, and SSH Keys. The SSH Keys section is currently selected. It shows two existing SSH keys: "FirePro" and "Jarvis", each with a "Delete" button. A link to "generating SSH keys" is highlighted with a red box. At the bottom left, it says "PRIVATE REPOS" and "5 OF 5".



GitHub

- Creating New Repo
- Committing
- Branching/Merging
- Inspection
- **Cloning a Repo**
- Updating

\$ git clone <url> <name>

<https://github.com/jblomo/datamining290>

The screenshot shows a Mac OS X desktop with multiple browser tabs open. The active tab is GitHub, Inc. [US] at <https://github.com/jblomo/datamining290>. The page displays the repository details for 'jblomo / datamining290'. The 'Code' tab is selected. A red box highlights the 'HTTP' cloning link: 'git@github.com:jblomo/datamining290.git'. Below the cloning section, the repository summary shows 9 commits. The commits listed are:

- HW updates by Jim Blomo 7 days ago
- slides by Jim Blomo 7 days ago
- .gitignore by Jim Blomo 15 days ago
- COPYING by Jim Blomo 10 days ago
- README.org by Jim Blomo 8 days ago
- index.html by Jim Blomo 8 days ago



GitHub

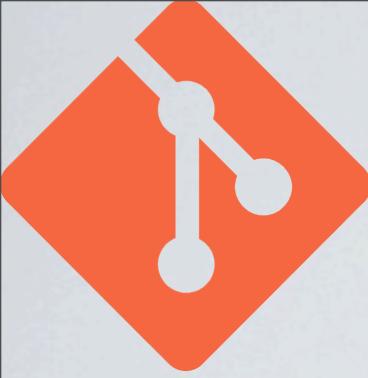
- Creating New Repo
- Committing
- Branching/Merging
- Inspection
- Cloning a Repo
- Updating

Fork a repo

The screenshot shows a web browser window with multiple tabs open, including ones for Git, Fontello, and GitHub. The main content is a GitHub repository page for 'jbromo / datamining290'. A modal dialog box is centered over the page, titled 'Where do you want to fork this to?'. It contains two options: 'Fork to seekshreyas' and 'Fork to Acrowit (organization)'. Below the modal, the repository's file list is visible, showing files like 'slides', '.gitignore', 'COPYING', 'README.org', and 'index.html' with their respective commit history.

Monday, January 28, 13

now show them a demo of creating ssh key on my ischool account



GitHub

- Creating New Repo
- Committing
- Branching/Merging
- Inspection
- Cloning a Repo
- **Updating**

```
$ git pull
```



```
$ git push
```

= *git fetch + git merge*



GitHub

- Creating New Repo
- Committing
- Branching/Merging
- Inspection
- Cloning a Repo
- Updating

GitHub Pull Request

The screenshot shows a web browser window with the GitHub pull request interface. The URL in the address bar is <https://github.com/seekshreyas/datamining290/pull/new/master>. The page displays an error message: "Oops! master is already up-to-date with master Try a different branch?". Below the message, there are four dropdown menus for selecting repositories and branches. The "base repo" and "head repo" are both set to "seekshreyas/datamining290". The "base branch" and "head branch" are both set to "master". The browser's title bar shows multiple tabs related to Git and GitHub.



GitHub Ninja Features

Markdown

for documentation

Pages

for project hosting

Gist

for project hosting

Service Hooks

'do something' on commit



may the Force be with you

