Version control & git

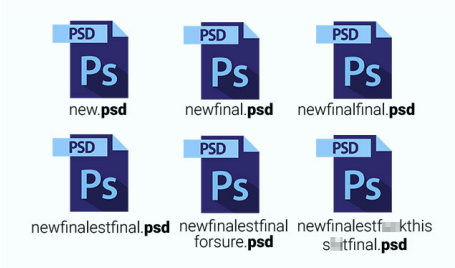
An indroduction

LISCO Lab Meeting. 11.05.2020

Why do we need version control?

Does this sound familiar?

- Shared code updates via email
- Made updates on productive code
- Accidentally overwrote some file, which can never be retrieved again



Let's get away from this . . .

Why do we need version control?

. . . and look forward to:

- Making changes with confidence, and reverting them if needed
- Easily deploying code to production servers
- Understanding who made a change, when and why it happened

The Basics - Tracking Changes

- Track changes that happen within directories or files
- **Repository**: The set of files and directories tracked by version control
- Tell version control which files to track ...
- ... or clone repository from a server

As you make changes, it will track each change behind the scenes, until you are ready to **commit** those changes.

The Basics - Committing and Changesets

- Submit your changes as a collection of actions: a **commit**
- The changeset is given a unique revision ID (hash)

A commit includes:

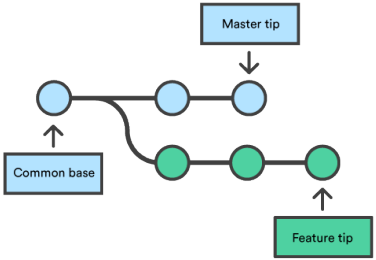
- reference to the person committing
- a timestamp
- affected files and the changes
- a comment from the author

The Basics - Branching

- **Branch**: a copy/snapshot of a repository
- switch between branches and commit without altering the "original repository" (**master**)

Why branching?

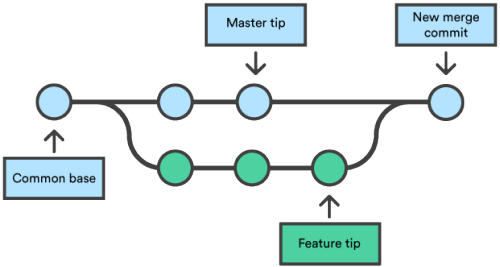
- do changes without worrying of breaking things
- experimental changes
- work on a new feature



The Basics - Merging

Happy with the experimental changes in your branch? Merge it!

- Changes in your branch will be applied to master
- master contains most recent version combined with changes from the branch
- **conflict** may arise when merging → requires manual intervention



The Basics - Pulling and Pushing

Pulling:

- Get latest version when team members **commit** changes
- **Pulling** only downloads changes since last request from server
- These changes are applied to your local copy of the repository
- Might result in a **conflict**

Pushing

- Provide your changes to the team members
- Repository on the server now contains your changes

Get Started

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Please go to

tinyurl.com/liscogit

and download the template.

Git-Workflow

$ git config --global user.name <name>

Define author name to be used for all commits. Replace name by email to define email address.

$ git init <directory>

Create empty Git repo in specified directory. Run with no arguments to initialize the current directory as a git repository.

$ git status

List which files are staged, unstaged, and untracked.

$ git add <files>

Stage all changes in <files>for the next commit. If <files>are untracked, they are added to the repo.

$ git commit -m "message"

Commit the staged snapshot. The flag -a can be used to add all unstaged files to the commit.

$ git log

Display the entire commit history

$ git branch

List all of the branches in your repo. Add a <branch>argument to create a new branch with the name <branch>.

$ git checkout -b <branch>

Create and check out a new branch named <branch>. Drop the -b flag to checkout an existing branch.

$ git merge <branch>

Merge <branch>into the current branch.

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Git-Workflow - Remote Repository

$ git pull

Fetch the remote's copy of current branch and immediately merge it into the local copy.

$ git fetch origin <branch>

Fetches a specific <branch>, from the repo. Leave off <branch>to fetch all remote refs.

$ git push

Push the current branch to remote repo, along with necessary commits and objects. Creates named branch in the remote repo if it doesn't exist.

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Thanks

Author	Commit	Message	Date
Kally Brunner	`0a9bbad`	ups ausversehen familienfotos hinzugefügt	2019-01-28
Kally Brunner	`2a855fe`	BOI ich hab gerade den dümmsten Bug meines Lebens gefangen	2019-01-28