



Jan Krause, 2016-10-25, Creative Commons CC-By-SA

## 0 - Create a repository on a server

Examples:

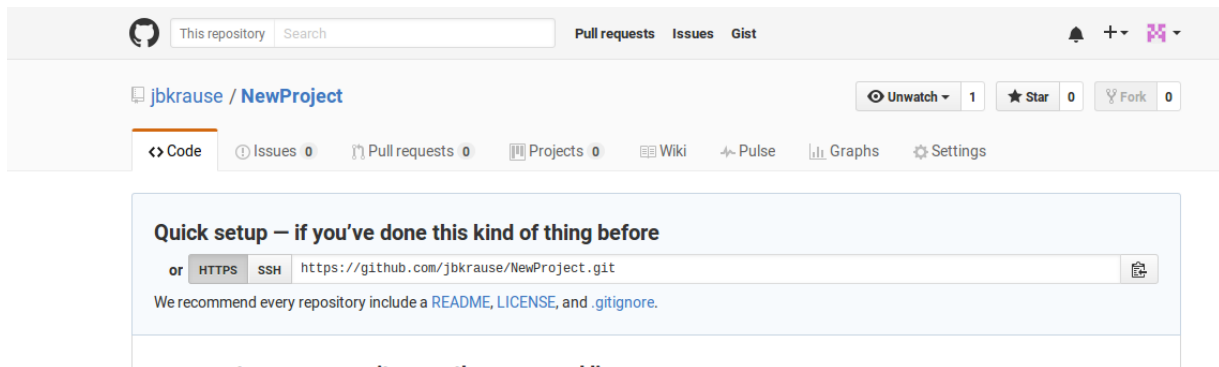
- <http://c4science.ch> (<http://c4science.ch>)
- GitHub ( <https://github.com/new> (<https://github.com/new>) ):

A screenshot of the GitHub 'Create a new repository' page. The page has a light gray header with the GitHub logo, a search bar, and navigation links for 'Pull requests', 'Issues', and 'Gist'. The main content area is white and contains the following elements:

- Create a new repository**: The title of the page.
- A repository contains all the files for your project, including the revision history.**: A descriptive sentence.
- Owner**: A dropdown menu showing 'jakrause'.
- Repository name**: A text input field containing 'NewProject' with a green checkmark.
- Description (optional)**: A text input field containing 'An empty repository, for teaching purposes.'
- Public**: A radio button that is selected, with the text 'Anyone can see this repository. You choose who can commit.'
- Private**: A radio button that is not selected, with the text 'You choose who can see and commit to this repository.'
- Initialize this repository with a README**: A checkbox that is not checked, with the text 'This will let you immediately clone the repository to your computer. Skip this step if you're importing an existing repository.'
- Add .gitignore: None**: A dropdown menu.
- Add a license: None**: A dropdown menu with an information icon.
- Create repository**: A green button.

The footer of the page contains copyright information, navigation links, and the GitHub logo.

## GitHub attributes an address (URL) to the new repository:



## Alternatively, you may start with a local repository (no central repository):

```
mkdir NewProject
```

```
git init
```

## 1 - Clone the remote repository : initialize the local repository

Git is a free software, available under Windows, Mac and Linux. Download: <https://git-scm.com/downloads> (<https://git-scm.com/downloads>) .

```
In [68]: # Set terminal language to English
         export LC_ALL=C
```

```
In [69]: git clone https://github.com/jbkrause/NewProject.git
         Cloning into 'NewProject'...
         warning: You appear to have cloned an empty repository.
         Checking connectivity... done.
```

```
In [70]: cd NewProject
         git status

On branch master

Initial commit

nothing to commit (create/copy files and use "git add" to track)
```

## 2 - Create files

```
In [71]: echo "Hello, this is line is **Markdown** text." | cat
         > Introduction.md

         echo "In this tutotial, we need two files. This is the
         second." | cat > Content.md
```

```
In [72]: git status

On branch master

Initial commit

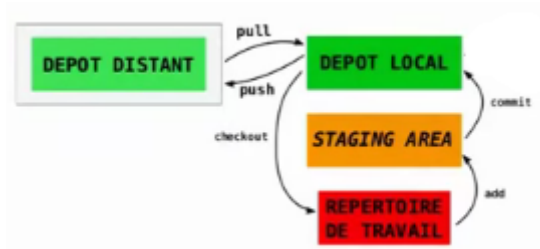
Untracked files:
  (use "git add <file>..." to include in what will be committed)

        Content.md
        Introduction.md

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

## 3 - Track files with git (add)

## Add to the "Staging Area"



```
In [73]: git add *.md
```

```
In [74]: git status
```

```
On branch master
```

```
Initial commit
```

```
Changes to be committed:
```

```
(use "git rm --cached <file>..." to unstage)
```

```
new file:   Content.md
```

```
new file:   Introduction.md
```

## Do a "commit": from staging area to the repository

```
In [75]: git commit -m "First commit"
```

```
[master (root-commit) f83b13e] First commit
```

```
2 files changed, 2 insertions(+)
```

```
create mode 100644 Content.md
```

```
create mode 100644 Introduction.md
```

```
In [76]: echo "Adding a line to Content.md" | cat >> Content.md
```

```
In [77]: git status
```

```
On branch master
Your branch is based on 'origin/master', but the upstream is gone.
  (use "git branch --unset-upstream" to fixup)
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   Content.md

no changes added to commit (use "git add" and/or "git commit -a")
```

```
In [78]: git add Content.md
git commit -m "Extension de Contenu.md"
```

```
[master 72250bb] Extension de Contenu.md
1 file changed, 1 insertion(+)
```

## 4 - Lookup in history

### List commits

```
In [79]: git log
```

```
commit 72250bbe4111bcf1399ca0dec761ae61cb5c8fd9
Author: Jan Krause <jan.krause@epfl.ch>
Date:   Mon Oct 24 10:19:39 2016 +0200
```

```
    Extension de Contenu.md
```

```
commit f83b13ea591446b1918b22524b4749639cbeeac8
Author: Jan Krause <jan.krause@epfl.ch>
Date:   Mon Oct 24 10:19:38 2016 +0200
```

```
    First commit
```

In [80]: `git log Content.md`

```
commit 72250bbe4111bcf1399ca0dec761ae61cb5c8fd9
Author: Jan Krause <jan.krause@epfl.ch>
Date:   Mon Oct 24 10:19:39 2016 +0200
```

Extension de Contenu.md

```
commit f83b13ea591446b1918b22524b4749639cbeeac8
Author: Jan Krause <jan.krause@epfl.ch>
Date:   Mon Oct 24 10:19:38 2016 +0200
```

First commit

In [81]: `git log --author="Jan Krause" -- Introduction.md`

```
commit f83b13ea591446b1918b22524b4749639cbeeac8
Author: Jan Krause <jan.krause@epfl.ch>
Date:   Mon Oct 24 10:19:38 2016 +0200
```

First commit

In [82]: `git log --since="2016-06-24" -- Introduction.md`

```
commit f83b13ea591446b1918b22524b4749639cbeeac8
Author: Jan Krause <jan.krause@epfl.ch>
Date:   Mon Oct 24 10:19:38 2016 +0200
```

First commit

## List differences between two commits

In [83]: `git diff HEAD~1..HEAD`

```
diff --git a/Content.md b/Content.md
index f5a3b61..1e6213e 100644
```

```
--- a/Content.md
```

```
+++ b/Content.md
```

```
@@ -1,2 @@
```

```
    In this tutotial, we need two files. This is the second
```

```
.
```

```
+Adding a line to Content.md
```

In [84]: `#git diff 987fdb4739644772..1c90866eb442108524031`

## Show the history

```
In [85]: git show HEAD~1:Content.md
```

In this tutorial, we need two files. This is the second.

```
In [86]: git show HEAD@{2016-10-10}:Content.md
```

```
warning: Log for 'HEAD' only goes back to Mon, 24 Oct 2016 10:19:38 +0200.
```

In this tutorial, we need two files. This is the second.

## 5 - Revert files to a former commit.

Revert to a specific commit, but without losing the history: a new commit is created with the old version.

```
In [87]: git revert HEAD
```

```
[master 789662e] Revert "Extension de Contenu.md"
 1 file changed, 1 deletion(-)
```

```
In [88]: git show Content.md
```

```
commit 789662e83ff4602e012e02e524f8029bd8004209
```

```
Author: Jan Krause <jan.krause@epfl.ch>
```

```
Date: Mon Oct 24 10:19:41 2016 +0200
```

```
Revert "Extension de Contenu.md"
```

```
This reverts commit 72250bbe4111bcf1399ca0dec761ae61cb5c8fd9.
```

```
diff --git a/Content.md b/Content.md
```

```
index 1e6213e..f5a3b61 100644
```

```
--- a/Content.md
```

```
+++ b/Content.md
```

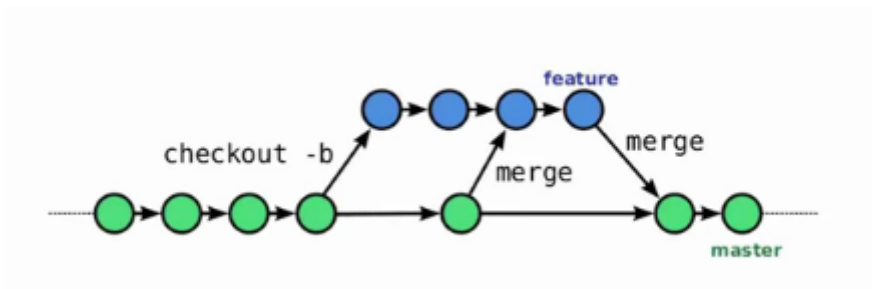
```
@@ -1,2 +1 @@
```

```
In this tutorial, we need two files. This is the second
```

```
.
```

```
-Adding a line to Content.md
```

## 6 - Branches



```
In [89]: git checkout -b maBranche
```

```
Switched to a new branch 'maBranche'
```

```
In [90]: echo "And another new line for Content.md :)" | cat >>
Content.md
```

```
In [91]: git add Content.md
git commit -m "We document the new line."
```

```
[maBranche 8ba0bce] We document the new line.
1 file changed, 1 insertion(+)
```

```
In [92]: git show Content.md
```

```
commit 8ba0bceb89a0578730fbb067cca732b65269ccb9
Author: Jan Krause <jan.krause@epfl.ch>
Date: Mon Oct 24 10:19:44 2016 +0200
```

```
We document the new line.
```

```
diff --git a/Content.md b/Content.md
index f5a3b61..46eb507 100644
--- a/Content.md
+++ b/Content.md
@@ -1,2 @@
```

```
In this tutotial, we need two files. This is the second
.
+And another new line for Content.md :)
```

### Merge branches



```
In [93]: git checkout master
git merge maBranche
```

```
Switched to branch 'master'
Your branch is based on 'origin/master', but the upstream
is gone.
(use "git branch --unset-upstream" to fixup)
Updating 789662e..8ba0bce
Fast-forward
 Content.md | 1 +
 1 file changed, 1 insertion(+)
```

```
In [94]: git show Content.md
```

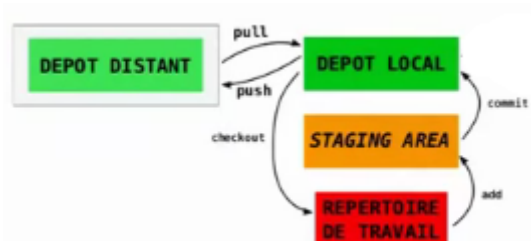
```
commit 8ba0bceb89a0578730fbb067cca732b65269ccb9
Author: Jan Krause <jan.krause@epfl.ch>
Date: Mon Oct 24 10:19:44 2016 +0200
```

We document the new line.

```
diff --git a/Content.md b/Content.md
index f5a3b61..46eb507 100644
--- a/Content.md
+++ b/Content.md
@@ -1,2 @@
```

In this tutotial, we need two files. This is the second  
+And another new line for Content.md :)

## 7 - Synchronization: local / remote



```
In [95]: # send local repository content to remote repository
#git push

# get remote repository content and update local repository
#git pull
```