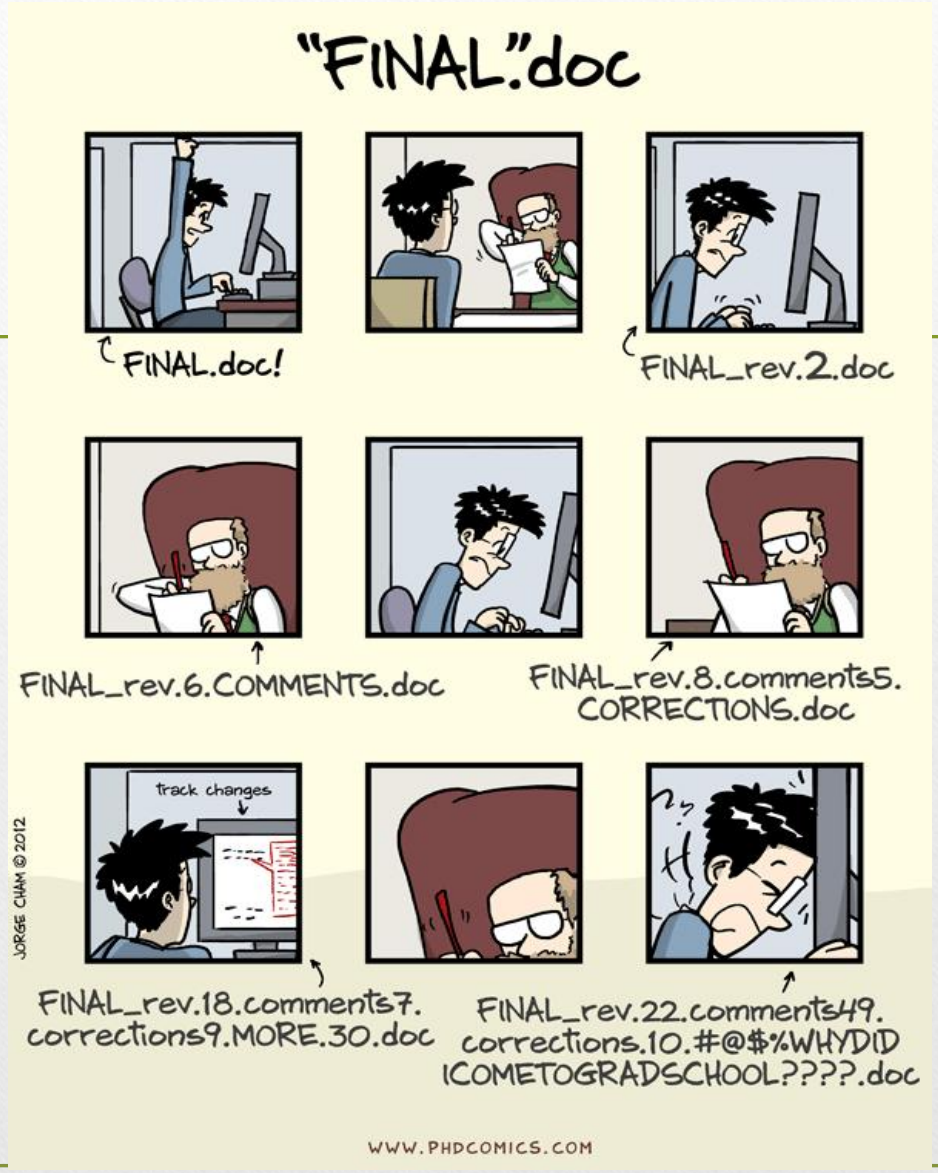
# Git & Github Introduction (1)


*Tommy Fihla*
*Team Leader in EB*
*Digital Academy*

# Objectives

- Version Control
- Git , Git repository
- Git vs Github
- Setup git environment
- Create a git repository ( adding file, adding folder)
- Checkout different version/ignore files…
- Git tools

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# Why Version Control?

Collaboration Versioning Rolling Back
Understanding

**Scenario** : Multiple students are doing a project together

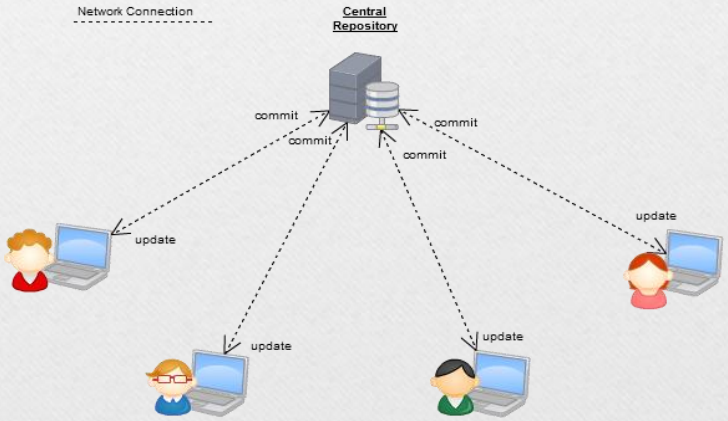
**Question:** Why not Google drive & One drive ????

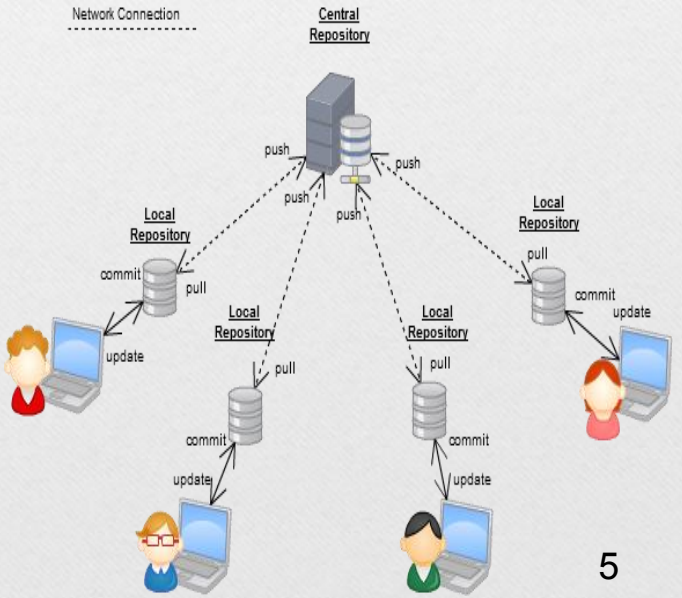
source code management vs file storage management



# Version Control Systems

- Some well–known version control systems are CVS, Subversion, Mercurial, and Git

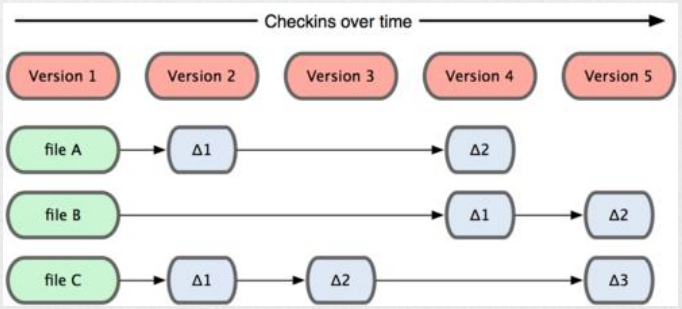


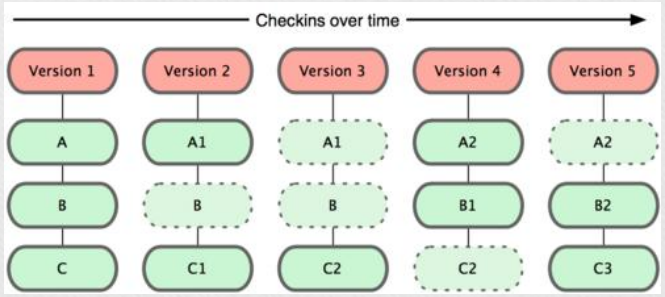
# Why Git?

- Git :most commonly used software for tracking changes in any set of files, usually used for coordinating work among programmers collaboratively developing source code during software development.
- Git has many advantages over earlier systems such as CVS and Subversion

Subversion




Git



# Git History

- Came out of Linux development community
- Linus Torvalds, 2005
- Initial goals:
  - Speed
  - Support for non-linear development (thousands of parallel branches)
  - Fully distributed
  - Able to handle large projects like Linux efficiently
  - Global Information Tracker (acronym name)

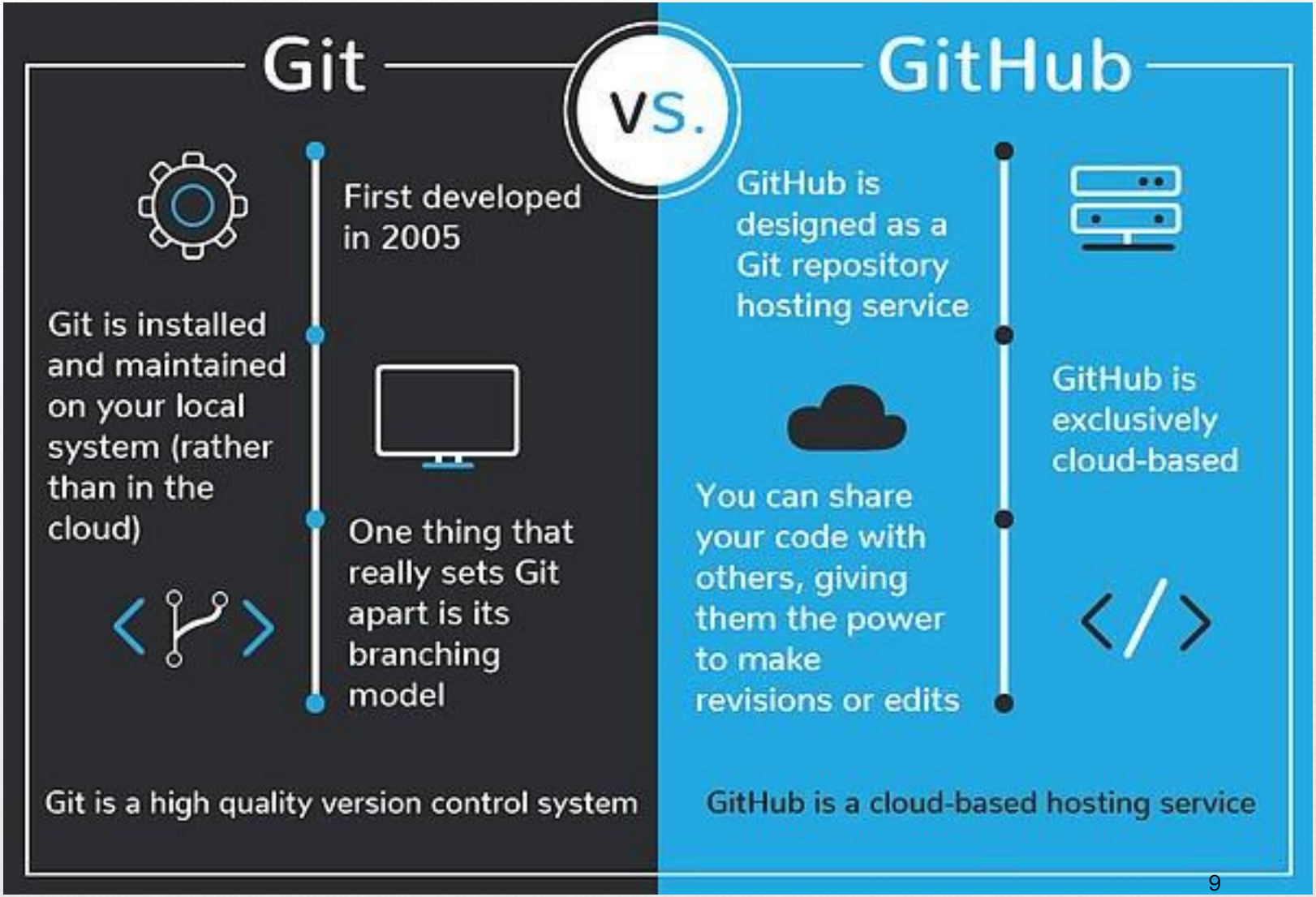
# What is Github?

- GitHub was developed by Chris Wanstrath, P. J. Hyett, Tom Preston–Werner and Scott Chacon using Ruby on Rails, and started in February 2008
- It is a subsidiary of Microsoft, which acquired the company in 2018 for $7.5 billion
- GitHub.com is a site for online storage of Git repositories.
- You can get free space for open source projects or you can pay for private projects.

**Question**: Do I have to use Github in order to use Git?

**Answer**: No!

- you can use Git completely locally for your own purposes, or
- you or someone else could set up a server to share files, or
- you could share a repo with users on the same file system.


Git
vs.
GitHub
First developed in 2005
Git is installed and maintained on your local system (rather than in the cloud)
One thing that really sets Git apart is its branching model
GitHub is designed as a Git repository hosting service
GitHub is exclusively cloud-based
You can share your code with others, giving them the power to make revisions or edits
Git is a high quality version control system
GitHub is a cloud-based hosting service

# Download and install Git

- Here's the standard one: http://git-scm.com/downloads
- Git Repository is a place where Git can store versions of our files
  - $ cd ~/gitclass
  - $ mkdir demo
  - $ cd demo
  - $ git init
  - $ dir /ah or $ ls –a (* .git directory to store all the tracing info)



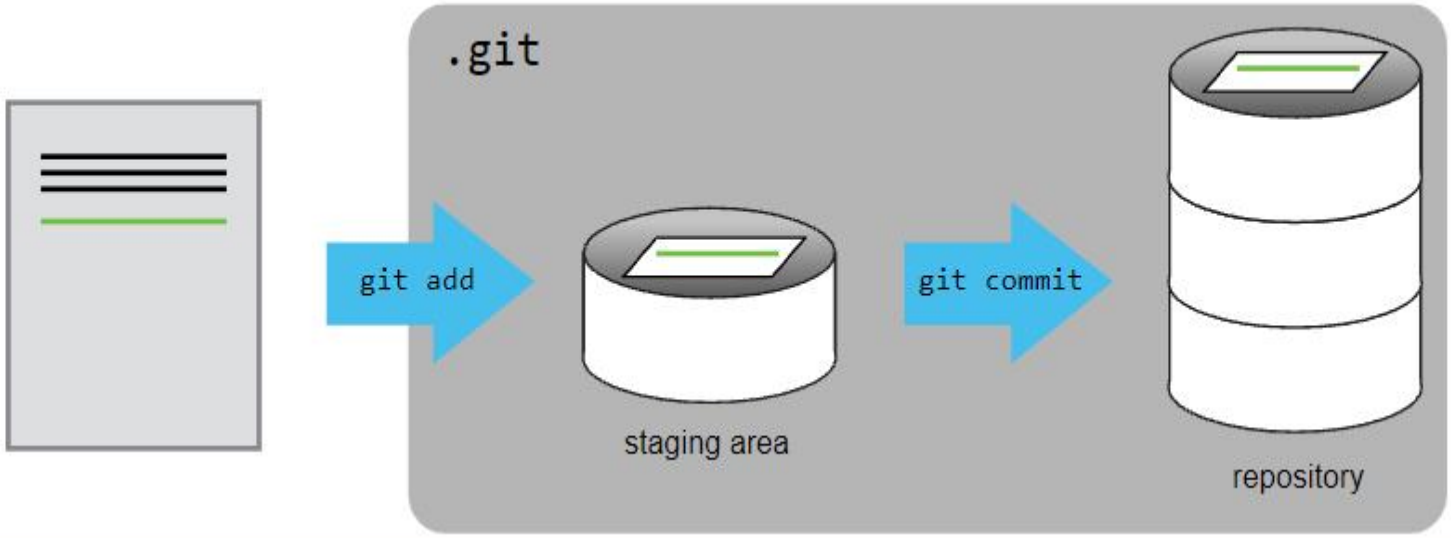
# Introduce yourself to Git

- Enter these lines (with appropriate changes):
  - git config user.name "John Smith"
  - git config user.email jsmith@gmu.edu
- –-global param

| command | description |
| --- | --- |
| git clone *url [dir]* | copy a git repository so you can add to it |
| git add *files* | adds file contents to the staging area |
| git commit | records a snapshot of the staging area |
| git status | view the status of your files in the working directory and staging area |
| git diff | shows diff of what is staged and what is modified but unstaged |
| git help *[command]* | get help info about a particular command |
| git pull | fetch from a remote repo and try to merge into the current branch |
| git push | push your new branches and data to a remote repository |

others: init, reset, branch, checkout, merge, log, tag

# Adding a file to git repository



# Adding a file to git repository

- Create a rose.txt file ,copy rose.txt to demo folder
- $git checkout –b main
- Git status $git status
- $ git add rose.txt
- $ git status
- $ git commit –m “my first file checked in “
- $ git log

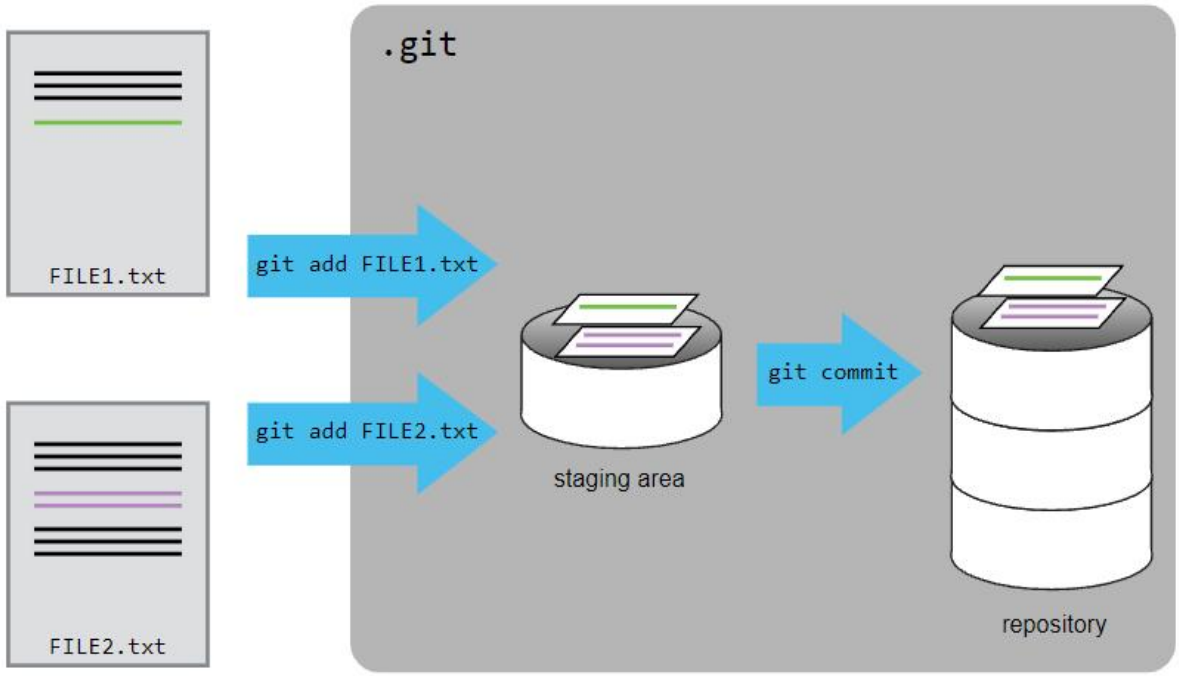
# Continue…

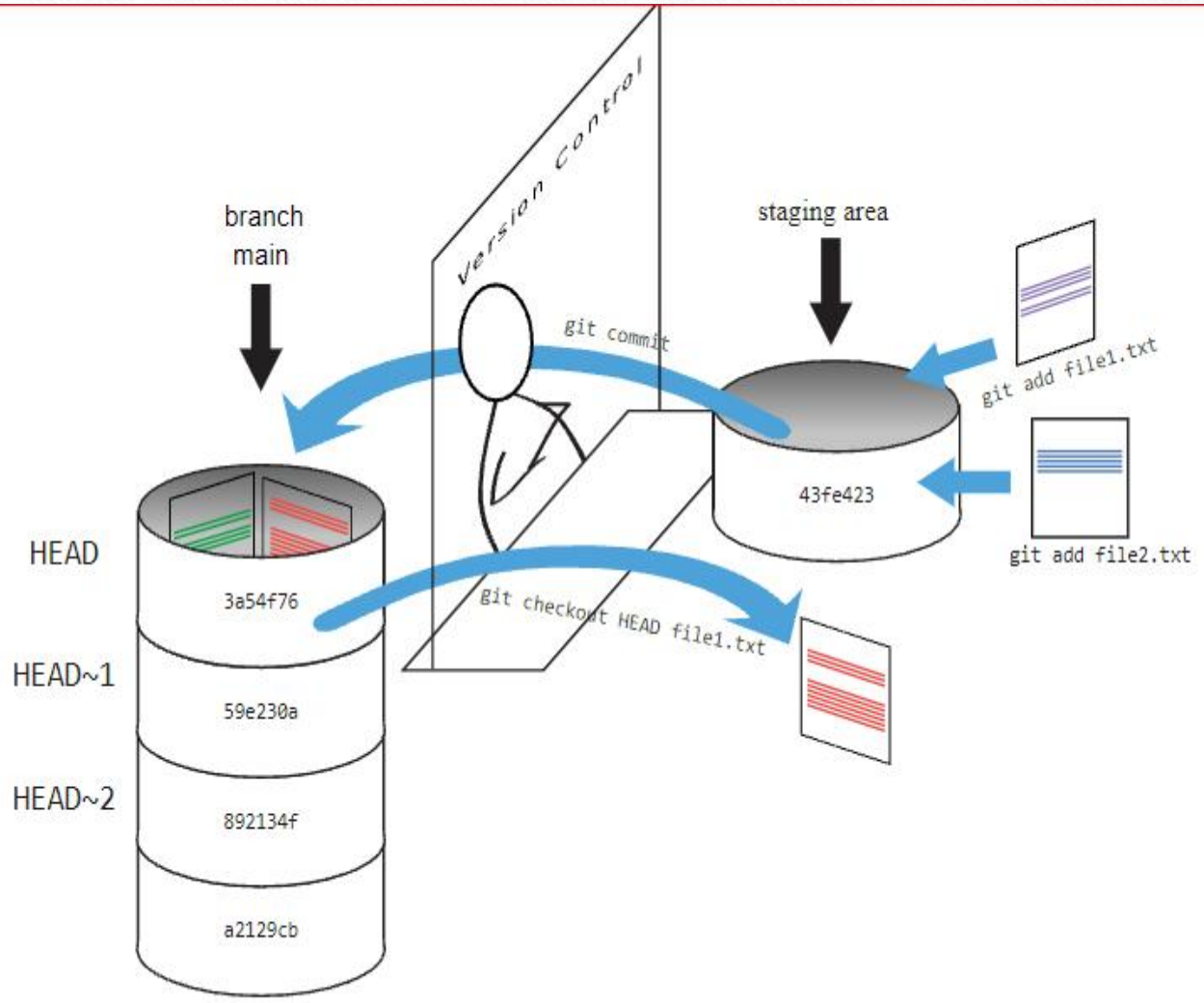
- Change rose.txt file
- $git status
- $git diff
- $git commit –a –m “new message….”

# Adding new folder

- $mkdir  poem
- copy two text files to that poem folder
- $git add poem

# Adding Multimpule files...




branch
main
Version Control
staging area
git commit
git add file1.txt
43fe423
git add file2.txt
HEAD
3a54f76
HEAD~1
59e230a
HEAD~2
892134f
a2129cb
git checkout HEAD file1.txt

# Checking previous version

- $ git diff HEAD~1 rose.txt
- $git checkout HEAD~1 rose.txt
- $git checkout HEAD rose.txt

# Ignoring Things

- Configure Git to ignore specific files.
- Explain why ignoring files can be useful.
- Copy results folder with files
- Create .gitignore file
- Add

```
*.dat
results/
```

# Git Tools


Windows Git Clients:

- Sourcetree
- GitHub for Windows .
- Tortoise Git

Mac Git Clients:

- GitUp
- GitBox
- Git-Xdev

# Thank You