Introduction to Git and GitHub for Writers

Puget Sound STC Workshop

Peter Gruenbaum

SDK BRIDGE

Introduction

- This Course Covers:
  - What are Web APIs?
  - Markdown
  - JSON
  - What is REST?
  - HTTP Methods
  - Query ParametersTools
  - Next Steps

Schedule

- 8:30 Registration
- 9:00 Introduction
- 9:15 Intro to Git and GitHub
- 10:00 Git add, commit, and push
- 11:45 Break
- 11:00 Git checkout, pull, and merge
- 11:30 Branching

Peter Gruenbaum

- PhD in Applied Physics from Stanford
- Commercial Software Developer
  - Boeing, Microsoft, start-ups
  - C#, C++, Java, JavaScript, Objective-C
- API Writer
  - Brought together writing and technology
  - Since 2003
  - President of SDK Bridge
- Teacher: Programming at middle, high school, and college

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Wi-Fi

- Network: galvanize guest seattle
- Password: none, but requires an email address

- Be sure that you have everything in the Preparation section of the workbook

Download Presentation and Workbook

- Go to http://sdkbridge.com/downloads/
- Enter email to get put on my newsletter list
  - Will notify you of Git/GibHub Udemy course (with coupon!)
  - At most one email every two months
  - Put in a fake email if you don't want me to have it (fake@example.com)

Introduction

Git and GitHub for Writers

What is Git and GitHub?

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Git

- Version control system
- Free
- Open source
- Really fast
- Takes up very little room

GitHub

GitHub

- Commercial platform to host files through Git
- Allows for easy collaboration
- Nice visual user interface
- Free for public files
- Subscription for private files

Why this workshop?

- Writers are being asked to use Git, but…
- Git was designed for developers, not for writers
- Git can be quite complex
- Git is often not intuitive
- Sometimes Git does not have safeguards

- Writers need their own Git and GitHub course!

Notes about this workshop

- We will use the command line rather than a GUI tool
- We will use GitHub, but be aware that other Git platforms exists
- We will write some simple content in Markdown, which is a simple markup language
  - You do not need to know Markdown
- I will show you how to do something, then you will do an exercise where you do it yourself

Docs Like Code

Git and GitHub for Writers

Treating Documentation Like Code

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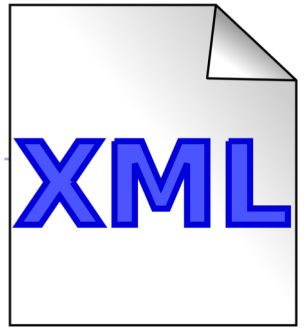
Docs Like Code

- Phrase that means treat writing documents the same way you treat writing code
  - "Docs Like Code" book by writer Anne Gentle
- Documentation in text format, not binary
- Use version control tools (Git, GitHub, etc.)
- Use a review process similar to code reviews

Text vs Binary

- When a document is in a text format, you can open it in a text editor and read it
- Some formats are designed for this:
  - Markdown, reStructuredText
- Some formats are kind of readable
  - XML, HTML
- Binary formats (Microsoft Word files, for example) are not readable at all

XML



- Combination of text and tags
- Used for DITA
- When software is automatically merging two versions of an XML file, it can mess up the structure
- Not ideal for “Docs like code”

Markdown

- Simple markup language
- No tags
  - `**bold**` instead of `<strong>bold</strong>`
- Has many variations (called “flavors”)
- GitHub-flavored Markdown is very popular
- Works well for “Docs like code”

reStructuredText

- Simple markup language
  - A little more complex than Markdown
- Originally came from documenting Python through a tool called Sphynx
- No tags
- Only one variation (no flavors)
- Can extend its functionality
- Works well for “Docs like code”

AsciiDoc

AsciiDoc

- Similar to reStructuredText
- No tags
- Only one variation (no flavors)
- Can extend its functionality
- Works well for “Docs like code”

Git and GitHub for Writers

Version Control

How do you keep track of versions?

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What is version control?

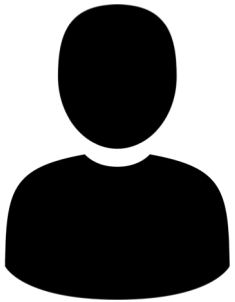
- As you modify a document, you create new versions
- You could give each file a new name:
  - intro-v1.txt
  - intro-v2.txt
  - intro-v3.txt
- Gets confusing when multiple people working on it
- In version control systems, multiple users manage the versions as if they all had the same name
- Also called revision control and source control

Collaboration

- Often you work on a document in a team
- Different people make changes to the document
- Version control systems can help manage this
- Documents are hosted remotely, but worked on locally

Previous version control systems

- Earliest: one person checks out at a time.



Check out

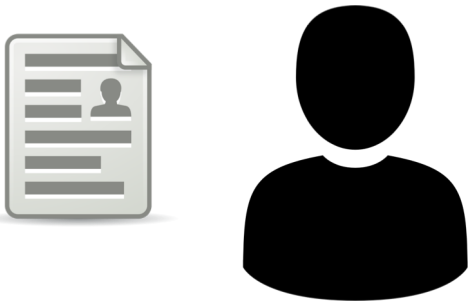
Previous version control systems

- Earliest: one person checks out at a time.

Modify

Previous version control systems

- Earliest: one person checks out at a time.



Check in

Previous version control systems

- Later: multiple people check out simultaneously.

Check out

Previous version control systems

- Later: multiple people check out simultaneously.

Modify

Previous version control systems

- Later: multiple people check out simultaneously.

Check in with Merge

Previous version control systems

- Later: multiple people check out simultaneously.

Check in with Merge

Git

- Created by Linus Torvalds in 2005
- The name doesn't really mean anything
- Rather than storing every version, it stores the differences between versions
  - Much smaller
- Every computer stores all versions
  - Older systems you only stored what you were working on

Other Git innovations

- Git manipulates files using the file system
  - File content changes with git commands
- Separates commit and push
  - Older systems: check in marks and uploads files
  - Git: marking and uploading are two separate things

GitHub and platforms like it

- You can create a git remote repository on any server
- However, commercial platforms make it easier
- GitHub:
  - The most popular

- Others:
  - Provide better security, better integration with other tools, etc.
  - BitBucket, GitLab, Beanstalk, etc.

ATLASSIAN Bitbucket

beanstalk

Git and GitHub for Writers

Getting Started with Git

Installing and configuring

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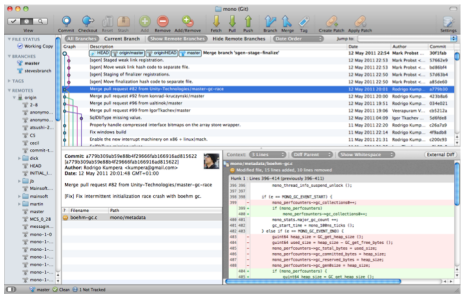
Git Command line vs. GUI

- Command line
  - Type commands in a terminal
  - Gives you full power of git
  - Most people (even non-technical) eventually use command line
- GUI
  - An app with a user interface
  - Not that much less confusing that command line
- This workshop will use the command line only



Mac

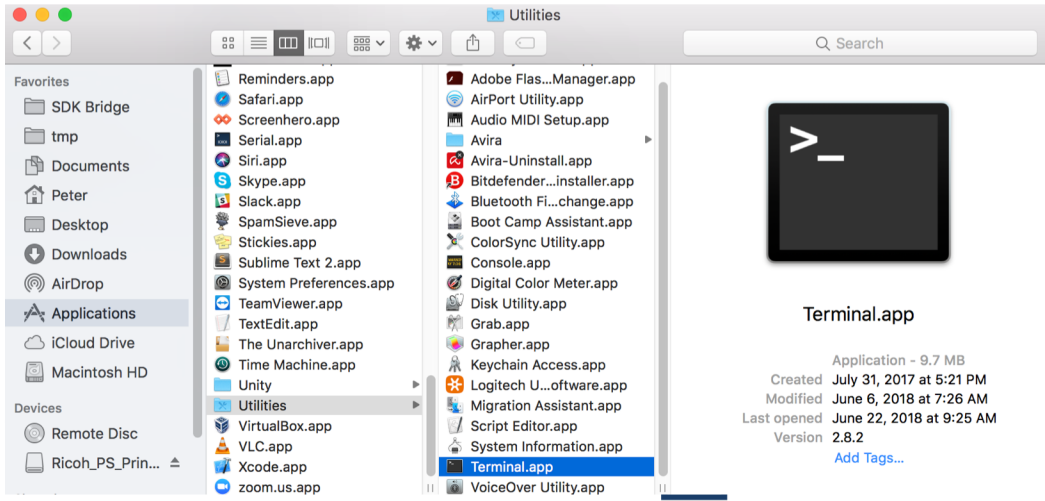
- If you have a Mac, then git is automatically installed already
- All you have to do is use the terminal app
- Can't get easier than that!

Windows

- Will require an installation
- Use special terminal app called “git bash shell”
- Go to https://git-scm.com/downloads
- Click on **Windows**
- Download and install
- Instructions in workbook

Testing to see if git is installed

- The easiest way to test is to have git show you its version
- Mac: Open Terminal app under Utilities
- Windows: Open git bash shell
- Type `git --version`



Git and GitHub for Writers

Getting Started with GitHub

Signing up and creating a repository

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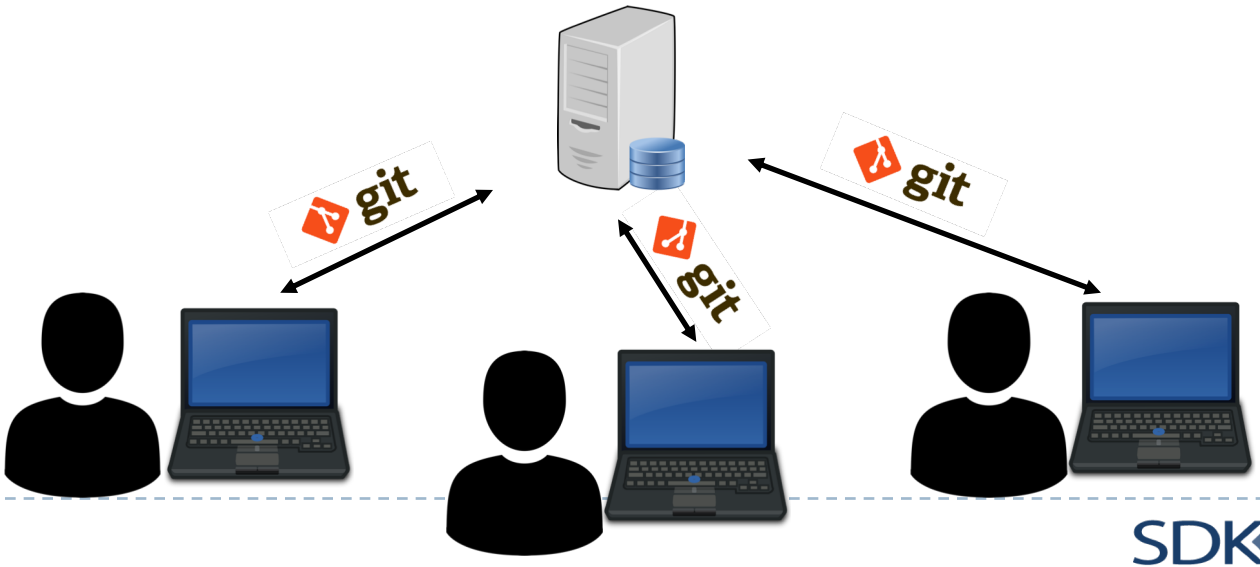
What is GitHub?

- A way to host your content remotely
- Multiple users can read and/or write versions
- Everyone uses Git to access it



Creating an account

- Accounts on GitHub are free
- It's free to host files if those files are open to the public to view
- Most companies will pay a subscription for privacy
- Open source projects are often public

Repositories

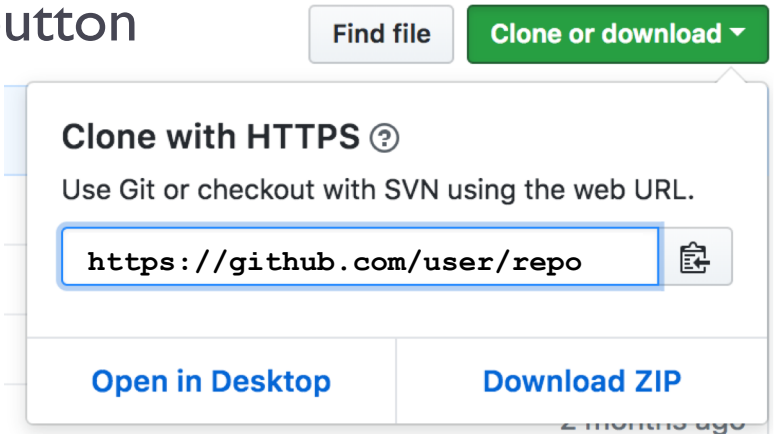
- A place that holds a directory structure (folders) with files
- Contains not just current versions, but all versions and history
- Typically exists both remotely and locally, although not necessarily in sync

Creating a repository

- Can be created locally with Git and then "pushed" to the remote platform (GitHub)
- Easier to create in GitHub and then "clone" it locally

Cloning a repository

- Once repo is created, GitHub shows you its path
  - Click the **Clone or download** button



- Use this in a **git clone** command
  - `git clone https://github.com/user/repo`

Command Line

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Typing Git commands

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What is the command line?

- Before 1973, computers did not have GUIs
  - Xerox invented the GUI, and Apple ran with it
- Instead, you interacted with a computer through text
  - Type commands
  - Read responses
- This is called the command line
- You can use git through the Unix operating system command line

Useful Unix commands

- With git, you'll be using Unix commands to move around your directory structure (folders and files)
- **`pwd`** tells you what folder you are in
- **`ls`** tells you what files and folders are in your current folder
- **`cd`** moves you to a new folder
- **`mkdir`** creates a new folder

pwd

- Stands for "**p**rint **w**orking **d**irectory"
  - Folders in Windows and Mac OS are called directories in Unix
- Returns the path to which directory you are working in
- Note that levels are separated with forward slashes, even on Windows

ls

- Short for "**list**"
- Returns a list of all of the files and directories in your current directory

cd

- Short for "**c**hange **d**irectory"
- Changes your current directory to a new directory
- Special directory names:
  - . (one period): your current directory
  - .. (two periods): up one directory
  - ~ (tilde): home directory

mkdir

- Short for "**ma**k**e** **dir**ectory"
- Creates a new directory
- Does not move you into the new directory automatically

Command line shortcuts

- Tab: Fills in the rest of a name
  - Stops if it doesn't have enough information to finish
- Up arrow: Repeats the previous command
  - Multiple up arrows keep going back in history
  - You can then edit the line to make changes

Command structure

- General command structure
  - `command -o --option argument(s)`
- Options modify the command in some way
- One dash for one-letter options
- Two dashes for multiple-letter options
- Options before arguments
- Because elements are separated by spaces, sometimes you need to put arguments in quotes

Example git commands

- Git commands start with git and then a command
  - `git config --list`
  - `git config --global user.name "Peter Gruenbaum"`

- Example one-letter option
  - `git commit -m "Marketing changes"`

Exercise 1: Create a repo and command line

- Follow the instructions in the exercise
- Create a repository in GitHub
- Clone the repository locally

Git Concepts

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The four stages of files

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File Stages

- As you work with files in git, they move through four stages

Unstaged Staged Committed Pushed

Stages defined

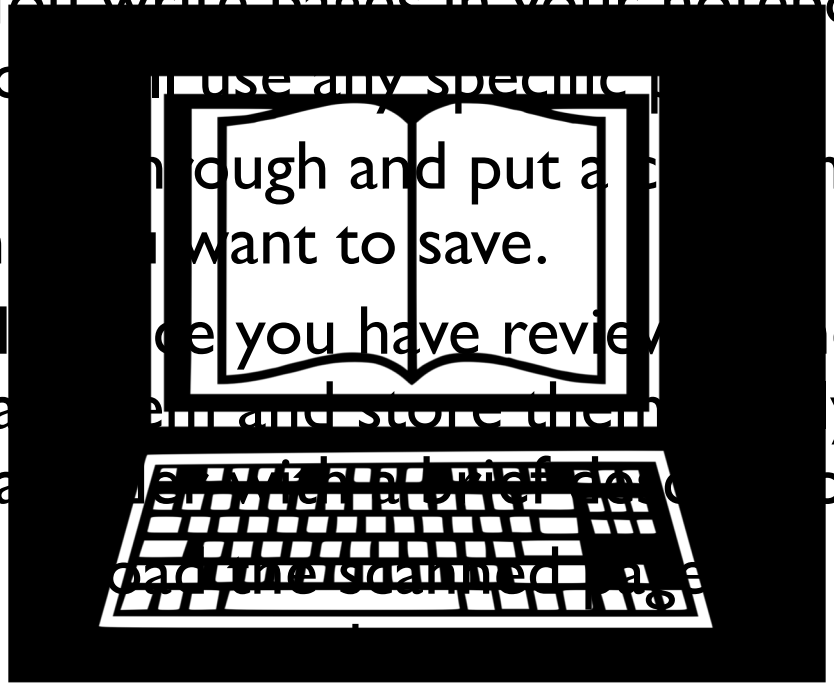
- **Unstaged.** You've made a local change to the file. (Or added or deleted a file.)
- **Staged.** You've marked a local change as something you want to commit to save in git
- **Committed.** You have committed the file, saving this version in git.
  - Each commit has description to help you remember what this version is about
- **Pushed.** You've uploaded the file to the server so that others can access it

When you use stages

- **Unstaged.** You've made additions and changes that you aren't sure you want to keep
- **Staged.** You're pretty sure you want to keep the changes
- **Committed.** You definitely want to keep the changes
- **Pushed.** You want to share the changes with others

Analogy: Writing a book

- **Unstaged.** You write pages in your notebook. You don't know yet if yo[illegible] use any specific [illegible]
- **Staged.** You [illegible]ough and put a [illegible]mark on each page you thin[illegible] want to save.
- **Committed** [illegible]ce you have revie[illegible]e checked pages, you sca[illegible]em and store them [illegible]y on your computer in a [illegible]on.
- **Pushed.** You [illegible]oad the scanned [illegible]a server where other people [illegible]



How to Move Files from One Stage to the Next

- **Unstaged.** Just make changes on your computer
- **Staged.** Use the **`git add`** command
- **Committed.** Use the **`git commit`** command
  - Add a description
  - You don't need to tell it which files, because it commits the staged ones
- **Pushed.** Use the **`git push`** command
  - You don't need to tell it which files because it pushes all the committed files that haven't been pushed already

Text and Binary Files

- Git works on both text and binary files
- Text: documents
- Binary: images, video, audio, etc.
- Both are treated the same
- The only difference: merging different versions
  - Text: software can reliably figure out how to merge
  - Binary: extremely difficult to figure out how to merge

Adding Files to the Repository

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How to add a new file

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Text editors

- To do the exercises, you will need a text editor
- Although you can use built-in Notepad (Windows) and TextEdit (Mac), there are better tools available
  - For example, if Git changes the file that's being shown
- Windows: Notepad++
  - Free, powerful
- Mac
  - SublimeText (Free trial)
  - Brackets (Free)

Markdown

- Very simple markup language
- Text-based, very easy to read
- Unlike HTML, no style information
- GitHub can display it nicely
  - GitHub assumes GitHub-flavored Markdown
- We will use it for this course
  - But you really don't need to know it

Useful git commands

- **`git status`** – Provides useful information
- **`git add`** – Moves one or more files from unstaged to staged
- **`git commit`** – Commits any staged files
- **`git push`** – Uploads committed files to GitHub

- Note that to have our file be unstaged, all we have to do is create it!

Placeholder

- Show how to do it

Exercise 2: Create, add, commit, and push

- Follow the instructions in the exercise
- Create a new file
- Stage it
- Commit it
- Push it to GitHub

Changing Files

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What happens when you make changes

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What happens when you make a change

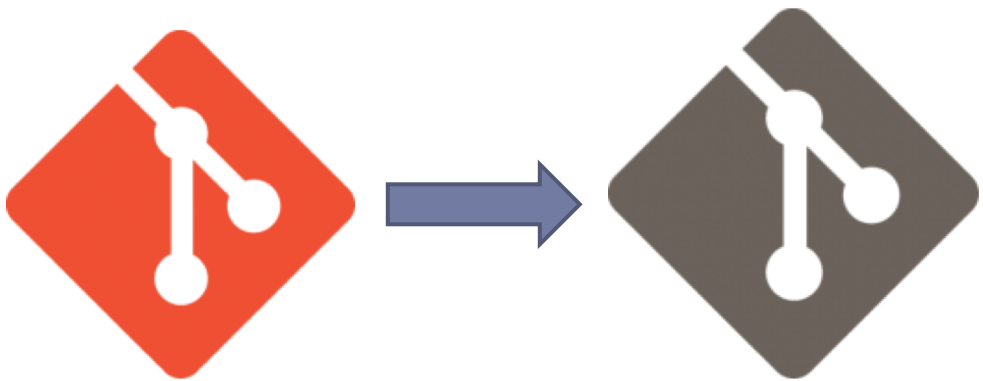
- File is automatically unstaged
- Do a **`git add`** to stage it
- You still have a chance to change it before committing
  - If you do, you will need to do a **`git add`** again to stage it again
- Do a **`git commit`** to commit it
- Do a **`git push`** to upload it to GitHub
- Note that although I will show you how to do this for one file, you can use any of these commands for multiple files

Placeholder

- Show how to do it

Exercise 3: Making changes

- Follow the instructions in the exercise
- Make changes to your file
- Stage it
- Commit it
- Push it to GitHub



Why is Git Designed This Way?

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The motivation behind the four stages

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When would you make changes but not stage them?

- You don't stage changes until they are at a point where you expect to commit them
- You don't know yet that you are going to keep these changes
- Example:
  - Your project manager wants you to totally reorganize to see if it works
  - You may decide to just delete all the changes and go back to the old organization

When would you stage changes but not commit them?

- Staging gives you a final check to make sure it's what you want
- Example:
  - You stage some changes
  - You read over them one last time
  - If they are fine, you commit them
  - If not, then you continue editing, unstaging the files

When would you commit changes but not push them?

- Until they are pushed, they are private
- You might not be ready to share
- Example:
  - You finish a rough draft and commit it
  - You reread everything and decide to make some edits
  - You stage and commit the edits
  - Now you are ready and you push both commits

Going Back In Time

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Working with previous commits

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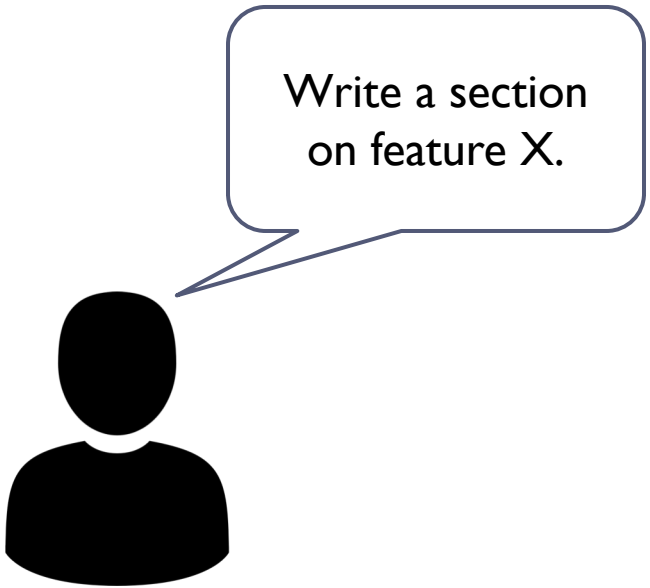
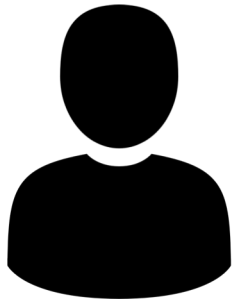
Without version control

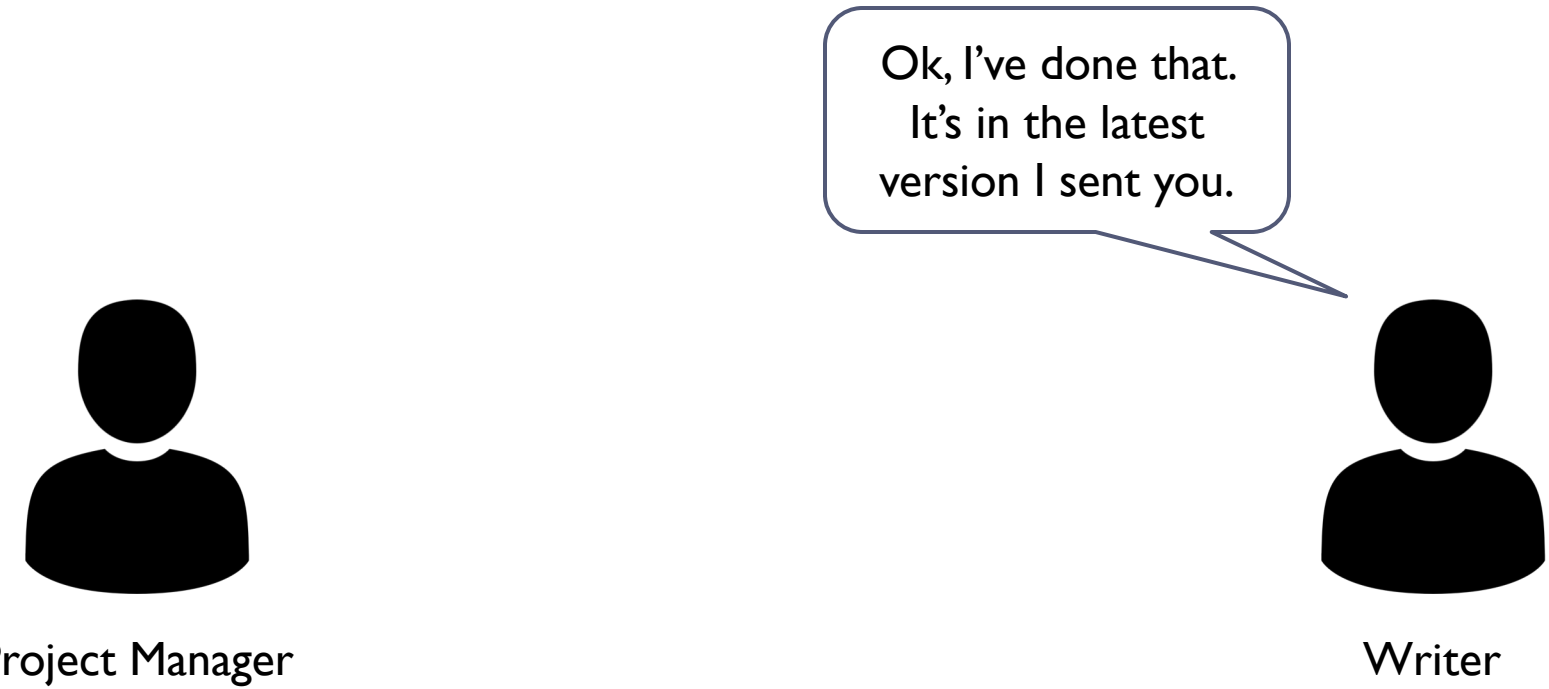


Project Manager



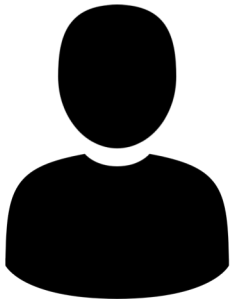
Writer

Without version control



Without version control

One week later…



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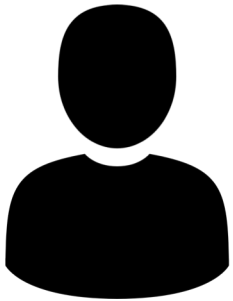
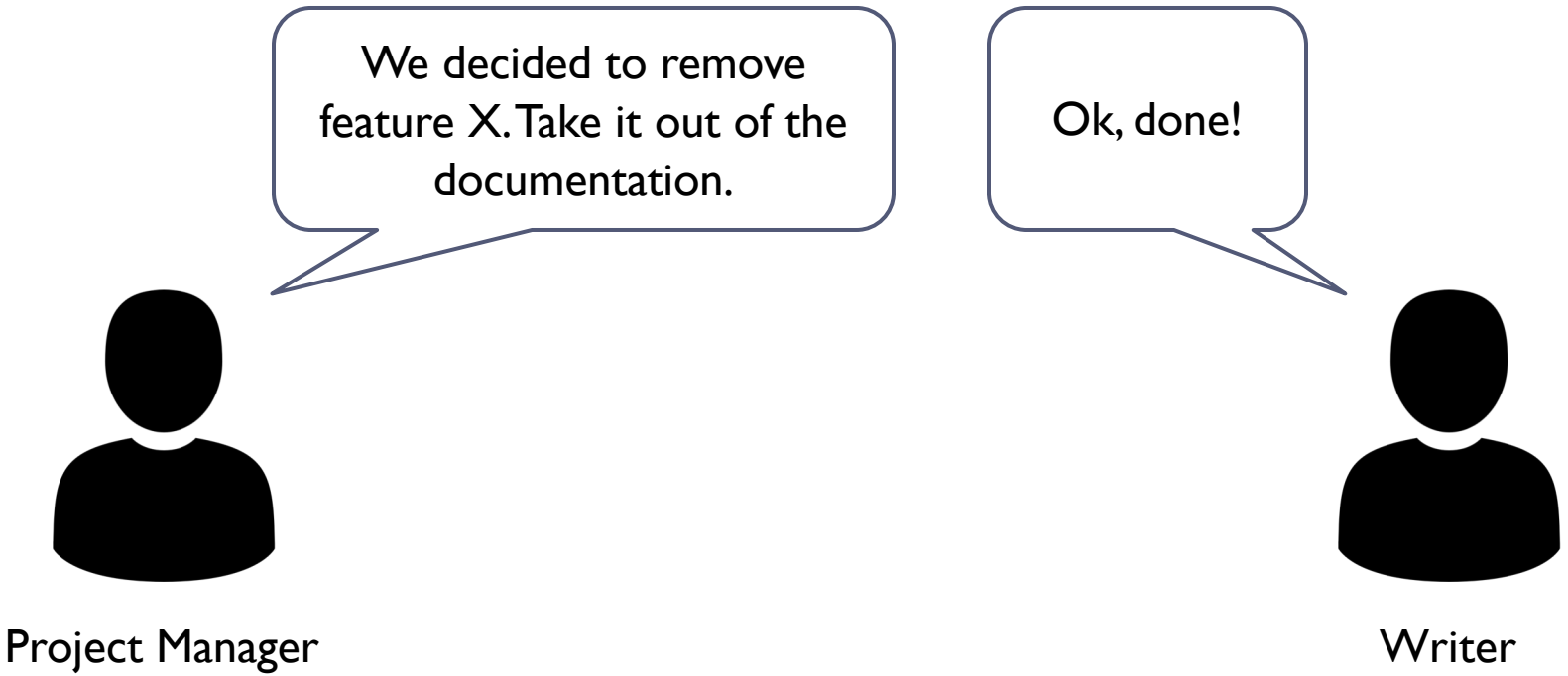


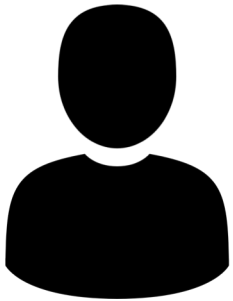
Writer

Without version control



Without version control

Two weeks later…



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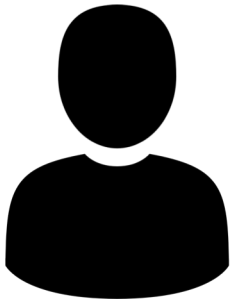
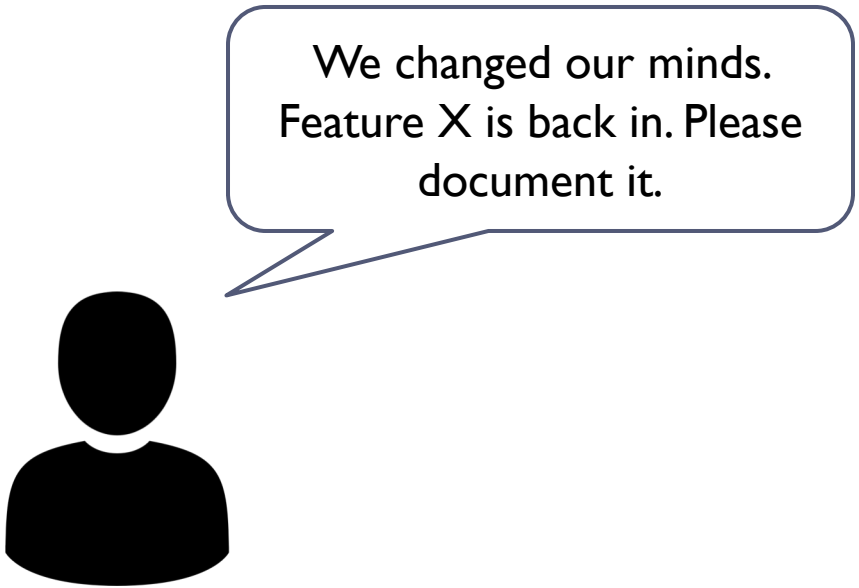


Writer

Without version control



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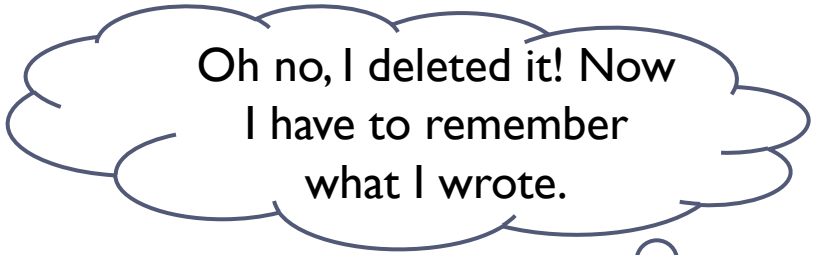

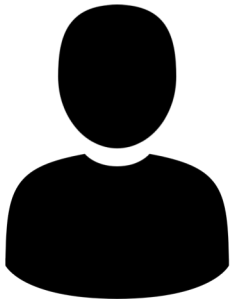

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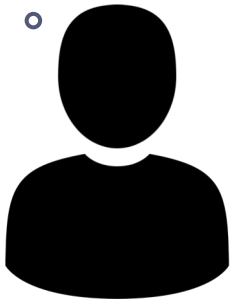

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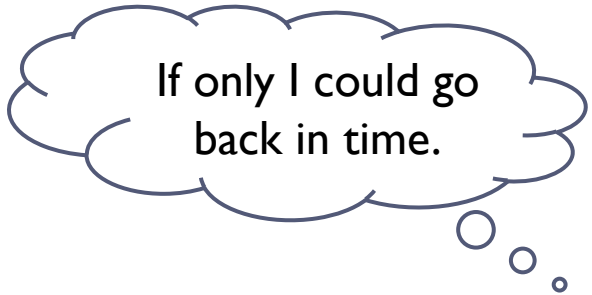

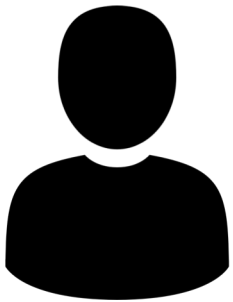

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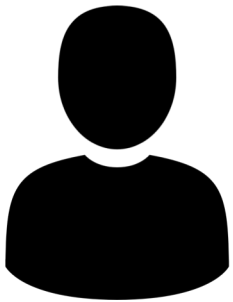

Writer

GitHub

- GitHub can show you previous commits through the UI
- This allows you to easily look back and see what you did previously

HEAD

- Git labels a special commit as HEAD (all capitals)
- It means that commit you are currently working on
- This is usually the most recent commit you've made
  - Technically, the most recent you've made on a branch
- However, you can move HEAD to a different commit if that's something you want to work with

Git

- **`git log`** shows you your history
- **`git log --oneline`** presents a compact version
- **`git checkout`** is the a command that means:
  - Set the commit that I am working on
- Use **`git checkout`** to set the current version to an old commit
- Use **`git checkout master`** to set the current version to the most recent (on the master branch)
  - More on the master branch later

Placeholder

- Show everything in last slide
- Show how git uses hidden files

Best practices for commits

- Commit often
- Ideally each commit for changes contain just one change
  - For example: added a section, removed a section, changed the product name, etc.
- Clear, concise message for each commit
  - Lets you find changes easily

Exercise 4: Going back in time

- How to see commit history
- How to checkout old commit

Tags

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Marking Special Commits

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Tags

- Sometimes you want to label a commit as special
  - This is called a tag
- For example: you could tag a commit that corresponds to the files that are part of a release
- A tag is just a label applied to a commit to make it easier to find
- Tags have a name and a description
- Tags are applied locally. Use **`git push`** to upload it to GitHub

Git commands

- **`git tag -a`** adds a tag with name and description
  - `git tag -a my_tag -m "This is my new tag"`
- **`git tag`** lists all tags
- **`git checkout tags/<tagname>`** to checkout a tag
- **`git push origin <tagname>`** to push a tag

Pull

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Downloading new versions

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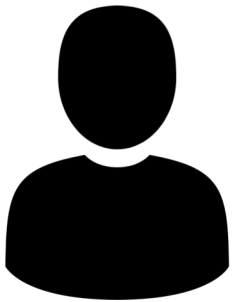
Collaboration

- The main advantages of version control:
  - Going back in time
  - Collaboration
- Version control lets multiple people work on a file at the same time
  - But you each have your own copy
- You can control how that those separate changes are incorporated

Collaboration

Repository

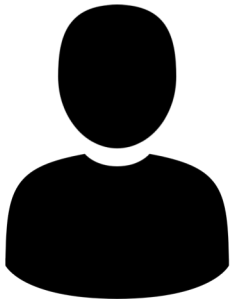


Developer

Writer

Collaboration

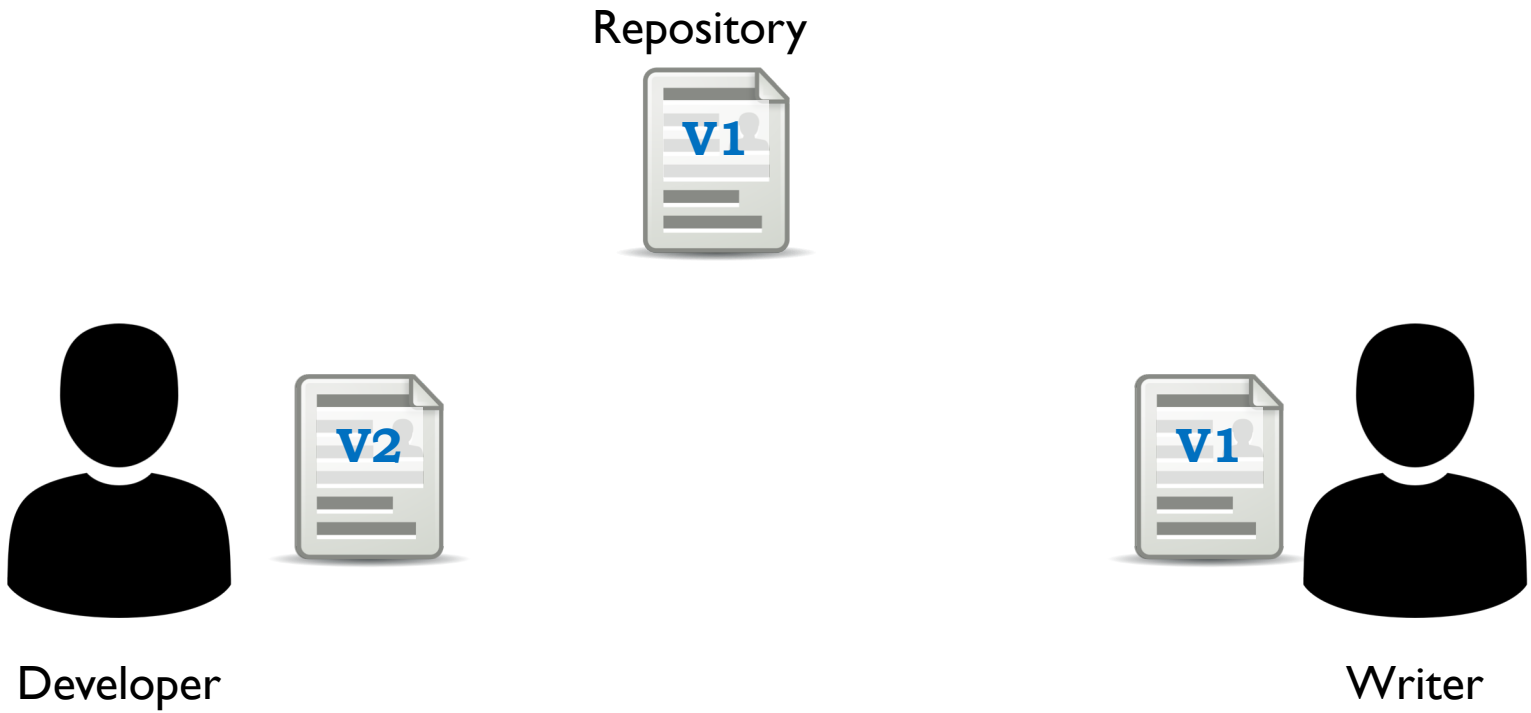
Repository



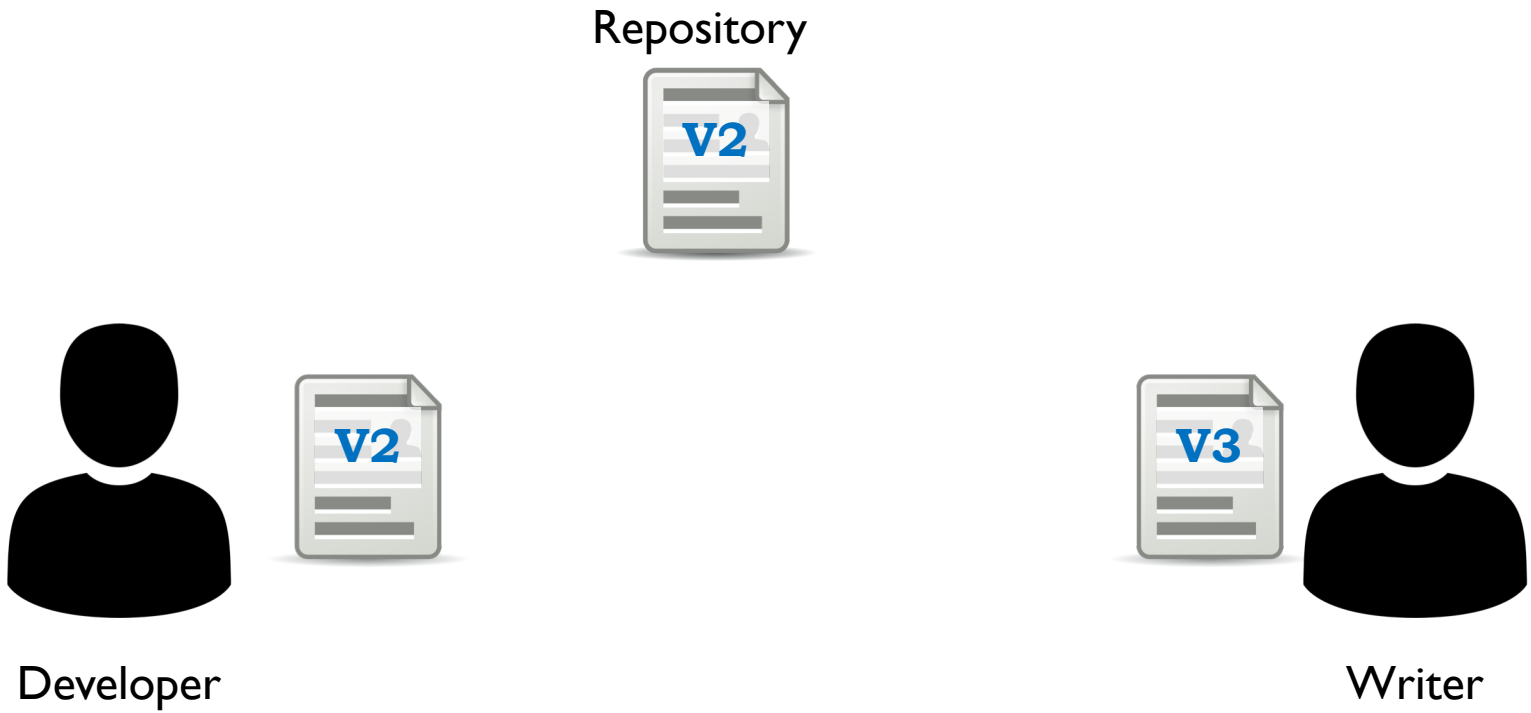
Developer

Writer

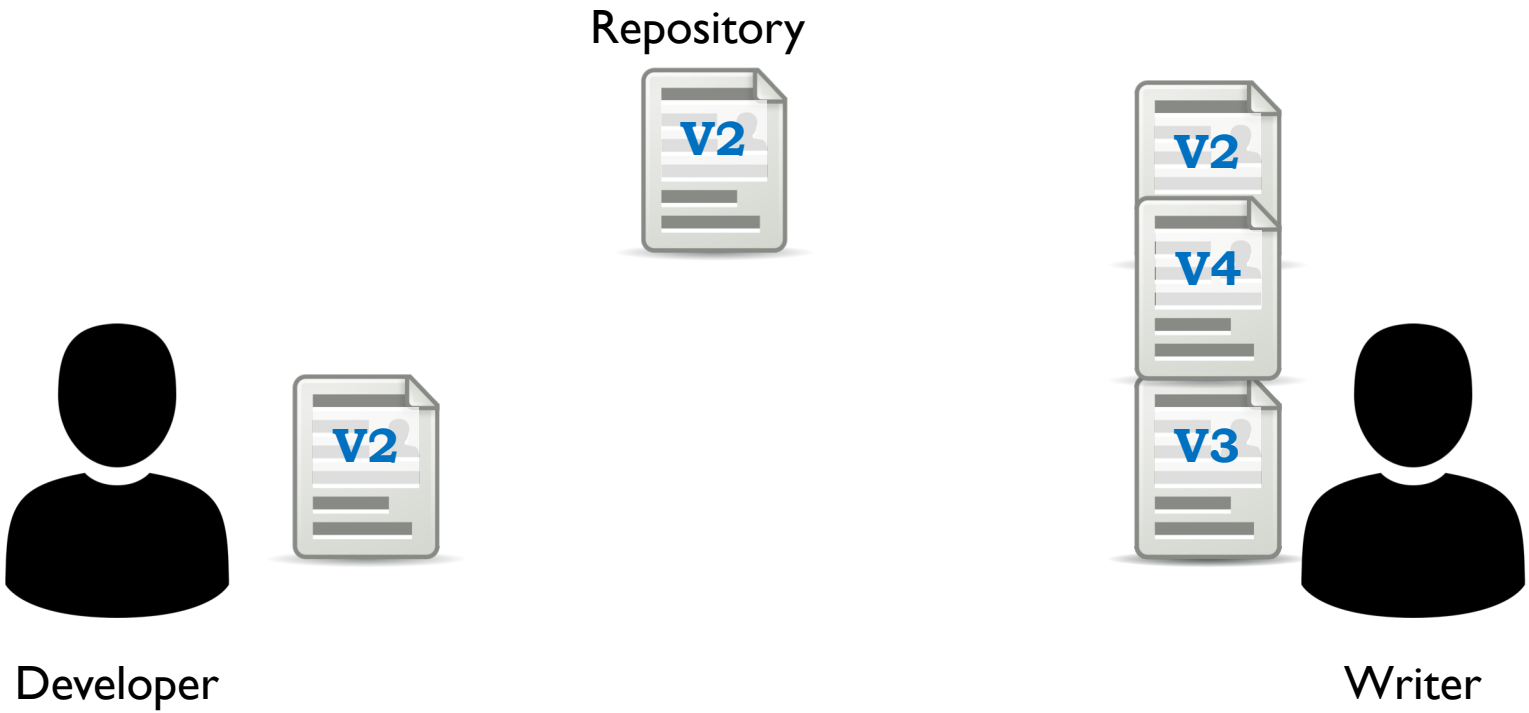
Collaboration



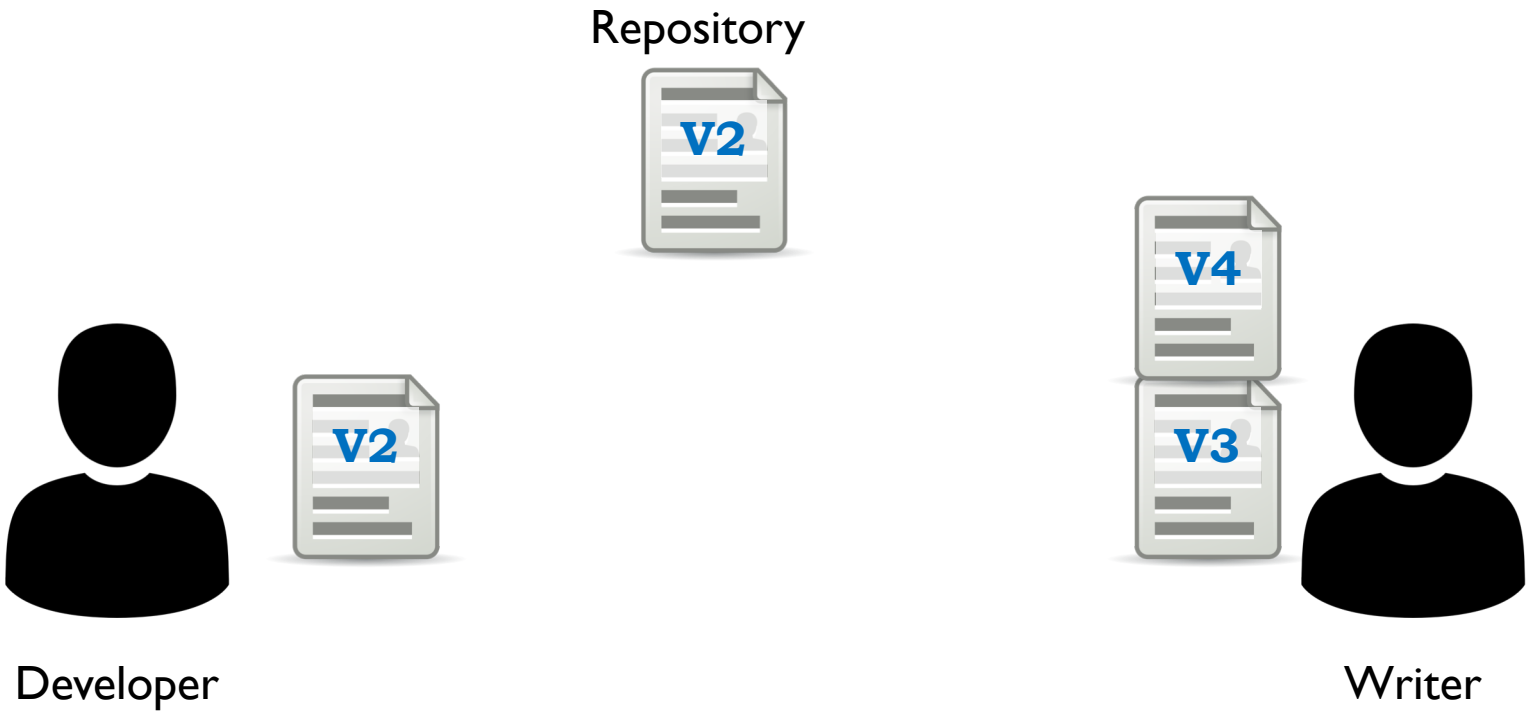
Collaboration



Collaboration



Collaboration



Pull

- **`git pull`** downloads all commits that have been pushed to the repository
- You can only do a **`git pull`** if you have committed your files
  - In other words, no merging unless you are at a good stopping place

Handling changes

- How does `git pull` handle changes? Three cases:
- Remote file hasn't changed since last pull you've done.
  - Leaves local file as is, whether you've changed it or not.
- Remote file has changed. Local file hasn't changed.
  - Replaces local file with remote file
- Both remote and local files have changed.
  - Remote file is merged into local file

Merging

- How does a merge happen?
- Git compares line-by-line, noticing which lines have changes
- If the line hasn't changed remotely or locally, then the line stays the same
- If a line has changed, either remotely or locally, it uses the changed line
- If the line has changed both remotely and locally, then this is called a "conflict"

Conflict

- If a line is changed both remotely and locally, then Git doesn't have enough information to know which one is right.
- It will notify you of a conflict
- It puts both the old and new ones in the file, marking them with <<<<<<< and >>>>>>> symbols, so you know where they are
- Edit the files, choosing how you want to merge and removing the <<<<<<< and >>>>>>> symbols
- Tell Git that the conflict is resolved

Placeholder

- Show how to do it

Binary files

- Git can only merge text files
  - Remember, it goes line by line
- Binary files (images, audio files, video files, etc.) cannot be merged
- You will need to choose a version
- If you need to merge, you will have to do it manually

Fetch

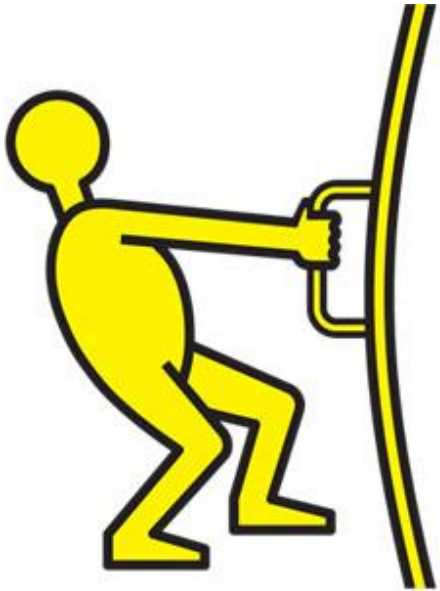
- You may come across the **`git fetch`** command
- This will download the remote files, but not merge them
- You will need to do the **`git merge`** command to merge
- **`git pull`** does both automatically. **`git fetch`** and **`git merge`** give you finer control.
- As a writer, you will probably only need to use **`git pull`**

Exercise

- Create a change on GitHub
- Pull the change and see it locally
- Create a change on both GitHub and locally
- Pull the change and merge
- Create a conflict
- Pull the change and resolve the conflict

Exercise 5: Pulling

- Make a simple pull
- Handle a merge
- Handle a conflict



Branches

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Creating variations

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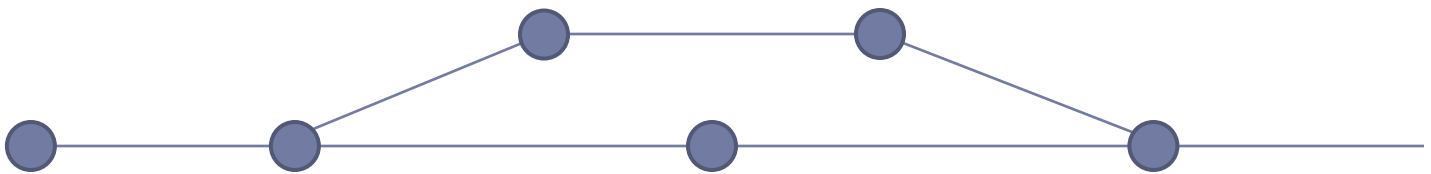
Branches

- Often it's useful to create a set of versions for a particular purpose
- You might create a new branch:
  - To add a new feature
  - To fix a particular bug
  - For documentation

Branches, continued

- Create a new branch when you start making changes for that particular purpose
- Once you have everything in the branch the way you want it, merge it back into the branch it came from



The master branch

- When a repository is created it has one branch called master
- The master branch is the root branch
- Unless you are on a very small project, you typically don't work directly on the master branch
- Instead, you create a branch, make commits, and then merge back into master
- You can branch off a branch that's branched off master

Creating a branch

- **`git branch` *`branch-name`*** creates a branch named *branch-name*
  - Branches off the current branch
  - But you stay on the current branch
- **`git checkout -b` *`branch-name`*** creates a branch and also moves you to that branch
  - Handy shortcut

Branch names

- Branch names can use letters, numbers, dashes, periods, and forward slashes
- They are case sensitive
- Most common is to use lowercase with dashes between words
  - Example: `api-docs`
- Slashes are used to create groups of branches
  - Example: `v1.2/api-docs, v1.2/login-fix`

Moving to a branch

- **`git checkout` *`branch-name`*** moves to the branch named *branch-name*
- You can only move to another branch if all files are committed
  - In other words, you want to be at a good stopping place
  - If you aren't ready to commit, you can use **`git stash`** (more later)
- **`git branch`** displays all branches and which one you are on

Deleting and pushing

- **`git branch -d` *`branch-name`*** deletes the branch named *branch-name*
  - Only do this once you have merged your changes or else you are sure you don't want that branch
- **`git push`** uploads everything to the server, including new branches
  - Until you do this, all new branches are local only
- Once pushed, you can delete the branch on GitHub
  - You will see the changes when do a **`git pull`**

Pull request

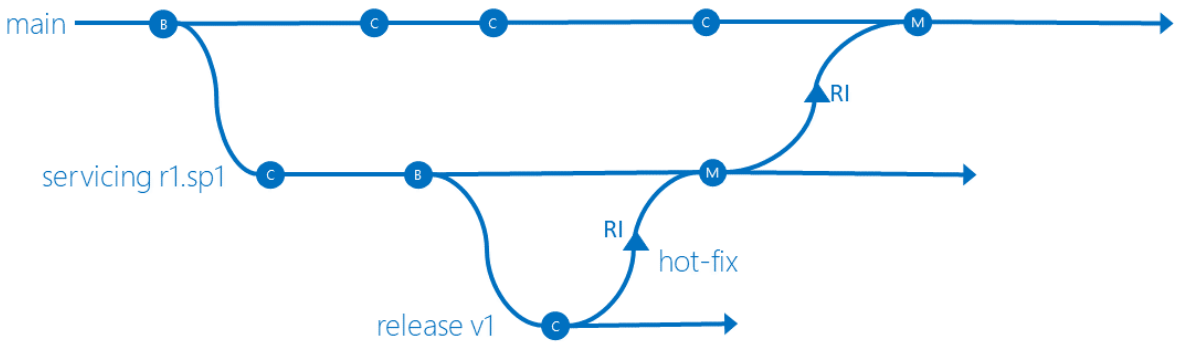
- Typically, at some point you want to merge your changes from the branch back into the branch they came from
- You can do this with the Git command line
- But it's easier to do with GitHub
  - This is called "Pull request" when done through GitHub
  - The idea is that you request your branch be merged and someone else can review and approve the changes.

Placeholder

- Show how to do it

Exercise 6: Branching

- Create a branch
- Create a pull request



Next Steps

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Resources

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What do you need to know next?

- You've learned a lot
- There are other concepts I haven't covered
  - Stash
  - Rebase
  - Forking

Resources

- I'm creating a Udemy course in the near future
- GitBook – a platform for documentation that uses Git.
- Docs Like Code by Anne Gentle

Other Udemy courses

- SDK Bridge Online courses
  - sdkbridge.com/online-courses
  - Workbook contains links with discounts