Git :- Version Control System (VCS) that helps to manage project, history of changes, runnings tests/debugging, contributing code, etc

Important Git Commands

- git init ⇒ Initialize Git repository (empty)
  ⇒ adds configuration files in '.git' hidden folder

- git clone ⇒ Clones a git repository from a existing URL by git clone 'url' (from remote rep.)

- git status ⇒ shows changes in code as untracked, modified or staged.

- git diff file_name ⇒ shows changes in code in a particular file

- git add file_name(s) ⇒ Make changes in code as 'staged', {Changes to be committed need to be in 'staged' first} {Staged karna}
  ⇒ To stage all files use 'git add .'

- git commit -m "Message" ⇒ Saves changes in code to project history & completes change-tracking process. {Lock lagana}

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- git log ⇒ Show previous commits

Note:- To view previous k commits ⇒ git log -k

- git branch ⇒ shows current branch & worked on locally.

- git checkout branchname ⇒ switches to branch 'branchname'

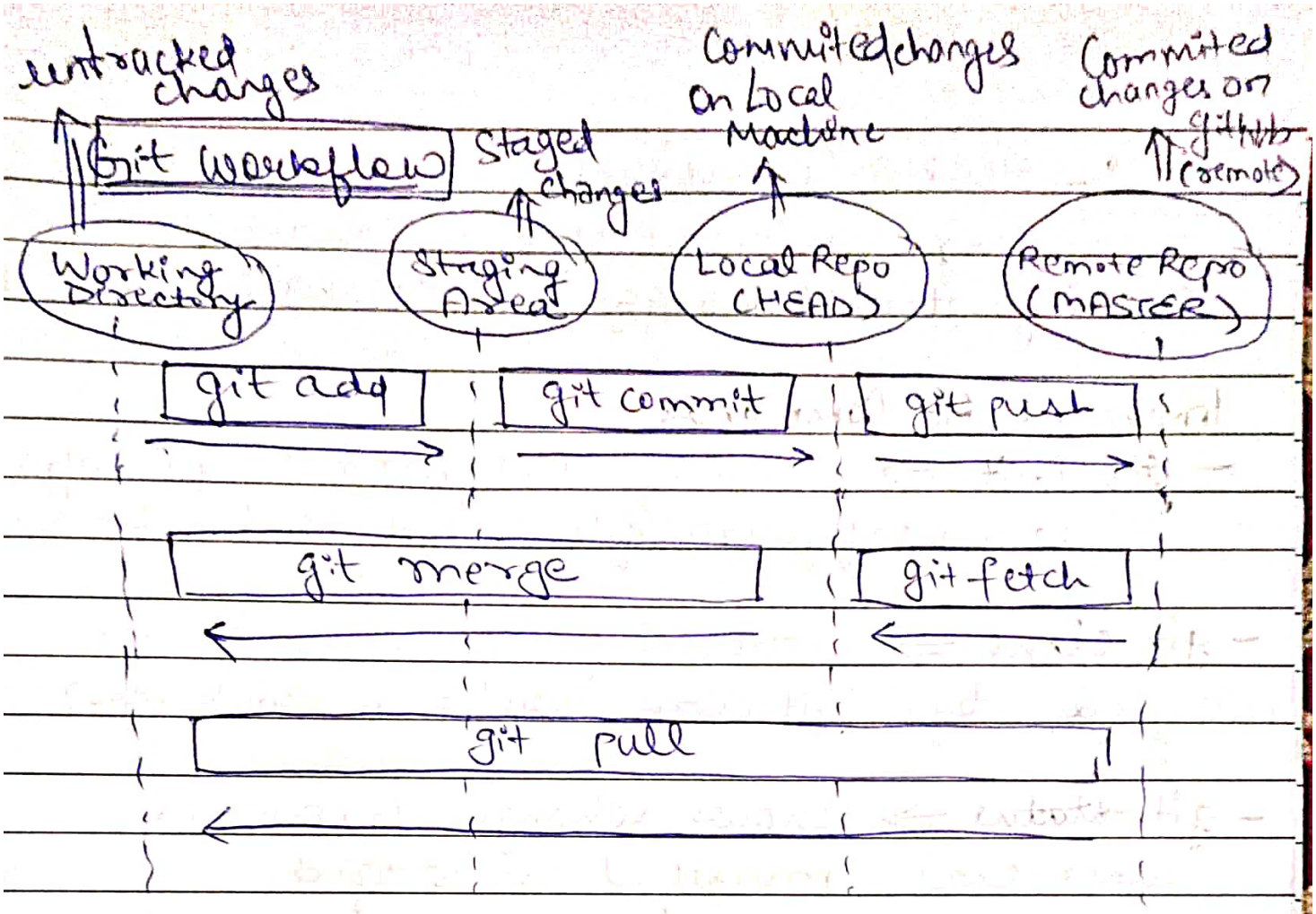
- git checkout -b branchname ⇒ Creates a new branch & switches to that new branch.

- git branch -d branchname ⇒ Deletes the branchname! , Note:- Current branch from where command is executed should be master (or parent) branch

- git merge branchname ⇒ Merges 'branchname' into master (or main) branch. Note:- Current branch from where merge is executed should be master (& not 'branchname').

- git reset --hard HEAD^ ⇒ revert commit & remove code changes in that commit

- git reset --soft 'commit-id' (from git log) ⇒ revert commit but changes in code are not removed.




**Github :-** Cloud-based hosting platform for git repositories.

Git commands for remote repository (on github) :-

- git remote add origin 'Github Repo URL'
  ⇒ Adds remote repository for current local project

- git push -u origin master
  ⇒ Send changes from local Repo to the remote repo
  { After first time only 'git push' will work }

- git pull
  ⇒ Bring changes from Remote Repo to the local repo. {{ Bring changes by other developers in our local code }}

# Fork :- Make a clone of somebody else's project from his/her github to our github

Github Workflow
- Fork (or Clone) project to our github
- Clone project to our local machine
- Make changes & Commit them to our github (to forked project)
- Generate a 'pull request' on project at somebody's else github (from where project is forked) & wait for pull request to be merged.

# Git Ignore
⇒ Files which need not be pushed to remote repo { personal files or data which we require only on local repo } are added to '.gitignore' directory
eg Node Modules folder should be added to git ignore (as it need be pushed to remote)
eg API keys based on my personal id's

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# Git Cheat Sheet

## 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. |

## UNDOING CHANGES

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|---|---|
| `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. |
| `git clean -n` | Shows which files would be removed from working directory. Use the `-f` flag in place of the `-n` flag to execute the clean. |

## REWRITING GIT HISTORY

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|---|---|
| `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. |

## GIT BRANCHES

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|---|---|
| `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. |

## 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. |

# Additional Options +

## 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

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|---|---|
| `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

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|---|---|
| `git diff HEAD` | Show difference between working directory and last commit. |
| `git diff --cached` | Show difference between staged changes and last commit |

## GIT RESET

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|---|---|
| `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

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|---|---|
| `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

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|---|---|
| `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

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|---|---|
| `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. |