Git Workshop

Spring 2024 - Alex Meall

Agenda

- Intro to Git + How to Use Git
- Repo tour
- Hands-on Git Experience

THIS IS GIT. IT TRACKS COLLABORATIVE WORK ON PROJECTS THROUGH A BEAUTIFUL DISTRIBUTED GRAPH THEORY TREE MODEL.
COOL. HOW DO WE USE IT?
NO IDEA. JUST MEMORIZE THESE SHELL COMMANDS AND TYPE THEM TO SYNC UP. IF YOU GET ERRORS, SAVE YOUR WORK ELSEWHERE, DELETE THE PROJECT, AND DOWNLOAD A FRESH COPY.

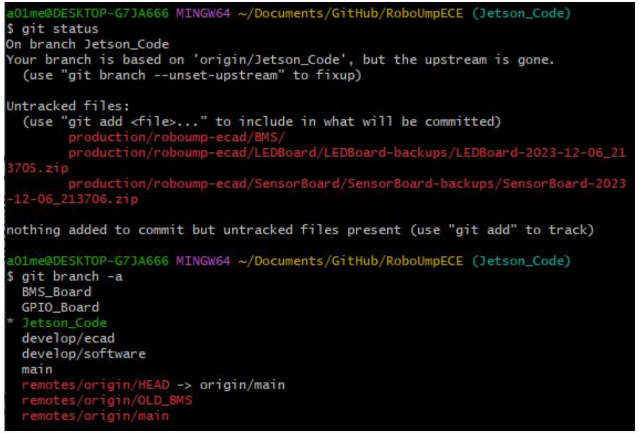
Introducing Git

Version Control Software for tracking files

Git vs. GitHub

- Git: Local software on your machine
- GitHub: Remote container (repo/repository) for code
  - https://github.com

Git is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

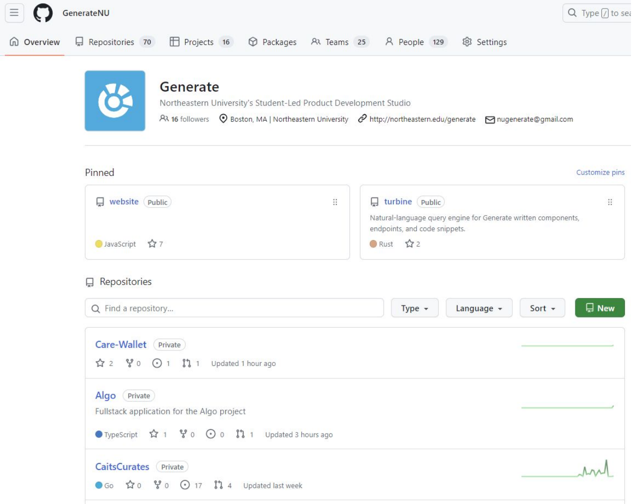


```
a01me@DESKTOP-G7JA666 MINGW64 ~/Documents/GitHub/RoboUmpECE (Jetson_Code)
$ git status
On branch Jetson_Code
Your branch is based on 'origin/Jetson_Code', but the upstream is gone.
  (use "git branch --unset-upstream" to fixup)

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        production/roboump-ecad/BMS/
        production/roboump-ecad/LEDBoard/LEDBoard-backups/LEDBoard-2023-12-06_21
3705.zip
        production/roboump-ecad/SensorBoard/SensorBoard-backups/SensorBoard-2023
-12-06_213706.zip

nothing added to commit but untracked files present (use "git add" to track)

a01me@DESKTOP-G7JA666 MINGW64 ~/Documents/GitHub/RoboUmpECE (Jetson_Code)
$ git branch -a
  BMS_Board
  GPIO_Board
* Jetson_Code
  develop/ecad
  develop/software
  main
  remotes/origin/HEAD -> origin/main
  remotes/origin/OLD_BMS
  remotes/origin/main
```



Generate

Northeastern University's Student-Led Product Development Studio

16 followers · Boston, MA | Northeastern University · http://northeastern.edu/generate · nugenerate@gmail.com

Pinned

website Public
JavaScript ☆ 7

turbine Public
Natural-language query engine for Generate written components, endpoints, and code snippets.
Rust ☆ 2

Repositories

Care-Wallet Private
☆ 2 · 0 · 1 · 1 · Updated 1 hour ago

Algo Private
Fullstack application for the Algo project
TypeScript ☆ 1 · 0 · 0 · 1 · Updated 3 hours ago

CaitsCurates Private
Go ☆ 0 · 0 · 17 · 4 · Updated last week

Repositories

A repository (repo) is the place where project files are stored

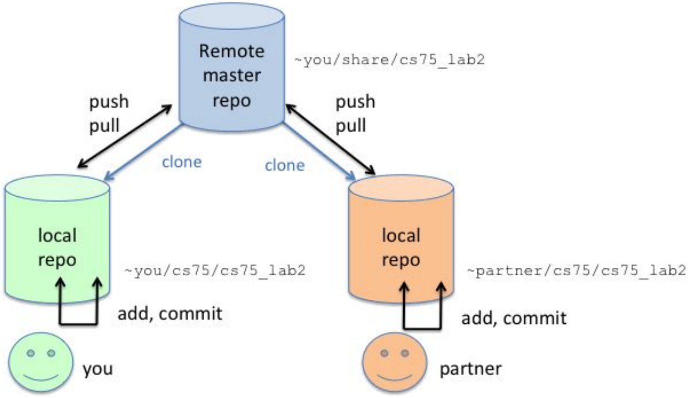
Remote vs. Local Repo

- Remote Repo: Centralized container for code
- Local Repo: Cloned copy of the remote repo that lives on your machine as files

As changes are made, the remote repo and your local repo will become out of sync

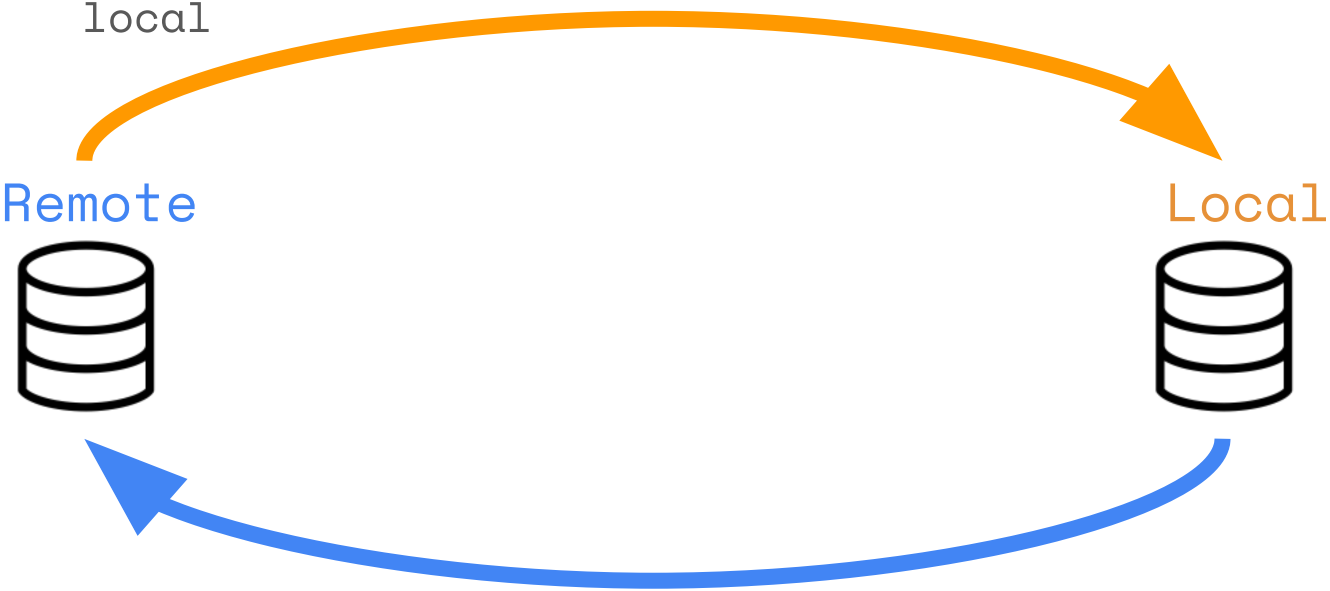
- How do we fix this?

From cs.swarthmore.edu



Pulling vs. Pushing

Pulling Changes: Downloading remote info to local



Pushing Changes: Uploading local info to remote

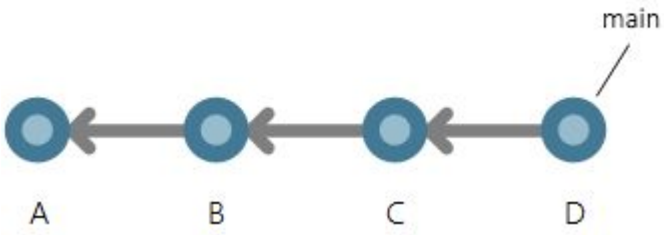
Committing

Commits act as a “virtual breadcrumb trail”

Commits show:

- Who made the commit
- What files were changed
- Message written by committer

“Pull the trigger” and save changes

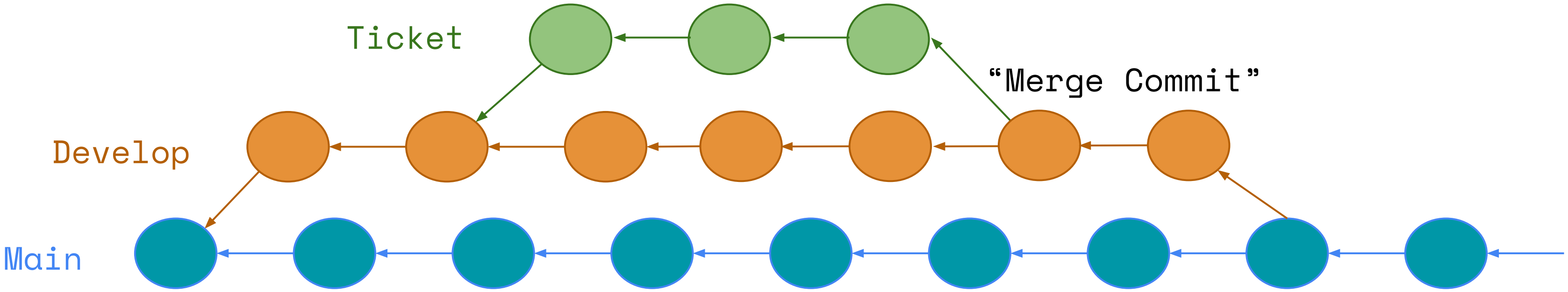


Branches

Branches allow for the development and testing of new features without risking breaking the production-level project

- "Branch off of" other branches
- Branches don't update along with other branches

How to combine branches back together?

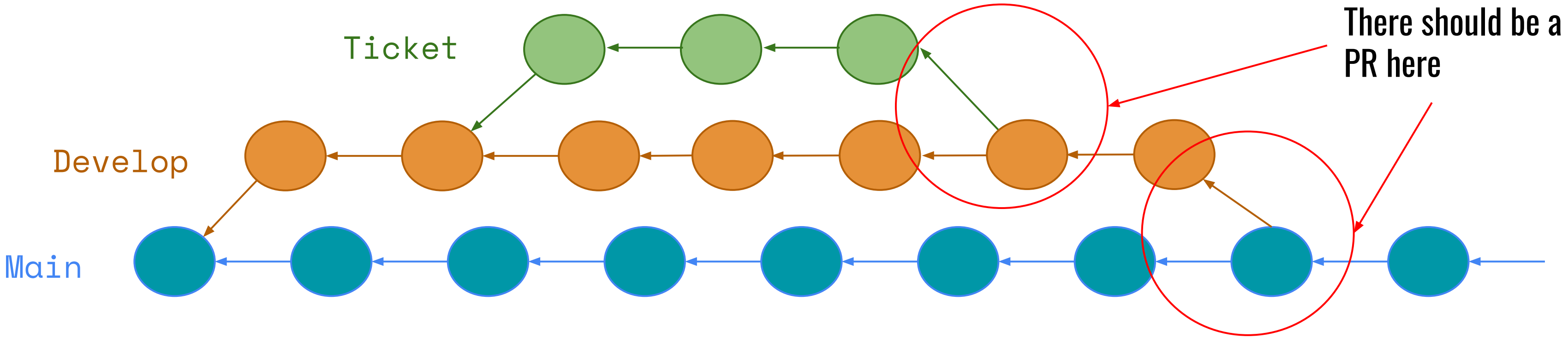


Merging/Pull Requests

Check for conflicts → if none found, merge

Pull Requests (PRs) allow for code/file review before a merge

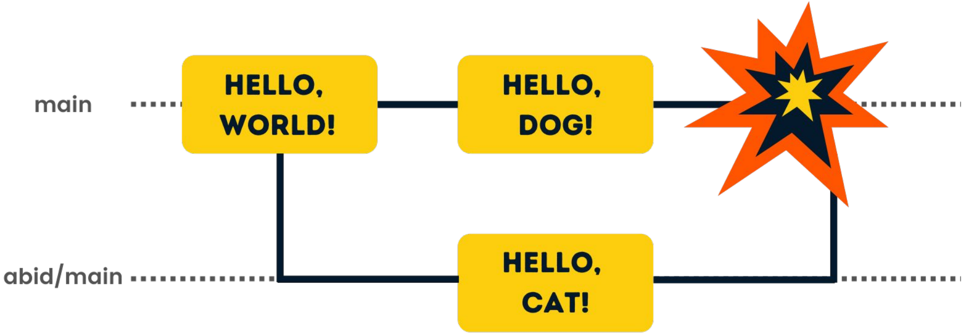
- PRs can be updated before merging



Conflicts

Two main types of merge conflicts:

- Branch merge conflicts
- Commit conflicts



Basic Git Commands

git **pull**	Update local repo with changes in remote
git **status**	See state of all files in local repo
git **add**	Add changed files to the staging area
git **commit**	Locally record changes to repo
git **push**	Update remote repo with local changes
git **branch**	List/modify/create branches
git **switch**	Switches your “active branch”

Good Git Hygiene

Before doing work:

- Check branch and “git pull”

Commit:

- Whenever a change is made (1 commit, 1 purpose)
- Only necessary files that have been tested

Commit messages should be:

- Clear and concise, and describe what was changed + why
- “Motor ramp function” vs. “Added motor ramp up function to prevent overcurrent shutdown”

Git Demo