

## 01 Git configuration

```
$ git config --global user.name "Your Name"
```

Set the name that will be attached to your commits and tags.

```
$ git config --global user.email "you@example.com"
```

Set the e-mail address that will be attached to your commits and tags.

```
$ git config --global color.ui auto
```

Enable some colorization of Git output.

## 02 Starting A Project

```
$ git init [project name]
```

Create a new local repository. If **[project name]** is provided, Git will create a new directory name **[project name]** and will initialize a repository inside it. If **[project name]** is not provided, then a new repository is initialized in the current directory.

```
$ git clone [project url]
```

Downloads a project with the entire history from the remote repository.

## 03 Day-To-Day Work

```
$ git status
```

Displays the status of your working directory. Options include new, staged, and modified files. It will retrieve branch name, current commit identifier, and changes pending commit.

```
$ git add [file]
```

Add a file to the **staging** area. Use in place of the full file path to add all changed files from the **current directory** down into the **directory tree**.

```
$ git diff [file]
```

Show changes between **working directory** and **staging area**.

```
$ git diff --staged [file]
```

Shows any changes between the **staging area** and the **repository**.

```
$ git checkout -- [file]
```

Discard changes in **working directory**. This operation is **unrecoverable**.

```
$ git reset [file]
```

Revert your **repository** to a previous known working state.

```
$ git commit
```

Create a new **commit** from changes added to the **staging area**. The **commit** must have a message!

```
$ git rm [file]
```

Remove file from **working directory** and **staging area**.

```
$ git stash
```

Put current changes in your **working directory** into **stash** for later use.

```
$ git stash pop
```

Apply stored **stash** content into **working directory**, and clear **stash**.

```
$ git stash drop
```

Delete a specific **stash** from all your previous **stakes**.

## 04 Git branching model

```
$ git branch [-a]
```

List all local branches in repository. With **-a**: show all branches (with remote).

```
$ git branch [branch_name]
```

Create new branch, referencing the current **HEAD**.

```
$ git checkout [-b][branch_name]
```

Switch **working directory** to the specified branch. With **-b**: Git will create the specified branch if it does not exist.

```
$ git merge [from name]
```

Join specified **[from name]** branch into your current branch (the one you are on currently).

```
$ git branch -d [name]
```

Remove selected branch, if it is already merged into any other. **-D** instead of **-d** forces deletion.

## 05 Review your work

```
$ git log [-n count]
```

List commit history of current branch. **-n count** limits list to last **n** commits.

```
$ git log --oneline --graph --decorate
```

An overview with reference labels and history graph. One commit per line.

```
$ git log ref..
```

List commits that are present on the current branch and not merged into **ref**. A **ref** can be a branch name or a tag name.

```
$ git log ..ref
```

List commit that are present on **ref** and not merged into current branch.

```
$ git reflog
```

List operations (e.g. checkouts or commits) made on local repository.

## 06 Tagging known commits

```
$ git tag
```

List all tags.

```
$ git tag [name] [commit sha]
```

Create a tag reference named **name** for current commit. Add **commit sha** to tag a specific commit instead of current one.

```
$ git tag -a [name] [commit sha]
```

Create a tag object named **name** for current commit.

```
$ git tag -d [name]
```

Remove a tag from local repository.

## 07 Reverting changes

```
$ git reset [--hard] [target reference]
```

Switches the current branch to the **target reference**, leaving a difference as an uncommitted change. When **--hard** is used, all changes are discarded.

```
$ git revert [commit sha]
```

Create a new commit, reverting changes from the specified commit. It generates an **inversion** of changes.

## 08 Synchronizing repositories

```
$ git fetch [remote]
```

Fetch changes from the **remote**, but not update tracking branches.

```
$ git fetch --prune [remote]
```

Delete remote Refs that were removed from the **remote** repository.

```
$ git pull [remote]
```

Fetch changes from the **remote** and merge current branch with its upstream.

```
$ git push [--tags] [remote]
```

Push local changes to the **remote**. Use **--tags** to push tags.

```
$ git push -u [remote] [branch]
```

Push local branch to **remote** repository. Set its copy as an upstream.

**Commit** an object

**Branch** a reference to a commit; can have a **tracked upstream**

**Tag** a reference (standard) or an object (annotated)

**Head** a place where your **working directory** is now

## A Git installation

For GNU/Linux distributions, Git should be available in the standard system repository. For example, in Debian/Ubuntu please type in the **terminal**:

```
$ sudo apt-get install git
```

If you need to install Git from source, you can get it from [git-scm.com/downloads](http://git-scm.com/downloads).

An excellent Git course can be found in the great **Pro Git** book by Scott Chacon and Ben Straub. The book is available online for free at [git-scm.com/book](http://git-scm.com/book).

## B Ignoring Files

```
$ cat .gitignore
/logs/*
!logs/.gitkeep
/tmp
*.swp
```

Verify the `.gitignore` file exists in your project and ignore certain type of files, such as all files in `logs` directory (excluding the `.gitkeep` file), whole `tmp` directory and all files `*.swp`. File ignoring will work for the directory (and children directories) where `.gitignore` file is placed.

## C Ignoring Files

This is a tag. It looks like a developer's note so it's probably a reference, not an object.

**working-version**

This is an initial commit, it has no parents

This is an upstream branch

**origin/fix/a**

This is a tag. It looks like a version so it's probably an object (annotated tag)

**V1.0.1**

This is a merge commit, it has two parents!

**fix/a**

This is a local branch. It is 3 commits ahead, you see it, right?

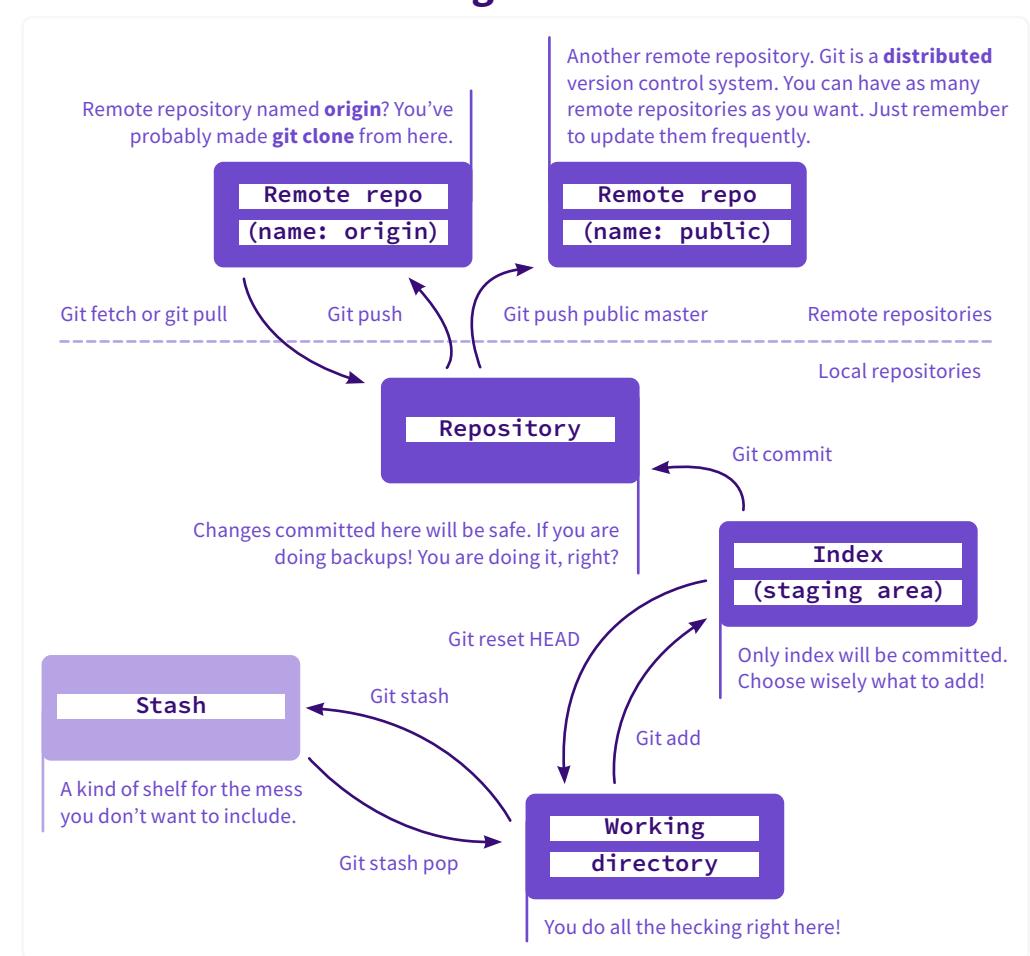
**Master**

This is also a local branch

**HEAD**

Your **working directory** is here

## D The zoo of working areas



## case 1: no remote repo, git init local repo

```
no remote repo, create a repo local -> how to -> git init  
git init  
git status / git add . / git commit / git log / git push (can not)  
create a repo in git and connect the local repo mit remote repo  
git remote add origin git@gitlab.com:xxx/xxx.git  
git push --set-upstream origin master
```

倒数第二个是连接local and remote repo

倒数第一个是 link local master and remote master

**case 2:** create a local branch, then changed the file in the this branch, push to remote

Wrong: because there is no up-stream for the new created branch.

To do: git push --set-upstream origin feature/add-new-feature (Not just push)

```
[W (feature/database-connection)]$ git push
fatal: The current branch feature/database-connection has no upstream branch.
To push the current branch and set the remote as upstream, use

    git push --set-upstream origin feature/database-connection
```

**case 3:** know what the 0 and 2 means in this image

Y **feature/database-connection**

- o [d9fccd42](#) · adjusted smth · just now

0 2

Y **bugfix/user-auth-error**

- o [1d00a8f6](#) · Initial commit · 30 minutes ago

0 0

Y **master** default protected

- o [1d00a8f6](#) · Initial commit · 30 minutes ago



## case 4: delete branch

- remote: just delete
- local: three steps

Viewing commit d9fccd42

1 file, +1 -1 Show latest version Edit

Assignee Nana Janashia

adjusted smth  
Nana Janashia authored 5 minutes ago

README.md

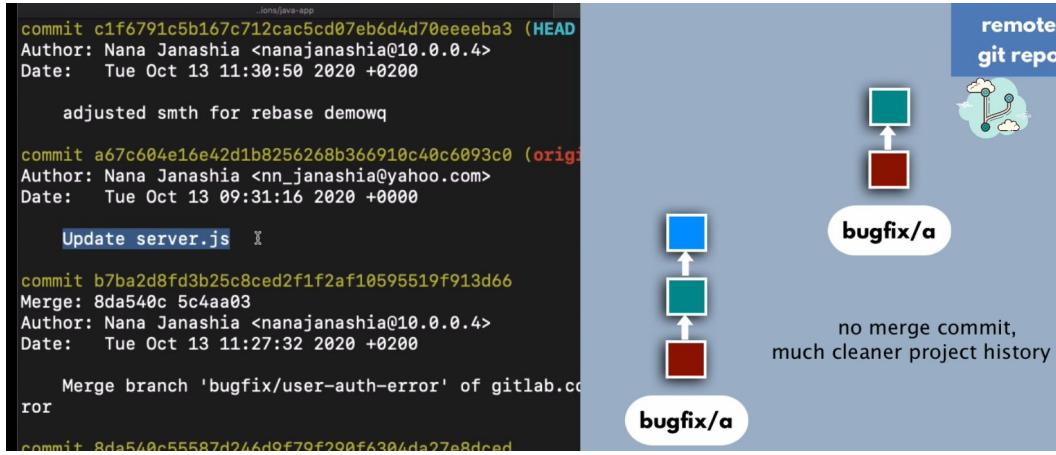
1 - #### 1. Application set  
1 + #### 1. Application set  
2 This simple nodejs app  
3 which is running in a n  
4 the es service name in

deleting branches:  
- leave the branch  
- delete it  
- locally (1. back to master (git checkout master), then pull (git master), those changes locally. then git branch -d feature/xxxx. use git branch to check if it was deleted.  
- remote (just delete in gitlab web)

**case 5:** two develop work on the same branch. One has changed something and pushed to remote, another don't it and also want to push to remote. **they have changed different code**. How to do ?

- 1- git pull -r
2. git push

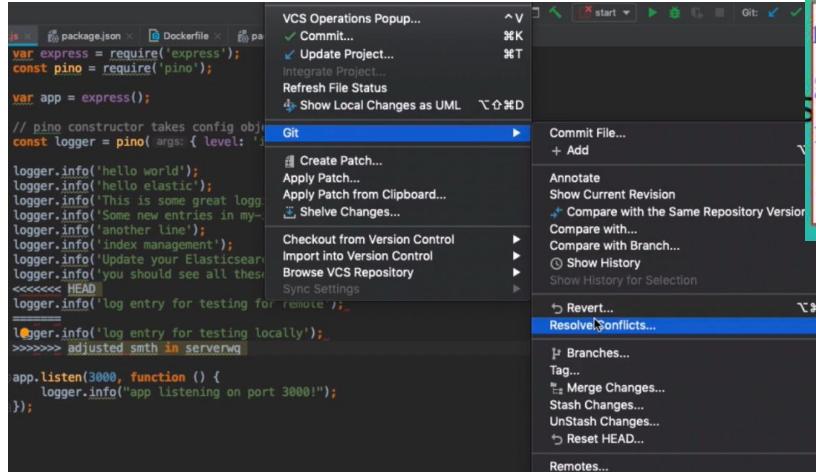
当我在push之前， master里面已经有了变化，我要通过git pull -r (rebase)进行更新，然后再进行push，就不会有2个merge了



if they changed the same code ?

git pull -r 不能起到作用, because merge conflict

```
Using index info to reconstruct a base tree...
M      app/server.js
Falling back to patching base and 3-way merge...
Auto merging app/server.js
CONFLICT (content): Merge conflict in app/server.js
error: failed to merge in the changes.
Patch failed at 0001 adjusted smth in serverwq
Use 'git am --show-current-patch' to see the failed patch
```



merge conflicts: 多个人同时更改同一个code。在 git pull -r 之前, 你要先在editor里面进行 resolve conflict. 3个列进行比较最后完成更改, 然后最后进行git rebase --continue. 然后git push

**case6:** .gitignore 有一些文件已经在repo里面了，但是你现在写入gitignore。就不用track他们。  
要对他们进行 git rm -r cached thisfile

已经remote的，但是现有爱被ignore他们。可以用  
git rm -r --cached .idea (.idea是不要再被上传的  
文件夹), then git status, git commint, git push

case 7: code changed, not working, test if the code before changed works:

git stash

git stash pop

case 8: code changed, go to another branch, can not because the changes has not saved. so

git stash

go to other brach

git stash pop then you can continuous the changes

Shareable to collaborate as team

1. 如果在一个支里面进行了更改，你不可以switch到另外的  
branch. 但是你可以用 git stash (save current changes for  
later).

你可以去其他的比如branch. 回来后可以通过 git stash pop 得到之  
前的改变 (stash 存放；贮藏)

git stash => git stash pop

2. 如果你对code进行了更改，但是不能运行了，你可以先git stash你的  
更改，去测试之前的从code是否能够成功。

case 9 git checkout commithash

commithash form git log.

你可以去到你之前的地方，然后个git checkout 当前的branch

git log: commit hash / auto/ commit message

- go back to a specific project version
- git checkout commitHash
- git checkout currentBranch

case 10 git add / git commit **but not git push**. so want to reset the change.

```
[\W (bugfix/user-auth-error)]$ git status  
On branch bugfix/user-auth-error  
Your branch is ahead of 'origin/bugfix/user-auth-error' by 1  
(use "git push" to publish your local commits)  
  
nothing to commit, working tree clean  
[\W (bugfix/user-auth-error)]$ git log  
[\W (bugfix/user-auth-error)]$ git reset --hard HEAD~1
```

### history of commits

HEAD



removed some log lines

removed node\_modules..

Added gitignore file

branch

revert commit: (HEAD is pointer to last commit)

- git reset --hard HEAD~1 返回到上个commit. HEAD~2 HEAD~3

--hard back to commit and discard changes

- git reset --soft HEAD~1 (--soft is default. change is there but commit is gone.)

revert commit: (HEAD is pointer to last commit)

- git reset --hard HEAD~1 返回到上个commit. HEAD~2 HEAD~3

--hard back to commit and discard changes

- git reset --soft HEAD~1 (--soft is default. change is there but  
commit is gone.)

5: 你commit了，但是你发现你需要对commit进行更改，所以你可以用  
git commit --amend (change the last commit)

soft: commit 被取消了，但是你更改的code还在那里。你可以继续进行更改，然后进行commit

case 11. **git push to remote** but now want to change the commit how?

if you change the last commit,

if commit is pushed to remote. how to do the revert  
commit:

git reset --hard HEAD~1 (local repo is changed)

git push --force (revert something, our branch is  
not up to date. so use --force. force changes)

**git revert <commit hash>**

- creates a new commit to revert the old  
commit's changes

**git reset <commit hash>**

- removed old commit

如果已经push到remote. 用revert. 看他们的区别

case 12: the master branch has new merge. before you merge your change to master. you need to test the changes on the master on your brach then merge.

1. git checkout master
2. git pull up to date
3. then merge master to your branch
4. check if everything work
5. then merge your branch again to the master

git reset commitHash: remove old commit

git merge | 你的自己的branch已经很长时间了，master已经有变换了。Pull the changes in the master to your branch. -> local master branch needs to be up-to-date.

git checkout master / git pull / git checkout mybranch / git merge master ( takes the changes in the master branch to mybranch). / test, works done / git push







# Version Control with GIT

## Key Takeaways

# What is Version Control?

- Also known as "source control"
- Practice of **tracking and managing changes to software code**
- It enables multiple people to **simultaneously work on a single project**



- Code is **hosted centrally on the internet**
- Every developer has an **entire copy of the code locally**

# Basic Concepts of Version Control

- Version Control keeps a **history of changes**

**Every code change and file is tracked!**



You can revert commits



Each change labelled with commit message

回复，恢复（到原来状态、情况或做法）



**git**

Add list for...

Fix button...

Version 2



Version 1

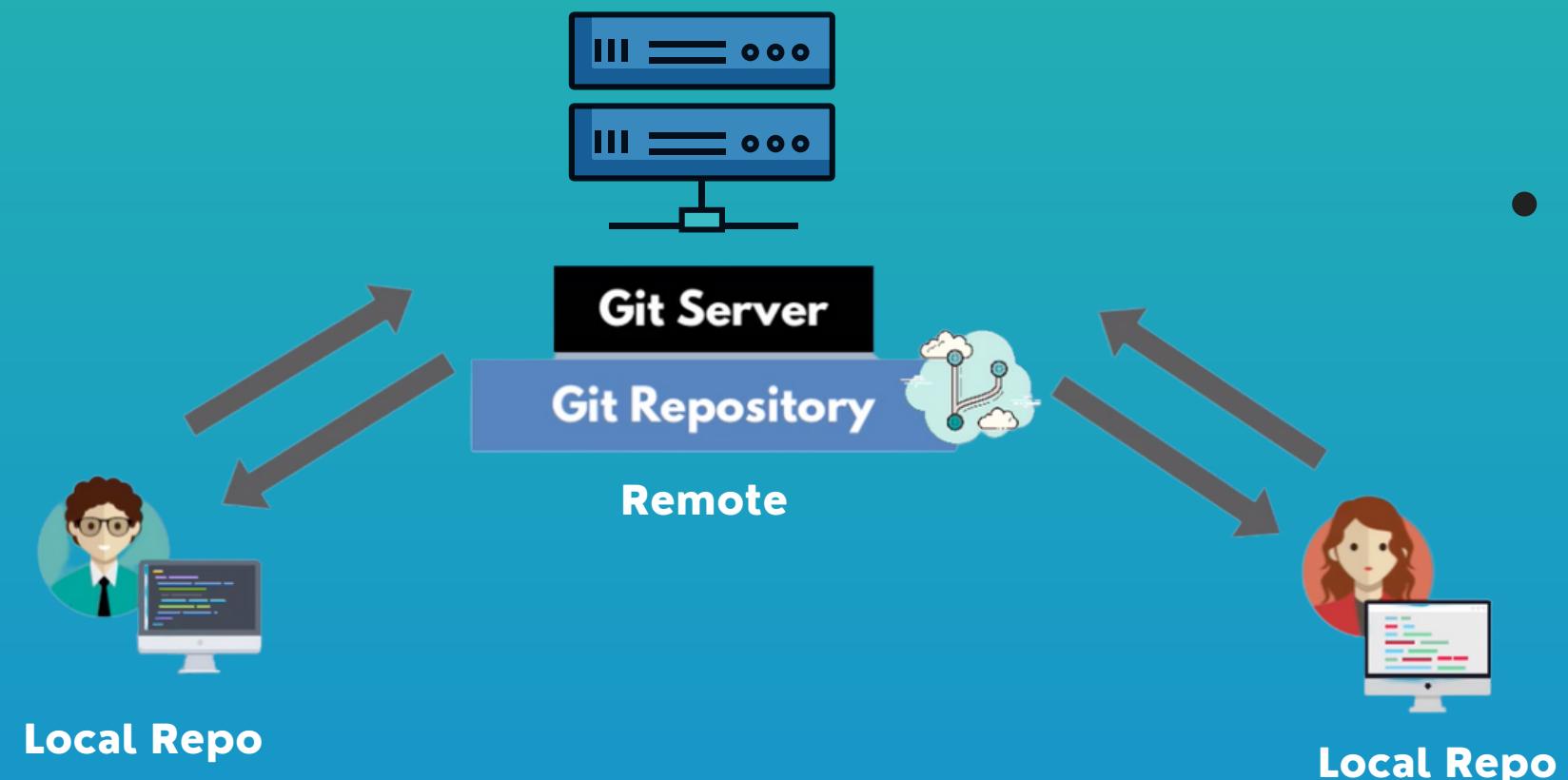
**Git is the most used  
version control system**



**TECHWORLD  
WITH NANA**

# Basic Concepts of Git - 1

- **Remote Git Repository:** where the **code is hosted**, e.g. on Gitlab or GitHub
- **Local Git Repository:** **local copy** of the code on your machine
- **Git Client:** to connect and **execute git commands** can be UI or Command Line Tool



- Code is fetched ("pulled") from remote repo and "pushed" to it

# Basic Concepts of Git - 2

- Most of the time, Git knows how to **merge changes automatically**
- But you have a "**Merge Conflict**", when e.g. same line was changed. Then you need to resolve it manually

- To avoid merge conflicts:

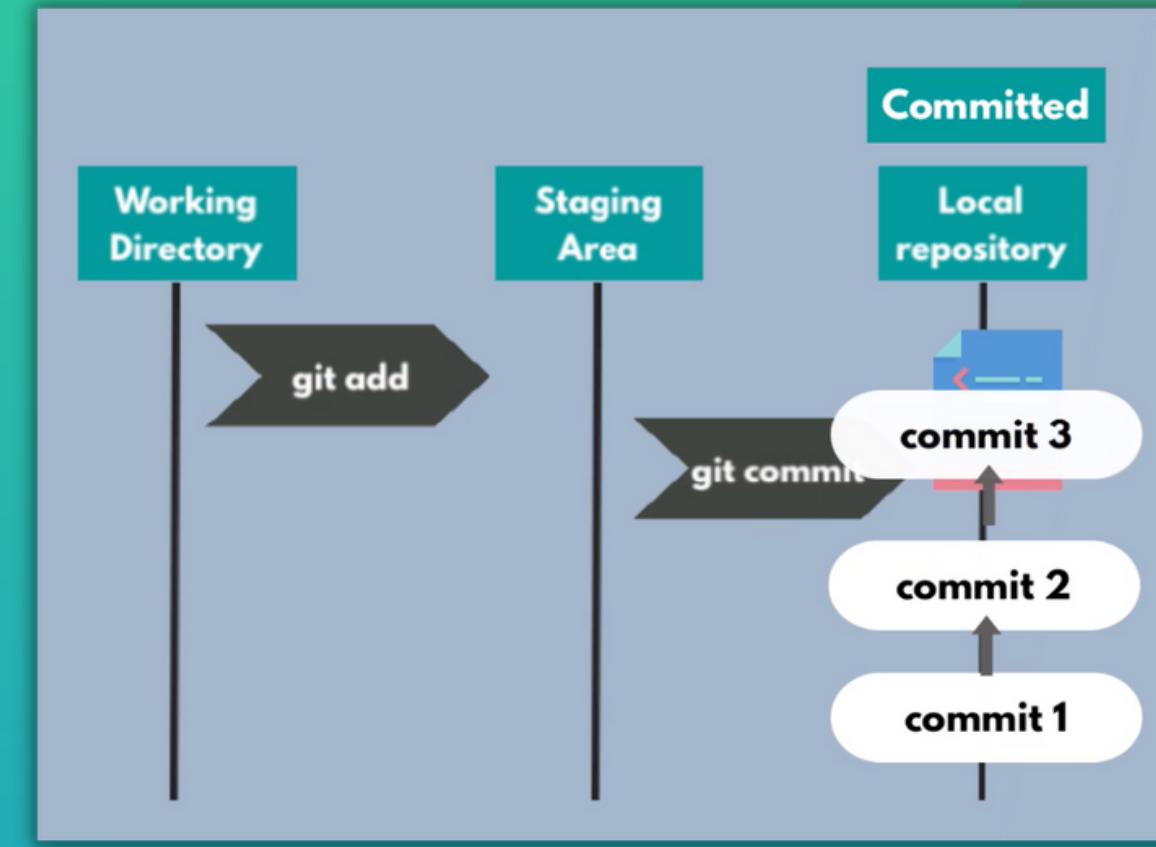
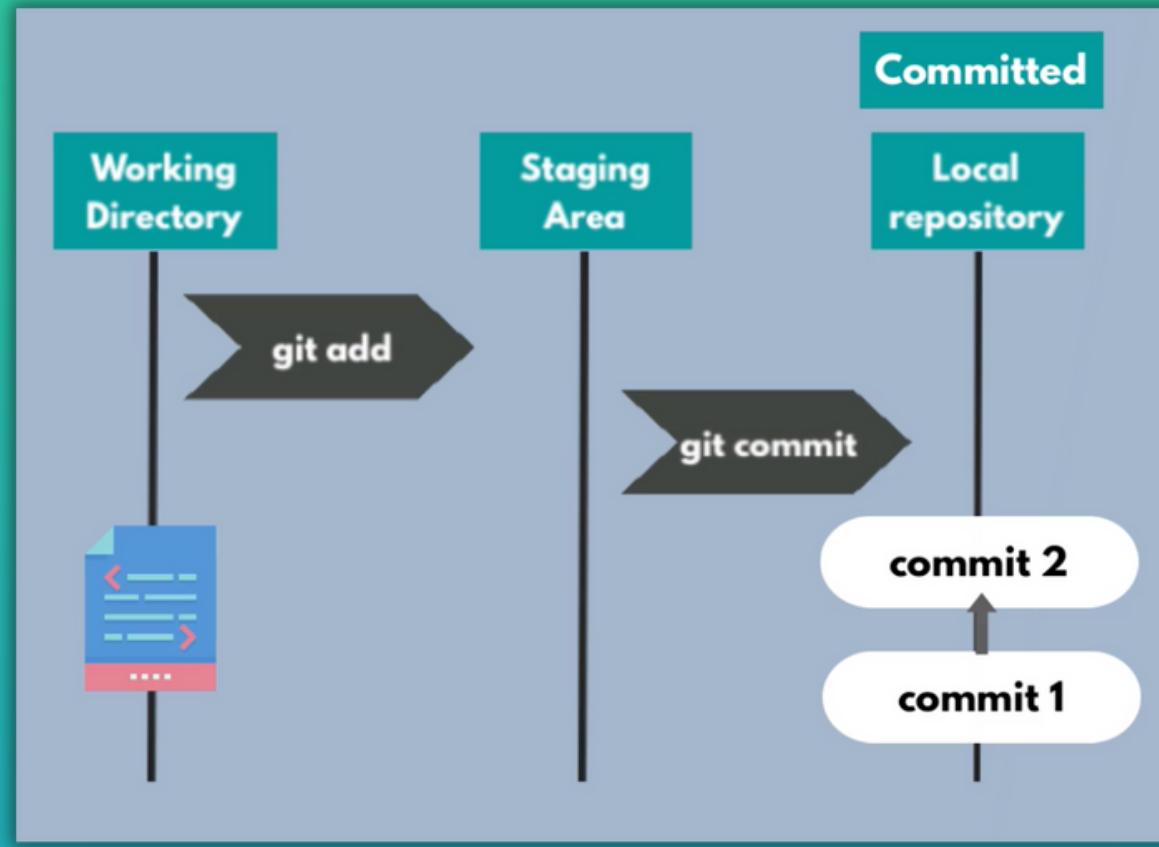
**Best Practice:** Push and Pull often from remote repository to stay in sync



- Note: Breaking changes doesn't affect you until you pulled the new code



# Working with Git - 1



***git add <file>:***

- To include the changes of a file into the next commit
- Moves the changes from "working directory" to the "staging area"

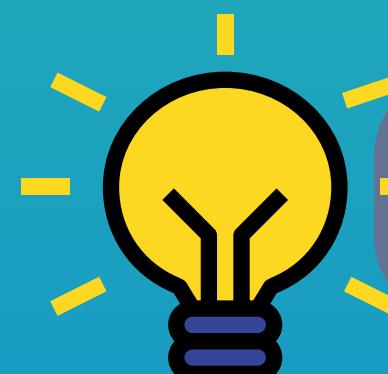
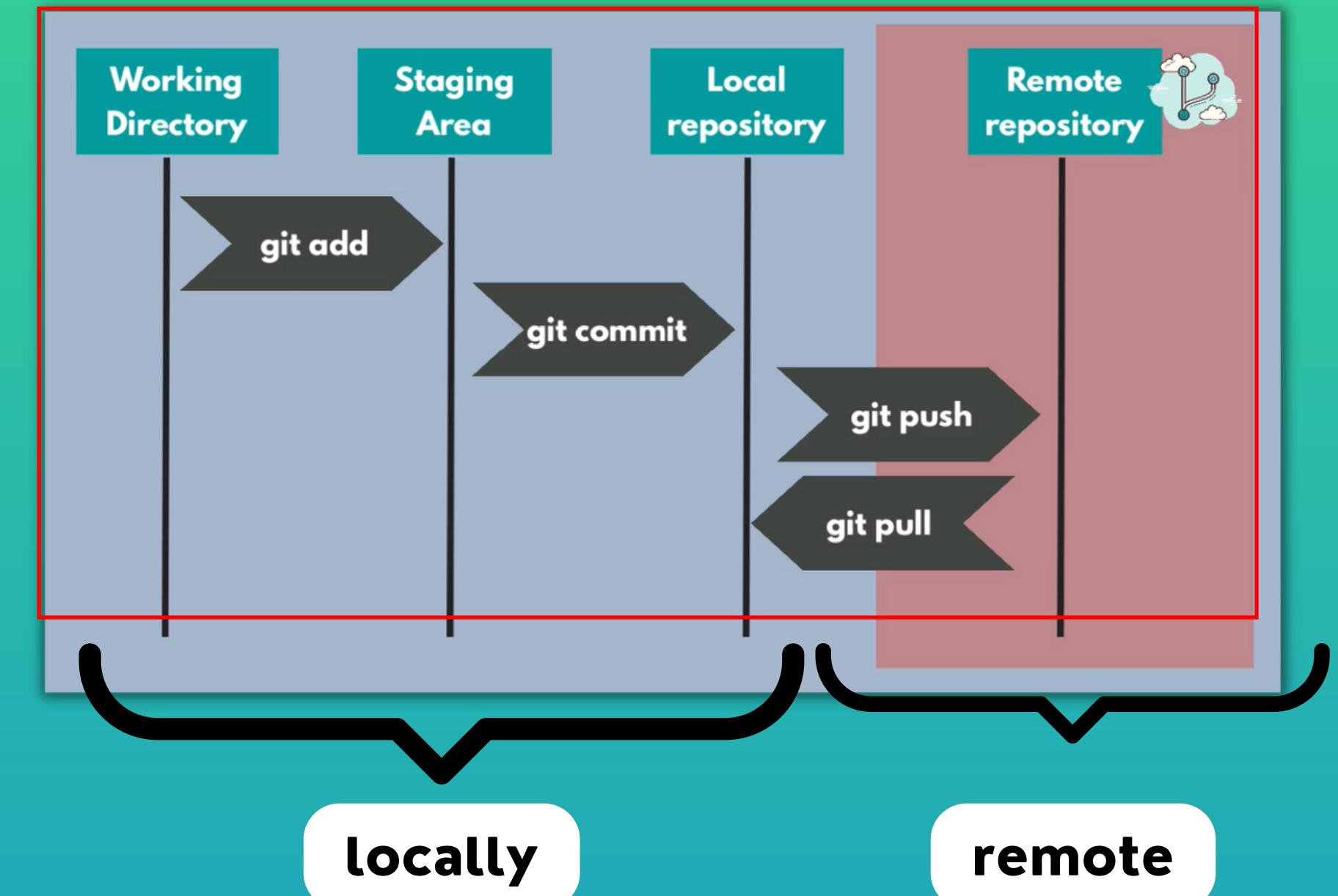
***git commit -m "commit message":***

- To save your changes in your local repository
- Creates a new commit, which you can go back to later if needed

# Working with Git - 2

***git push <remote> <branch-name>:***

- After committing your changes, you want to send your changes to the remote Git server
- Uploads your commits to the remote repo



At the end of the handout you can find a summary of most important git commands

# Setup Git Repository - 1

## 1) Remote Repository

- Different Git Repositories to register:



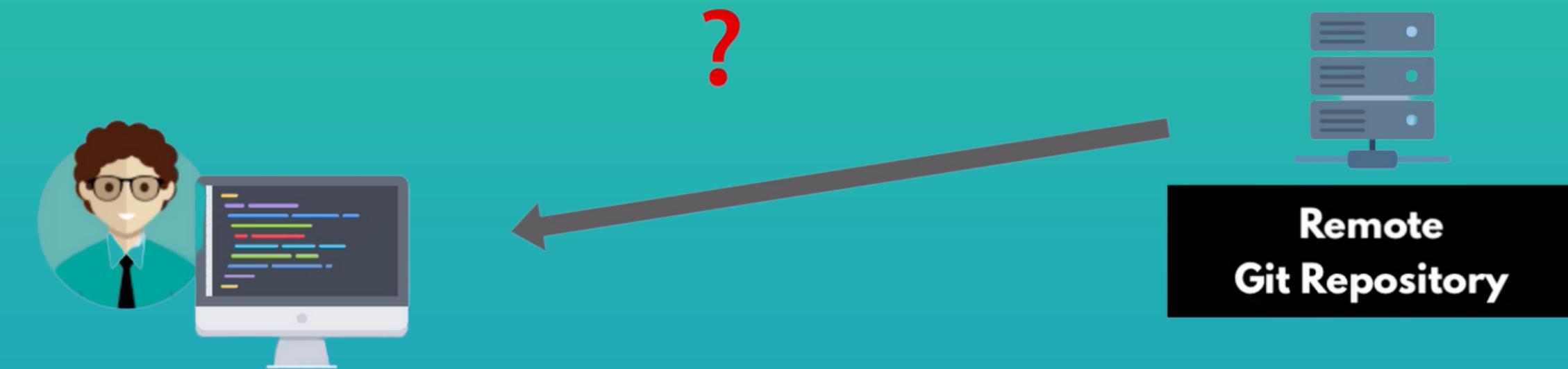
- These are platforms that **host your repository**
- Companies have own Git servers hosted by them
- Your repository can be **private or public**.  
E.g. Private for companies, Public for open source projects
- You can do a lot via the Platforms UI

The screenshot shows the GitLab web interface for creating a new project. The URL in the address bar is `gitlab.com/projects/new#blank_project`. The page title is "New Project · GitLab". The main heading is "Create blank project". A large button with a plus sign inside a square is on the left. The "Project name" field contains "my-project". The "Project URL" field contains `https://gitlab.com/nanuchi/`. The "Project slug" field also contains "my-project". Below these fields is a note about creating a group. The "Project description (optional)" section has a "Description format" dropdown. Under "Visibility Level", the "Private" option is selected, with a note that access must be granted explicitly to each user. The "Public" option is also available. At the bottom is a "Create project" button.

# Setup Git Repository - 2

## 2) Local Repository

- Having the remote repository set up, you need a way to connect with the remote repository to copy or "**clone**" git project to your local machine



- Git client** needs to be installed

**UI client**

or

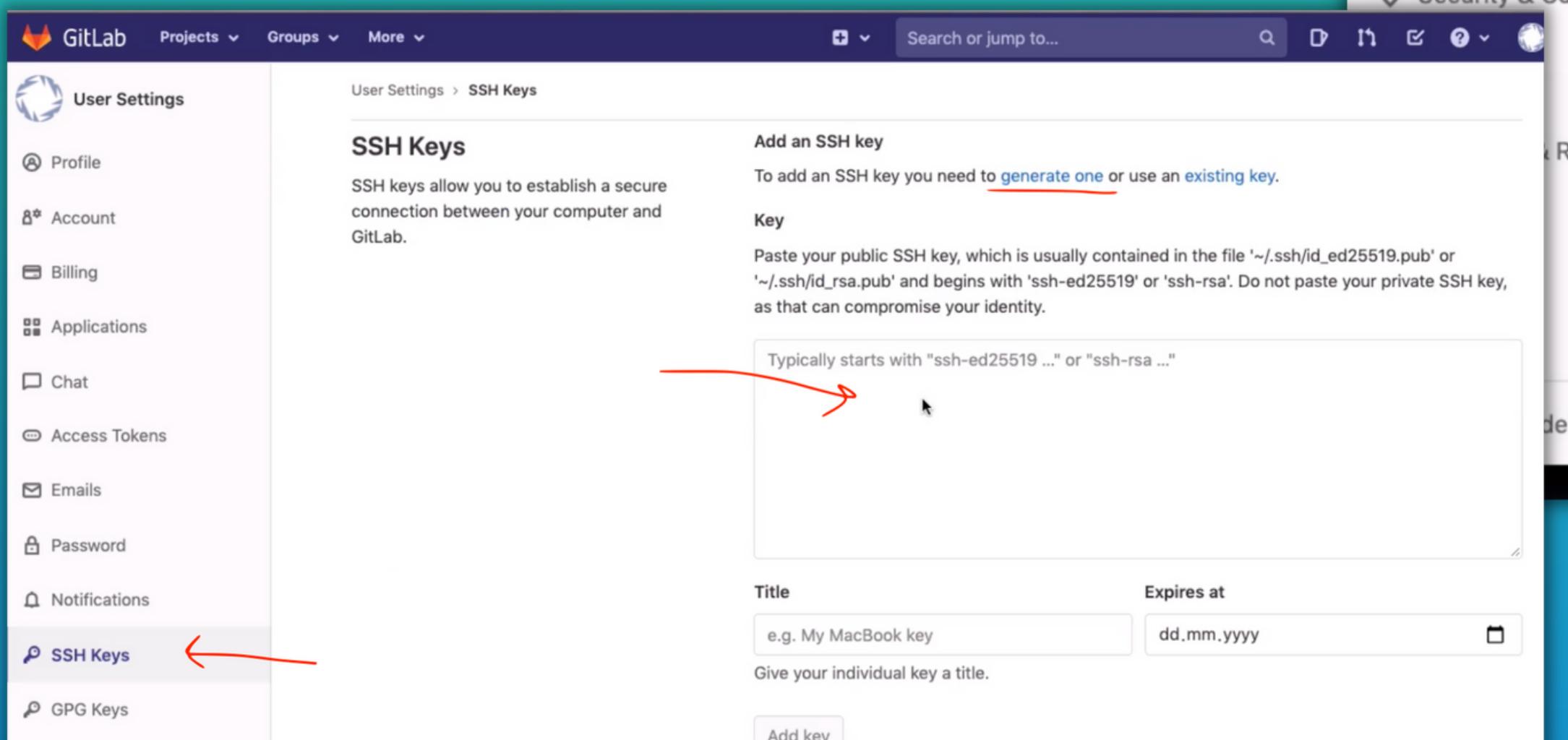
**Git Command Line Tool**

- <https://git-scm.com/downloads/guis>
- Installation Guide: <https://git-scm.com/downloads>

# Setup Git Repository - 3

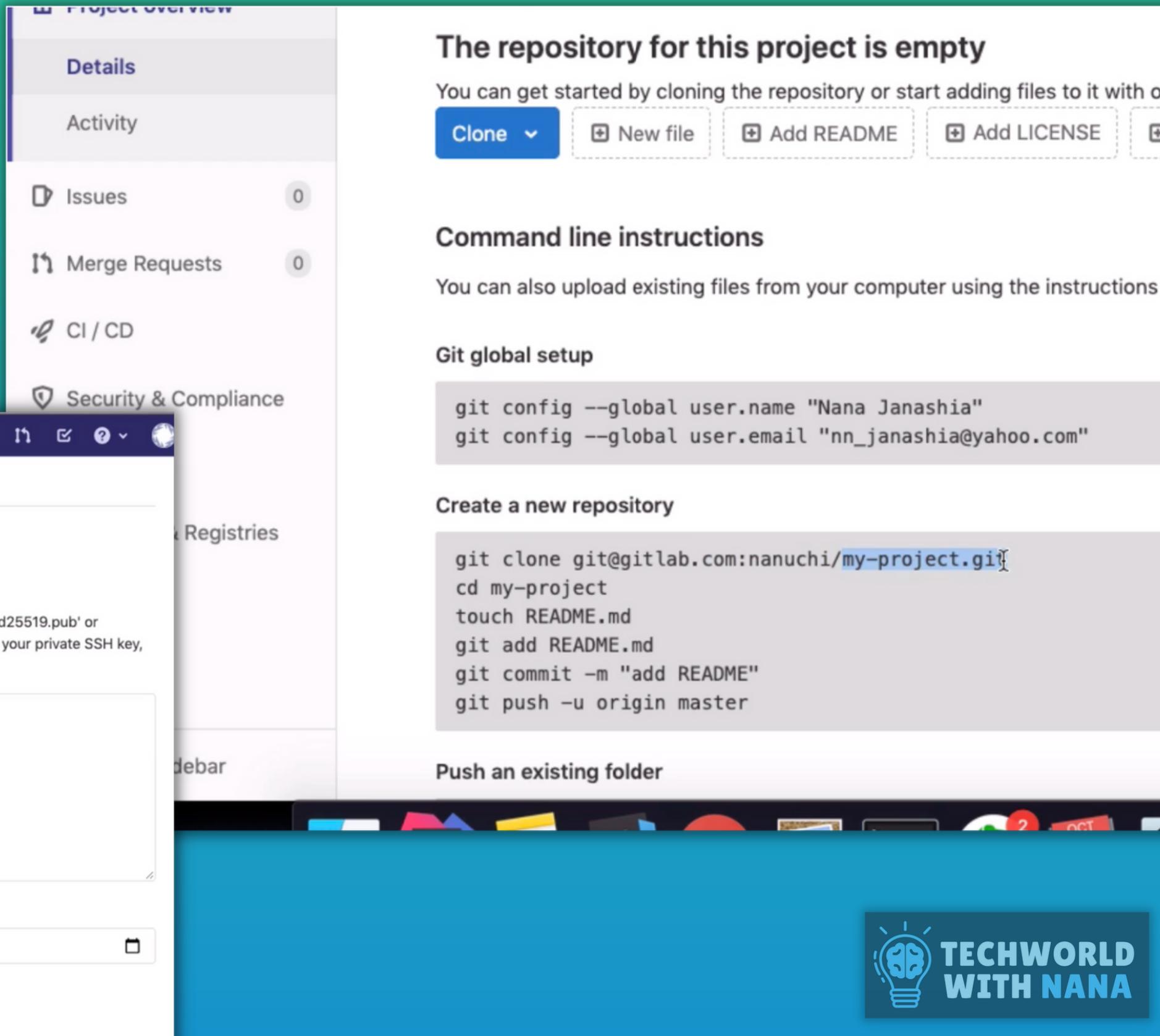
## 2) Local Repository

- You need to **authenticate** with GitHub/GitLab/...
- For that, your public SSH Key must be added to the remote platforms:



The screenshot shows the GitLab user settings interface. On the left, there's a sidebar with links like User Settings, Profile, Account, Billing, Applications, Chat, Access Tokens, Emails, Password, Notifications, SSH Keys (which is highlighted with a red arrow), and GPG Keys. The main content area is titled 'User Settings > SSH Keys'. It has a sub-section 'SSH Keys' with a brief description and a 'Key' input field where users can paste their public SSH key. Below this is a text box for entering a title and expiration date for the key.

Getting started guide available:



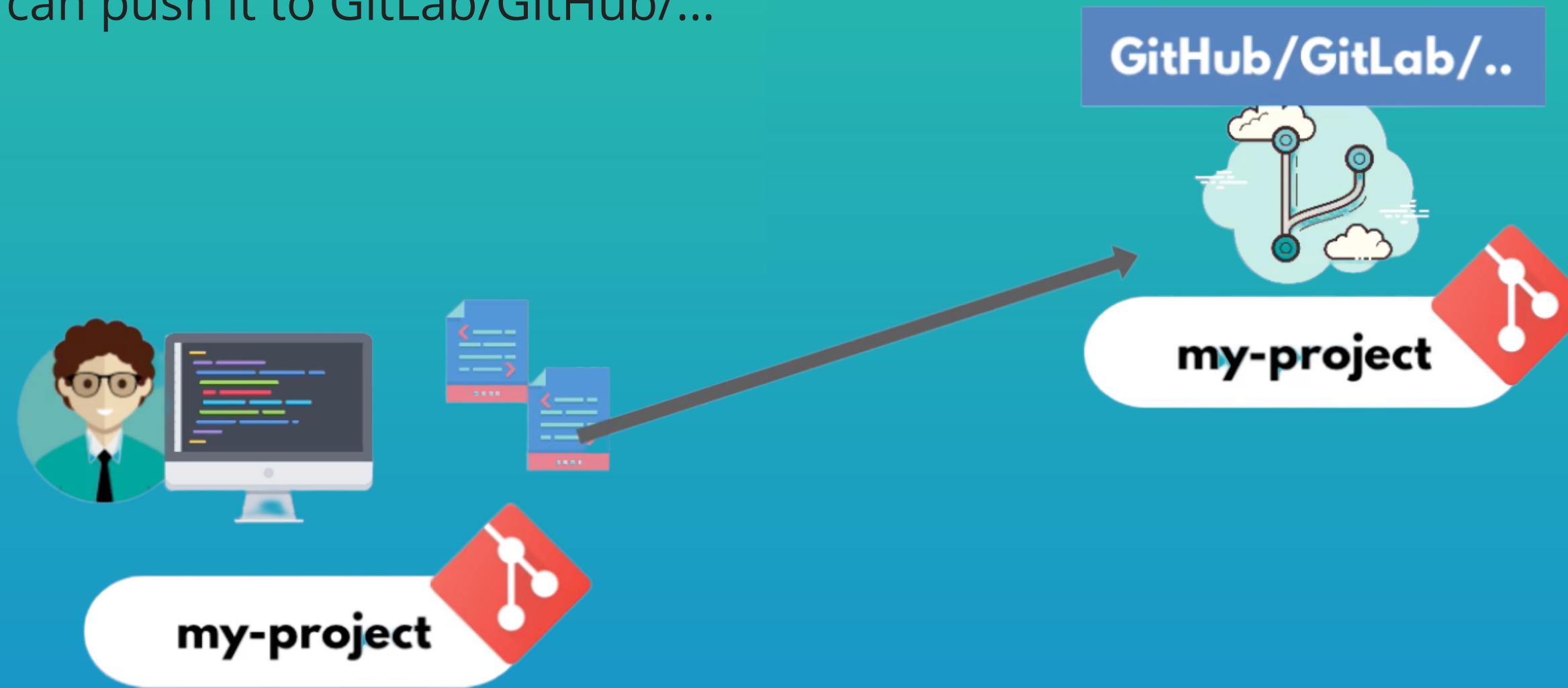
The screenshot shows a GitLab project overview page for a project that is currently empty. It features a sidebar with 'Project Overview', 'Details', and 'Activity'. Below these are sections for 'Issues' (0), 'Merge Requests' (0), 'CI / CD', and 'Security & Compliance'. At the bottom, there's a 'Clone' button (highlighted with a red arrow) and options to 'New file', 'Add README', 'Add LICENSE', and 'Import'. To the right, there's a 'Getting started guide' with sections for command line instructions, git global setup, creating a new repository, and pushing an existing folder, each with corresponding code snippets.

# Setup Git Repository - 4

## 2) Local Repository

As an **alternative**:

- If you have already an existing project locally, you can **initialize a git repository with "git init"**
- Then you can push it to GitLab/GitHub/...



no remote repo, create a repo local -> how to -> git init  
git init  
git status / git add . / git commit / git log / git push (can not)  
create a repo in git and connect the local repo mit remote repo  
git remote add origin git@gitlab.com:xxx/xxx.git  
git push --set-upstream origin master

git checkout master: checkout is switch; switch to master branch

create a new branch and switch to the new branch:

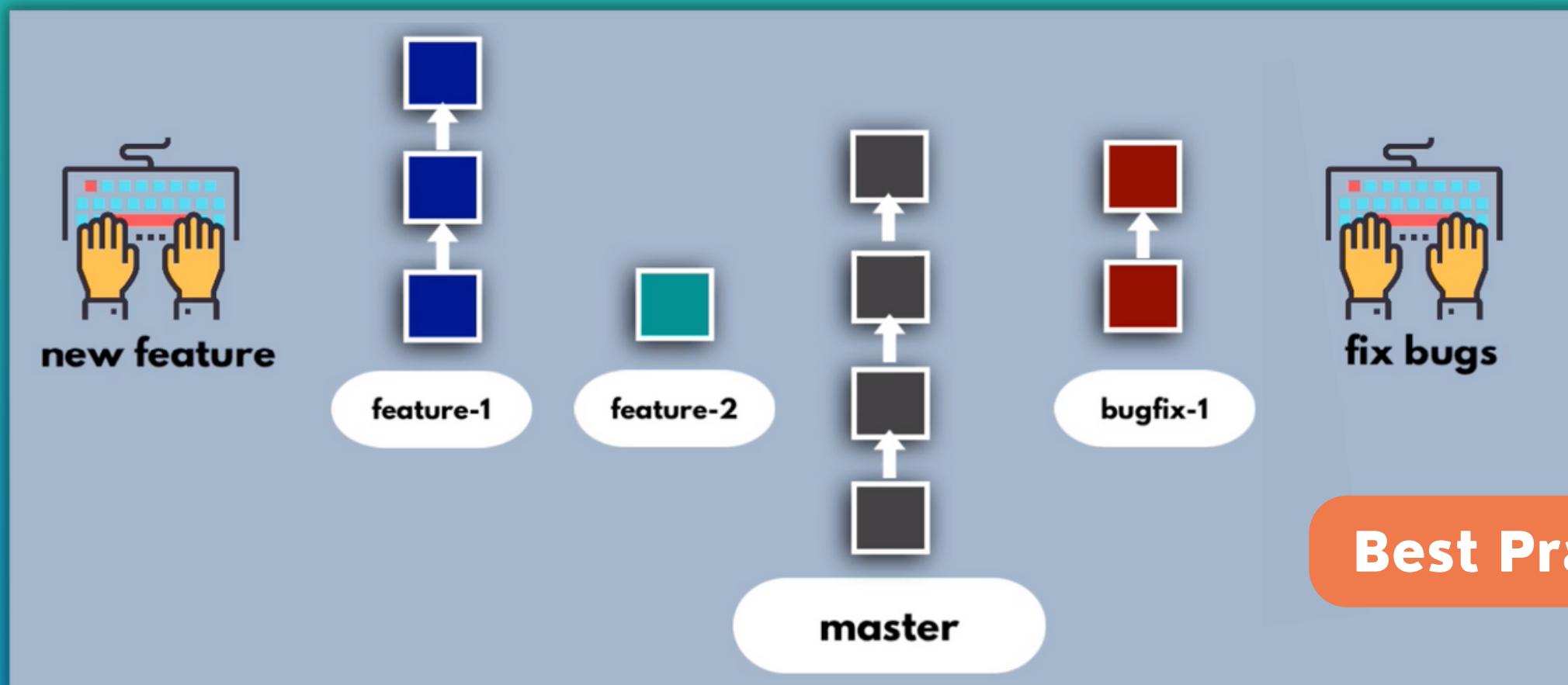
- git checkout -b feature/add\_new\_feature

then push new branch to the repo

git push --set-upstream origin feature/add\_new\_feature

# Concept of Branches - 1

- Branches are used for better collaboration
- A "**main**" branch (**also called "master"**) is created by default when a new repository is initialized
- Each developer can then create temporary branches e.g. for a feature or bugfix and work on it without worrying to break the main branch

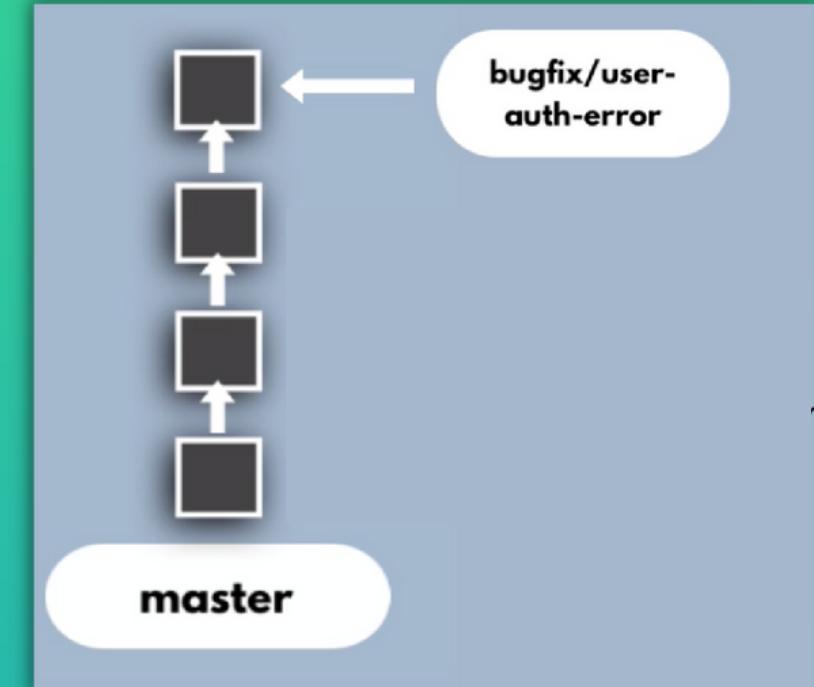
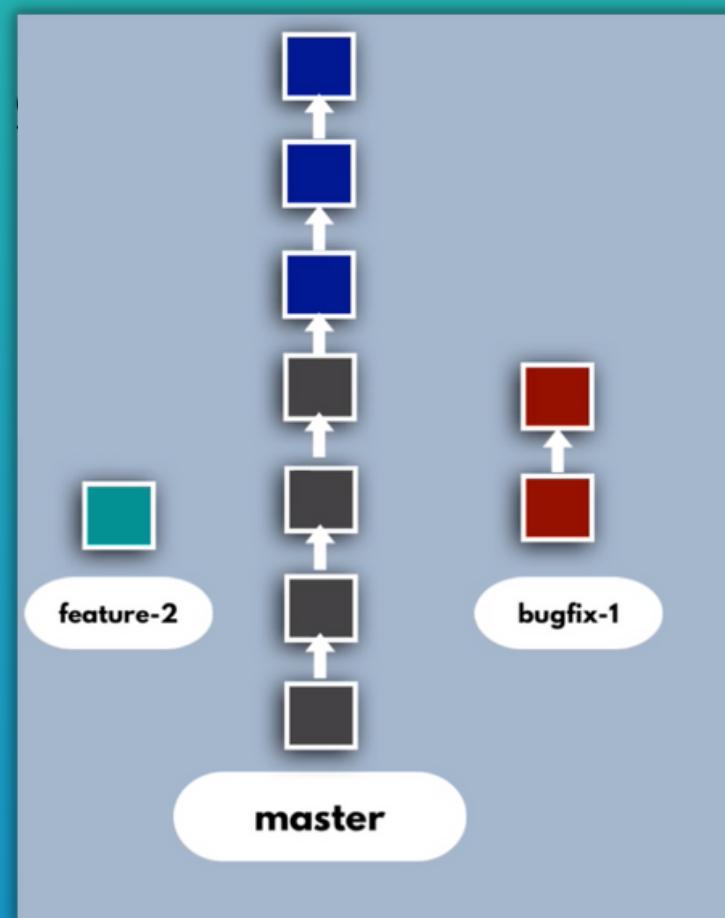


Here we have 4 different branches

# Concept of Branches - 2

- Branch is **based on main branch**. So, it starts from same codebase:
- When finished, the complete branch can be merged back to the main branch

Branch for "feature-1" was merged into the main branch:



Goal is to have a stable main branch, ready for production deployment

# Merge Requests or Pull Requests



**Best Practice: Other developer reviews code changes before merging**

- For that we have "merge request" or also called "pull request"
- It's basically a **request to merge one branch into another** (usually in the main branch)

merge request in your branchens  
- the number of changes are shown  
0 (master changes) 2(my branch changes)

gitlab: merge request

github: pull request same meaning



- Reviewer can see the changes made and either **approve or decline** the merge request

A screenshot of a GitHub commit page for a file named 'Readme.md'. The commit message is 'adjusted smth' and it was authored by Nana Janashia 5 minutes ago. The commit shows a diff where line 1 has been deleted and line 2 has been added. The text in the file reads: 'This simple nodejs app which is running in a n the es service name in'. A red box highlights the text 'deleting branches:' and a list of steps for deleting branches:

- leave the branch
- delete it locally (1. back to master (git checkout master), then pull (git master), those changes locally. then git branch -d feature/xxxx. use git branch to check if it was deleted.
- remote (just delete in gitlab web)

# Why to know Git as DevOps Engineer? - 1

## Use Case 1) Infrastructure as Code

- As a DevOps engineer you write code (configuration files and scripts) to create and provision infrastructure

当我在push之前， master里面已经有了变化，我要通过git pull -r (rebase)进行更新，然后再进行push, 就不会有2个merge了

merge conflicts: 多个人同时更改同一个code。在git pull -r 之前，你要先在editor里面进行resolve conflict. 3个列进行比较最后完成更改，然后最后进行git rebase --continue. 然后git push

## Use Case 2) Automation Scripts

- As a DevOps engineer you write automation scripts e.g. with Python to automate different tasks

- So these files should also "live" in a remote repository and be tracked and versioned by Git

Just like software code, files should be:



Tracked - history of changes



Securely stored in one place



Shareable to collaborate as team

- 如果在一个支里面进行了更改，你不可以switch到另外的branch. 但是你可以用git stash (save current changes for later).



你可以去其他的比如branch. 回来后可以通过 git stash pop 得到之前的改变 (stash 存放；贮藏)  
git stash => git stash pop  
2. 如果你对code进行了更改，但是不能运行了，你可以先git stash你的更改，去测试之前的从code是否能够成功。

# Why to know Git as DevOps

## Use Case 3) CI/CD Pipeline and Build Automation

- CI means: On each merge, checkout code from repository, test and build application
- For that, you need integration for the build automation tool with application git repository
- You need to **setup integration with build automation tool and git repository**
- You need to **know git commands for example for:**



Getting commit hash of specific commit



Check if changes happened in frontend or backend code

git log: commit hash / auto/ commit message  
- go back to a specific project version  
- git checkout commitHash  
- git checkout currentBranch



Jenkins

# Git Cheatsheet - 1

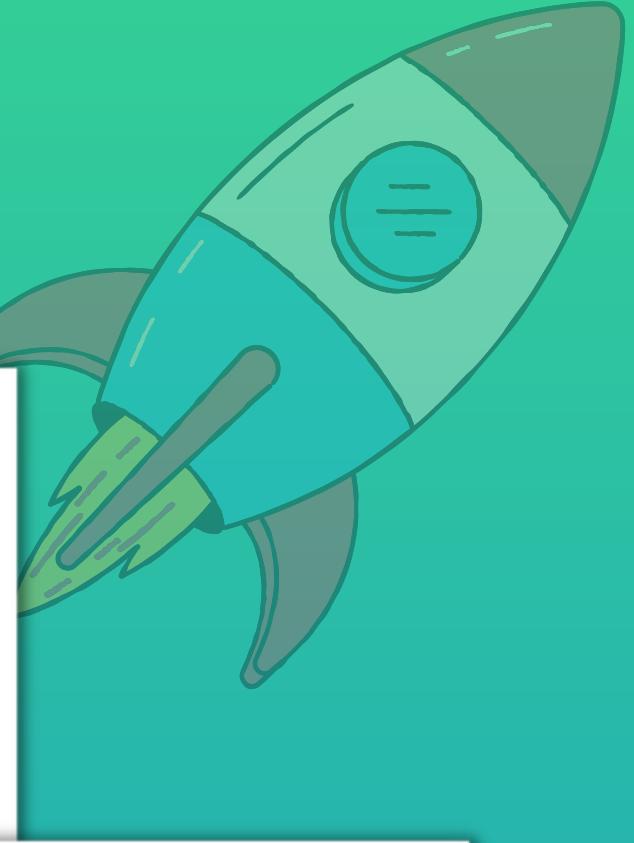
Source: <https://www.atlassian.com/git/tutorials/atlassian-git-cheatsheet>

GIT BASICS	
git init <directory>	Create empty Git repo in specified directory. Run with no arguments to initialize the current directory as a git repository.
git clone <repo>	Clone repo located at <repo> onto local machine. Original repo can be located on the local filesystem or on a remote machine via HTTP or SSH.
git config user.name <name>	Define author name to be used for all commits in current repo. Devs commonly use --global flag to set config options for current user.
git add <directory>	Stage all changes in <directory> for the next commit. Replace <directory> with a <file> to change a specific file.
git commit -m "<message>"	Commit the staged snapshot, but instead of launching a text editor, use <message> as the commit message.
git status	List which files are staged, unstaged, and untracked.
git log	Display the entire commit history using the default format. For customization see additional options.
git diff	Show unstaged changes between your index and working directory.

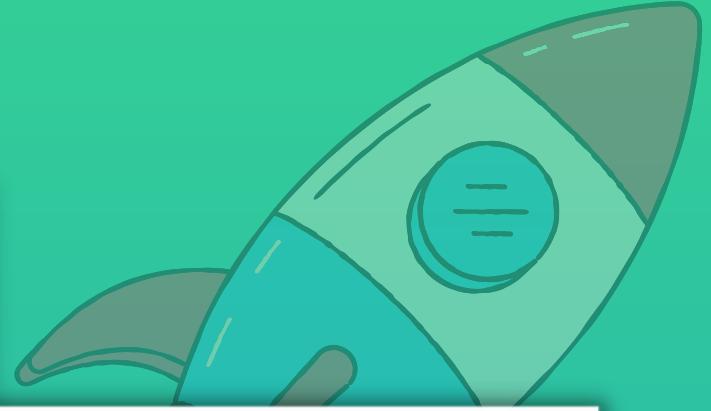
GIT BRANCHES	
git branch	List all of the branches in your repo. Add a <branch> argument to create a new branch with the name <branch>.
git checkout -b <branch>	Create and check out a new branch named <branch>. Drop the -b flag to checkout an existing branch.
git merge <branch>	Merge <branch> into the current branch.

UNDOING CHANGES	
git revert <commit>	Create new commit that undoes all of the changes made in <commit>, then apply it to the current branch.
git reset <file>	Remove <file> from the staging area, but leave the working directory unchanged. This unstages a file without overwriting any changes.
REWRITING GIT HISTORY	
git commit --amend	Replace the last commit with the staged changes and last commit combined. Use with nothing staged to edit the last commit's message.
git rebase <base>	Rebase the current branch onto <base>. <base> can be a commit ID, branch name, a tag, or a relative reference to HEAD.
git reflog	Show a log of changes to the local repository's HEAD. Add --relative-date flag to show date info or --all to show all refs.

REMOTE REPOSITORIES	
git remote add <name> <url>	Create a new connection to a remote repo. After adding a remote, you can use <name> as a shortcut for <url> in other commands.
git fetch <remote> <branch>	Fetches a specific <branch>, from the repo. Leave off <branch> to fetch all remote refs.
git pull <remote>	Fetch the specified remote's copy of current branch and immediately merge it into the local copy.
git push <remote> <branch>	Push the branch to <remote>, along with necessary commits and objects. Creates named branch in the remote repo if it doesn't exist.



# Git Cheatsheet - 2



## GIT CONFIG

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

Define the author name to be used for all commits by the current user.

`git config --global user.email <email>`

Define the author email to be used for all commits by the current user.

`git config --global alias. <alias-name> <git-command>`

Create shortcut for a Git command. E.g. `alias.glog "log --graph --oneline"` will set "git glog" equivalent to "git log --graph --oneline".

`git config --system core.editor <editor>`

Set text editor used by commands for all users on the machine. `<editor>` arg should be the command that launches the desired editor (e.g., vi).

`git config --global --edit`

Open the global configuration file in a text editor for manual editing.

## GIT LOG

`git log --<limit>`

Limit number of commits by `<limit>`.  
E.g. "git log -5" will limit to 5 commits.

`git log --oneline`

Condense each commit to a single line.

`git log -p`

Display the full diff of each commit.

`git log --stat`

Include which files were altered and the relative number of lines that were added or deleted from each of them.

`git log --author=<pattern>`

Search for commits by a particular author.

`git log --grep=<pattern>`

Search for commits with a commit message that matches `<pattern>`.

`git log <since>..<until>`

Show commits that occur between `<since>` and `<until>`. Args can be a commit ID, branch name, HEAD, or any other kind of revision reference.

`git log -- <file>`

Only display commits that have the specified file.

`git log --graph --decorate`

--graph flag draws a text based graph of commits on left side of commit msgs. --decorate adds names of branches or tags of commits shown.

## GIT DIFF

`git diff HEAD`

Show difference between working directory and last commit.

`git diff --cached`

Show difference between staged changes and last commit

## GIT RESET

`git reset`

Reset staging area to match most recent commit, but leave the working directory unchanged.

`git reset --hard`

Reset staging area and working directory to match most recent commit and overwrites all changes in the working directory.

`git reset <commit>`

Move the current branch tip backward to `<commit>`, reset the staging area to match, but leave the working directory alone.

`git reset --hard <commit>`

Same as previous, but resets both the staging area & working directory to match. Deletes uncommitted changes, and all commits after `<commit>`.

## GIT REBASE

`git rebase -i <base>`

Interactively rebase current branch onto `<base>`. Launches editor to enter commands for how each commit will be transferred to the new base.

## GIT PULL

`git pull --rebase <remote>`

Fetch the remote's copy of current branch and rebases it into the local copy. Uses git rebase instead of merge to integrate the branches.

## GIT PUSH

`git push <remote> --force`

Forces the git push even if it results in a non-fast-forward merge. Do not use the --force flag unless you're absolutely sure you know what you're doing.

`git push <remote> --all`

Push all of your local branches to the specified remote.

`git push <remote> --tags`

Tags aren't automatically pushed when you push a branch or use the --all flag. The --tags flag sends all of your local tags to the remote repo.

## Be

revert commit: (HEAD is pointer to last commit)  
- git reset --hard HEAD~1 返回到上个commit. HEAD~2 HEAD~3  
--hard back to commit and discard changes  
- git reset --soft HEAD~1 (--soft is default. change is there but  
commit is gone.)

## Commit-related best practices:

你commit了，但是你发现你需要对commit进行更改，所以你可以用  
`git commit --amend (change the last commit)`

- Use descriptive and meaningful commit messages
- Commit in relatively small chunks
- Commit only related work
- Adequately configure the commit authorship (name and email address) with git config

if commit is pushed to remote. how to do the revert  
commit:  
`git reset --hard HEAD~1 (local repo is changed)`  
`git push --force (revert something, our branch is  
not up to date. so use --force. force changes)`

!!! Don't do this in develop or master  
branch, only in branch you alone

## Avoiding very large deviations between local and remote repository:

- Keep your feature/bugfix branch up-to-date with remote master and/or develop branch. So pull often from remote git repository
- Branches shouldn't be open for too long or master branch should be merged into your feature/bugfix branch often

in Master, new commit. -> revert the last commit.  
`git revert commitHash (creates a new commit to revert the old commit's  
changes)`  
`git reset commitHash: remove old commit`

git merge | 你的自己的branch已经很长时间了，master已经有变换了。Pull the changes in the master to your branch. -> local master branch needs to be up-to-date.  
git checkout master / git pull / git checkout mybranch / git merge master ( takes the changes in the master branch to mybranch). / test, works done / git push

## Other:



- Don't "git push" straight to main branch
- Use -force push carefully! Do NOT force push into master or develop branches or better only when working alone in a branch
- Create a separate branch for each feature or bugfix and name the branch with prefix "feature/xx" and "bugfix/xxx" respectively
- Doing Code Reviews via Merge Requests
- Use .gitignore file to ignore e.g. editor specific files, build folders

.git: all info for connection