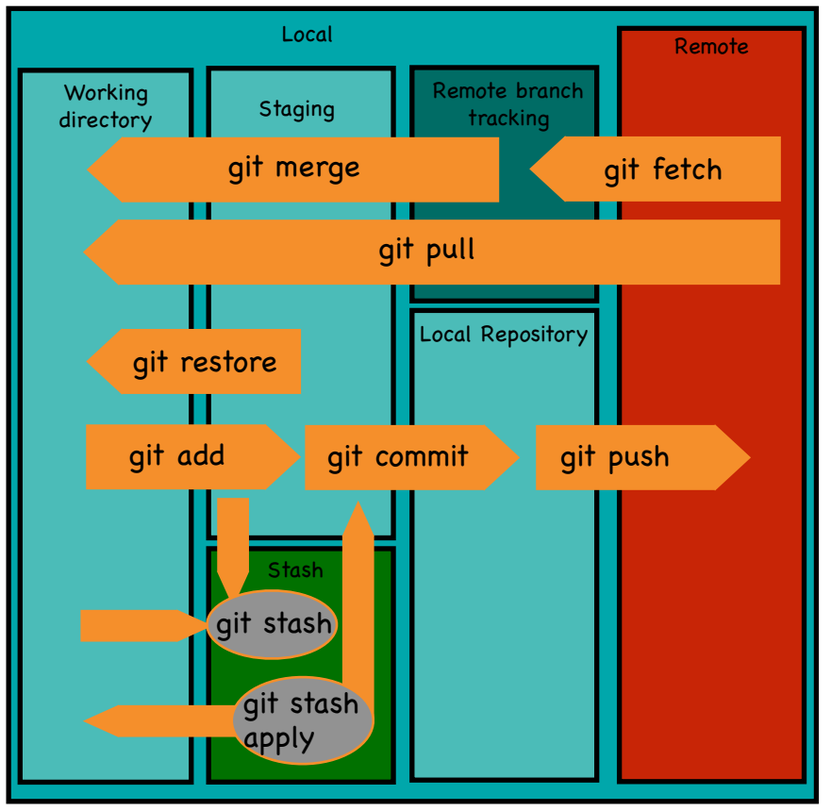
Git Cheat Sheet

Inspired by git cheat sheet of DoableDanny and CERTHPPO
Current version by O. Mattelaer (version 1.3)

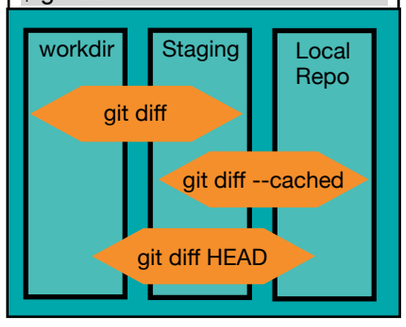


Start a project

Create a local repo (omit <directory> to initialise the current directory as a git repo
```
$ git init <directory>
```
Download a remote repo
```
$ git clone <url>
```

Review your repo

List of modified files
```
$ git status
```
List of commit history
```
$ git log --oneline
```
Show changes to file
```
$ git diff
```



Setup

Set the name and email that will be attached to your commits and tags
```
$ git config --global user.name "John Doe"
$ git config --global user.email "me@univ.ac"
```

Make a change

Add a file to staging
```
$ git add <file>
```
Stage all files
```
$ git add .
```
Choose interactively which line to stage in each modified file
```
$ git add -p
```
Commit all staged files
```
$ git commit -m "message"
```
Staged all tracked files and commit
```
$ git commit -am "message"
```

Basic Concepts

master: default development branch (can also be main)
origin: default upstream repo
HEAD: current branch
HEAD^: parent of HEAD
HEAD~2: grandparent of HEAD

Undoing mistake

Revert your file in working directory to one in staging area
```
$ git restore <file>
```
Revert a git add (un-stage) a file
```
$ git restore --staged <file>
```
Restore a file from an old commit/other branch/tag
```
$ git restore --source=<ID> <file>
```
Create a new commit reverting the change of an old commit
```
$ git revert <commit_ID>
```
Go back to a previous commit and delete all commits ahead of it. Does not change working directory (does it with --hard: careful no backup of local change)
```
$ git reset <commit_ID>
```
Recover recently lost commit
```
$ git reflog
$ git switch -c <name> <commit_ID>
```

Searching for bug

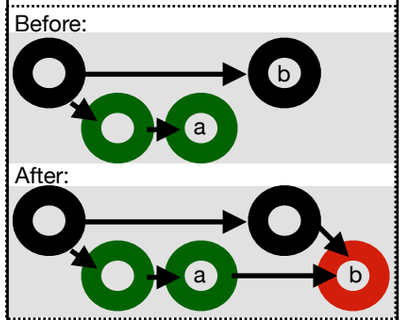
Start the search procedure
```
$ git bisect init
```
Set the current commit as "bad"
```
$ git bisect bad
```
Set the last known working commit as good
```
$ git bisect good <taglcommit>
```
Then check the propose commit and then run one of the command
```
$ git bisect good
$ git bisect bad
```
When finish/or to stop the search
```
$ git bisect reset
```

Branches

List all local branches. Add -r to show all remotes branches, -a for all branches
```
$ git branch
```
create a new branch and switch to it
```
$ git switch -c <new-branch>
```
Switch to a new branch (update the working directory)
```
$ git switch  <branch>
```
Delete a merged branch (use -D if the branch is not merged)
```
$ git branch -d  <branch>
```

Merging

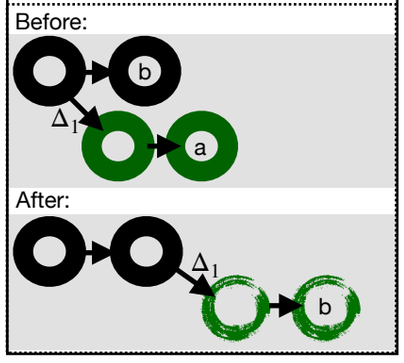
Merge branch a into branch b
```
$ git switch <b>
$ git merge <a>
```



Merge and squash all commit to a single one
```
$ git merge --squash <a>
```

Rebasing

Alternative to merge to include **independent** changes into another branch (keep local only)
```
$ git switch <b>
$ git rebase <a>
```



Stash area

Store modified changes away (reset working directory and staging area to last commit). With or without comment
```
$ git stash
$ git stash save "comment"
```
Partial stash (interactive mode)
```
$ git stash -p
```
Re-apply the stash without deleting it
```
$ git stash apply
```
Re-apply the stash and delete it
```
$ git stash pop
```
List all stash
```
$ git stash list
```
clear all stash
```
$ git stash clear
```

Remote's management

Add a remote repo
```
$ git remote add <alias> <url>
```
View all remote
```
$ git remote -v
```
Remove a remote connection
```
$ git remote remove <alias>
```
Change url of remote
```
$ git remote set-url <alias> <url>
```

Synchronizing

Update (all) local status of remote branch
```
$ git fetch <alias>
```
Fetch the remote of the current branch and then merge
```
$ git pull
```
Mover your local change onto the top of the new changes coming from the remote repo
```
$ git pull --rebase
```

Basic Objects

Commit: a state of the code
Branch: *line of development*
TAG: symbolic names for a given *commit*.

Publish to GitHub

Upload local content to remote repo
```
$ git push
```
Push a new branch on a remote and setup git to follow the remote
```
$ git push --set-upstream <alias> <branchname>
```

Typical workflow

After debugging code. Select interactively what to keep and discard
```
$ git add -p
```
Stash all the rest (-k forbid to stash the staging area)
```
$ git stash -k
```
Run check that everything is fine (if not restore the stash) and commit the change
```
$ git commit -m "Message"
```
Publish the change on github/lab
```
$ git push
```
Clean the last entry of the stash
```
$ git stash drop
```

Tag

Tag current commit with a human readable name
```
$ git tag <tagname>
```
List all tags
```
$ git tag
```
Remove a tag
```
$ git tag -d <tagname>
```
Set worker as state of the tag
```
$ git switch --detach <tagname>
```
Start a new branch from a tag
```
$ git switch -c <newname> <tagname>
```

Working in wrong branch

This works with both change in the working directory and staging Area
```
$ git stash
$ git switch <correct branch>
$ git stash pop
```