CS304 Software Engineering

Lab 11 Version Control

Why we need version control?

- Collaboration
- Storing Versions (Properly)
- Restoring Previous Versions
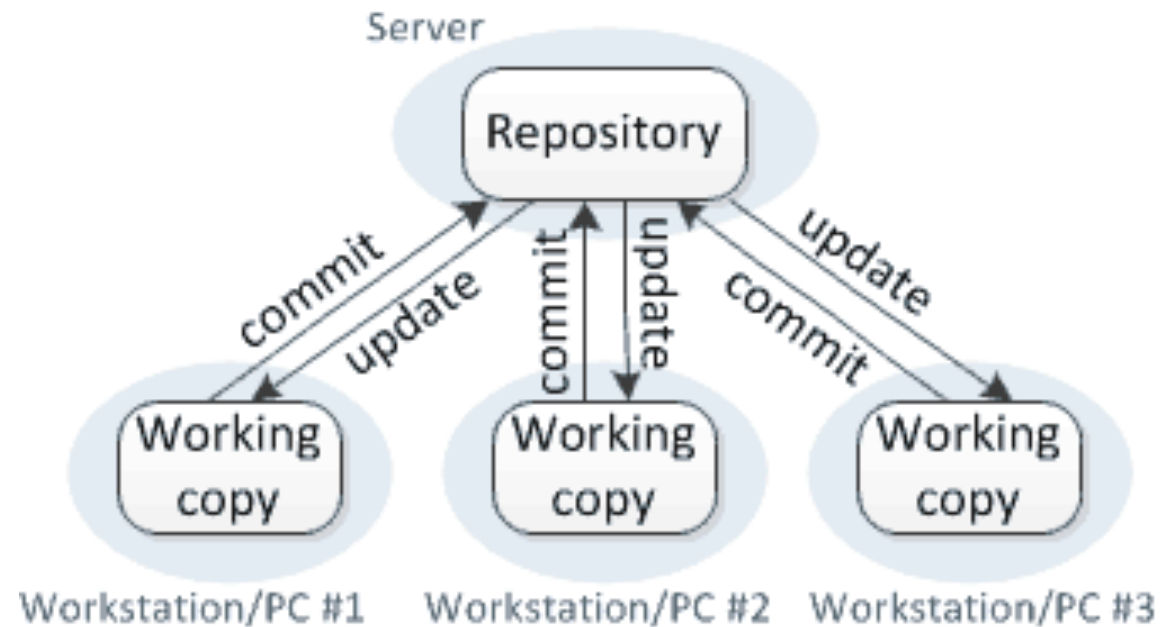- Understanding What Happened
- Backup

https://www.git-tower.com/learn/git/ebook/en/desktop-gui/basics/why-use-version-control

Types of Version Control System

- Centralized

- Distributed
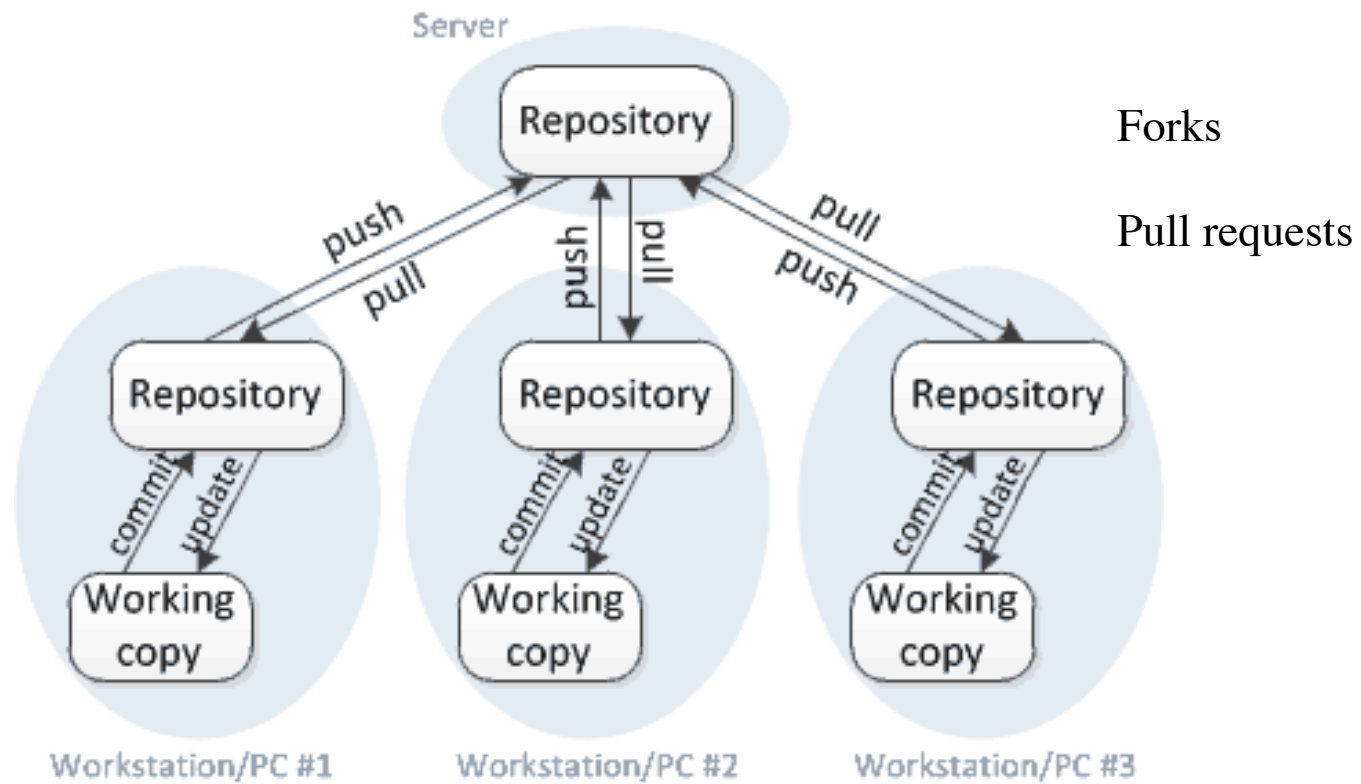
Centralized

Centralized version control

Server

Repository

commit — update — commit — update — update — commit

Working copy — Working copy — Working copy

Workstation/PC #1 Workstation/PC #2 Workstation/PC #3

Distributed

Distributed version control

Server

Repository

push   pull   push   pull   pull   push

Repository   Repository   Repository

commit update commit update commit update

Working copy   Working copy   Working copy

Workstation/PC #1   Workstation/PC #2   Workstation/PC #3

Forks

Pull requests

Concepts

- Diffs: different version of files
- Branching: diverge from a version
- Merging: combine changes
- Conflicts: contradict changes for a same file
- Tagging: a meaningful label
- …

https://www.codebasehq.com/blog/how-version-control-works

Tools

- **Git**

- SVN

- Mercurial

https://stackoverflow.com/questions/35837/what-is-the-difference-between-mercurial-and-git
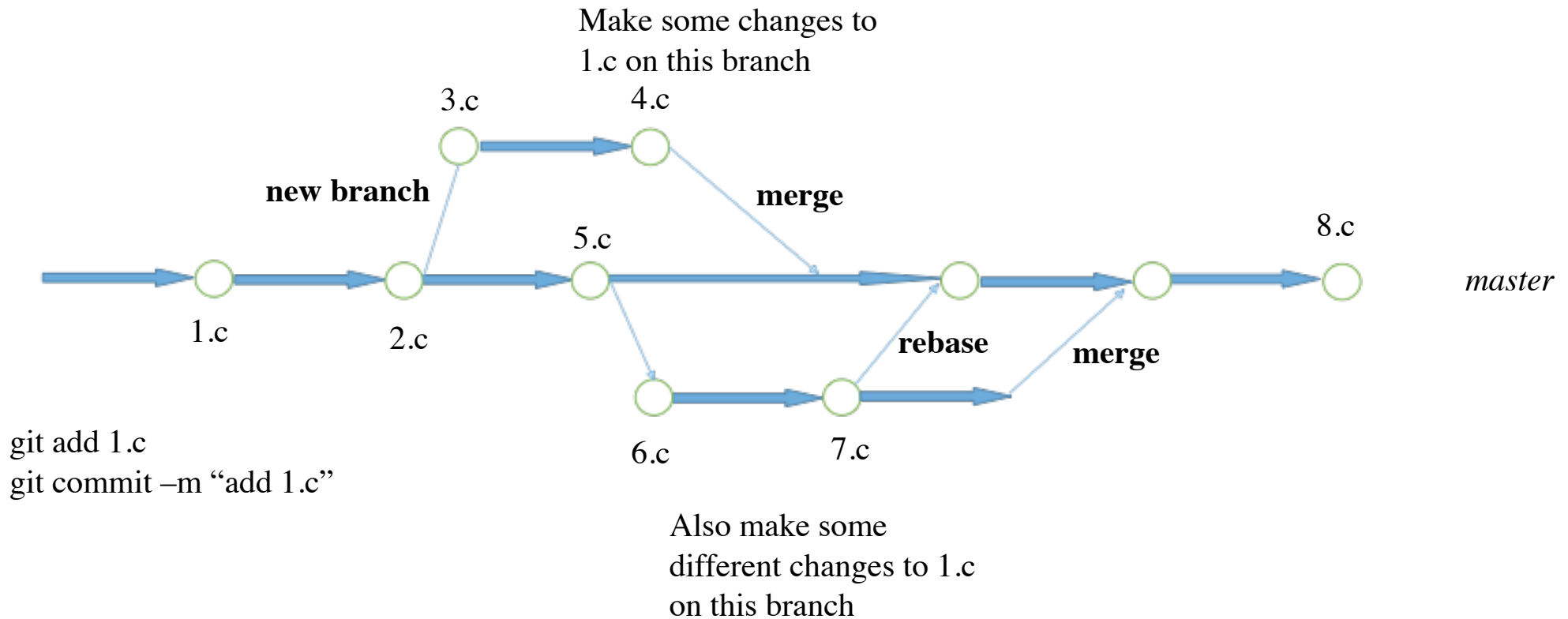
Tutorials

- *Git 教程* by 廖雪峰 (**highly recommend**)

- GitHub documentation: *Using Git*

Try learning while you use Git instead of reading all these materials before you start.

Assignment: due 23:59pm, June 4th

• You should have set up Git before doing exercises for this lab.

Make some changes to
1.c on this branch

3.c   4.c

new branch   **merge**   8.c

5.c

1.c   2.c   **rebase**   **merge**   *master*

git add 1.c
git commit –m "add 1.c"   6.c   7.c

Also make some
different changes to 1.c
on this branch

Submit

- All you **files** (including **.git**) or **link** to your GitHub repository.

- Report:
  - All you **bash commands**
  - Copy and paste **results**: *git log*
  - **Screenshots**: *git log --all --decorate --oneline –graph*
  - **Comments**: how do you solve conflicts on second merge?