



# Version Control System

*a better workflow*

# Code Management Before Version Control System

Developers develop source code and store them locally in their system or some remote shared drive. This makes code insecure and there is high risk of code getting deleted.



# Code Management After Version Control System

Version Control system provides developer an mechanism to manage application source code and provide versioning for each and every change.

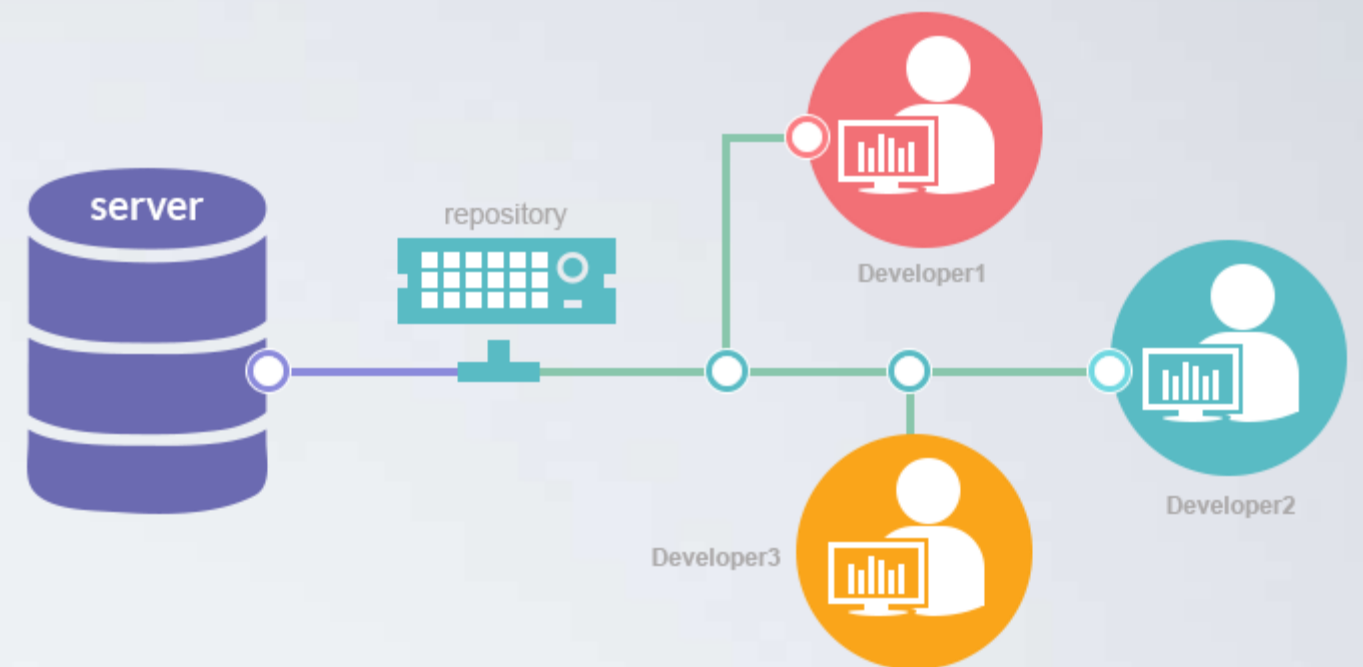


Credits: Medium



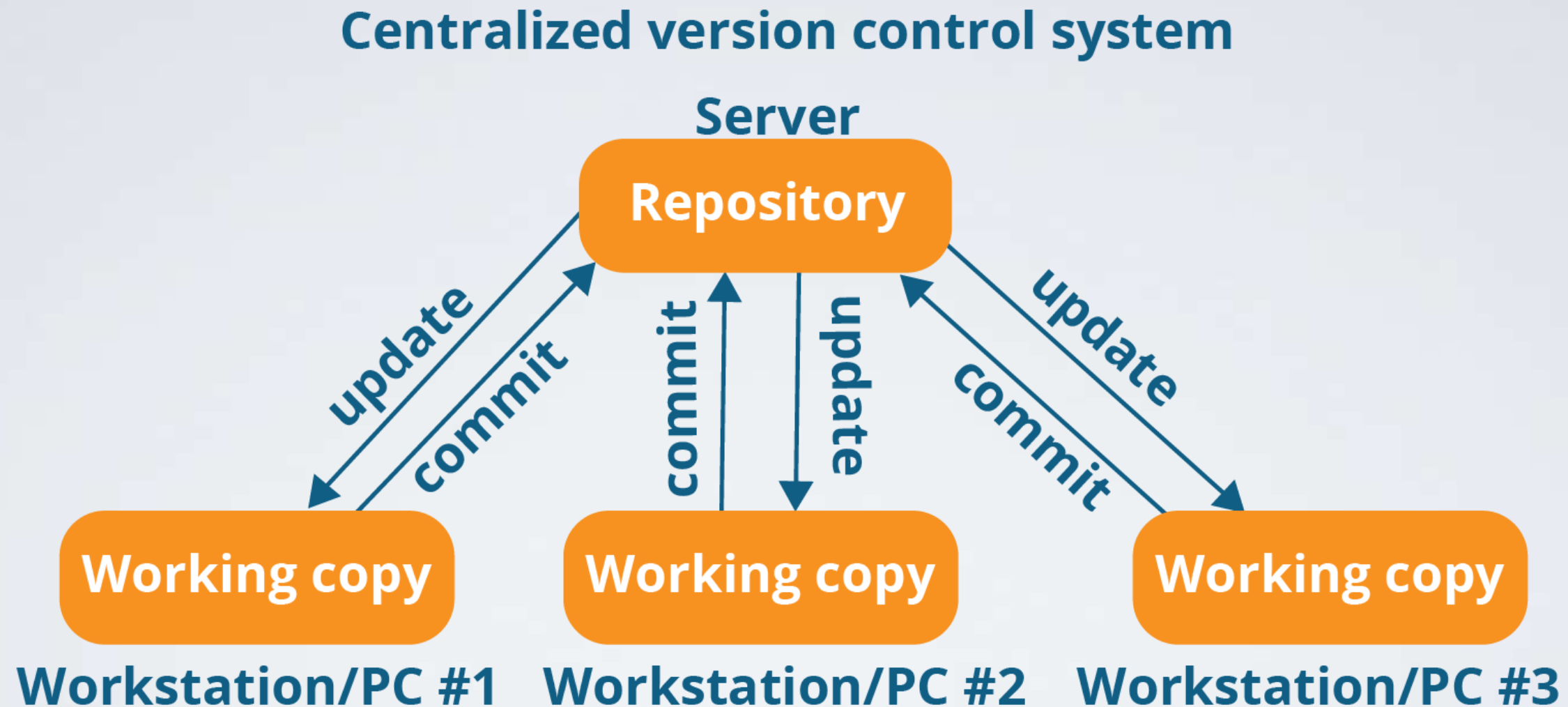
# Version Control System

A major focus of version control system (also known as revision control or source control) is to manage the changes to the files, programs, logs, and other information related to code development, code deployment, and code operation.



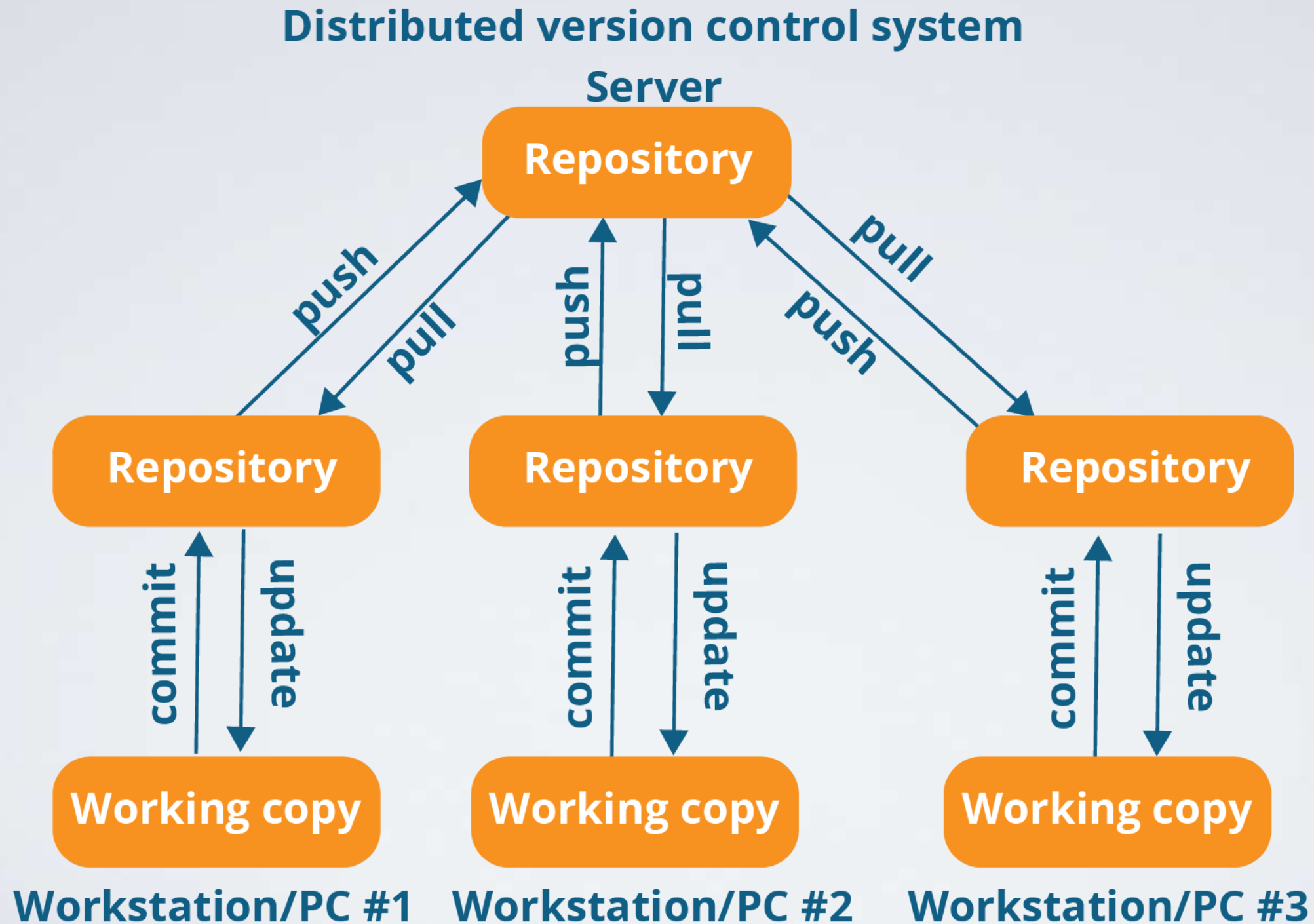


# Centralized Version Control System





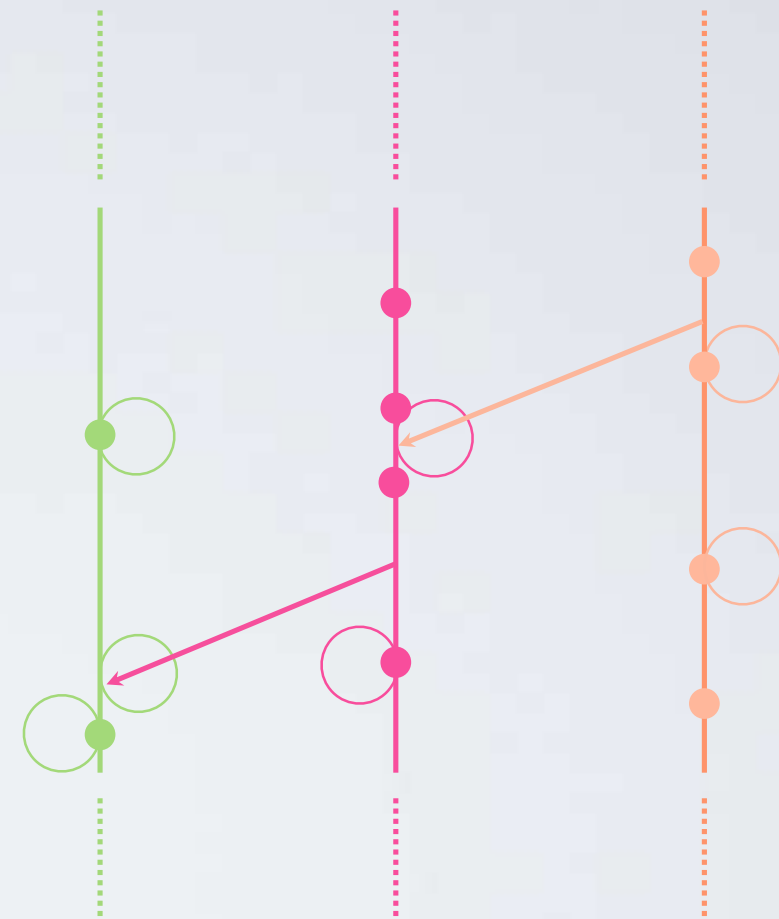
# Distributed Version Control System





# Git

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

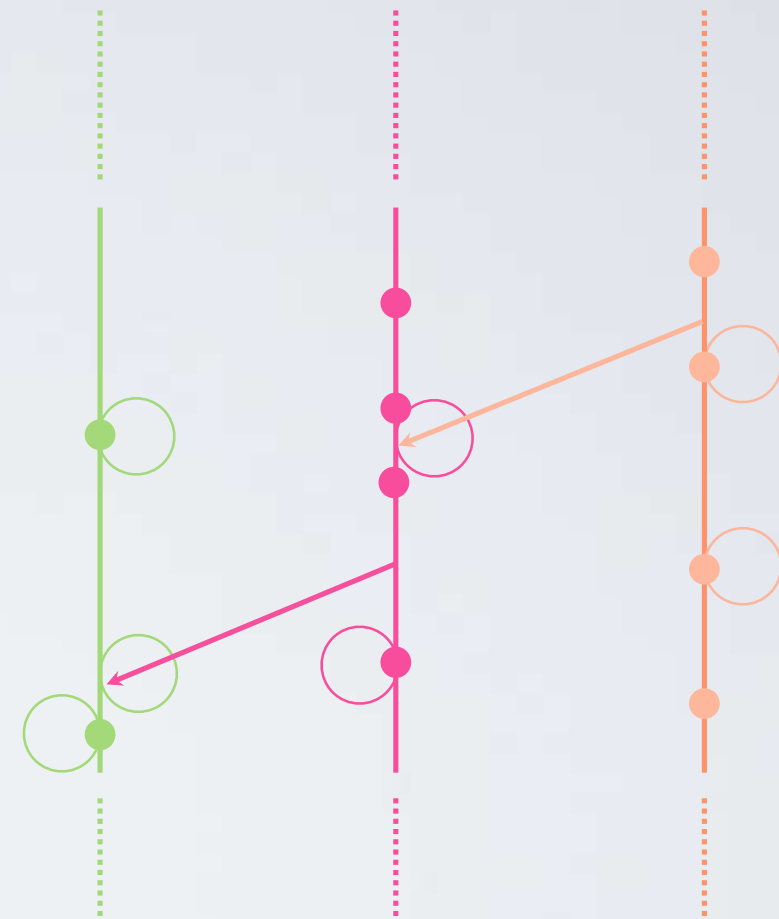


*(almost) everything is local*



# 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*





# installing git

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

The screenshot shows a web browser window with the address bar displaying `git-scm.com/downloads`. The page features the Git logo and the tagline `--local-branching-on-the-cheap`. A search bar is located in the top right. On the left sidebar, there are links for **About**, **Documentation**, **Downloads** (highlighted), **GUI Clients**, **Logos**, and **Community**. Below these links, a text box mentions the **Pro Git book** by Scott Chacon, available for free online or on Amazon.com. The main content area is titled **Downloads** and includes a section for the latest stable release, **1.8.1.1**, with a **Download for Mac** button. Below this, it states that older releases are available and the Git source repository is on GitHub. There are also sections for **GUI Clients** and **Logos**, each with a link to view more options. At the bottom, there is a section for **Git via Git**.

Git – Downloads

git --local-branching-on-the-cheap

Search entire site...

**About**

**Documentation**

**Downloads**

GUI Clients

Logos

**Community**

The entire **Pro Git book** written by Scott Chacon is available to [read online for free](#). Dead tree versions are available on [Amazon.com](#).

## Downloads

Mac OS X Windows

Linux Solaris

Older releases are available and the [Git source repository](#) is on GitHub.

**GUI Clients**

Git comes with built-in GUI tools (**git-gui**, **gitk**), but there are several third-party tools for users looking for a platform-specific experience.

[View GUI Clients →](#)

**Logos**

Various Git logos in PNG (bitmap) and EPS (vector) formats are available for use in online and print projects.

[View Logos →](#)

**Git via Git**



# getting setup ...

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

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

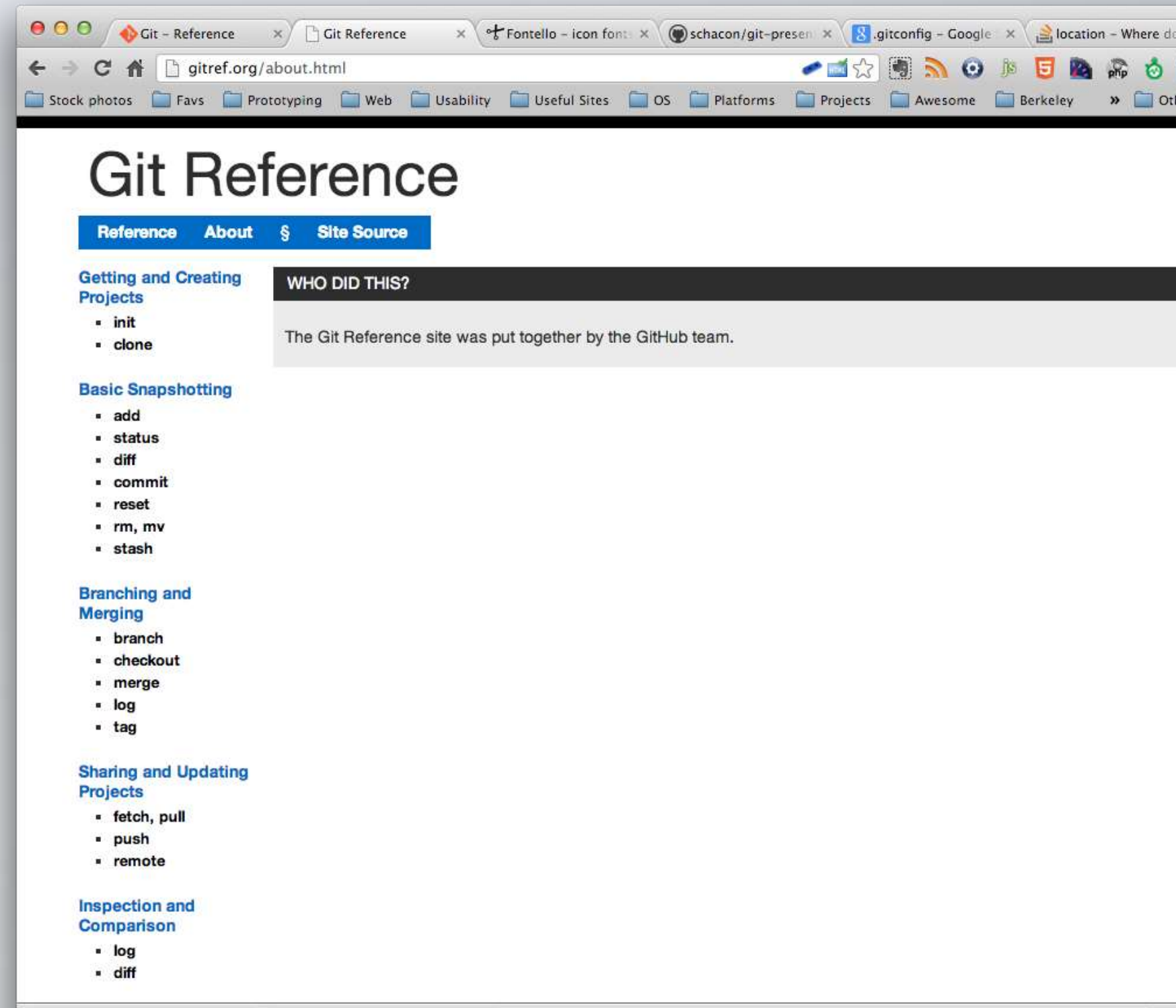
*or edit them in ~/.gitconfig*



# lets dive in..

[gitref.org/](https://gitref.org/)

- Creating New Repo
- Committing
- Branching/Merging
- InspectionCloning a RepoUpdating

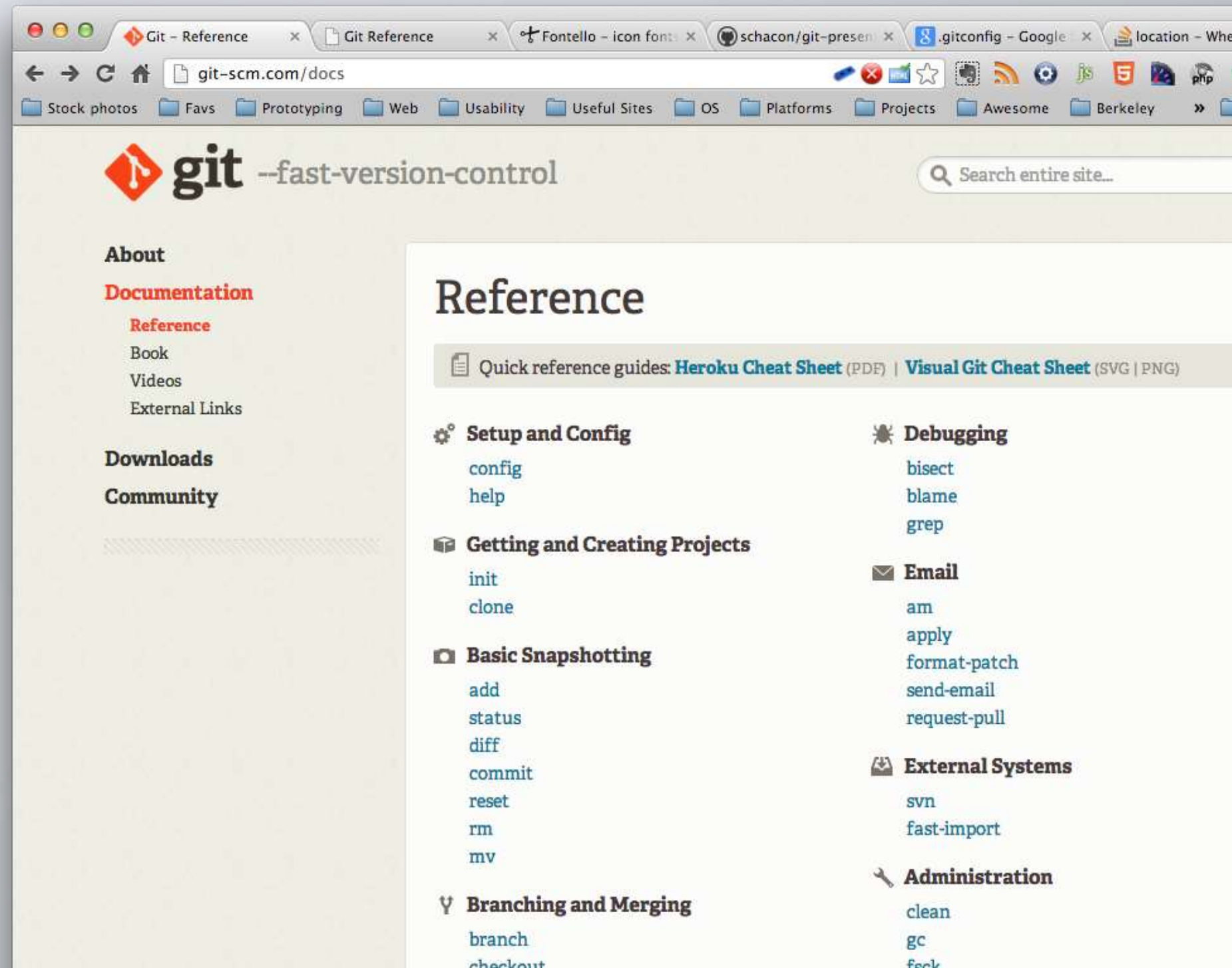




# lets dive in..

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

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





# 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
- Branching/Merging
- 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
- Inspection
- Cloning a Repo
- 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
- Branching/Merging
- Inspection
- Cloning a Repo
- Updating

```
$ git rm <filename>
```

*remove a file from the  
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
- Branching/Merging
- Inspection
- Cloning a Repo
- Updating

branch list →

new branch  
dev →

switch branch →

```
Shreyas at Jarvis in ~/Documents/_Berkeley/sem2/i290DataMining/workspace on master*
$ git branch
* master
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
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
- Committing
- Branching/Merging
- Inspection
- Cloning a Repo
- Updating

\$ 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
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- Cloning a Repo
- Updating

\$ git log

--graph

*text-based graph :)*

--decorate

--abbrev-commit

--all

--pretty=oneline

```
$ git log --graph --decorate --abbrev-commit --all --pretty=oneline
* 1fd3b2d (origin/native-dev) Merge branch 'native-dev' of https://github.com:
|
| * 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 added
|/
* 2cacb88 Tag search results are listed properly on the dashboard
* 6d9e2b3 (origin/qa) Tag filter is working in advance search
* f440164 QA release 0.2.4.0
* 77e05c8 Merge remote-tracking branch 'origin/native-dev' of https://github.com:
|
| * 1843b03 Dashboard wit usage widget improved
| * 737a64e Merge branch 'native-dev' of https://github.com:
|/
| * 664abf0 side bar made similar to ui concepts
| * f0ea951 fixed issue for coming back from search results
| * cbfa98a Merge branch 'native-dev' of https://github.com:
|/
| * 030f2b2 dosearch
| * 3e5c533 Top 5 wits graph is implemented
|/
|
| * 4fed3cb Tags added in wit search result
| * 94881c7 First level of advance search integration
| * 61399e3 Merge branch 'native-dev' of https://github.com:
|/
|/
```





# 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
```

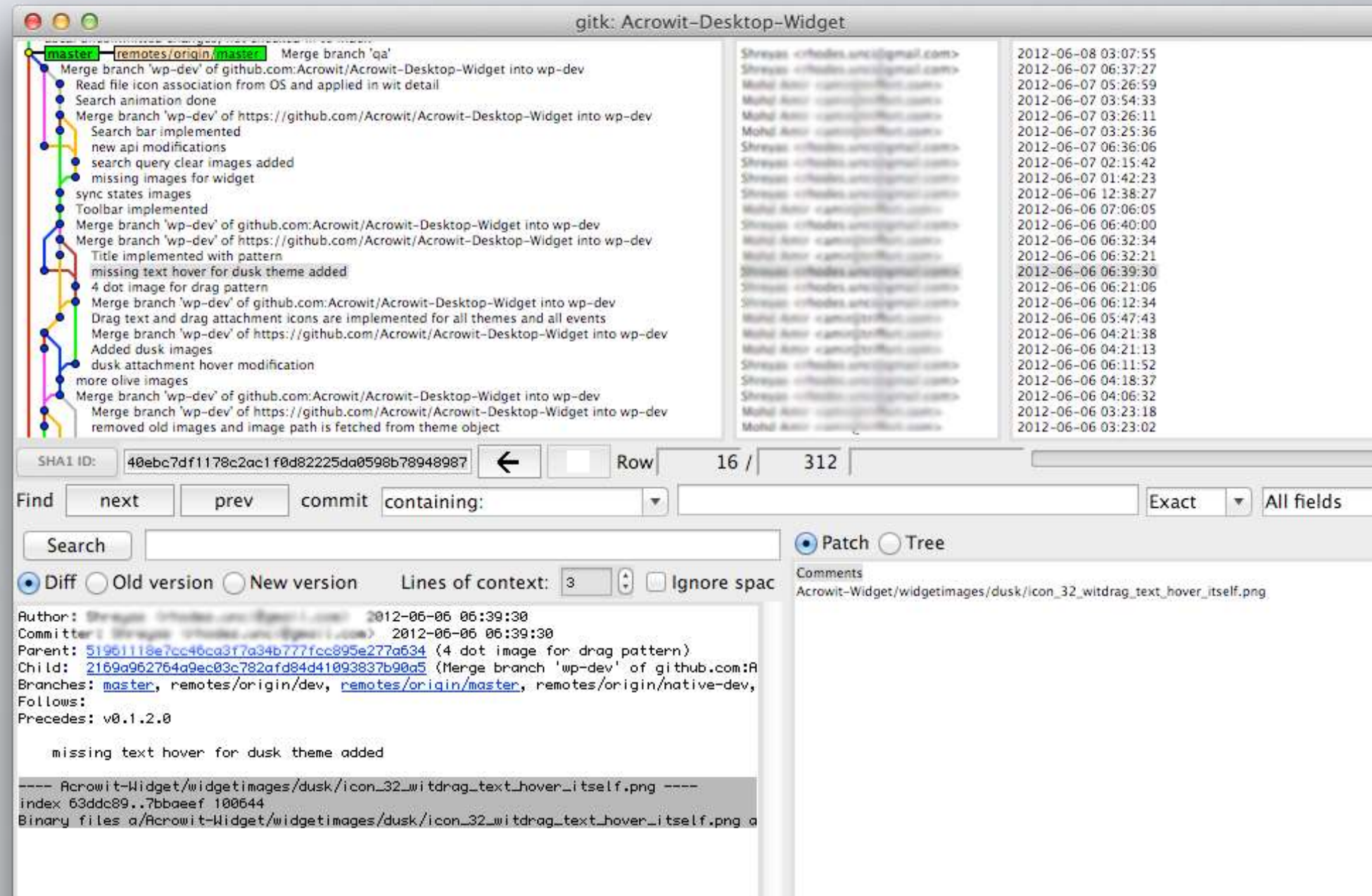
```
$ git l
* 883567e70d3325eb566c15bcf743200d8d5a572a Merge branch 'qa'
|
| * d603345f32fcf4b53325311ccf284f88750a28d6 Merge branch 'wp-dev' of github.c
|/
| * e1d9cd4da0e42a03c95c599baa0d1939db924586 Read file icon association from 0
| * aaa61ad3c87d0422876971e16dec6b60a5363021 Search animation done
| * aa359488a3bac15e1a1ed8da350eff28cc89fe90 Merge branch 'wp-dev' of https:
|/
| * | daa54ce681898aa53b3cdc49e8e09ffb73fcb8c8 Search bar implemented
| * | 6d8f2d261d94a4c24ce27296dd909ff86d6fe15f new api modifications
|/
| * 70bcbb0acd1b3ec7a1e31e1972c11d9bfb70cda9 search query clear images added
```



# Git Commands

\$ gitk

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





# Working with others...

github

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





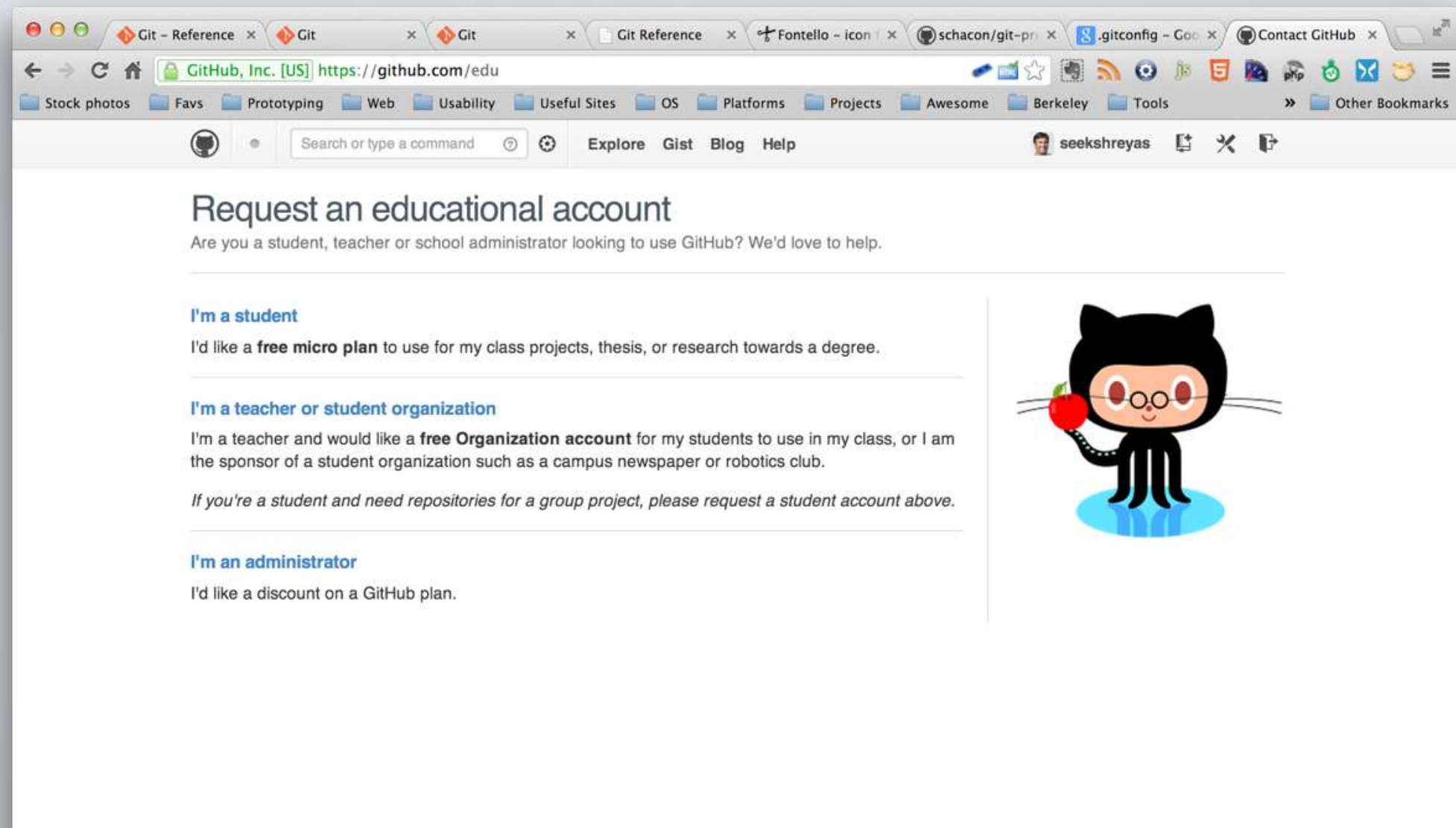


# GitHub

## create an account

[www.github.com/](https://www.github.com/)

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





# GitHub

## \$ git clone <url> <name>

<https://github.com/anujdevopslearn/InterviewQuestions>

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

The screenshot shows the GitHub repository page for `anujdevopslearn / InterviewQuestions`. The repository has 7 stars and 11 forks. The main branch is `master`, with 1 branch and 0 tags. The repository contains 88 commits. The file list includes:

| File                    | Commit Message               | Time Ago      |
|-------------------------|------------------------------|---------------|
| Demos                   | Add files via upload         | 2 months ago  |
| InstallationGuides      | Update Ansible.txt           | 4 months ago  |
| InterviewQuestions      | Modified directory structure | 11 months ago |
| Project                 | Add files via upload         | 12 months ago |
| 60761_Linux.pdf         | Add files via upload         | 8 months ago  |
| DevOps_Das.docx         | Modified directory structure | 11 months ago |
| README.md               | Update README.md             | 6 months ago  |
| Top50LinuxCommands.docx | Add files via upload         | 2 years ago   |

The right sidebar shows the repository's description, README, releases, and packages.



# GitHub

## Fork a repo

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

The screenshot shows a GitHub repository interface. At the top right, there are buttons for 'Unwatch' (with a dropdown arrow), '7' (forks count), 'Star' (with a dropdown arrow), '11' (stars count), and 'Fork' (with a dropdown arrow and '200' forks count). The 'Fork' button is highlighted with a red rectangle. Below these buttons are links for 'Insights' and 'Settings'. The main content area has buttons for 'Go to file', 'Add file' (with a dropdown arrow), and 'Code' (with a dropdown arrow). Below these buttons is a commit history table with columns for commit hash, date, and commit count. The first row shows 'c70261e' on 'Jul 12' with '88 commits'. Below this are four rows with dates: '2 months ago', '4 months ago', '11 months ago', and '12 months ago'. To the right of the commit history is the 'About' section, which says 'No description, website, or topics provided.' and has a 'Readme' link. Below the 'About' section is the 'Releases' section, which says 'No releases published' and has a 'Create a new release' link.

| Commit Hash | Date          | Commits    |
|-------------|---------------|------------|
| c70261e     | on Jul 12     | 88 commits |
|             | 2 months ago  |            |
|             | 4 months ago  |            |
|             | 11 months ago |            |
|             | 12 months ago |            |



# GitHub

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

## \$ git pull

*= git fetch + git merge*

## \$ git push



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



# GitHub

## GitHub Pull Request

### Comparing changes

Choose two branches to see what's changed or to start a new pull request. If you need to, you can also [compare across forks](#).



base: master ▼



compare: develop ▼

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

Discuss and review the changes in this comparison with others. [Learn about pull requests](#)

Create pull request

1 commit

1 file changed

0 comments

1 contributor



Commits on Jul 21, 2018



Update pom.xml

Verified

e43721f



