

# Implementacija osnovnih git komandi

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```
git init
```

- Git init stvori .git datoteku te ostale u njoj napravi još neke datoteke potrebne za rad git-a.

```

vovencan@vovencan-VirtualBox: ~/Seminar
vovencan@vovencan-VirtualBox:~$ cd Seminar
vovencan@vovencan-VirtualBox:~/Seminar$ ls
README.md
vovencan@vovencan-VirtualBox:~/Seminar$ git branch
* main
anton
marin
vovencan@vovencan-VirtualBox:~/Seminar$ nano prez1
vovencan@vovencan-VirtualBox:~/Seminar$ git hash-object
vovencan@vovencan-VirtualBox:~/Seminar$ ls -l
ls: cannot access '-l': No such file or directory
vovencan@vovencan-VirtualBox:~/Seminar$ ls .git/
.git/COMMIT_EDITMSG  .git/description  .git/HEAD  .git/ORIG_HEAD
.git/config         .git/FETCH_HEAD  .git/index
vovencan@vovencan-VirtualBox:~/Seminar$ git branch
.git/branches:
vovencan@vovencan-VirtualBox:~/Seminar$ git hooks
vovencan@vovencan-VirtualBox:~/Seminar$ git log --graph --decorate --pretty=full
commit-msg.sample      pre-commit.sample      pre-push.sample
post-update.sample     prepare-commit-msg.sample  update.sample
vovencan@vovencan-VirtualBox:~/Seminar$ git info
exclude
vovencan@vovencan-VirtualBox:~/Seminar$ git logs
HEAD refs
vovencan@vovencan-VirtualBox:~/Seminar$ git objects
06 1b 27 53 56 48 00 08 99 ab cb ed ff pack
ff 22 2b 54 5d 6d 84 92 9c ae ca f7 info
vovencan@vovencan-VirtualBox:~/Seminar$ git refs
heads remotes tags
vovencan@vovencan-VirtualBox:~/Seminar$

```

# Clone i config

- Clone funkcioniira vrlo slično git initu, ali kopira već gotov repozitrorij s udaljene lokacije.

```
zvonecan@zvonecan-VirtualBox:~/Testing$ ls -a
.
..
zvonecan@zvonecan-VirtualBox:~/Testing$ git clone /home/zvonecan/Seminar
Cloning into 'Seminar'...
done.
zvonecan@zvonecan-VirtualBox:~/Testing$ ls -a
.
..
Seminar
zvonecan@zvonecan-VirtualBox:~/Testing$ cd Seminar
zvonecan@zvonecan-VirtualBox:~/Testing/Seminar$ ls -a
.
..
.git
new.txt
prezi
README.md
Seminar_aux
Seminar.dvi
Seminar.log
Seminar.nav
Seminar.out
Seminar.snn
Seminar.tex
Seminar.toc
slike
test.txt
zvonecan@zvonecan-VirtualBox:~/Testing/Seminar$
```

- Pomoću naredbe config postavljamo username i email od korisnika

- Git commit git izvršava tako da datoteku spremi pod ključ zvan SHA-1.
- SHA-1 je kombinacija od 40 malih slova ili brojeva koja služi kao pointer na spremljenu datoteku.
- Pomoću komande git hash-object možemo spremi neki file u git te dodavanjem -w nam git vraća SHA-1 od tog filea.
- Pomoću git hash-object spremamo neki file pod SHA-1 kao blob i možemo mu pristupiti samo pomoću SHA-1 ključa.

# git commit

```
romeo@romeo-VirtualBox:~/Seminar$ ls .git/*
.git/COMMIT_EDITMSG  .git/description  .git/HEAD  .git/HEAD~
.git/config           .git/FETCH_HEAD  .git/index
.git/branches:
.git/hooks:
applypatch-msg.sample  pre-applypatch.sample  pre-push.sample
commit-msg.sample      pre-commit.sample      pre-rebase.sample
post-update.sample     prepare-commit-msg.sample  update.sample
.git/Info:
exclude
.git/logs:
HEAD  refs
.git/objects:
4e 1b 27 33 56 68 80 88 99 ab c8 ed ff pack
0f 22 2b 54 5a 6d 86 92 9c aa ca f7 info
.git/refs:
HEAD  remotes  logs
romeo@romeo-VirtualBox:~/Seminar$ echo 'Neki tekst' > test.txt
romeo@romeo-VirtualBox:~/Seminar$ ls
git datetext prezj 8260W md test.txt
romeo@romeo-VirtualBox:~/Seminar$ git hash-object -w test.txt
bb913ccba64e438c5243b57089339839a974cf
romeo@romeo-VirtualBox:~/Seminar$ git cat-file -p bb913ccba64e438c5243b57089339839a974cf
git: 'cat-file' is not a git command. See 'git -help'
romeo@romeo-VirtualBox:~/Seminar$ git cat-file -p bb913ccba64e438c5243b57089339839a974cf
Neki tekst
romeo@romeo-VirtualBox:~/Seminar$ echo 'Neki tekst verzija 2' > test.txt
romeo@romeo-VirtualBox:~/Seminar$ git hash-object -w test.txt
2a2ec3bf5959982b26912392356384b63f87fa1
romeo@romeo-VirtualBox:~/Seminar$ git cat-file -p 2a2ec3bf5959982b26912392356384b63f87fa1
Neki tekst verzija 2
romeo@romeo-VirtualBox:~/Seminar$ find .git/objects -type f
.git/objects/ca/42dba3b52f736c3bf76167127c407416b889d
.git/objects/mf/a7f4bcb4c83937c1d0b6911355915fda4f6a
.git/objects/54/644019ced7d2afdcdfb5dc812c2193d024d9e
.git/objects/2b/6f829c2cd413f96d1809fcd8e43795c
.git/objects/2b/6f8f60ab8cae55c3144a3473bb6dc3a3b1
.git/objects/c8/8f3579871eac8af9c9c773e3f2353ac8c1cf
.git/objects/8f/81ffa139e9f3774d8a1cf389ca5b089e5d
.git/objects/56/c4495Secd10e5411f3c3a42857a88941d6b5
.git/objects/21/4b38d49943b8119602376f1f0a93746a3381d
.git/objects/1b/bd2163d48099c974e4d6e6c335e30e1e5ec4e4
.git/objects/ff/9e0f1623b089c32809f4a8995d8f4692c6
.git/objects/9e/963b3580e247744f08b3450829382a81b7e49
.git/objects/8b/9139c3b0a4aa38c35243b57089339839a974cf
.git/objects/ab/7194d1d8b1e4fec32a0335896e55a21d717
.git/objects/27/329578937412f0c9736367c0b0914f9b65c3b4
.git/objects/ed/7acc73168f03c1ef4c6e1643dc7f46a9247b5
```

# git commit

- Git rješava taj problem pomoću stabala.
- Blob je neki podatak ili tekst dok je stablo više blobova i barem jedno stablo od kojih jedno stablo ima SHA-1 te datoteke ili stabla koji ga sadrži.

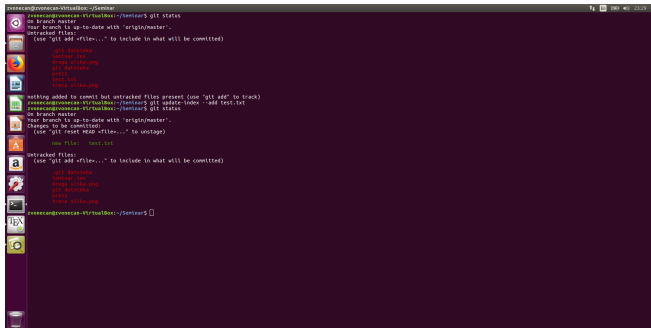
```
zvonecan@zvonecan-VirtualBox:~$ cd Seminar
zvonecan@zvonecan-VirtualBox:~/Seminar$ ls
druga slika.png  git datoteka  prez1  README.md  Seminar.tex  test.txt
zvonecan@zvonecan-VirtualBox:~/Seminar$ git cat-file -p master^{tree}
100644 blob 881cbief1487c8a663c12a3b6af90a15ab8947b2  README.md
zvonecan@zvonecan-VirtualBox:~/Seminar$ clear history

zvonecan@zvonecan-VirtualBox:~/Seminar$ git cat-file -p anton^{tree}
100644 blob 881cbief1487c8a663c12a3b6af90a15ab8947b2  README.md
100644 blob 92591f9a253a9e88f7e7cedcd6d258297c433537  pokusaj
zvonecan@zvonecan-VirtualBox:~/Seminar$
```

- Kada git commita file on obično uzme sto je na stage-u i spremi u jedno stablo ili kombinaciju stabala koji su svi spremljeni pod jedno stablo.

# git stage

- File u gitu stageamo tako da ga dodamo u pod datoteku index unutar .git datoteke.
- File dodajemo u index pomoću git update-index –add.



```
rosecan@rosecan-VirtualBox: ~/Seminar
rosecan@rosecan-VirtualBox:~/Seminar$ git status
On branch master
Your branch is up-to-date with 'origin/master'.
Untracked files:
  (use "git add <file>..." to include in what will be committed)

    .gitignore
    README.txt
    image1111a.png
    gitignore
    test.txt
    image1111a.png

nothing added to commit but untracked files present (use "git add" to track)
rosecan@rosecan-VirtualBox:~/Seminar$ git update-index --add test.txt
rosecan@rosecan-VirtualBox:~/Seminar$ git status
On branch master
Your branch is up-to-date with 'origin/master'.
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

    new file:   test.txt

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

    .gitignore
    README.txt
    image1111a.png
    gitignore
    test.txt
    image1111a.png
rosecan@rosecan-VirtualBox:~/Seminar$
```

- Ako želimo stagea neki prijašnji commit prije imena filea moramo dodati –cached i SHA-1 tog filea.
- Sad možemo napraviti istu stvar što git radi sa fileovima u indexu , stablo.

# git stage

```
romeoan@romeoan-VirtualBox: ~/Seminar
romeoan@romeoan-VirtualBox:~/Seminar$ git write-tree
4d683166fa57dac024fb240c3d00220dc20b990c
romeoan@romeoan-VirtualBox:~/Seminar$ 4d683166fa57dac024fb240c3d00220dc20b990c
4d683166fa57dac024fb240c3d00220dc20b990c: command not found
romeoan@romeoan-VirtualBox:~/Seminar$ git cat-file -t 4d683166fa57dac024fb240c3d00220dc20b990c
tree
romeoan@romeoan-VirtualBox:~/Seminar$ echo 'Drugo Stablo' > new.txt
romeoan@romeoan-VirtualBox:~/Seminar$ git update-index --add new.txt
romeoan@romeoan-VirtualBox:~/Seminar$ git write-tree
32642624f83a94a0203fccc733ecf1323f2a32f
romeoan@romeoan-VirtualBox:~/Seminar$ git cat-file -t 32642624f83a94a0203fccc733ecf1323f2a32f
tree
romeoan@romeoan-VirtualBox:~/Seminar$ git cat-file -p 32642624f83a94a0203fccc733ecf1323f2a32f
100644 blob 681c1b1e87c8a61c32a306a790a15ab0947b2 README.md
100644 blob 832794f0811c0985c2723aacc919f0811b3 new.txt
100644 blob 4ec19ca0f510914093b2ca1a3fa65770c6b746a test.txt
romeoan@romeoan-VirtualBox:~/Seminar$
```



# git stage

```
romecan@romecan-VirtualBox: ~/Seminar
clean
romecan@romecan-VirtualBox:~/Seminar$ git clean
fatal: clean.requireforce defaults to true and neither -i, -e, nor -f given; refusing to clean
romecan@romecan-VirtualBox:~/Seminar$ git clean
git: 'clean' is not a git command. See 'git --help'.

Did you mean this?
clean
romecan@romecan-VirtualBox:~/Seminar$ git history
git: 'history' is not a git command. See 'git --help'.
romecan@romecan-VirtualBox:~/Seminar$ git clear history
git: 'clear' is not a git command. See 'git --help'.

Did you mean this?
clean
romecan@romecan-VirtualBox:~/Seminar$ clear history
romecan@romecan-VirtualBox:~/Seminar$ clear history

romecan@romecan-VirtualBox:~/Seminar$ git read-tree --prefixubak 6683166fa5fdac024fb240c3d602260c29b590c
romecan@romecan-VirtualBox:~/Seminar$ git write tree
git: 'write' is not a git command. See 'git --help'.

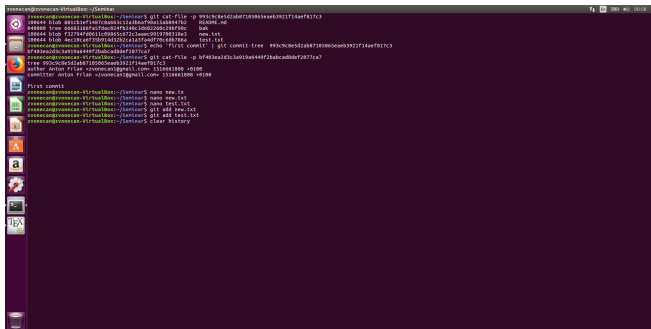
Did you mean one of these?
write-tree
romecan@romecan-VirtualBox:~/Seminar$ git write-tree
903c8c65d2ab07105865eaeb3921f14ae7817c3
romecan@romecan-VirtualBox:~/Seminar$ git cat-file --p93c8c65d2ab07105865eaeb3921f14ae7817c3
error: unknown switch 'p'
usage: git cat-file [-t [-allow-unknown-type]] [-s [-allow-unknown-type]] [-e] [-p] [-type] [--textconv] <object>
or: git cat-file [--batch | --batch-check] [--follow-symlinks]

<type> can be one of: blob, tree, commit, tag
-t          show object type
-s          show object size
-e          exit with zero when there's no error
-p          pretty-print object's content
--textconv  for blob objects, run textconv on object's content
--allow-unknown-type  allow -s and -t to work with broken/corrupt objects
--buffer    buffer --batch output
--batch[-formats]  show info and content of objects fed from the standard input
--batch-check[-formats]  show info about objects fed from the standard input
--follow-symlinks  follow in-tree symlinks (used with --batch or --batch-check)
--batch-all-objects  show all objects with --batch or --batch-check

romecan@romecan-VirtualBox:~/Seminar$ git clear history
romecan@romecan-VirtualBox:~/Seminar$ git cat-file -p 903c8c65d2ab07105865eaeb3921f14ae7817c3
100644 blob 081c1e1f487c4e60c123b64f9b051abb047b2  README.md
400000 tree 6683166fa5fdac024fb240c3d602260c29b590c  bak
100644 blob 71779f0861e39106527233aac095f760316d3  new.txt
100644 blob decc8ca0f331914e32b2ca1a3fa5d778c6b786a  Test.txt
romecan@romecan-VirtualBox:~/Seminar$
```

# git commit

- Sad samo commitamo stablo koje smo napravili te smo izvršili istu stvar koju git napravi kada nešto addamo i commitamo.



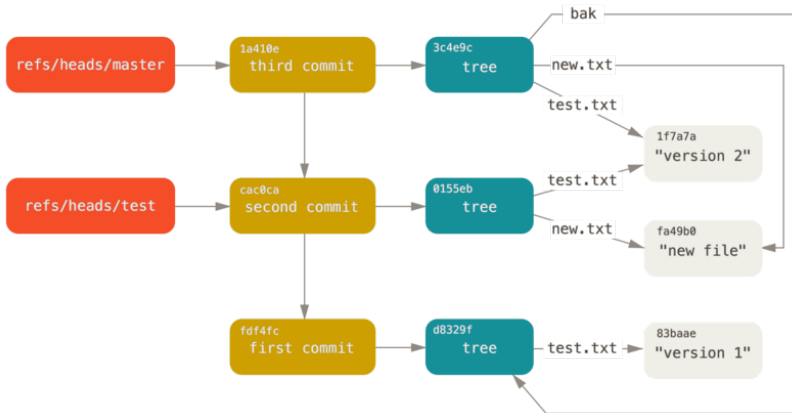
```
romecan@romecan-VirtualBox: ~/Seminar
romecan@romecan-VirtualBox:~/Seminar$ git cat-file -p 9939c9e3d2ab071898a5eab9321f14aef817c3
108664 blob 9831c1e3f9401c0a0d8c323a8e0f9ea10888f3d  README.md
408000 tree 0568116f6c5fdac24fb24dc3d0b208c28f56c  hak
108664 blob 123724f6e11109903c972c2e0cc929770d19a2  new.txt
108664 blob ac19c9eef3501643292c4c3afad0f70c4eb786a  test.txt
romecan@romecan-VirtualBox:~/Seminar$ echo 'first commit' && git commit -m 'first commit'
[master 9939c9e] first commit
1 file changed, 1 insertion(+), 1 deletion(-)
 create mode 100644 hak
 romecan@romecan-VirtualBox:~/Seminar$ git cat-file -p bf403ea223ca019a6440f28abcad8df207ca7
tree 9939c9e3d2ab071898a5eab9321f14aef817c3
author Anton Frlan <avrocar@gmail.com> 1538613806 +0100
committer Anton Frlan <avrocar@gmail.com> 1538613806 +0100

first commit
romecan@romecan-VirtualBox:~/Seminar$ nano new.txt
romecan@romecan-VirtualBox:~/Seminar$ nano new.txt
romecan@romecan-VirtualBox:~/Seminar$ git add new.txt
romecan@romecan-VirtualBox:~/Seminar$ git add new.txt
romecan@romecan-VirtualBox:~/Seminar$ git add test.txt
romecan@romecan-VirtualBox:~/Seminar$ git add test.txt
romecan@romecan-VirtualBox:~/Seminar$ Clear-History
```

# Branching

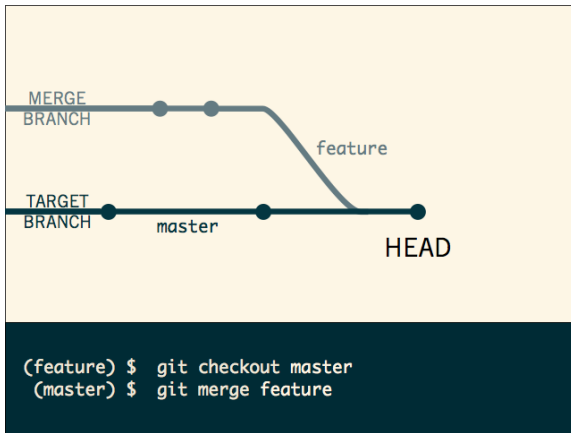
- Jedna od najbitnijih stvari u gitu je grananje.
- Ono omogućuje razvijanje i debugiranje zasebnih featura bez remećenja glavnog programa.
- Za ovo se mogu koristiti reference koje zamijene neki SHA-1 proizvoljnim imenom i odonda se toj novoj grani može pristupiti tim imenom, to jest prati HEAD te grane.

# Branching





# Merge



# HEAD

- Odmah nakon prvog commita u git, prvi se i onda svaki sljedeći commit oznacuje kao HEAD.
- HEAD je referenca koja pokazuje na granu na kojoj se trenutno nalazimo, makar postojala samo jedna.

- Tagovi su vrsta referenci i postoje lightweight and annotated.
  - Lightweight su vrsta referenci koji se ne miču, umjesto ostajući na jednom commitu
  - Annotated su složeniji tagovi koji stvore vlastiti objekt koji ima svoju referencu.



delete pokusa]

```
zvonecan@zvonecan-VirtualBox:~/Seminar$ git tag -a v.34 b85e06c32e4c0cf8517c5be8f480398d8db3c08e -m test tag
fatal: too many params
zvonecan@zvonecan-VirtualBox:~/Seminar$ git tag -a v.34 b85e06c32e4c0cf8517c5be8f480398d8db3c08e
zvonecan@zvonecan-VirtualBox:~/Seminar$ cat .git/refs/tags/v.34
5eba41754830deb19bf740f3483bc6dd37aba661
zvonecan@zvonecan-VirtualBox:~/Seminar$ git update-ref refs/tags/v.42 3cd591aab2835207569878a4d97efb1b83b7990d
zvonecan@zvonecan-VirtualBox:~/Seminar$ cat .git/refs/tags/v.42
3cd591aab2835207569878a4d97efb1b83b7990d
zvonecan@zvonecan-VirtualBox:~/Seminar$
```

- Remote je vrsta referenci koja se pokazuje na udaljeni repozitorij pomoću kojih se može fetchati (povući s udaljenog repozitorija da mozemo pogledati sadržaj), pushati (poslati na repozitorij) i pullati (povucć s udaljenog repozitorija te mergati) sadržaj tih repozitorija.

# Remov, diff i status

- Remove služi za brisanje pojedinih fileova iz trenutačne datoteke.
- Status uspoređuje zadnju commitanu verziju s onim što je napisano poslije i gleda jesu li te razlike stageane kako bi se mogle commitati.
- Diff uspoređuje razlike između zadnje commitane verzije i prvo stageanih promjena, ako nema onda svih promjena te ih ispisuje, a dodatci su zeleni i označeni s plusom, a što je izbrisano je crveno s minusom.

```
zvonecan@zvonecan-VirtualBox:~/Seminar
zvonecan@zvonecan-VirtualBox:~/Testing$ ls -la
...
zvonecan@zvonecan-VirtualBox:~/Testing$ git clone /home/zvonecan/Seminar
Cloning into 'Seminar'...
done.
zvonecan@zvonecan-VirtualBox:~/Testing$ ls -la
... Seminar
zvonecan@zvonecan-VirtualBox:~/Testing$ cd Seminar
zvonecan@zvonecan-VirtualBox:~/Testing/Seminar$ ls -la
... .git new.txt prez1 README.md Seminar.aux Seminar.dvi Seminar.log Seminar.nav Seminar.out Seminar.smm Seminar.tex Seminar.toc slike test.txt
zvonecan@zvonecan-VirtualBox:~/Testing/Seminar$ cd ..
zvonecan@zvonecan-VirtualBox:~/Testing$ cd ..
zvonecan@zvonecan-VirtualBox:~/Testing$ cd Seminar
zvonecan@zvonecan-VirtualBox:~/Seminar$ nano test
zvonecan@zvonecan-VirtualBox:~/Seminar$ nano test.txt
zvonecan@zvonecan-VirtualBox:~/Seminar$ git diff test.txt
diff --git a/test.txt b/test.txt
index c340e66..a7b9e9a 100644
--- a/test.txt
+++ b/test.txt
@@ 1,1,1 @@
-neki tekst verzija 2

drugi commit

d
+nuzja
-neso commit

nala promjena
+uradovic

nala git "zabava"
zvonecan@zvonecan-VirtualBox:~/Seminar$ git log --oneline --decorate
7776ae5 HEAD -> anton, origin/anton merge plz
7883b9e adrian
8c0c916 plz help
0cfb983 Update Seminar.tex
2e0d809 bore ponoci
703b9e8 update Seminar.tex
3e0cb85 Merge branch 'anton' of https://github.com/Zvonecan/Umutaraja-struktura-Git-a-1-Implementacija-osnovnih-komandi-Git-Internals- into anton
3cd591a (tag: v.42) svedno
3d2e425 Delete pokusaj 1
36c4409 pokusaj 1
ed7acc7 (origin/master, master) Update README.md
99a7764 Update README.md
54e4481 Update README.md
1bbd216 Update README.md
f7f050f formatiranje 1
ca3208e clonovi tina
zvonecan@zvonecan-VirtualBox:~/Seminar$
```

# Log i stash

- Log pokazuje povijest pojedinih grana. Tu se broje commitovi, autor, datum, vrijeme i reference.
- Stash privremeno sakriva necommitane promjene ako se iz nekih razloga treba nešto napraviti bez njih. Promjene ostaju skrivene u stashu dok ih se ne povрати nazad na stage.



[1] Merge,

<http://vimcasts.org/episodes/fugitive-vim-resolving-merge-conflicts-with-vimdiff/>



[2] Git internals i implementacija osnovnih komandi,

<https://git-scm.com/book/en/v2/Git-Internals-Plumbing-and-Porcelain>