GIT

Common commands

Command	Explanation
pwd	Returns the active directory location.
ls	Returns a list of a files and directories.
cd directory name	Changes the current directory too the following directory.

Check the version of Git

Command	Explanation
git --version	Returns the version of git.

Find hidden folders

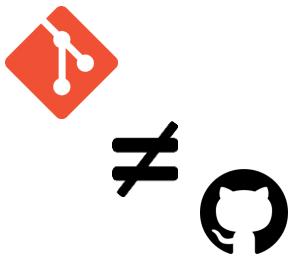
Command	Explanation
ls -a	Reveals hidden folders like the .git folder.

Editing file commands

Command/ *keybinds*	Explanation
Using nano to edit a file.	
nano file_name.extention (e.g. .csv, .txt)	Opens a text editor in which you can: * Delete. * Add to. * Make changes to a file.
Ctrl + 0	Save changes.
Ctrl + X	Exit text editor and return to shell.
Using echo to create / edit a file	
echo "text" > file_name.extention	Creates a new file in the active directory containing the text between " ".
echo "text" >> file_name.extention	Adds the text between "" to the designated file in the active directory.

Git workflow

1	Modify a file.
2	Save the draft in the staging area.
3	When tried and test commit the update file.



Making changes to a repo (project)

Command/ *keybinds*	Explanation
git add file_name.extention	Adds a single file too the staging area.
git add	Adds all files in the active directory too the staging area.
git commit -m "log message" file_name.extention	Commits singular stage draft with log message.
git commit -m "log message"	Commits all the staged draft(s) with log message.
git status	Returns which file have changes in them that aren't in the staging area yet AND returns which files are in the staging area and aren't committed yet.

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Comparing files

Command/ *keybinds*	Explanation
git diff file_name.extention	Compares the non-staged version with the committed version.
git diff -r HEAD file_name.extention	Compares the most recent staged version and the committed version.
git diff -r HEAD	Compares all staged files with the last committed versions.
git diff -r HEAD~1	Compares all the staged files with second to last(etc.) recent commit.
git diff hash[:8] hash[:8]	Compares 2 commits to each other selected by their hashes.
git diff HEAD~1 HEAD~2	Compares 2 commits to each other selected by their commit position.

-r	Indicating the selection of a specific version.
HEAD	Indicating the most recent version.
HEAD~integer	To indicate how many version beyond the most recent version to compare too.
hash	Being the unique identifier of the commit.

Returned results

@@	Indicates the location of the changes.
- red lines	Are removed lines.
+ green line	Are added lines.

Un-staging

Command/ *keybinds*	Explanation
git reset HEAD file_name.extention	Un-stages the staged version of the specified file.
git reset HEAD	Un-stages all files in the staging.

Un doing changes (un-staged files)

Command/ *keybinds*	Explanation
git checkout -- file_name.extention	Undo all the changes that are made to a specified un-staged file.
git checkout .	Undo all changes that are made to all still un-staged files.
git checkout hash[:8] file_name.extention	Revert the specified file to a version from a specific commit.
git checkout HEAD~1 file_name.extention	Revert the specified file to a specified historic version (e.g. second to last).
git checkout hash[:8]	Restores all files in the project to their version in a specific commit.
git checkout HEAD~1	Restores all files in the project to a specified historic version.

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Git log

Command / *keybinds*	Explanation
git log	Returns an overview of all commits to a repo (project) in chronological order descending.
git log -3	Returns the log of the number of most recent commits to a repo.
git log -4 file_name.extention	Returns the log of only the number of most recent commits of the specified file.
git log –since='Apr 2 2022'	Returns the logs of commits made since the indicated month day year.
git log –since='Apr 2 2022' –until='Apr 11 2022'	Returns the logs of commits made between the indicated dates.
space bar	Move through the recent commits.
q	Exit the log.
git show hash[:8]	Returns the diff comparing that commit with its previous one (hash being the unique identifier of the commit).
git show HEAD~1	To look at changes made to files in a specific commit (ranging from the most recent HEAD to any before that using ~integer.

Changes per document by line

Command/ *keybinds*	Explanation
git annotate file_name.extention	Returns all changes to the specified file returning: hash: first 8 digits of the commits unique id author: who made the change time: when and at what time was the change made line: which line was changed line content: part of the specified line.

Cleaning a project

Command/ *keybinds*	Explanation
git clean -n	Returns a list of files in the active directory that are currently not being tracked by GIT.
git clean -f	Delete all files from the active directory that aren't tracked by GIT.

Retrieve settings

Command/ *keybinds*	Explanation
git config –list (--local/ --global/ --system)	Returns a list of customizable settings, additionally can add –local for settings for one specific project, --global for settings for all projects and –system for settings for every user on this computer. (user.email, users.name, core.editor, core.reprositoryformatversion, core.filemode, core.bare,core.logallrefupdates).

Configure settings

Command / *keybinds*	Explanation
git config –<level> <setting> <value>	Changes on the level e.g. global the indicates setting too the value. It needs to be between ' ' if it contains any spaces. e.g. git config –global user.name 'robin goldenberg'

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Alias commands

Command/ *keybinds*	Explanation
git config –<level> alias.<alias name> '<command >'	Typically used to shorten a command for frequent use. E.g. git config –global alias.ci 'commit -m'.
git config--global --list	Returns a list of aliased commands and their original command.

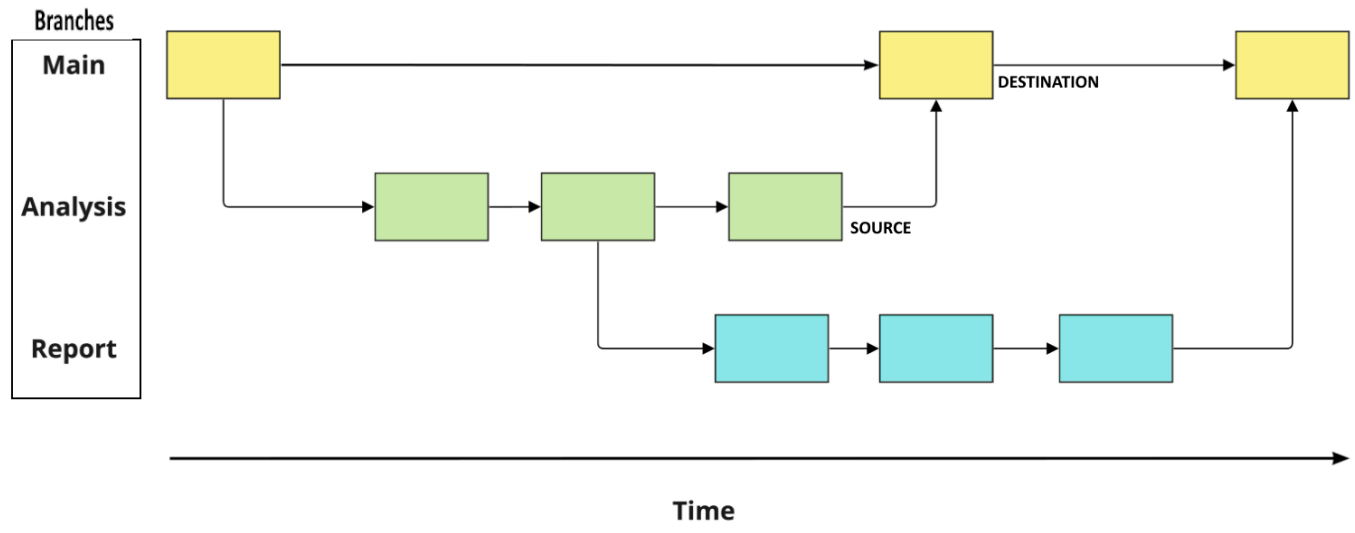
Ignore files

Command/ *keybinds*	Explanation
nano .gitignore	Creates a file called .gitignore after which you add the file names you want to ignore or *format e.g. *.log, *.csv to ignore all files ending with that format.

Branches

Branches avoids subdirectories and allows multiple users to work simultaneously without losing a working version. It keeps track of all changes. Each branch should be used for a specific task and then merged back into the main branch.

Command/ *keybinds*	Explanation
git branch	Returns a list of all branches, the current branch your operating in is indicated by the *.
git checkout <name>	Switch the indicated branch.
git checkout -b <name>	Creates a new branch.
git diff <branch> <branch>	Returns the differences between 2 branches.
git merge <source> <destination>	Merges source branch into the destination branch.



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Branches 2 Merge conflicts

If during a merge Git returns an Automatic merge failed message it encountered conflicts that need to be fixed first. If this happens you have to open (nano) the conflicted file and change the conflict areas. After which you can stage, commit it to the main branch. After that you can try to merge the branches again. Best is to avoid merge conflicts by avoiding editing the same file in multiple branches.

Example	Explanation

`<<<<<<< HEAD`
`=======`
`A) Write report.`
`B) Submit report.`
`>>>>>>> update`
`C) Submit expenses.`
	The Arrows too the left and the word HEAD indicates that lines beneath it contain the files contents in the latest commit of the current branch (destination).
	
	The line of = signs refer to the center of the conflict as it is straight after the < signs it indicates the liens beneath are from the source version. If = sign is after content it indicates both files have different content on the same lines.
	
	The > signs and the word update indicate that the source file has additional lines not found in the destination.

Remote repos

Instead of having the git saved locally you can use platform like GitHub, Bitbucket or Gitlab to host remote repos.

Git stores the location of the original repo using a tag in the configuration.

Command/ *keybinds*	Explanation
git clone <path-to-project-directory> <optional name>	Clones (copies) a local repo located at the path and if specified gives the new repo a different name.
git clone <[URL]>	Clones a remote repo (e.g. form GitHub)
git remote add <name> <URL>	Creates an alias for the remote (making it easier to merge back to the remote repo).
git remote -v	If in a repo, git remote returns the list of the remotes (original repo name). If -v is added it also returns the URL/original location.

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Making a new repo (project)

Command/ *keybinds*	Explanation
git init <name>	Creates a new Git repo under the given name. (Git creates a new subdirectory (.git) in the directory you are at that moment located). If you use git init while in a directory containing file Git automatically puts these files inside the repo.

Remote repos 2 pull

Command/ *keybinds*	Explanation
git fetch <remote alias> <local branch>	Fetches the latest remote version (generally main branch).
git merge <remote alias> <local repo>	Merges the fetched main branch with the local main branch to get it up to date.
git pull <remote alias> <local repo branch>	A combination of the two above commands in one. if –-no—edit is placed behind no message has to be given .

Remote repos 3 push

Start by pulling again and then by merging and saving all changes locally.

Example	Explanation
git push <remote alias> <local repo branch>	Pushes the local branch to the remote repo.

GITHUB

GitHub Keywords

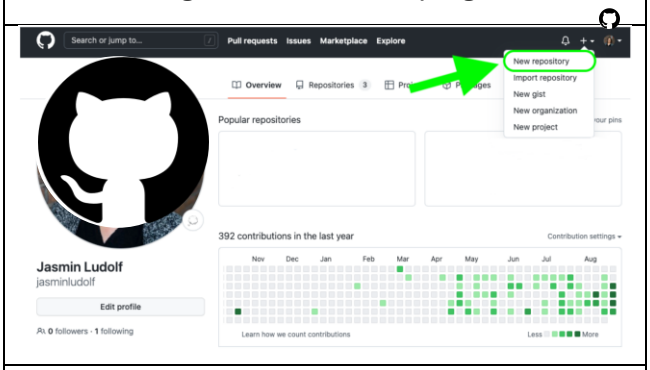
Keyword	Explanation
GitHub	Cloud-based hosting service used to upload and track its work. (Other example GitLab, bitbucket).
GitHub vs Git	GitHub uses Git but stores in cloud.
GitHub repo	A Remote repo of all the files related to a project and its history.

Repo Ui

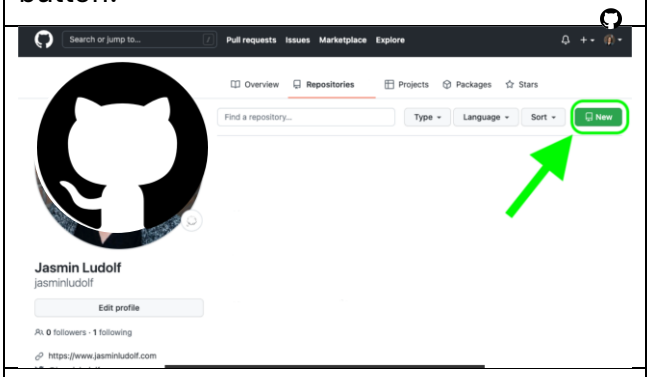
Page	Explanation
Code	Here the repos files are visible, and the description of the project is visible and can be edited. Furthermore, from here you can create branches.
Issues	Here tasks and problems are tracked and communication with others will happen here.
Pull requests	Request to make a change to the project. (suggestion box) you can view them and accept them
Settings	Here you can make changes to the repo, including name and access permissions.

Setting up a repository

There are two methods to set up a new repo, one is through the UI in the top right corner.



Or in the repositories view click the new button.



Once clicked you can import an existing repo or copy an existign repo template. Name the repo and give it an description and set it to public or private.

You can select if a README and Gitignore file file should be created for the repo.

You can select the license = None default copyright laws apply.

Markdown syntax

Syntax	Description	Syntax	Description
#	Biggest heading (with a line under it)	![<text>] (<url>)	Image if it fails to load the <text> is shown.
######	Smallest heading.	@<github username>	Tags a GitHub account.
<text>	Bold text.		
<text>	Italic text.		
[<text>] (<url>)	Hyperlink. The text between [] is clickable and sends you too the url.		

GITHUB

README

The readme its contents will always be visible at the bottom of the code page under all the files.
The README file is a markdown file and can be edited from the Code page.

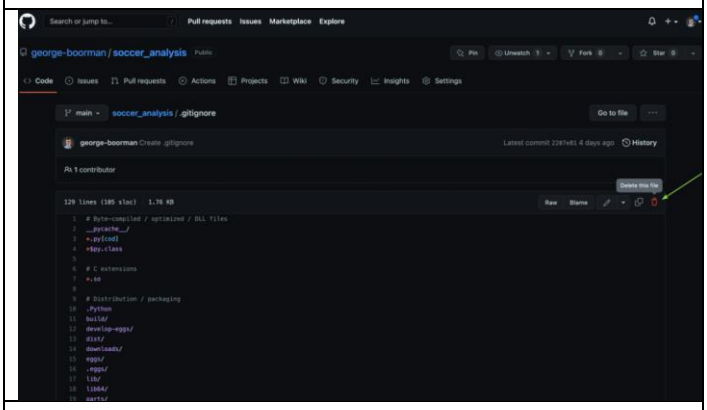
Writing a README

the README should contain list of contents of the repo, clearly explain the project to others.

Needs to have:
A title.
Table of contents.
How the project came about and the motivation about it.
Description of used technology and why.
Description of the process used and why.
Limitations.
Challenges that were encountered.
What problem the code hopes to solve.
What the intended use is.
Credits.

Edit/ Delete file

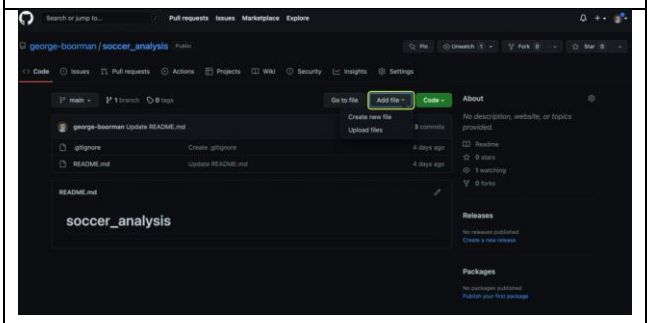
Once a file is opened in GitHub on the top right you have a few icons pressing the pencil will let you edit the file, while pressing the trash can will let you delete the file.



To safe the file with the edits or the deletion of the file all you have to do is write a commit message and make a commit.

Creating new file

You can do this by clicking the add file button.

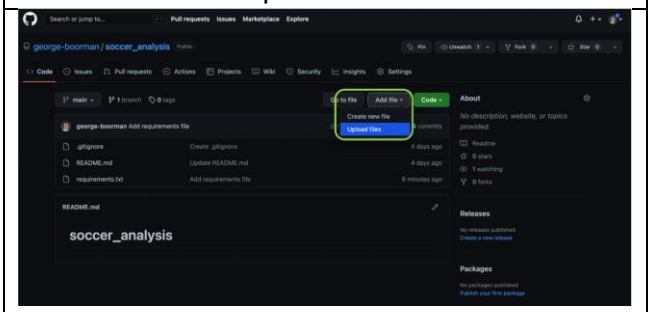


After this you can add the name of the file and extention.

After adding any content you can add an short commit message and optionally an extended description, before commiting it to the main branch.

Adding a local file

You can do this by clicking the add file button and then upload files.



Than drag your local file into the repo and same as creating a new file write a commit message and commit.

Creating new directory

You can do this by clicking the add file button during the file creation process.
Empty directories are not allowed by GitHub.

After this if you use:
<directoryname> / <file name>
it will create a sub directory, durring the file creation process.

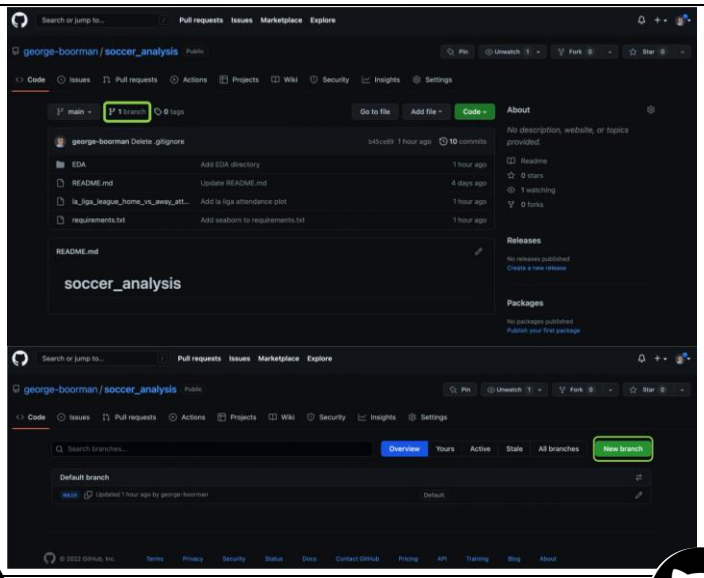
GITHUB

Creating a new branch

From the code page you can see which branches exists and by clicking the branch button next to the current branch and then the new branch button.

Enter a branch name and on which branch it should be based (branch source). Then press create branch.

To add rules to branches to protect the main branch by e.g. forcing a pull request before a commit, you have to add this in the settings under the branches tab.

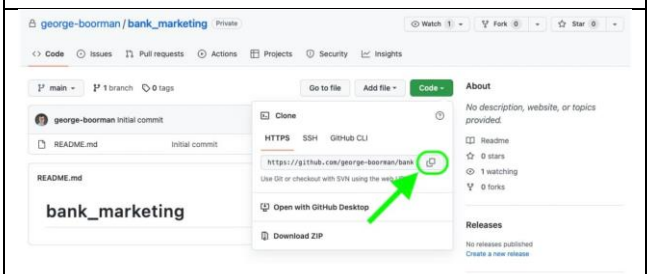


Collaboration in a private repo

To give access to a private repo to a colleague, you have to go to settings under collaborators. Here you can add people and add them through username, full name or email.

Cloning a repo

To clone someone else's repo you move to the code tab, press code and copy the HTTPS.



In the Git terminal you can use "git clone <copied https>" you can than be asked to enter your Github account name and personal access token.

This cloned repo is than still linked to the original.

Personal access tokens (PAT)

A PAT is an alternative to a password for terminal commands. It is only required when interacting with GITHUB and Git.

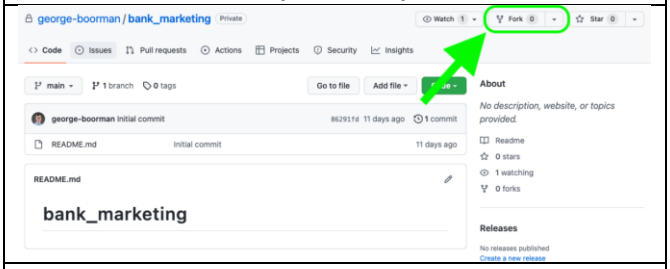
Creation

Go to the settings page and then too developer settings. Then go to personal access tokens and press Generate new token.

After this you can give the token a name, an expiration time and scope of the pat. After which you press generate Pat, page will refresh and the key will be displayed.

Forking

Forking is the copy a repo without linking to the original repo. Anyone with a GitHub account can fork a public repo.



You can fork a repo by pressing the fork button. Pressing creates a new fork.

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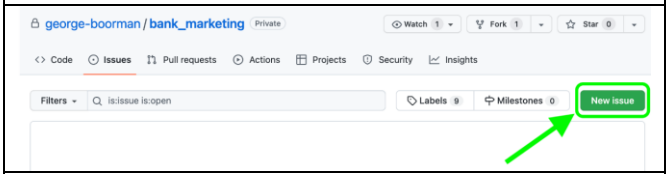
Create new issues

To create a new issue, go to the issues tab. From there press the new issue button.

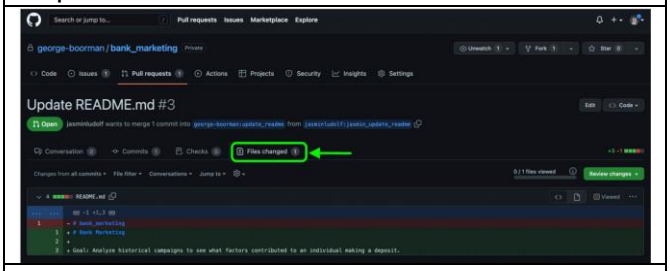


Give it a tile and add its details in a md format if an # is used you can link it to an existing issue. You can also assign it to people, give it a label or attach it to a milestone. After which you press the Comment button.

By pressing right mouse button on an existing issue you get the option to quote the comment in your own one.

Review a pull request

To review someone else's pull requests, you go to the pull request tab and click the pull request to review.



After which move too the Files changed tab. Where you can review the proposed changes. you can add command to each line by pressing the + sign. After which you can approve it, just comment without giving approval or requests changes to be made before merging (denying the request).

When you have approved you can click merge pull request and confirm the merging of the branches.

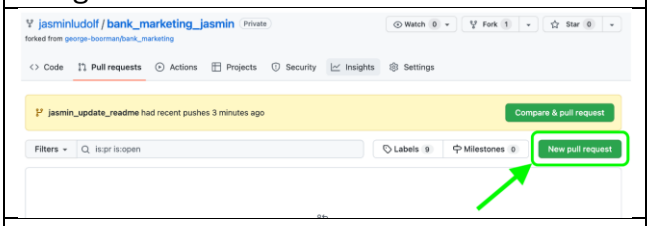
After which the old branch can be restored or deleted.

Pull request

A pull request is a way to notify others about a change you would like to make to a branch within a repo.

It allows the repo owner to check changes before they are added.

The intention of a pull request generally is to merge two branches.



To create a pull request, you go to the pull request tab.

After which you press the new pull request button. Than you chose the base branch (which is branch where we want to add our changes too), and the compare branch(which is the branch containing our changes).

After which you write some information about the intended changes, through a title and description, and assign someone too review the pull request.