



# Version Control with git



Week 6  
Data Science Workshop for  
NGA LTER REU Students



# Review of Last Week

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- ls : list
- cd : change directory
- mkdir : make a new directory
- nano : text editor
- cat : print contents of a file to the screen
- mv : move a file or directory
- cp : copy a file or directory
- rm : remove a file

# Goals for Today

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- Introducing concept of version control and git
- How does git help with reproducible research
- Interactive lesson working with git on your local machine

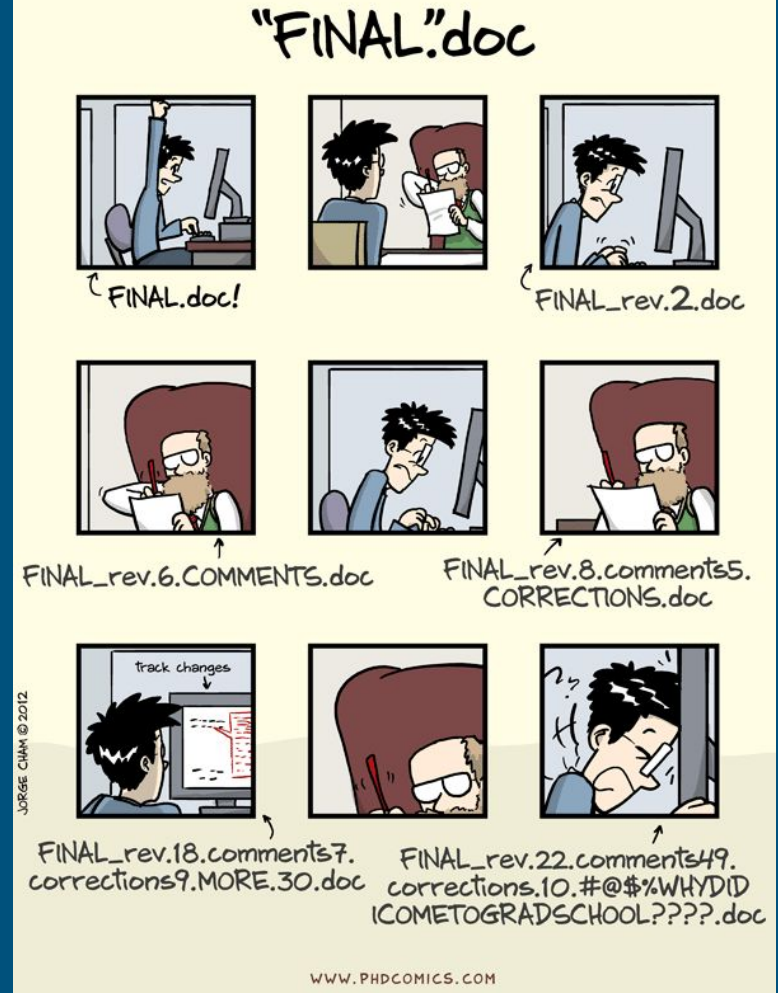
# Why use version control?

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- Collaboration
- Management
- Transparency
- Reproducibility

# Why Version Control?

“Piled Higher and Deeper” by  
Jorge Cham,  
<http://www.phdcomics.com>



# This is another method of version control.

The screenshot displays the Microsoft Word interface with the **Review** tab selected. The ribbon includes options for **Spelling & Grammar**, **Read Aloud**, **Check Accessibility**, **Translate**, **Language**, **New Comment**, **Delete**, **Resolve**, **Previous**, **Next**, **Show Comments**, **Tracking**, **Reviewing**, **Changes**, **Compare**, **Protect**, **Hide Ink**, and **Resume Assistant**. The **Share** and **Comments** buttons are also visible in the top right.

On the left, the **4 REVISIONS** pane shows a list of changes made by Elizabeth Dobbins:

- Insertions: 2
- Deletions: 2
- Moves: 0
- Formatting: 0
- Comments: 0

The list of revisions includes:

- Elizabeth Dobbins Deleted **twelve o'clock at night**
- Elizabeth Dobbins Inserted **midnight**
- Elizabeth Dobbins Inserted **by people who were there**
- Elizabeth Dobbins Deleted **u**

The main document area shows a paragraph of text with red dashed lines indicating tracked changes. The text reads:

Whether I shall turn out to be the hero of my own life, or whether that station will be held by anybody else, these pages must show. To begin my life with the beginning of my life, I record that I was born (as I have been informed and believe) on a Friday, at midnight. It was remarked by people who were there that the clock began to strike, and I began to cry, simultaneously.

Below this, the text continues: "In consideration of the day and hour of my birth, it was declared by the nurse, and by some sage women in the neighborhood who had taken a lively interest in me several months before there was any possibility of our becoming personally acquainted, first, that I was destined to be unlucky in life; and secondly, that I was privileged to see ghosts and spirits; both these gifts inevitably attaching, as they believed, to all unlucky infants of either gender, born towards the small hours on a Friday night. I need say nothing here, on the first head, because nothing can show better than my history whether that prediction was verified or falsified by the result. On the second branch of the question, I will only remark, that unless I ran through that part of my inheritance while I was still a baby, I have not come into it yet. But I do not at all complain of having been kept out of this property: and if anybody else should be in

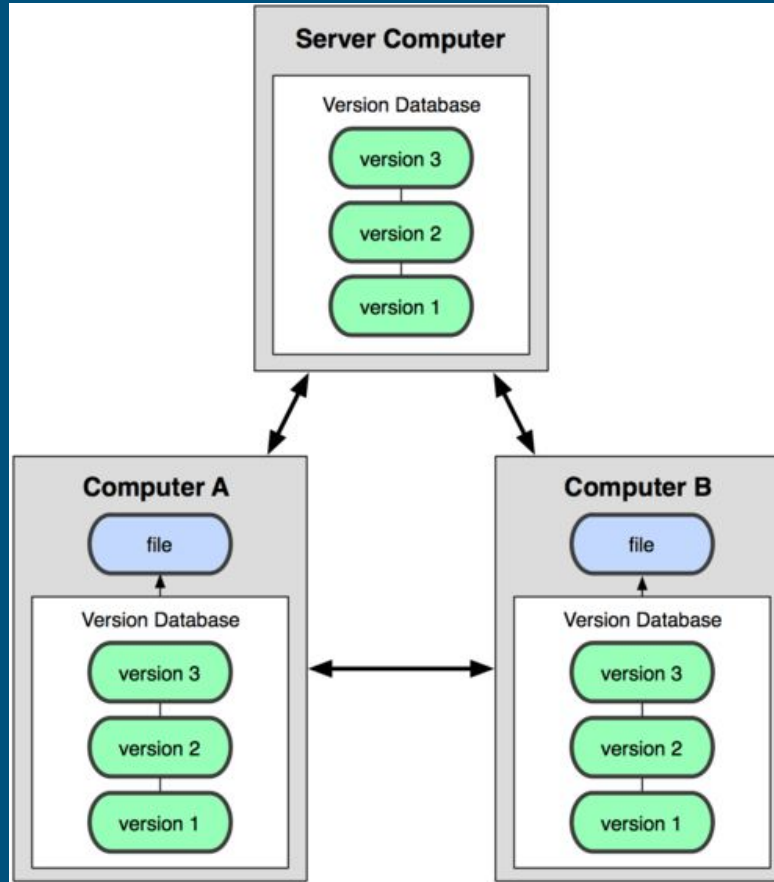
On the right side of the document, the **REVISIONS** pane shows the following changes:

- Elizabeth Dobbins Deleted: twelve o'clock at night
- Elizabeth Dobbins Deleted: u

The **REVISIONS** pane also shows the date and time of the changes: "A few seconds ago".

# Git model:

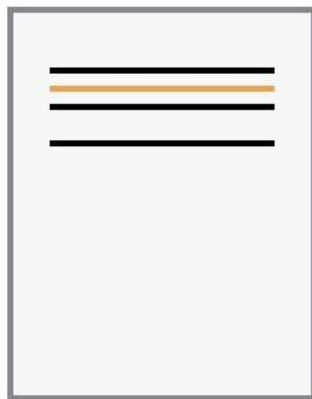
Repository  
on Local  
Computer



Repository  
on server  
like GitHub

Repository  
on Local  
Computer

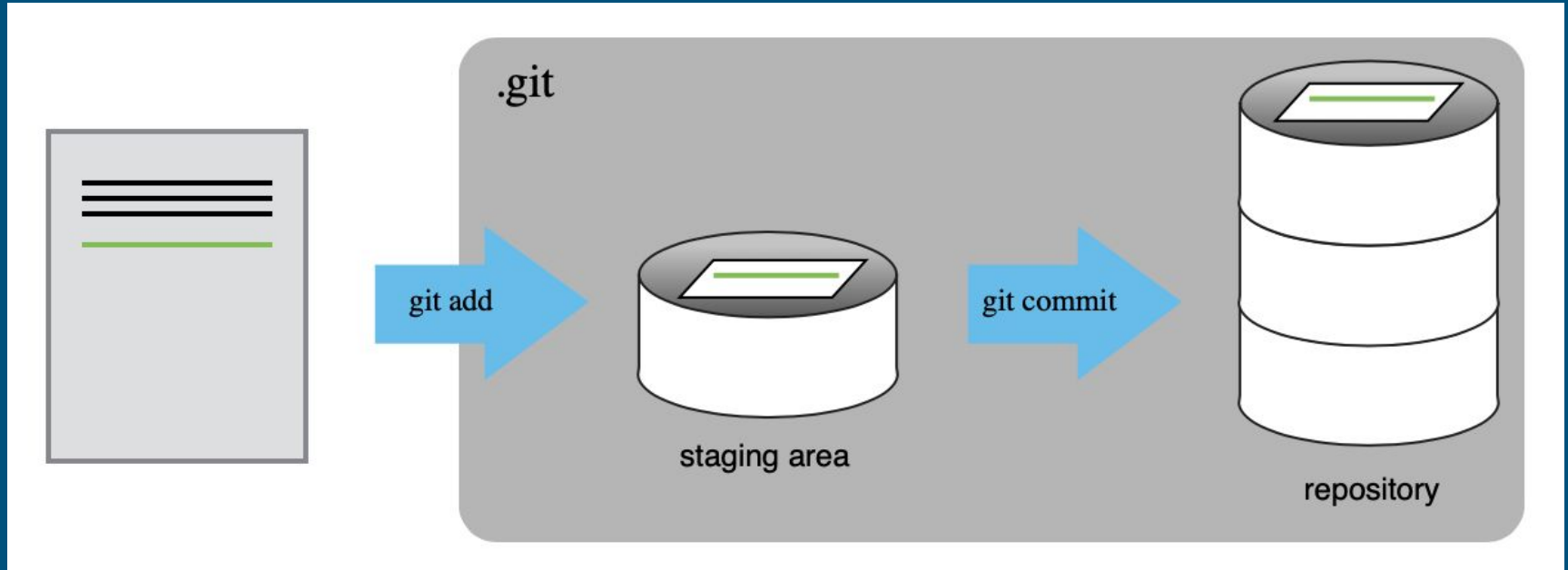
Garko, Ahmed et al. (2015). THE ROLE OF DISTRIBUTED VERSION CONTROL SYSTEMS IN TEAM COMMUNICATION AND LEARNING SYSTEM.





# Git add and commit

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Let's try it out.

# What did we do?

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- git status : how do files differ from the repository
- git add : add edits to the staging area
- git commit : commit edits to the repository
- git diff : to see changes
- git log : see list of commits
- git checkout : clobber local changes by checking out a file from the repository

<http://swcarpentry.github.io/git-novice/index.html>

# What could we do?

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- Learn how to resolve conflicts
- Try using git with another tool like MATLAB or RStudio
- Try using a GUI interface for git like GitKraken

<http://swcarpentry.github.io/git-novice/index.html>

# Finish-up

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- Assignment #6 on GitHub - [Get a GitHub account](#)
- Next week we will be at a this Zoom Link again