

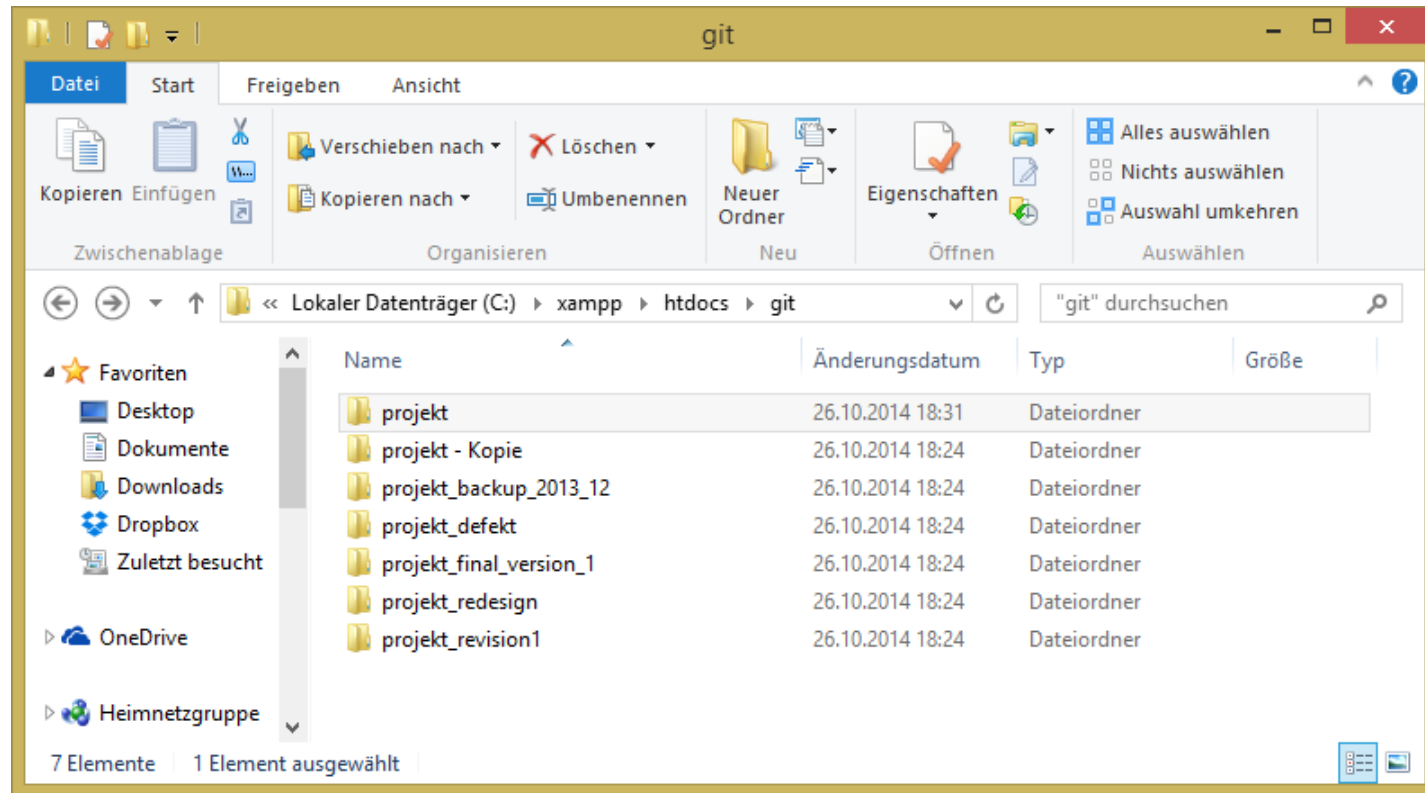
Versionsverwaltung mit Git

4. WP Meetup Berlin Workshop

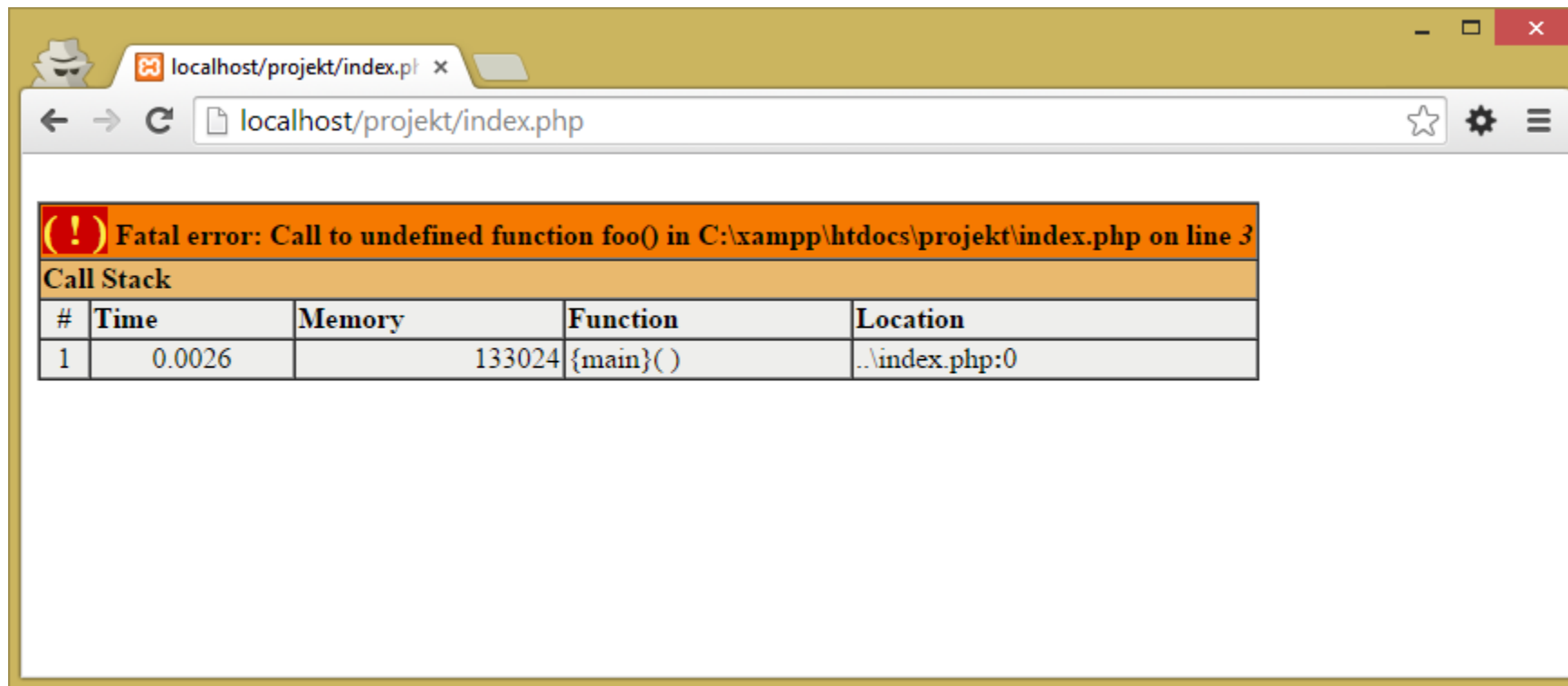
Was ist Git eigentlich?

- Git ist ein verteiltes (dezentrales) System zur Versionsverwaltung von Dateien.
- Es ist eine moderne Alternative zu zentralen Versionsverwaltungssystemen wie beispielsweise Subversion (SVN)
- Entwickelt wurde es von Linus Torvalds , dem Entwickler des Linux-Kernels.
- Git heißt übersetzt „Blödmann/Schwachkopf“ ;)

Wieso sollte ich Git einsetzen?



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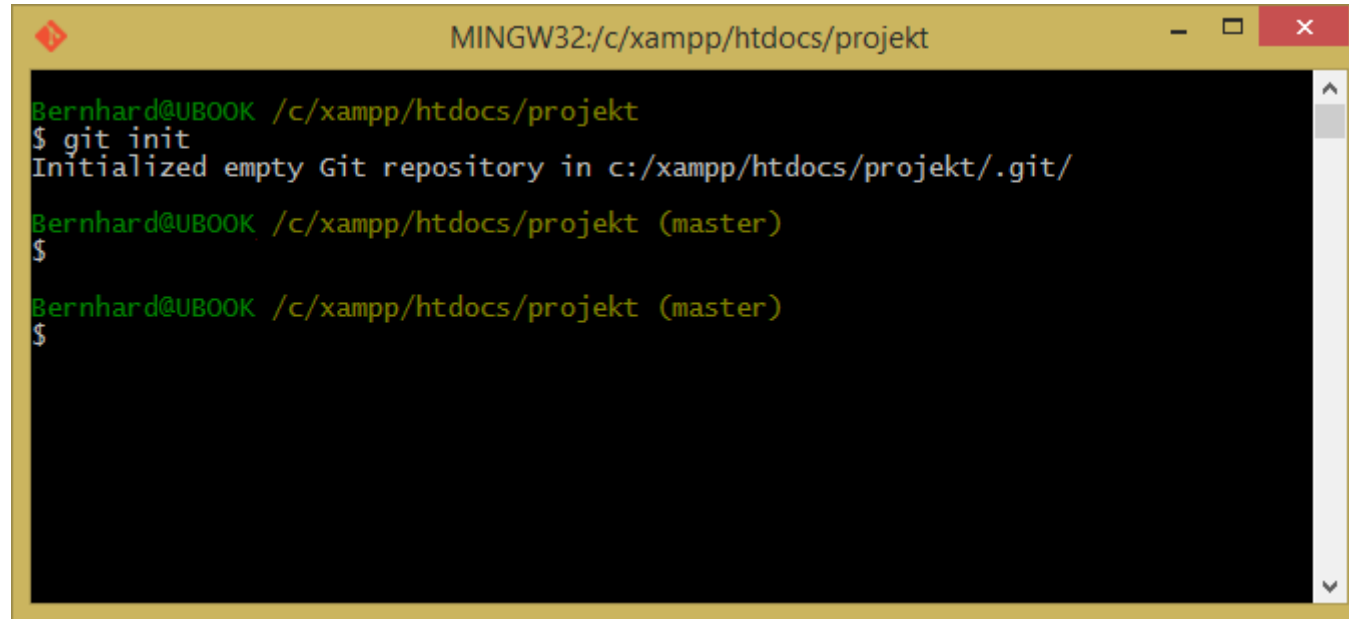
Die Git Basics

- Ein Repository erstellen
- Dateien zu einem Repository hinzufügen
- Änderungen an Dateien anzeigen
- Änderungen an Dateien sichern
- Änderungen rückgängig machen
- Arbeiten mit Entwicklungszweigen
- Projekt mit anderen teilen

Ein Repository erstellen

- Ein Repository aus einem (neuen) Projekt heraus erstellen

```
git init
```

A screenshot of a terminal window with a yellow title bar. The title bar contains a red diamond icon, the text 'MINGW32:/c:/xampp/htdocs/projekt', and standard window controls (minimize, maximize, close). The terminal has a black background with green text. It shows the command 'git init' being executed, followed by the output 'Initialized empty Git repository in c:/xampp/htdocs/projekt/.git/'. Below this, the prompt changes to 'Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)', and the command '\$' is entered twice, indicating the user is ready for further input.

```
MINGW32:/c:/xampp/htdocs/projekt

Bernhard@UBOOK /c:/xampp/htdocs/projekt
$ git init
Initialized empty Git repository in c:/xampp/htdocs/projekt/.git/

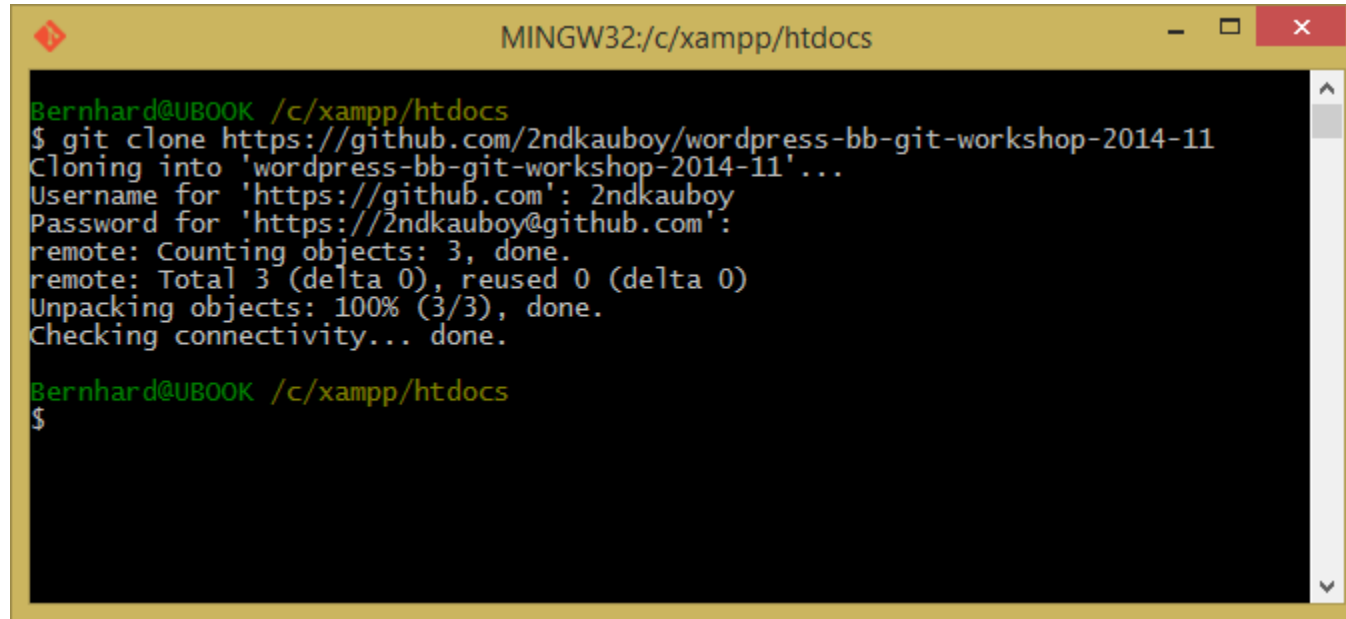
Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)
$

Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)
$
```

Ein Repository erstellen

- An einem bestehendes Projekt mitarbeiten – es „klonen“

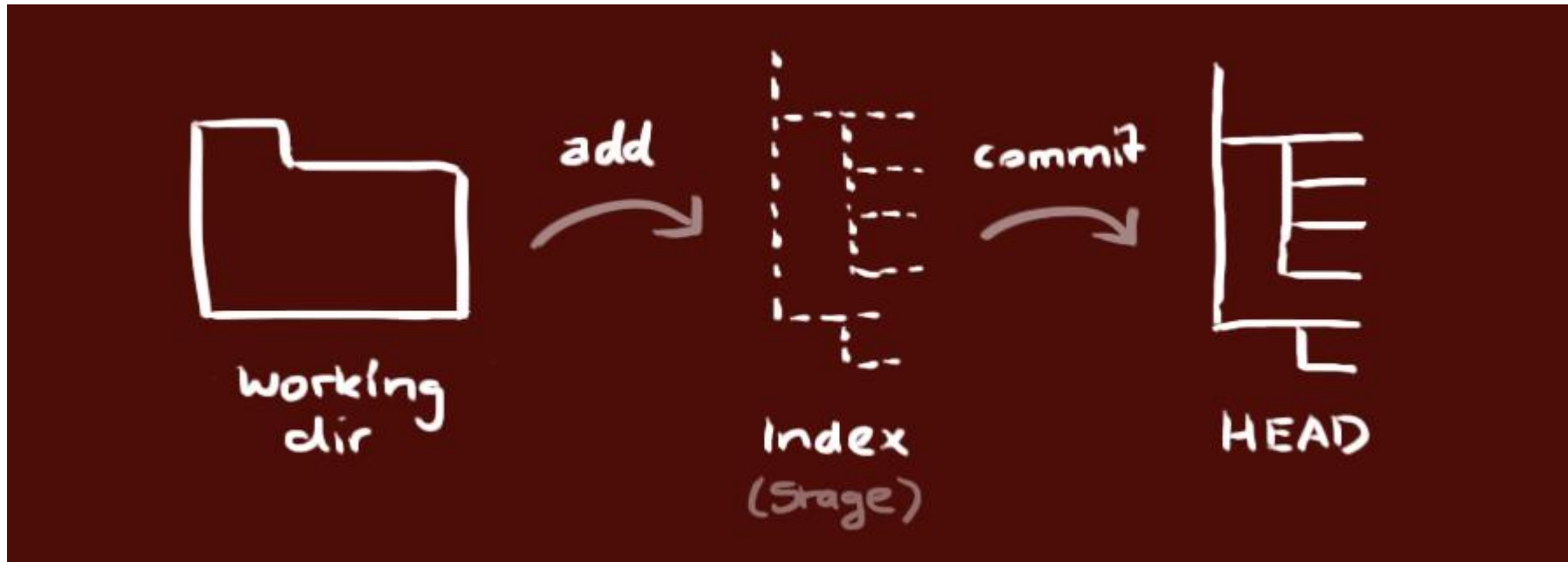
```
git clone https://github.com/2ndkauboy/wordpress-bb-git-workshop-2014-11
```

A screenshot of a terminal window titled "MINGW32:/c/xampp/htdocs". The prompt is "Bernhard@UBOOK /c/xampp/htdocs". The user enters the command "\$ git clone https://github.com/2ndkauboy/wordpress-bb-git-workshop-2014-11". The terminal output shows the cloning process: "Cloning into 'wordpress-bb-git-workshop-2014-11'...", "Username for 'https://github.com': 2ndkauboy", "Password for 'https://2ndkauboy@github.com':", "remote: Counting objects: 3, done.", "remote: Total 3 (delta 0), reused 0 (delta 0)", "Unpacking objects: 100% (3/3), done.", and "Checking connectivity... done.". The prompt returns to "\$".

```
Bernhard@UBOOK /c/xampp/htdocs
$ git clone https://github.com/2ndkauboy/wordpress-bb-git-workshop-2014-11
Cloning into 'wordpress-bb-git-workshop-2014-11'...
Username for 'https://github.com': 2ndkauboy
Password for 'https://2ndkauboy@github.com':
remote: Counting objects: 3, done.
remote: Total 3 (delta 0), reused 0 (delta 0)
Unpacking objects: 100% (3/3), done.
Checking connectivity... done.

Bernhard@UBOOK /c/xampp/htdocs
$
```

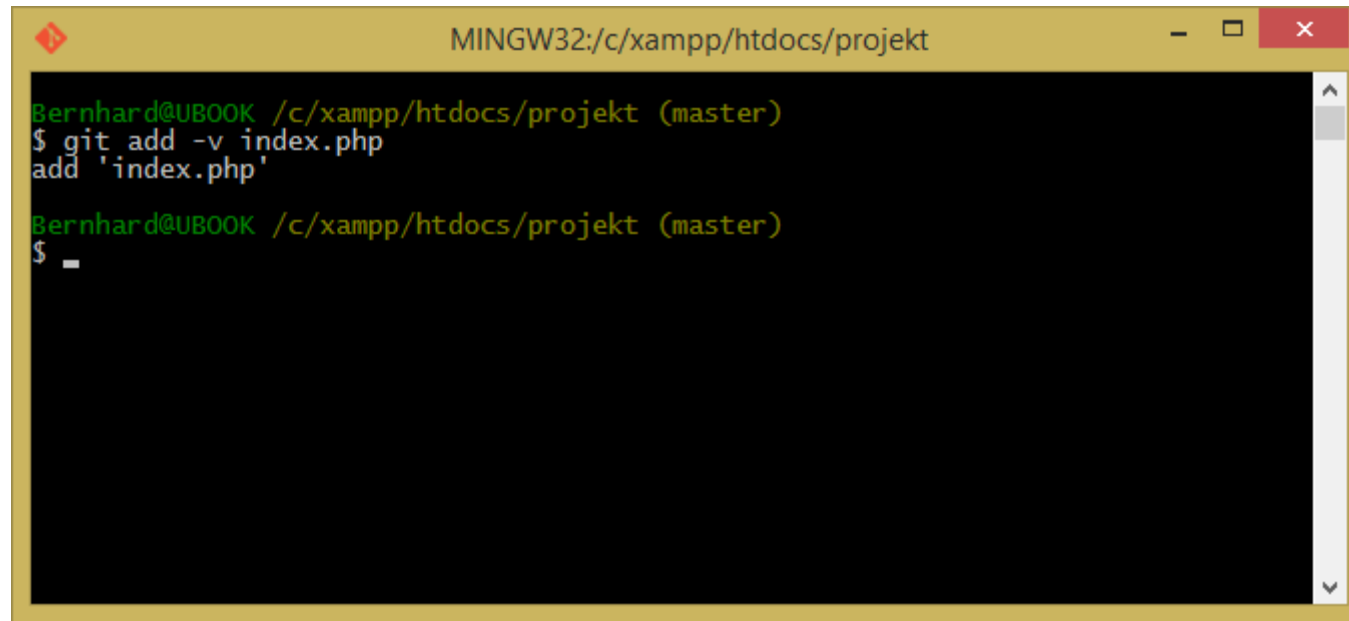
Dateien zu einem Repository hinzufügen



Dateien zu einem Repository hinzufügen

- Datei auf den „Index“ legen

```
git add index.php
```

A screenshot of a terminal window with a yellow title bar. The title bar text is "MINGW32:/c/xampp/htdocs/projekt". The terminal content shows a prompt "Bernhard@UBOOK /c/xampp/htdocs/projekt (master)" followed by the command "\$ git add -v index.php" and its output "add 'index.php'". Below this, the prompt appears again with a cursor, "\$ _".

```
MINGW32:/c/xampp/htdocs/projekt

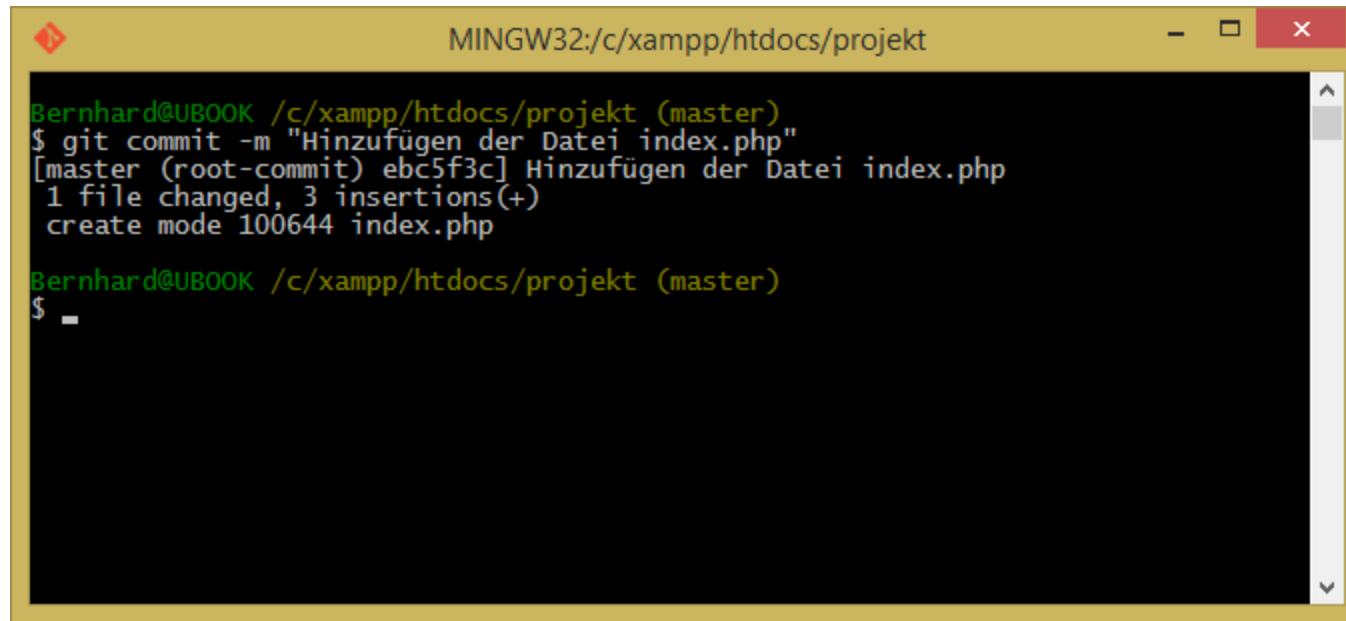
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git add -v index.php
add 'index.php'

Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ _
```

Dateien zu einem Repository hinzufügen

- Datei zum Repository hinzufügen

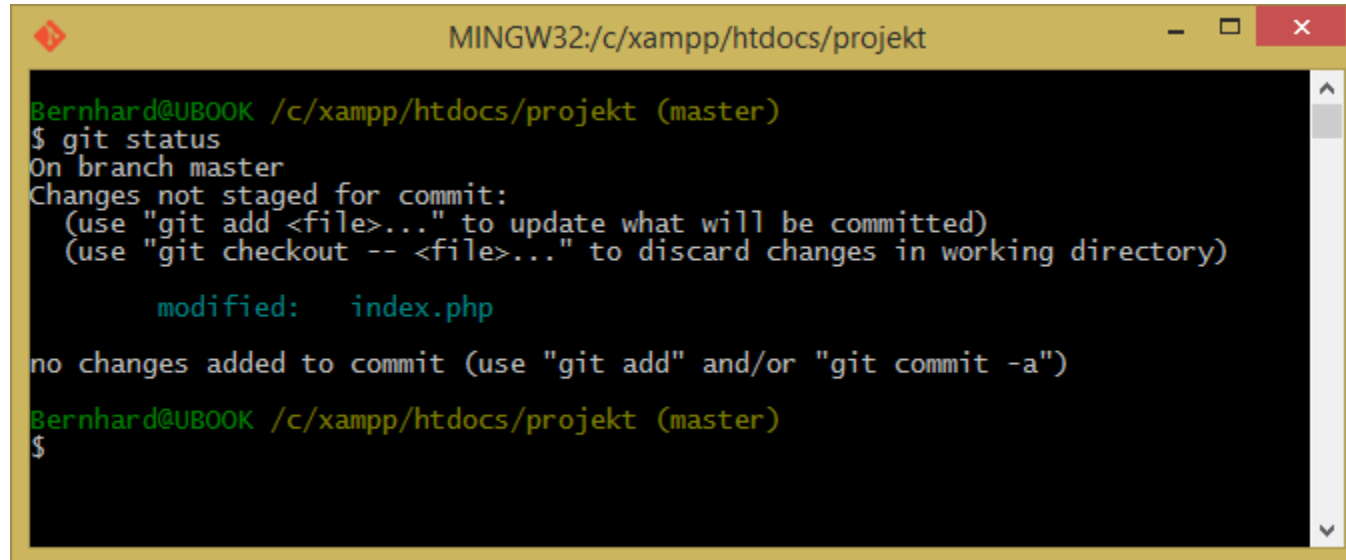
```
git commit -m "Hinzufügen der Datei index.php"
```

A screenshot of a Windows terminal window with a yellow title bar. The title bar text is 'MINGW32:/c/xampp/htdocs/projekt'. The terminal content shows a user named 'Bernhard@UBOOK' in the directory '/c/xampp/htdocs/projekt' on the 'master' branch. They execute the command '\$ git commit -m "Hinzufügen der Datei index.php"'. The output shows '[master (root-commit) ebc5f3c] Hinzufügen der Datei index.php', '1 file changed, 3 insertions(+)', and 'create mode 100644 index.php'. The prompt returns to '\$ _'.

Änderungen an Dateien anzeigen

- Was hat sich seit dem letzten Commit geändert?

`git status`

A screenshot of a terminal window with a yellow title bar. The title bar text is 'MINGW32:/c/xampp/htdocs/projekt'. The terminal content shows a user named 'Bernhard@UBOOK' in the directory '/c/xampp/htdocs/projekt' on the 'master' branch. They have run the command '\$ git status'. The output indicates that the working directory is clean, with no changes staged for commit. It shows 'modified: index.php' in green text. It also provides instructions on how to use 'git add' to stage changes or 'git checkout --' to discard changes. The prompt '\$' is visible at the bottom.

```
MINGW32:/c/xampp/htdocs/projekt

Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git status
On branch master
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)

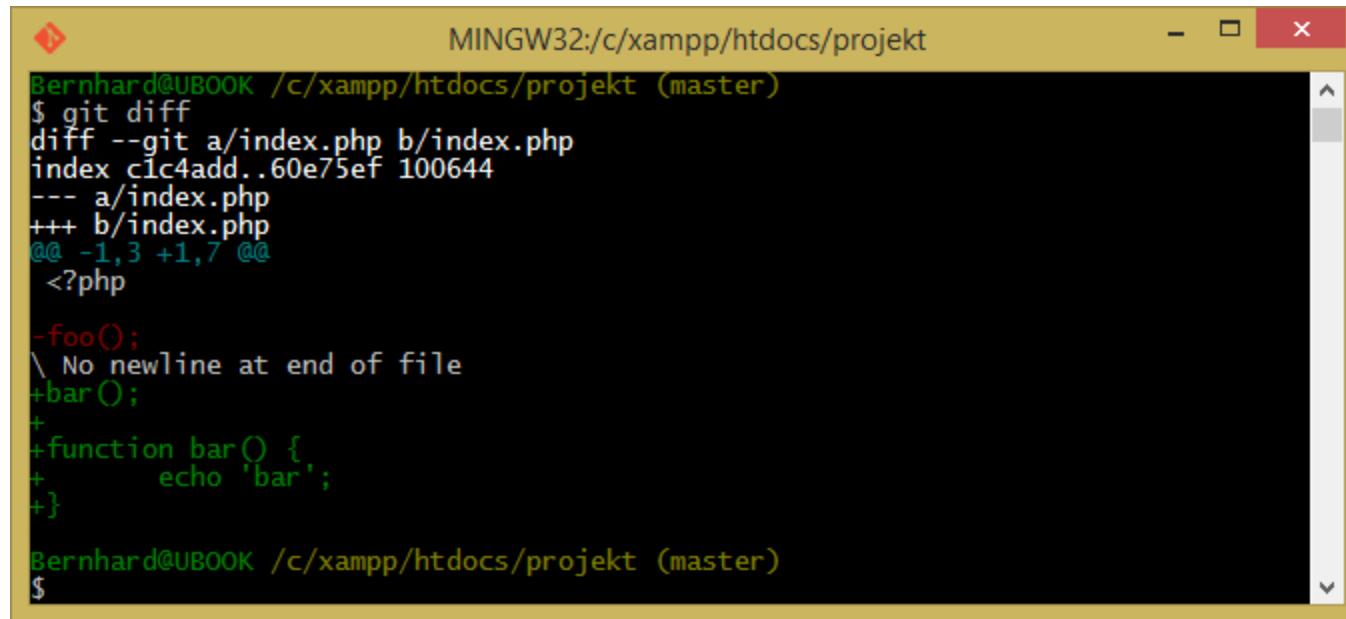
        modified:   index.php

no changes added to commit (use "git add" and/or "git commit -a")
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$
```

Änderungen an Dateien anzeigen

- Was hat sich seit dem letzten Commit geändert?

`git diff`



```
MINGW32:/c:/xampp/htdocs/projekt
Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)
$ git diff
diff --git a/index.php b/index.php
index c1c4add..60e75ef 100644
--- a/index.php
+++ b/index.php
@@ -1,3 +1,7 @@
<?php

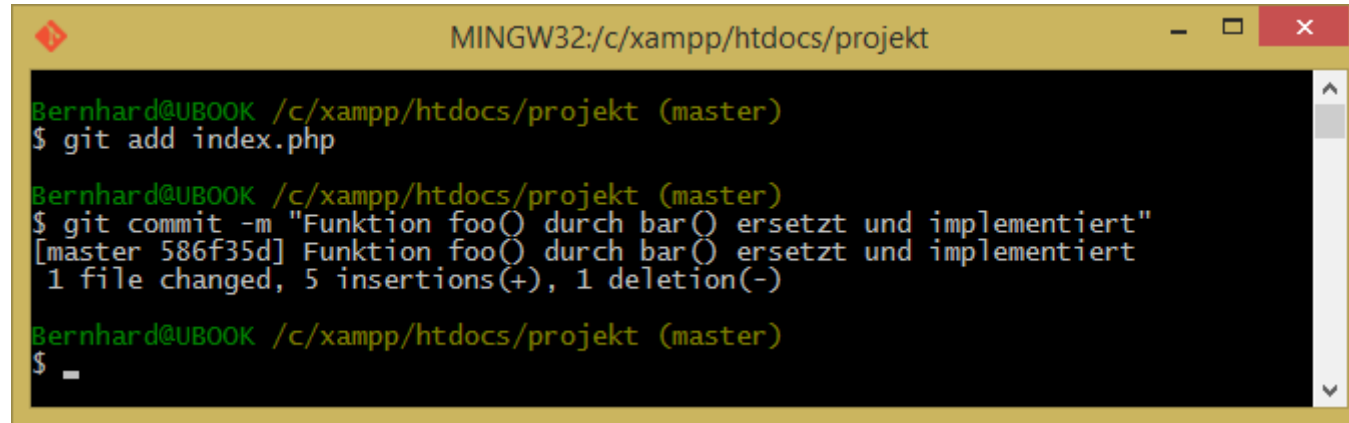
-foo();
\ No newline at end of file
+bar();
+
+function bar() {
+    echo 'bar';
+}

Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)
$
```

Änderungen an Dateien sichern

- Dateiänderungen vormerken und commiten

```
git add index.php  
git commit -m "Funktion foo() ..."
```

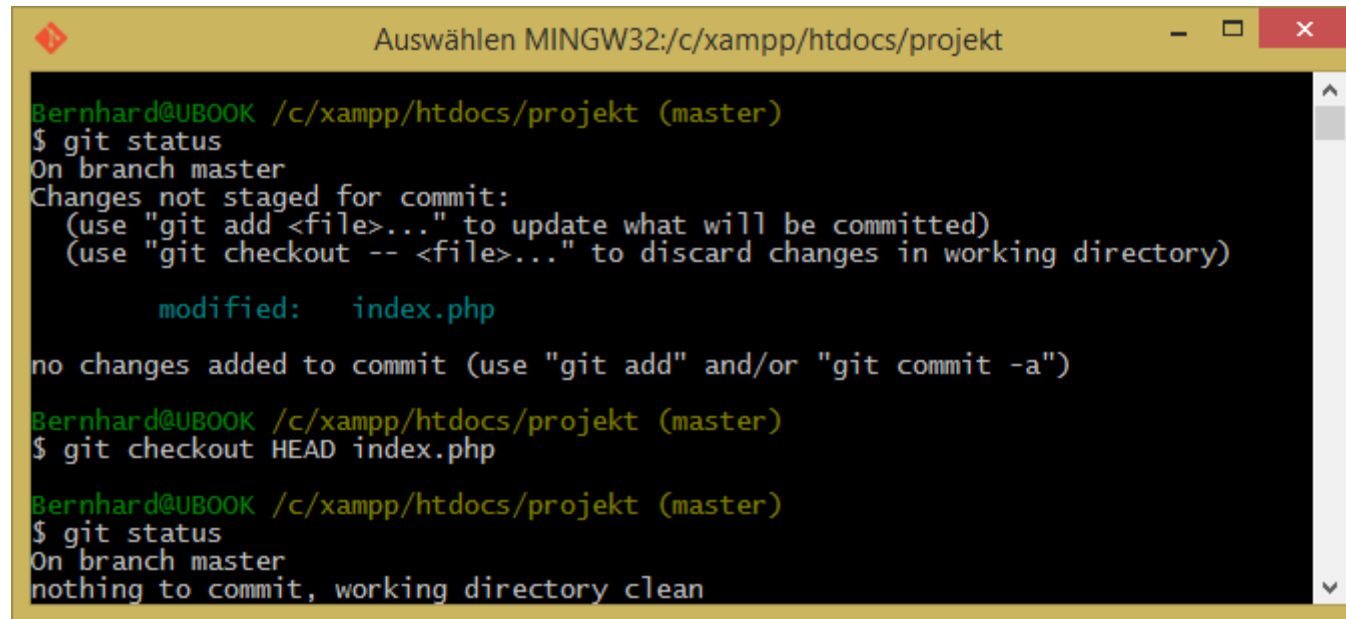
A screenshot of a terminal window with a yellow title bar. The title bar text is "MINGW32:/c/xampp/htdocs/projekt". The terminal content shows three lines of input and output. The first line is a prompt "Bernhard@UBOOK /c/xampp/htdocs/projekt (master)" followed by the command "\$ git add index.php". The second line is a prompt followed by "\$ git commit -m 'Funktion foo() durch bar() ersetzt und implementiert'", which is followed by two lines of output: "[master 586f35d] Funktion foo() durch bar() ersetzt und implementiert" and "1 file changed, 5 insertions(+), 1 deletion(-)". The third line is a prompt followed by "\$ _".

```
MINGW32:/c/xampp/htdocs/projekt  
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)  
$ git add index.php  
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)  
$ git commit -m "Funktion foo() durch bar() ersetzt und implementiert"  
[master 586f35d] Funktion foo() durch bar() ersetzt und implementiert  
1 file changed, 5 insertions(+), 1 deletion(-)  
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)  
$ _
```

Änderungen rückgängig machen

- Änderungen an einer Datei seit dem letzten Commit verwerfen

`git checkout HEAD index.php`

A screenshot of a terminal window with a yellow title bar that reads "Auswählen MINGW32:/c/xampp/htdocs/projekt". The terminal has a black background with green and white text. It shows a sequence of git commands and their output. First, the user runs "git status", which shows they are on the master branch and that the file "index.php" has been modified but not staged. Then, the user runs "git checkout HEAD index.php", and finally, they run "git status" again, which shows that the working directory is now clean.

```
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git status
On branch master
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:   index.php

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

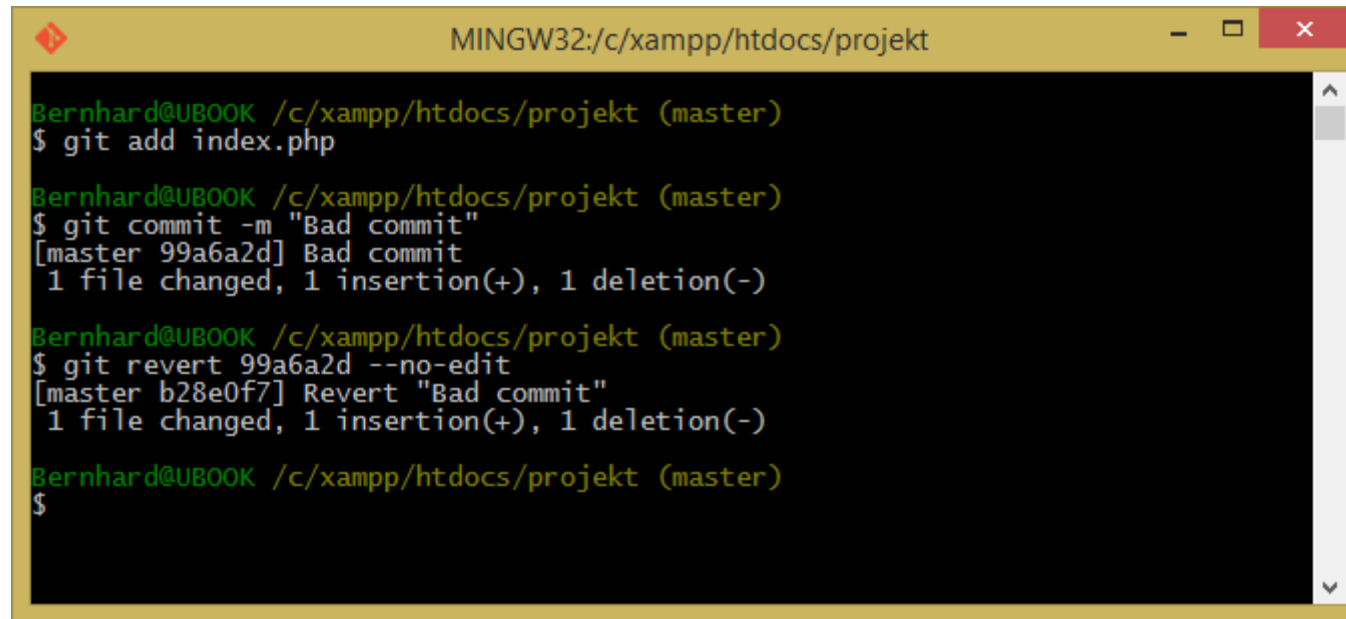
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git checkout HEAD index.php

Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git status
On branch master
nothing to commit, working directory clean
```

Änderungen rückgängig machen

- Alle Änderungen eines Commits rückgängig machen

`git revert <commit>`

A screenshot of a Windows command prompt window titled "MINGW32:/c/xampp/htdocs/projekt". The window shows a series of Git commands and their outputs. The user is in the "master" branch. They first add "index.php" and commit it with the message "Bad commit". The commit hash is 99a6a2d. Then, they run "git revert 99a6a2d --no-edit", which creates a new commit (b28e0f7) that reverts the previous one. The terminal text is as follows:

```
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git add index.php

Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git commit -m "Bad commit"
[master 99a6a2d] Bad commit
1 file changed, 1 insertion(+), 1 deletion(-)

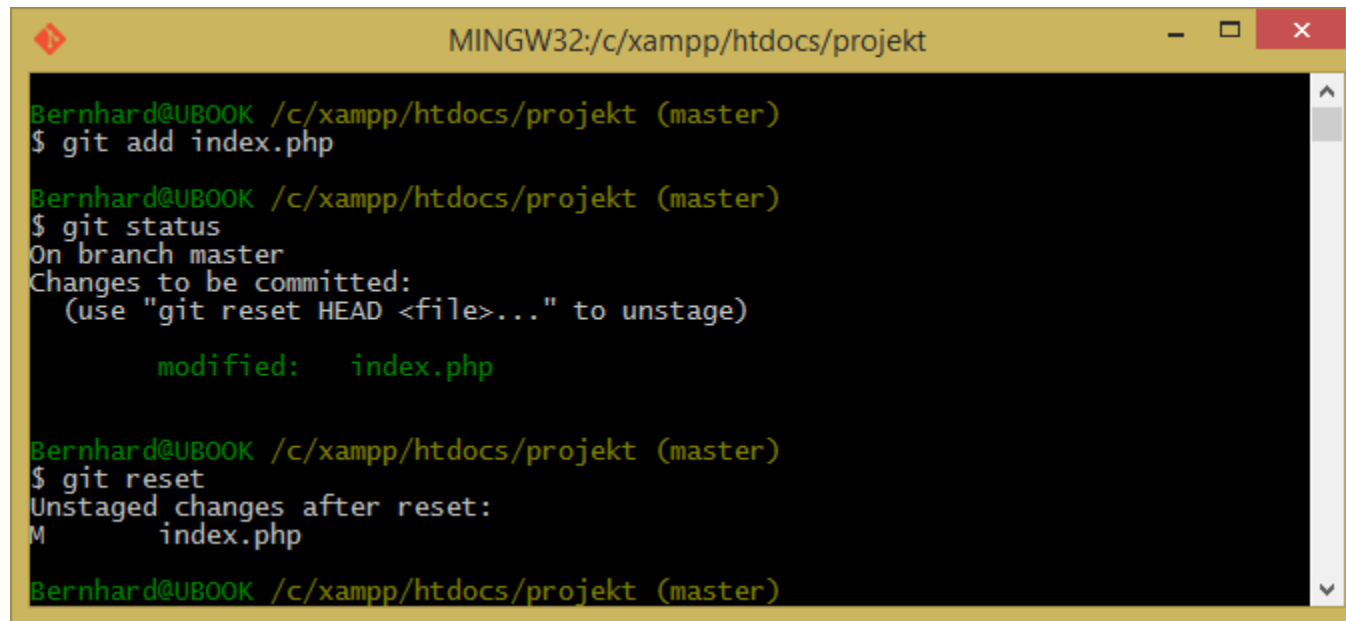
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git revert 99a6a2d --no-edit
[master b28e0f7] Revert "Bad commit"
1 file changed, 1 insertion(+), 1 deletion(-)

Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$
```

Änderungen rückgängig machen

- Datei vom Index nehmen (ein „git add“ rückgängig machen)

`git reset [datei]`

A screenshot of a terminal window with a yellow title bar. The title bar text is 'MINGW32:/c/xampp/htdocs/projekt'. The terminal shows a series of commands and their outputs. The first command is 'git add index.php'. The second command is 'git status', which shows that 'index.php' is staged for commit. The third command is 'git reset', which unstages the changes. The output shows 'Unstaged changes after reset:' and 'M index.php'.

```
MINGW32:/c/xampp/htdocs/projekt

Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git add index.php

Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git status
On branch master
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

        modified:   index.php

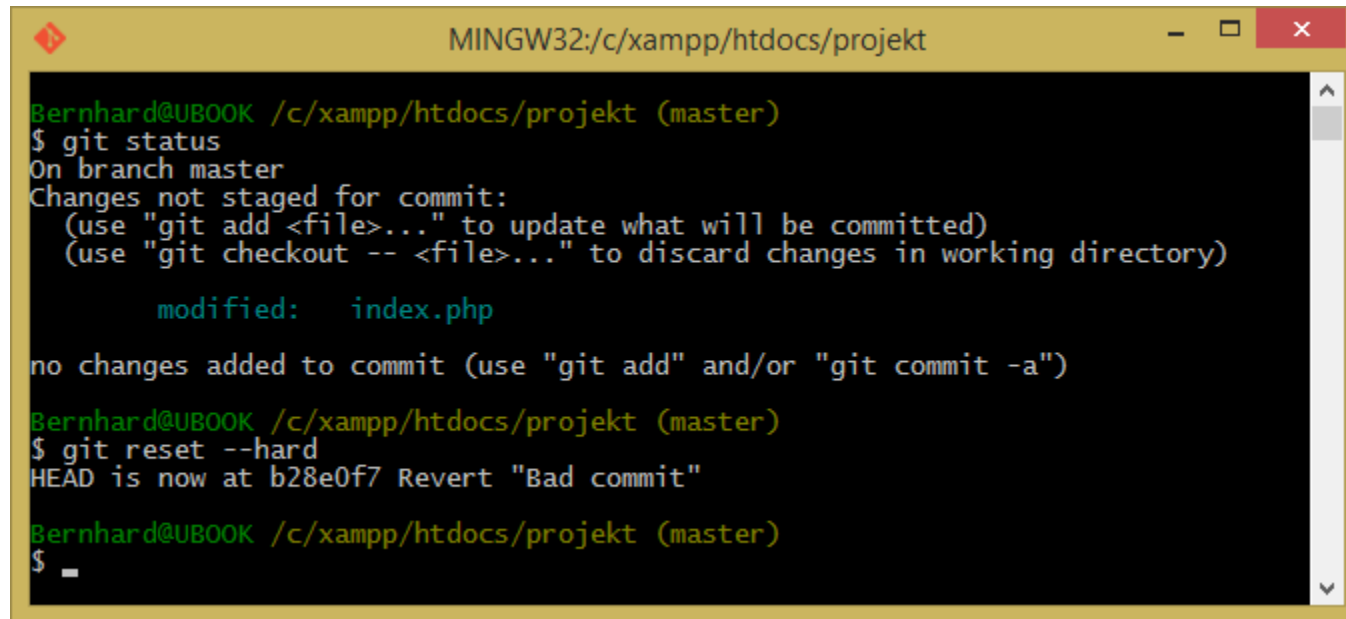
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git reset
Unstaged changes after reset:
M       index.php

Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
```


Änderungen rückgängig machen

- Alle lokalen Änderungen verwerfen und Index zurücksetzen – **GEFÄHRLICH!**

`git reset --hard`

A screenshot of a Windows terminal window with a yellow title bar. The title bar text is 'MINGW32:/c:/xampp/htdocs/projekt'. The terminal shows a user named 'Bernhard@UBOOK' in the directory '/c:/xampp/htdocs/projekt' on the 'master' branch. The user runs '\$ git status', which shows 'On branch master' and 'Changes not staged for commit:' with 'index.php' listed as 'modified:'. The user then runs '\$ git reset --hard', and the terminal responds 'HEAD is now at b28e0f7 Revert "Bad commit"'. Finally, the user runs '\$' and the prompt changes to '\$ _'.

```
MINGW32:/c:/xampp/htdocs/projekt

Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)
$ git status
On branch master
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:   index.php

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

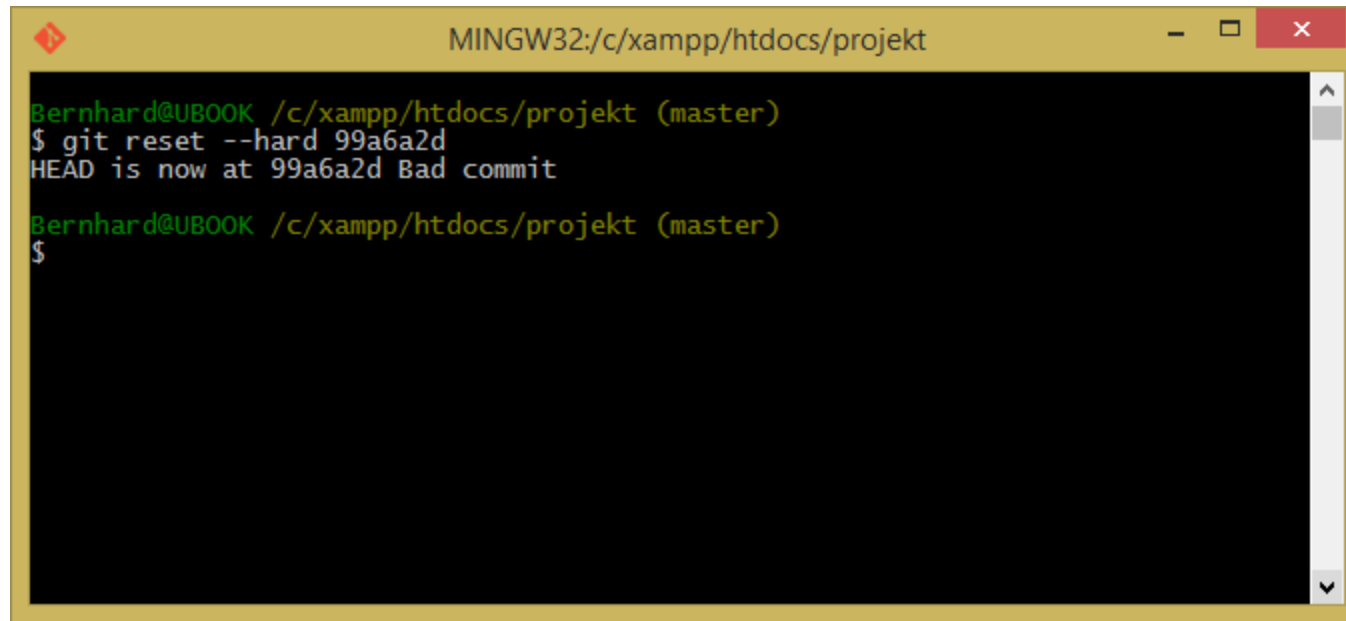
Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)
$ git reset --hard
HEAD is now at b28e0f7 Revert "Bad commit"

Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)
$ _
```

Änderungen rückgängig machen

- Einen Commit vom Verlauf entfernen – **GEFÄHRLICH!**

```
git reset --hard <commit>
```

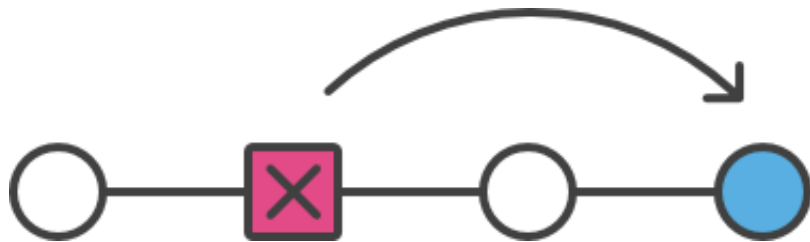
A screenshot of a Windows command prompt window titled "MINGW32:/c/xampp/htdocs/projekt". The prompt shows the user "Bernhard@UBOOK" in the directory "/c/xampp/htdocs/projekt" on the "master" branch. The user enters the command "\$ git reset --hard 99a6a2d". The output is "HEAD is now at 99a6a2d Bad commit". The prompt then returns to "\$".

```
MINGW32:/c/xampp/htdocs/projekt  
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)  
$ git reset --hard 99a6a2d  
HEAD is now at 99a6a2d Bad commit  
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)  
$
```

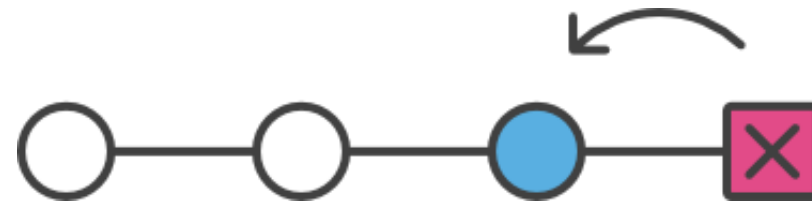
Änderungen rückgängig machen

- Der Unterschied zwischen „revert“ und „reset --hard“

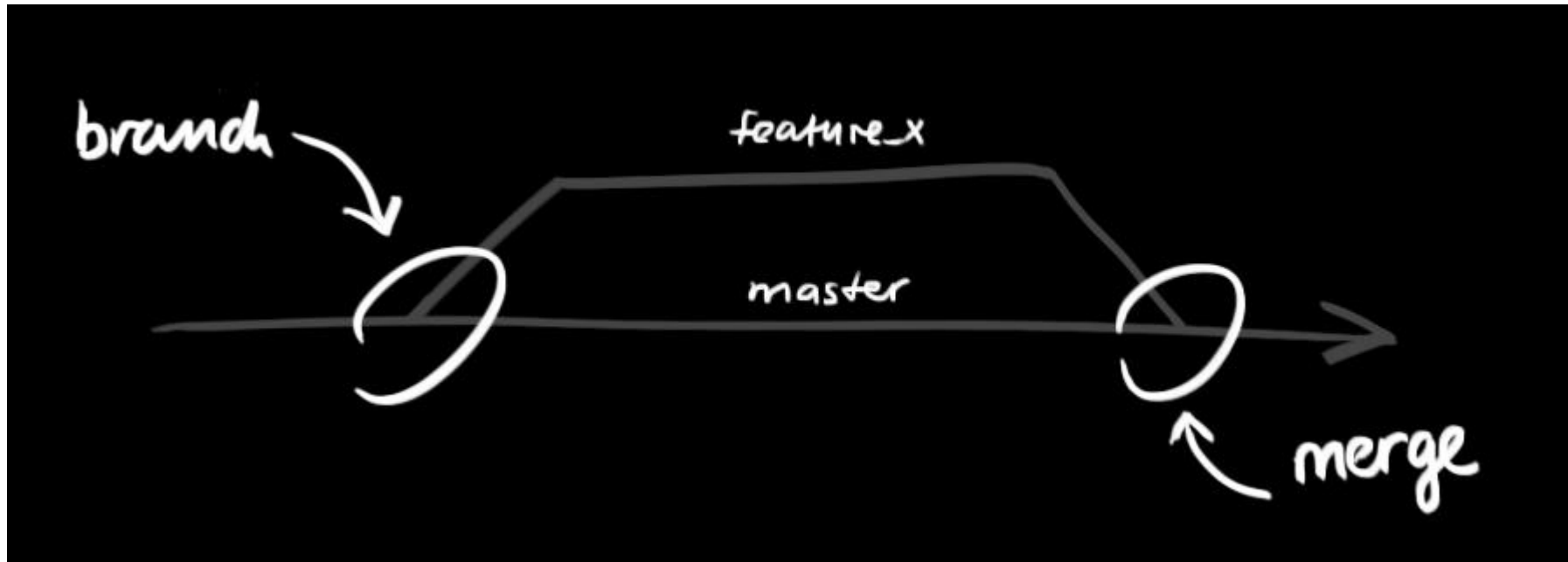
Revert



Reset



Arbeiten mit Entwicklungszweigen

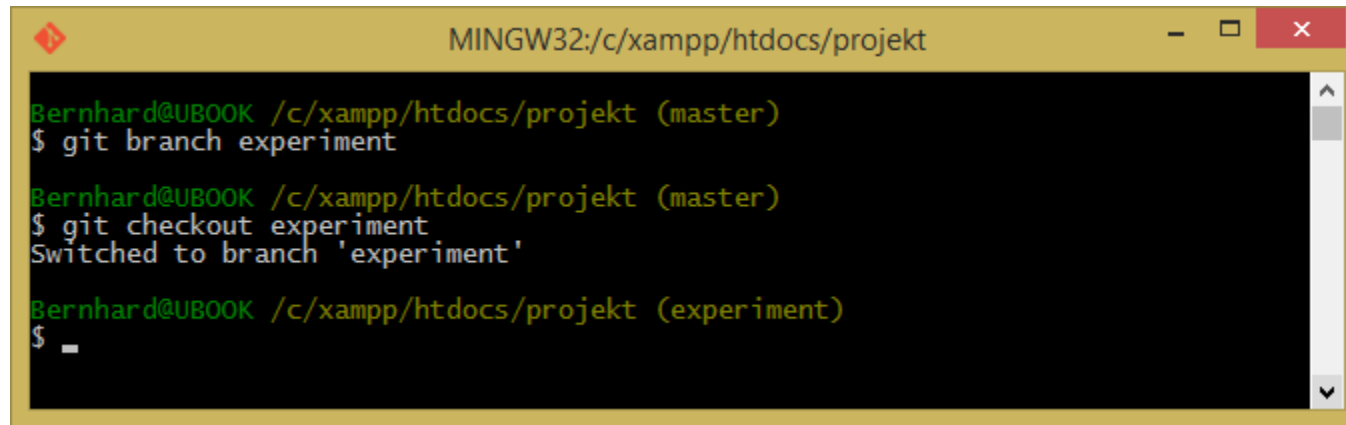


Arbeiten mit Entwicklungszweigen

- Neuen Entwicklungszweig („Branch“) erstellen und dorthin wechseln

```
git branch <branch>
```

```
git checkout <branch>
```

A screenshot of a Windows command prompt window titled "MINGW32:/c/xampp/htdocs/projekt". The window shows a series of Git commands and their outputs. The user is currently on the 'master' branch. They run 'git branch experiment' to create a new branch. Then they run 'git checkout experiment' to switch to the new branch, and the terminal confirms 'Switched to branch 'experiment''. Finally, they run '\$ _' which shows the prompt for the 'experiment' branch.

```
MINGW32:/c/xampp/htdocs/projekt

Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git branch experiment

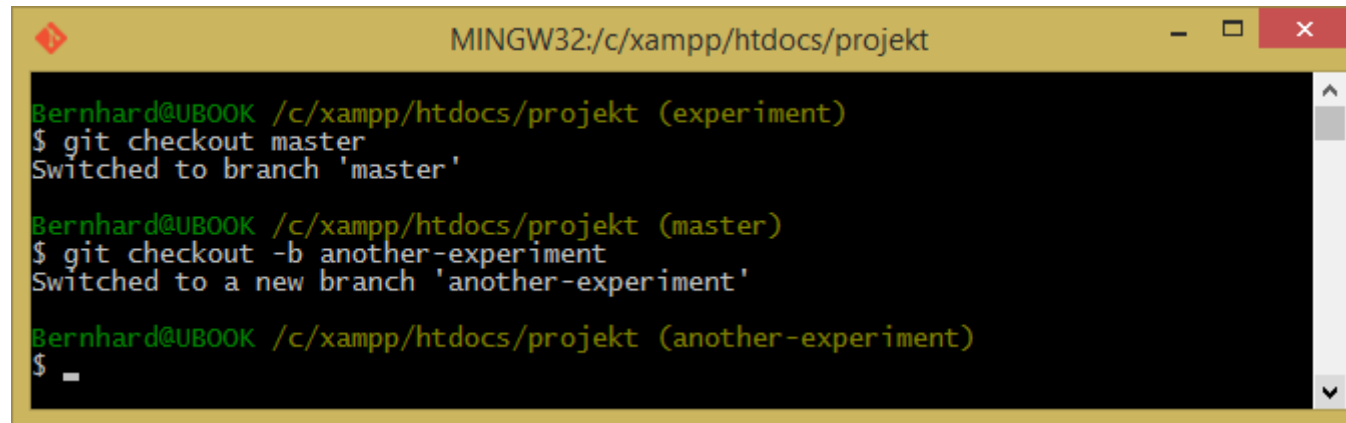
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git checkout experiment
Switched to branch 'experiment'

Bernhard@UBOOK /c/xampp/htdocs/projekt (experiment)
$ _
```

Arbeiten mit Entwicklungszweigen

- Einen neuen Branch erstellen und direkt auschecken

```
git checkout -b <branch>
```

A screenshot of a terminal window titled 'MINGW32:/c/xampp/htdocs/projekt'. The window shows a series of Git commands and their outputs. The user is initially on the 'experiment' branch. They run 'git checkout master', which switches them to the 'master' branch. Then, they run 'git checkout -b another-experiment', which creates a new branch named 'another-experiment' and switches to it. The prompt now shows '(another-experiment)'.

```
MINGW32:/c/xampp/htdocs/projekt

Bernhard@UBOOK /c/xampp/htdocs/projekt (experiment)
$ git checkout master
Switched to branch 'master'

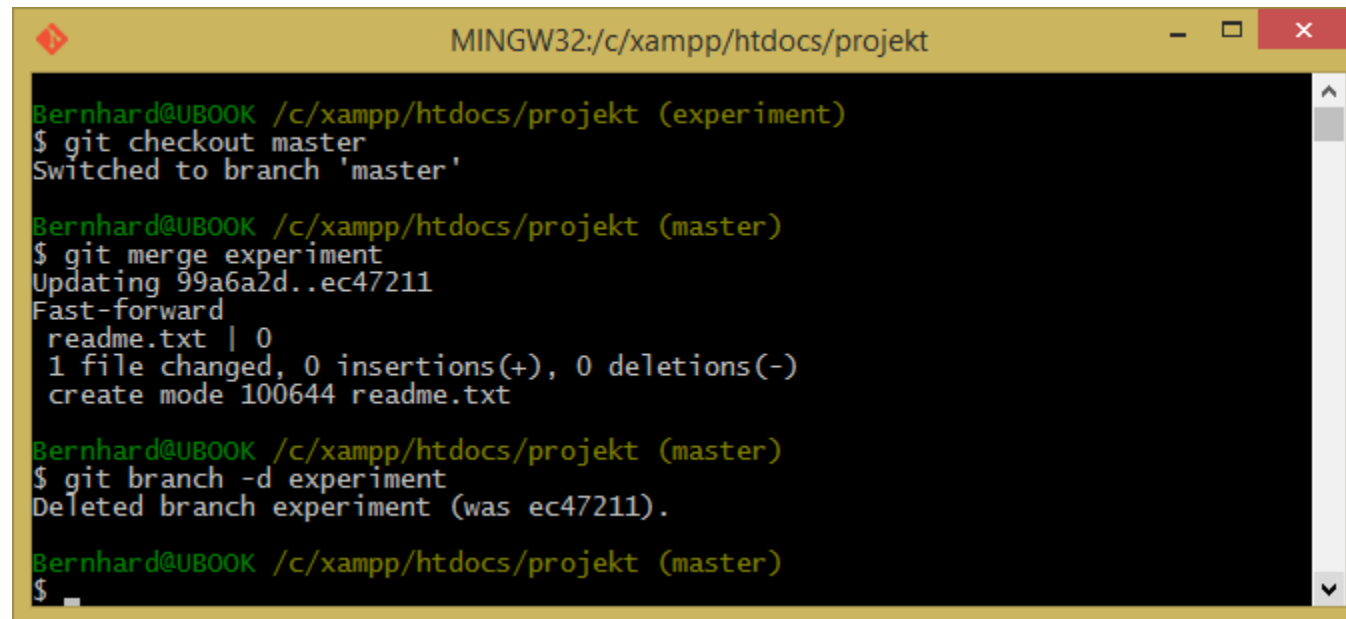
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git checkout -b another-experiment
Switched to a new branch 'another-experiment'

Bernhard@UBOOK /c/xampp/htdocs/projekt (another-experiment)
$ _
```

Arbeiten mit Entwicklungszweigen

- Änderungen eines Branches in den Hauptbranch zurückführen („merge“)

`git merge <branch>`



```
MINGW32:/c/xampp/htdocs/projekt

Bernhard@UBOOK /c/xampp/htdocs/projekt (experiment)
$ git checkout master
Switched to branch 'master'

Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git merge experiment
Updating 99a6a2d..ec47211
Fast-forward
 readme.txt | 0
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 readme.txt

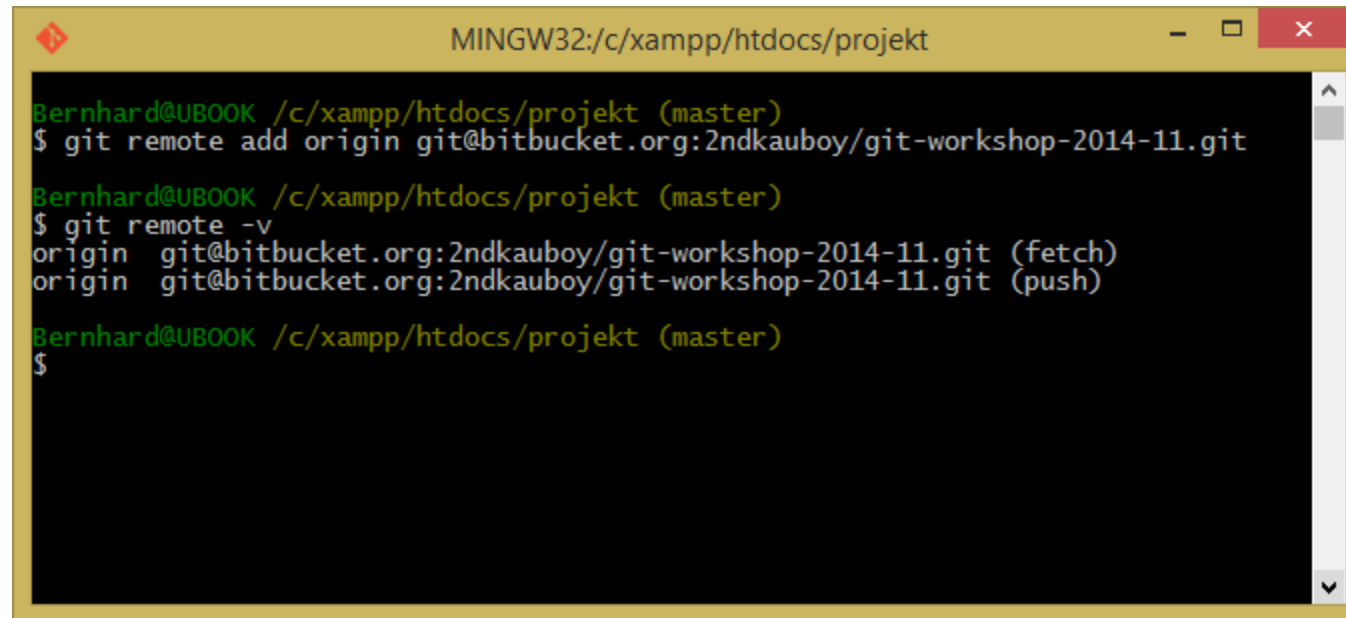
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git branch -d experiment
Deleted branch experiment (was ec47211).

Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$
```

Projekt mit anderen teilen

- Projekt mit einem Remote-Repository verknüpfen

```
git remote add <name> <url>
```

A screenshot of a Windows command prompt window titled "MINGW32:/c/xampp/htdocs/projekt". The window shows a series of commands and their outputs. The user is in the directory "/c/xampp/htdocs/projekt" and on the "master" branch. They run "git remote add origin git@bitbucket.org:2ndkauboy/git-workshop-2014-11.git". Then they run "git remote -v", which shows "origin git@bitbucket.org:2ndkauboy/git-workshop-2014-11.git (fetch)" and "origin git@bitbucket.org:2ndkauboy/git-workshop-2014-11.git (push)". Finally, they run a blank command line.

```
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git remote add origin git@bitbucket.org:2ndkauboy/git-workshop-2014-11.git

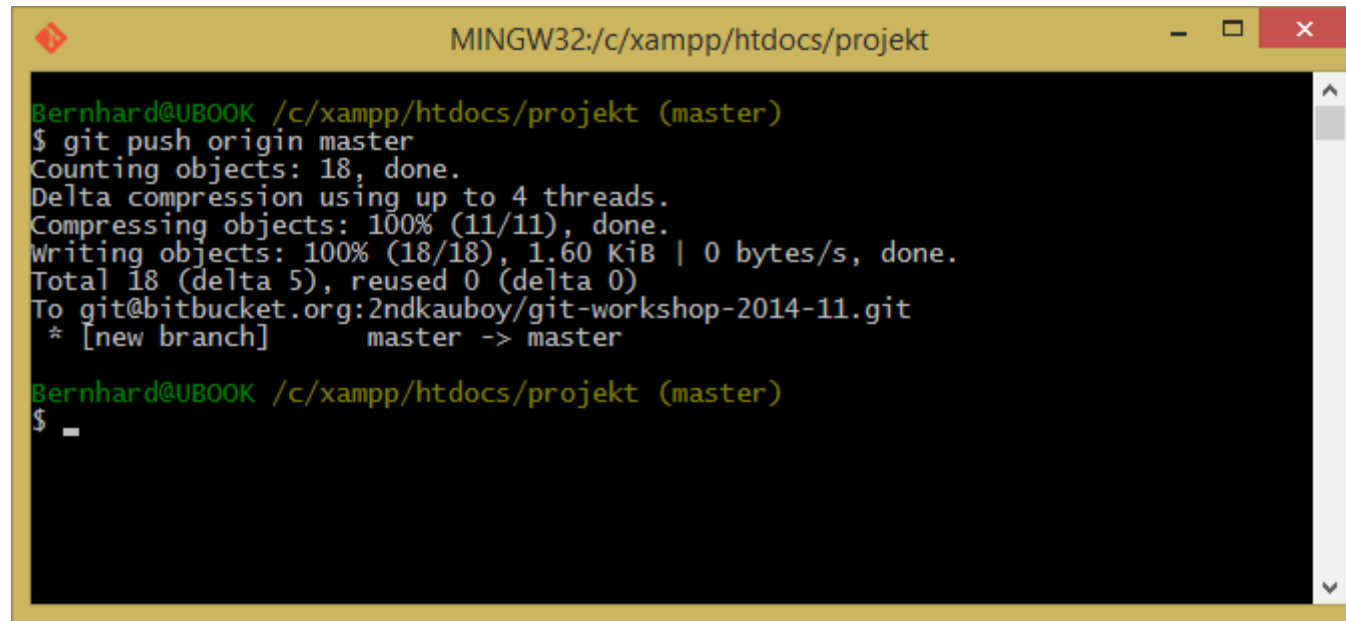
Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$ git remote -v
origin  git@bitbucket.org:2ndkauboy/git-workshop-2014-11.git (fetch)
origin  git@bitbucket.org:2ndkauboy/git-workshop-2014-11.git (push)

Bernhard@UBOOK /c/xampp/htdocs/projekt (master)
$
```


Projekt mit anderen teilen

- Commits an das Remote-Repository schicken

`git push <remote> <branch>`

A screenshot of a Windows command prompt window titled "MINGW32:/c:/xampp/htdocs/projekt". The window shows the execution of the "git push origin master" command. The output indicates that 18 objects were counted, compressed, and written to the remote repository at "git@bitbucket.org:2ndkauboy/git-workshop-2014-11.git". The push was successful, creating a new branch "master" on the remote.

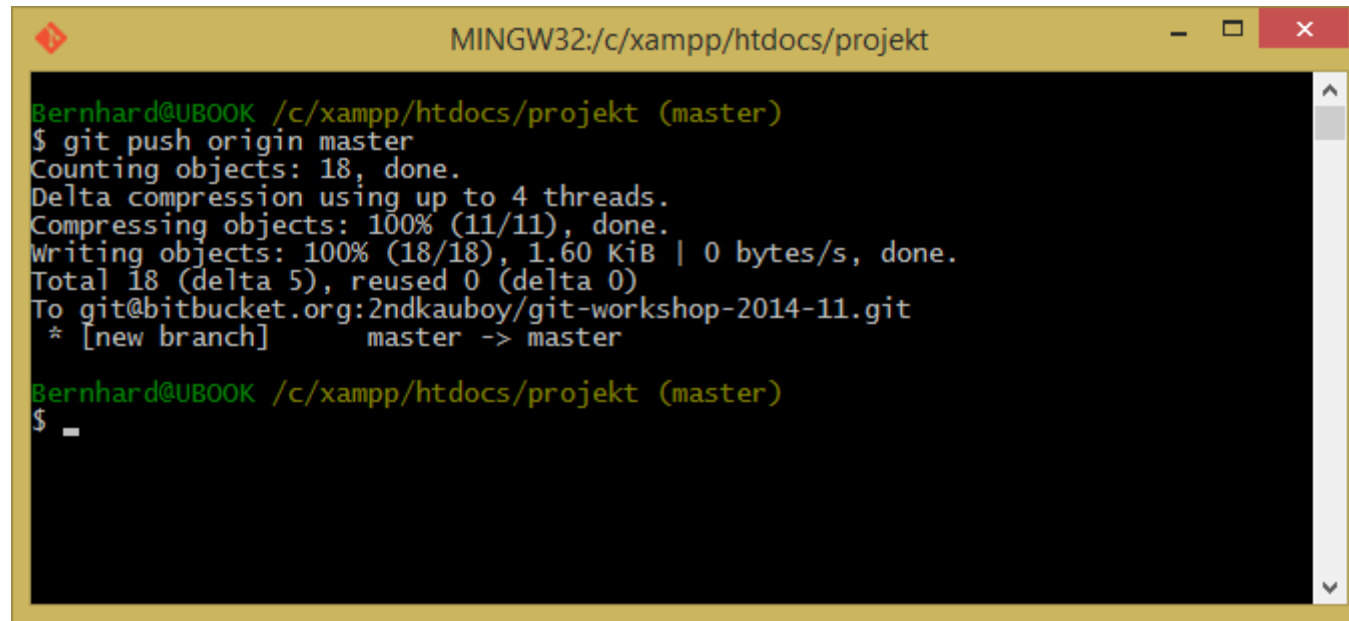
```
Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)
$ git push origin master
Counting objects: 18, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (11/11), done.
Writing objects: 100% (18/18), 1.60 KiB | 0 bytes/s, done.
Total 18 (delta 5), reused 0 (delta 0)
To git@bitbucket.org:2ndkauboy/git-workshop-2014-11.git
 * [new branch]      master -> master

Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)
$ _
```

Projekt mit anderen teilen

- Commits an das Remote-Repository schicken

`git push <remote> <branch>`

A screenshot of a Windows command prompt window titled "MINGW32:/c:/xampp/htdocs/projekt". The window shows the execution of the "git push origin master" command. The output indicates that 18 objects were counted, compressed, and written to the remote repository at "git@bitbucket.org:2ndkauboy/git-workshop-2014-11.git". The push was successful, creating a new branch "master" on the remote.

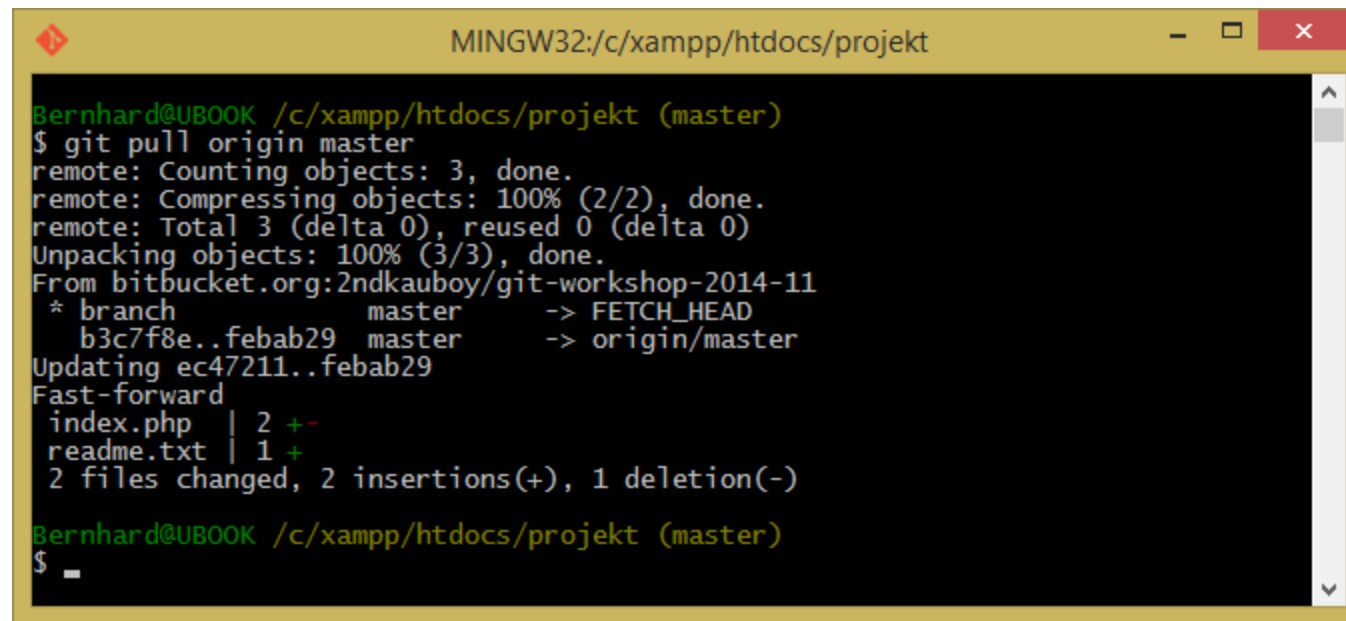
```
Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)
$ git push origin master
Counting objects: 18, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (11/11), done.
Writing objects: 100% (18/18), 1.60 KiB | 0 bytes/s, done.
Total 18 (delta 5), reused 0 (delta 0)
To git@bitbucket.org:2ndkauboy/git-workshop-2014-11.git
 * [new branch]      master -> master

Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)
$
```

Projekt mit anderen teilen

- Commits aus dem Remote-Repository holen

`git pull <remote>`

A screenshot of a Windows command prompt window titled "MINGW32:/c:/xampp/htdocs/projekt". The window shows the execution of the "git pull origin master" command. The output indicates a fast-forward merge from the remote repository. The files "index.php" and "readme.txt" are updated. The prompt returns to the user's shell.

```
Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)
$ git pull origin master
remote: Counting objects: 3, done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 0 (delta 0)
Unpacking objects: 100% (3/3), done.
From bitbucket.org:2ndkauboy/git-workshop-2014-11
 * branch            master       -> FETCH_HEAD
    b3c7f8e..febab29  master       -> origin/master
Updating ec47211..febab29
Fast-forward
 index.php | 2 +-
 readme.txt | 1 +
 2 files changed, 2 insertions(+), 1 deletion(-)

Bernhard@UBOOK /c:/xampp/htdocs/projekt (master)
$
```

Das war die Theorie

Let's get our handy dirty! ;)

Git einrichten

- Git installieren: <http://git-scm.com>
- Nutzerdaten in Konfiguration schreiben:

```
git config --global user.name "John Doe"  
git config --global user.email johndoe@example.com
```

- Texteditor für Commit-Nachrichten einrichten:

```
git config --global '"C:/Program Files (x86)/Notepad++/notepad++.exe' -multiInst -nosession -noPlugin"  
git config --global core.editor 'open -t -n -W'
```

Fragen?

Quellen und gute Ressourcen:

- <http://git-scm.com/>
- <http://rogerdudler.github.io/git-guide/>
- <https://www.atlassian.com/git/>
- <https://guides.github.com/>
- <https://try.github.io/>
- <http://www.sourcetreeapp.com/>