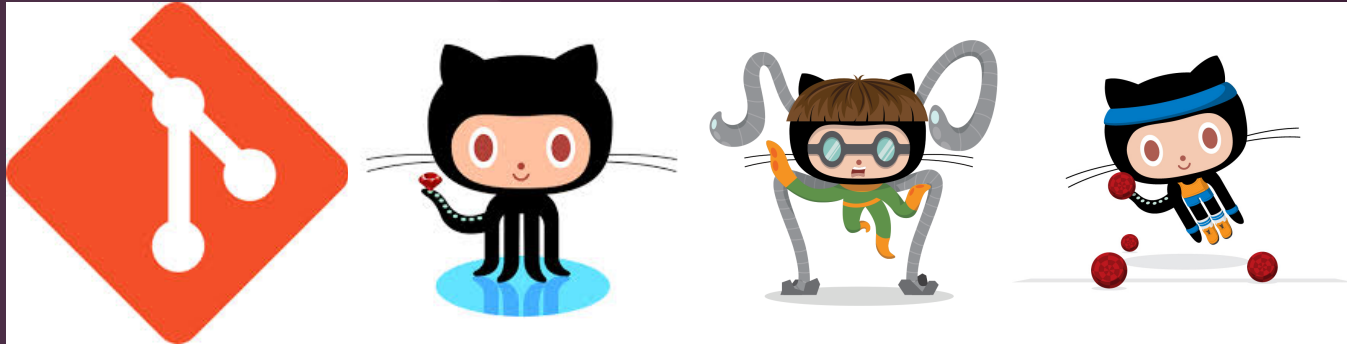# 98-174 Modern Version Control With Git

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Jonathan Miedel

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Class Logistics

- 15 Weeks
  - 13 Lectures
  - Midterm + Final
- Class materials hosted on GitHub
- For questions raise issues on GitHub or email us
  - Shannon Lee sjl1@andrew.cmu.edu
  - Jonathan Miedel jmiedel@andrew.cmu.edu
  - Alvin Wang alvinw@andrew.cmu.edu

Continued

- Class website
  - http://dogfalo.github.io/git-stuco/

Grading

- 6 Homeworks (30%)
- 1 Midterm (25%)
- 1 Final (35%)
- Participation (10%)
- Do not miss more than 3 classes

Reasons to Use Version Control Software

- Sharing code
- Maintain history of changes

Problem Scenarios

Email Echoing

● Imagine you are sharing code with your team members through email...

Dropbox Duplicates

● Picture two people working on the same file they both save and…

Investigating Integrity

- Pretend a disgruntled employee tampers with your companies code base making small bugs…

Feature Fiasco

- Recall, those times working on a new feature before the deadline…

Version Control

- "The management of changes to documents, computer programs, large web sites, and other collections of information" - Wikipedia
- Version Control Software (VCS) is any software that aids in the above tasks

Advantages

- Allows for parallel programing (code sharing)
- Maintain multiple versions
- Backup work
- Allow to view history
- Revert changes
- Speeds up development by allowing you to make errors

Introduction to Git

- Source code management software
- Distributed workflow
- Free and open source

Features of Git

- Operates faster than most competitors
- Easy to use (particularly branching)
- One of the most common in industry

  - As of April 2014, there were 247,103 repositories (https://www.openhub.net/repositories/compare)

- Offers data assurance

Installing Git

Windows: http://git-scm.com/download/win

Mac: http://git-scm.com/download/mac

Linux (Ubuntu): `sudo apt-get install git`

Setting up Git

```
$ git config --global user.name "Alvin Wang"
$ git config --global user.email alvinw@andrew.cmu.edu
```

Introduction to GitHub

- **github.com**
  - Create a new account and login
  - Sign up for GitHub!!!!
  - Confirm your email
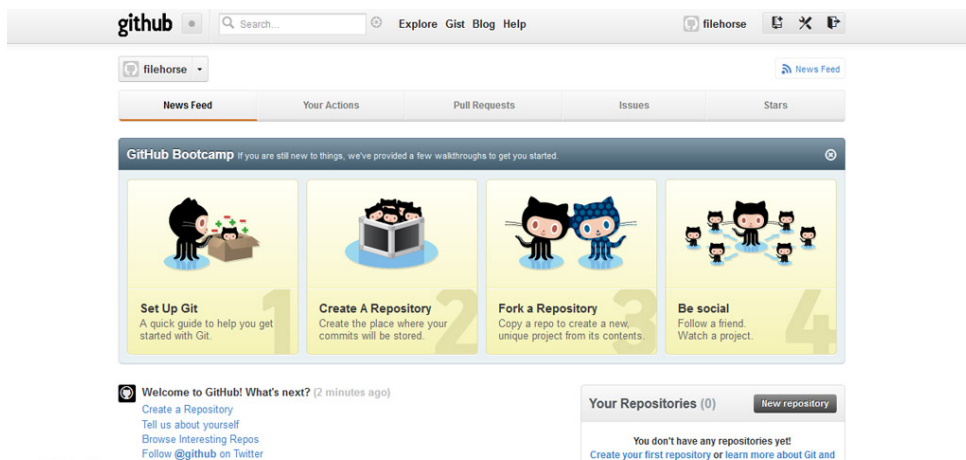
Creating a Repo within GitHub

How to Clone a Repository

`git clone` - clones a repository (creates the local copy in the current directory)

```
$ git clone <git-repo-link>
```
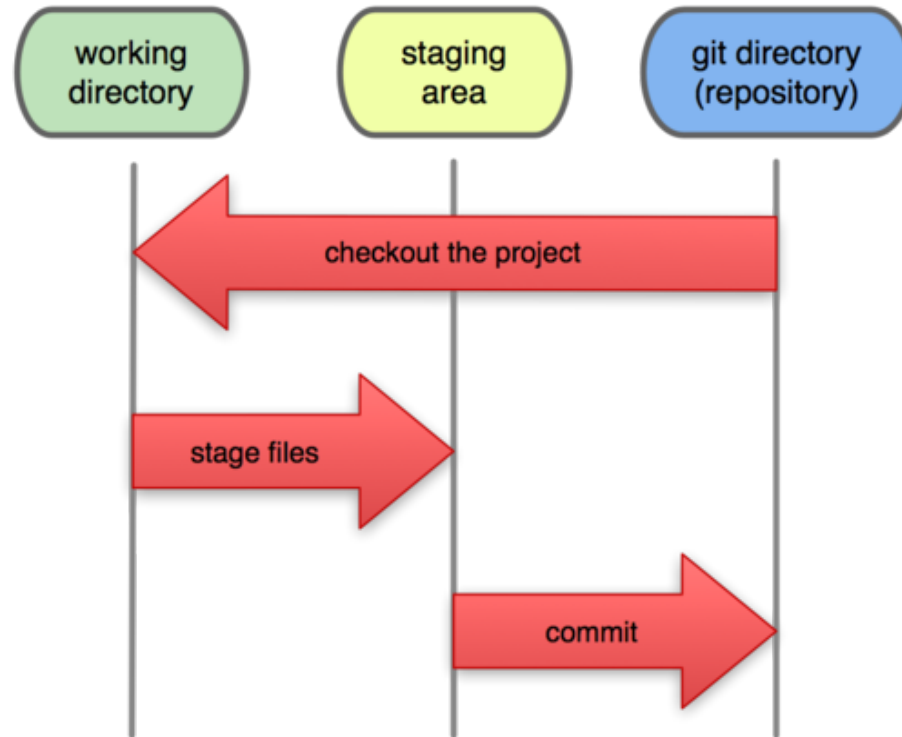
2048 Example

How to Create a Repository

`git init` - initializes a blank Git repository in the current directory
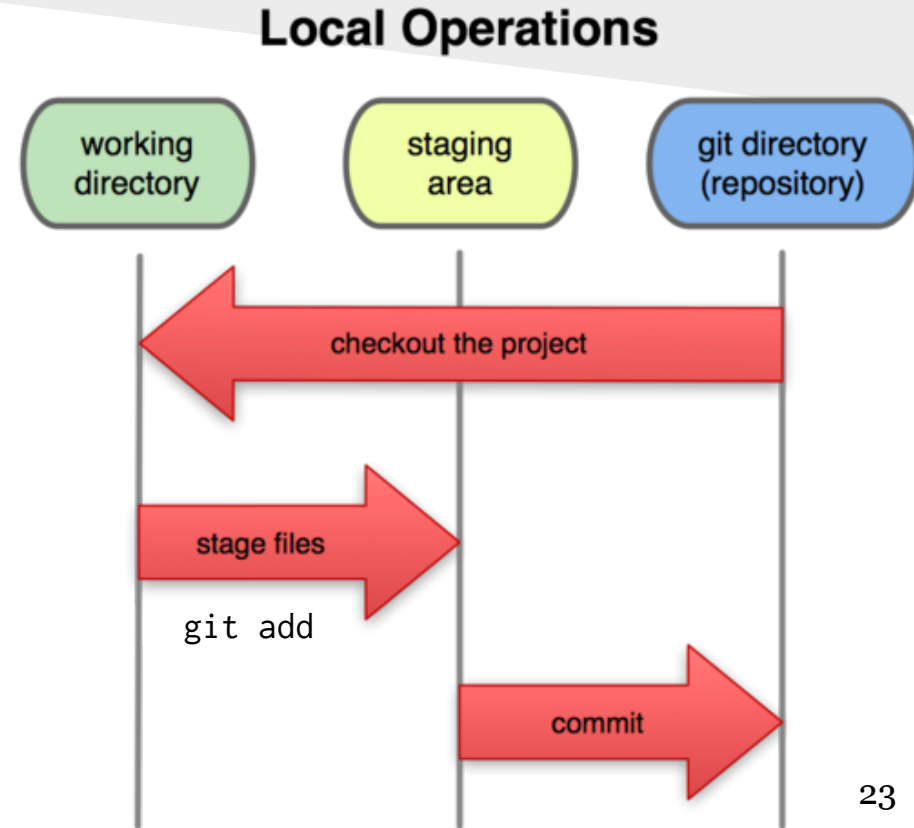
Workflow Diagram

git add

- Takes a "snapshot" of your files and puts it in the staging area

Local Operations

working directory

staging area

git directory (repository)

checkout the project

stage files

git add

commit

23

git add options

- `adds files to the index`
- `git add <filename>`
- `git add **/*.js` (adds only javascript files)
- `git add .` (adds all changes and additions in current folder + subdirectories and adds deletions in 2.0+)
- `git add -A` (same as git add --all, adds deletions too)
- In git 2.0, git add -A and -u operate on the entire tree, rather than just the current directory and subdirectories

git status

- `git status` - shows you what files in your repository have been changed, deleted, or added

git commit

- Commits your staged (git add) changes to your repository

Local Operations

working directory | staging area | git directory (repository)

checkout the project

stage files
git add

git commit

commit
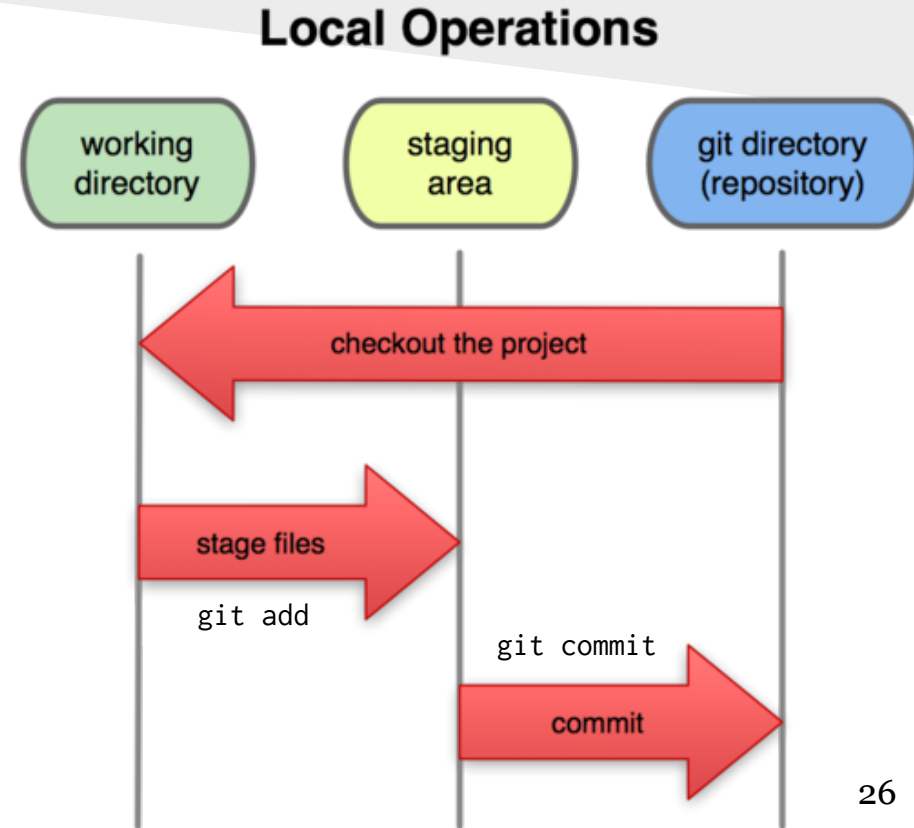
Opening Issues on Github

For this class we will handle questions by having you open issues on GitHub. This will help you get more familiar with the Git workflow.

https://github.com/Git-Stuco/GitStucoClass

Homework

- Fill out survey (2 mins)
  - http://goo.gl/veEcTn
- Clone the week 1 repo
  - https://github.com/Git-Stuco/Week1
- Follow link in repository to video (5 mins)

Next Week in 98-174

Basic Git Commands

- Clone in Detail
- Commits as a concept
- Push
- git log
- History of Git

Questions