Survey Repositories and Related Tools

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Managing your survey

- Using Git to submit assignments to Git repositories hosted on Github

Git is a SCM

- SCM = Source Code Management system
  - Version control system

Version Control System (VCS)

- Why do we need it?
  - https://stackoverflow.com/questions/1408450/

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Have you ever:

Made a change to code, realised it was a mistake and wanted to revert back?
Lost code or had a backup that was too old?
Had to maintain multiple versions of a product?
Wanted to see the difference between two (or more) versions of your code?
Wanted to prove that a particular change broke or fixed a piece of code?
Wanted to review the history of some code?
Wanted to submit a change to someone else's code?
Wanted to share your code, or let other people work on your code?
Wanted to see how much work is being done, and where, when and by whom?
Wanted to experiment with a new feature without interfering with working code?

Benefits of VCS

- VCS provides a "centralized" location to store project files
  - Versioned code, configuration files, build scripts …
- VCS tracks each contributors' individual changes
- VCS helps prevent concurrent work from conflicting

More Benefits of VCS

- Branching & merging.
  - Example workflow: branching for each feature, branching for each release.
- Traceability
  - Example use scenarios: track changes between revisions of a project, documented history of who did what and when
- Complete history of changes
  - Example use scenarios: help in root cause analysis for bugs, fix problems in older versions of software that has been released, roll back to an older version without newly introduced bugs

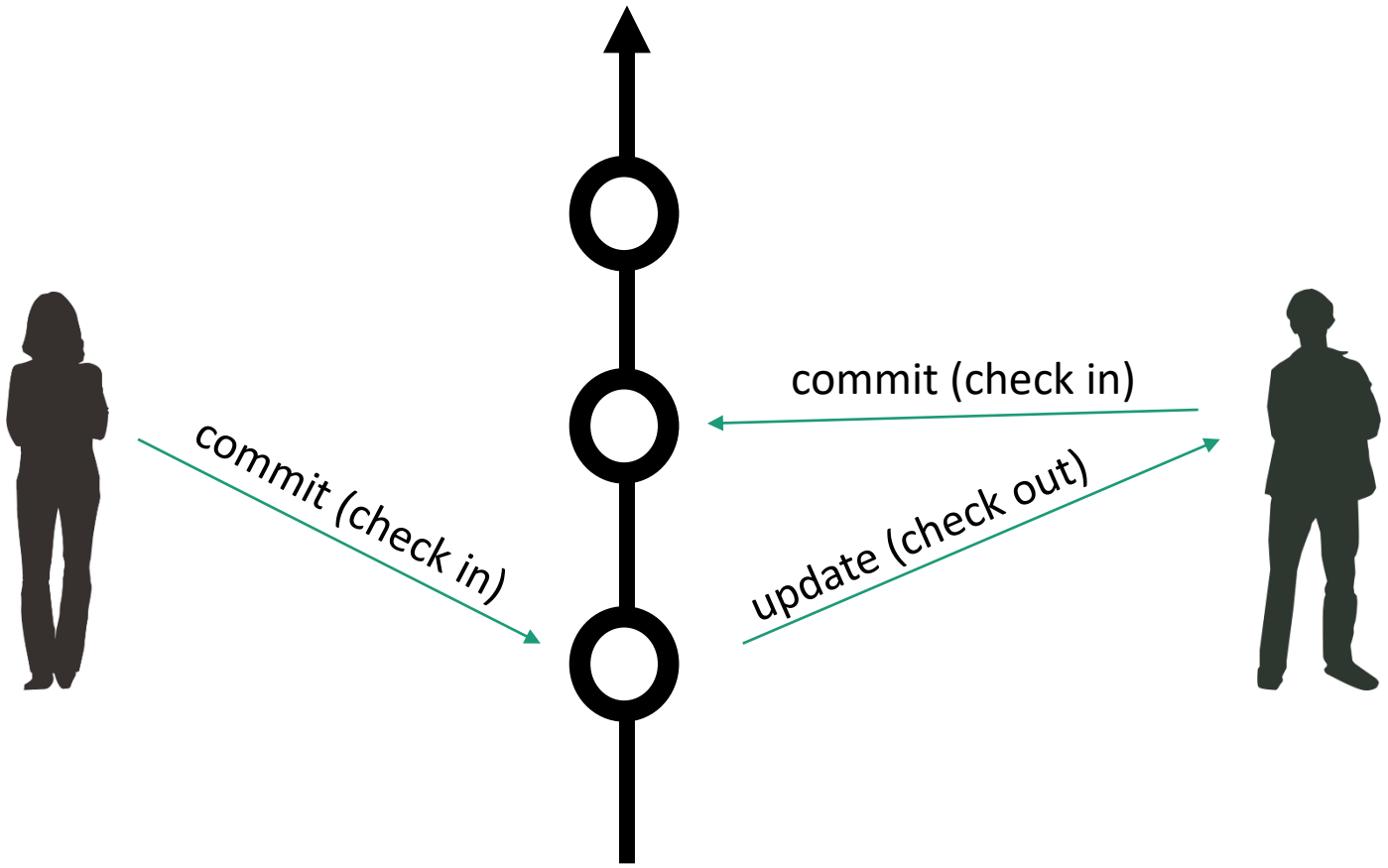
Centralized vs. Distributed

- Centralized VCS
  - Examples: Revision Control System (RCS), Concurrent versions systems (CVS), Subversion (SVN)
- Distributed VCS
  - Examples: Git, Mercurial (hg)

Basic VCS Operations

- Check out/update: copying the repository to the machine you are working at
- Check in/Commit: copying the changes you made to the repository and creating a new version
- Branch: create a new "child" development from a state of the repository

Example: Centralized Workflow

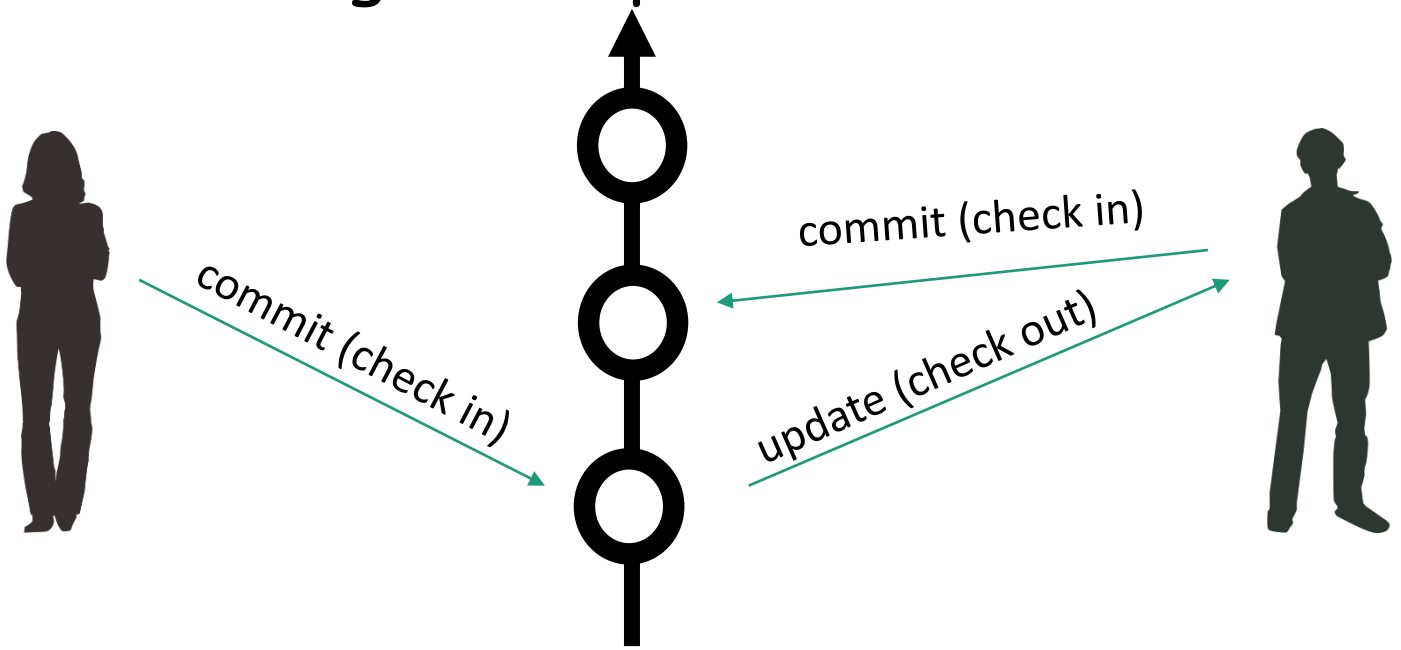


Merge Conflicts

- A conflict may occur when two developers edit the same file
- Merge
  - The developer that tries to commit the file ***last*** will have to combine her changes with those of the prior developer
  - Many VCS's (e.g., git) may automatically combine the changes
  - Developers may have to merge the changes by hand

Question: A Merge?

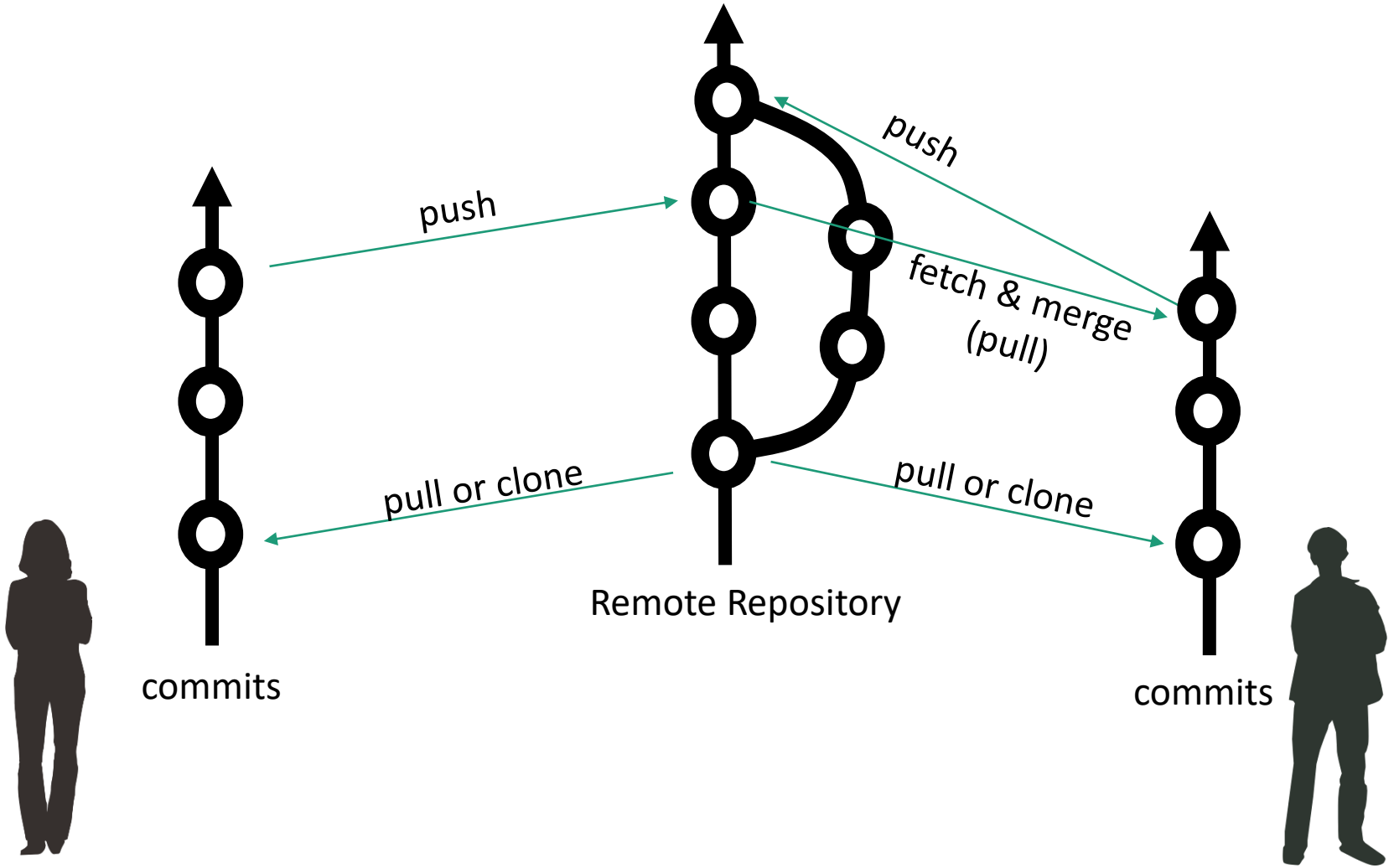
- How would you revise this graph to illustrate when a merge is required?



Distributed Version Control

- Possible to commit locally without upsetting the others
- Allow more flexibility and support different kinds of workflow

Example: Distributed Workflow



Demo

- Create a repositories (many of you have already done)
- Add a new file
- Change an existing file