

Git, verziókezelés

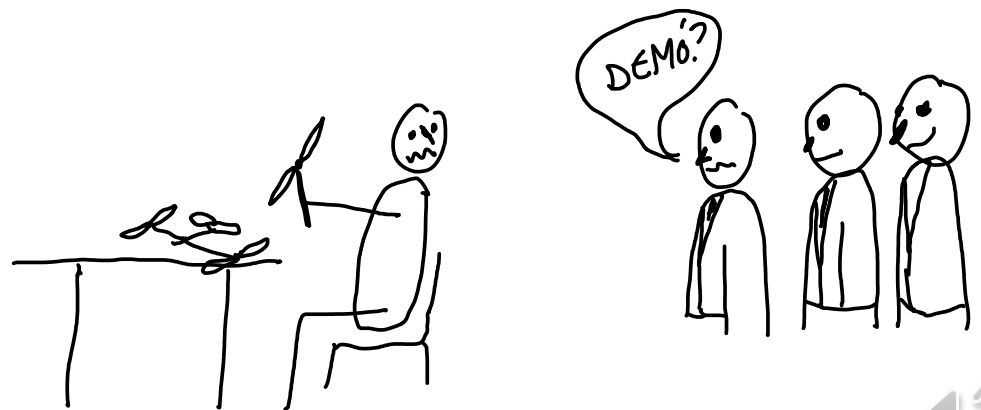
Csorba Kristóf (kristof@aut.bme.hu)

2019. ősz



“Tudunk gyorsan demózni egyet?”

“Persze, nem gond. Most kicsit darabokban van a rendszer, de mindjárt előveszek egy jót...”



Hajjaj...

20160905.zip

firmware2016szept06.zip

f_szept8.zip

demo_szept06.zip

demo0_javitva.zip

demo1_javitva_final.zip

demo2_felkesz.zip

demo2_ok.zip

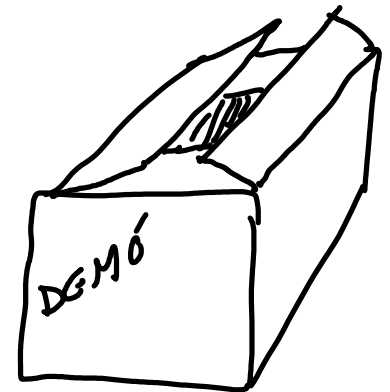
demo2_final.zip

demo2_final_megsem.zip



Mi a verziókezelés?

- Egyéni vagy csapatmunka követése
“zip – email – dropbox” helyett...
- Munkakönyvtár elmentett és megosztott állapotai, vissza lehet állítani
 - > legutolsó jó verzió
 - > “a márciusi demó verziója”
 - > ideiglenesen félrerakott verzió
- Párhuzamos munka összefésülése
Git, TFS, SVN, CVS, Perforce



Példa: cv4sensorhub repository



cv4sensorhub (dev) - Git Extensions

Start Repository Navigate View Commands Github Plugins Tools Help

E:\Projektek\cv4sensorhub\ dev Commit (6) Branches: Filter:

Commit	Author	Date
origin/gyorimihaly event graph refactor	Győri Mihály	5 months ago
refator, cos2 tesztek	Győri Mihály	6 months ago
Black treshold tests	Győri Mihály	6 months ago
origin/master Line breaks fixed.	Kristóf Csorba	7 months ago
Merge pull request #17 from bmeaut/pharmatech_docs	Kristóf Csorba	7 months ago
origin/pharmatech_docs Update PharmaTech's description on webpage	Ákos Köte	7 months ago
Update PharmaTech webpage	Ákos Köte	7 months ago
upgrades + refactor start	Győri Mihály	8 months ago
difference method added	Győri Mihály	8 months ago
dev origin/dev Merge pull request #16 from bmeaut/sumeghypeter	Kristóf Csorba	8 months ago
Diagram manipulator	Győri Mihály	8 months ago
origin/kristof small changes and fixes	Trkala Kristof	8 months ago
origin/sumeghypeter fix typo	s.peter	8 months ago
Schist segmenter histogram update	Győri Mihály	8 months ago
replace notimplemented exception with notsupported	s.peter	8 months ago

Commit File tree Diff (A: parent --> B: selection) Console

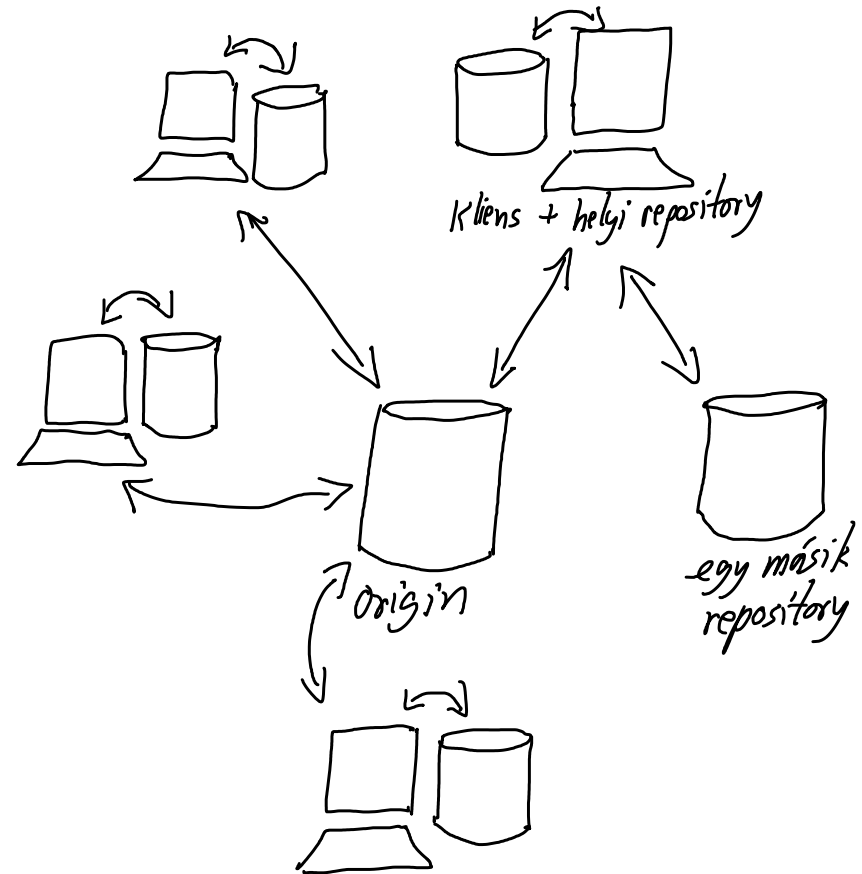
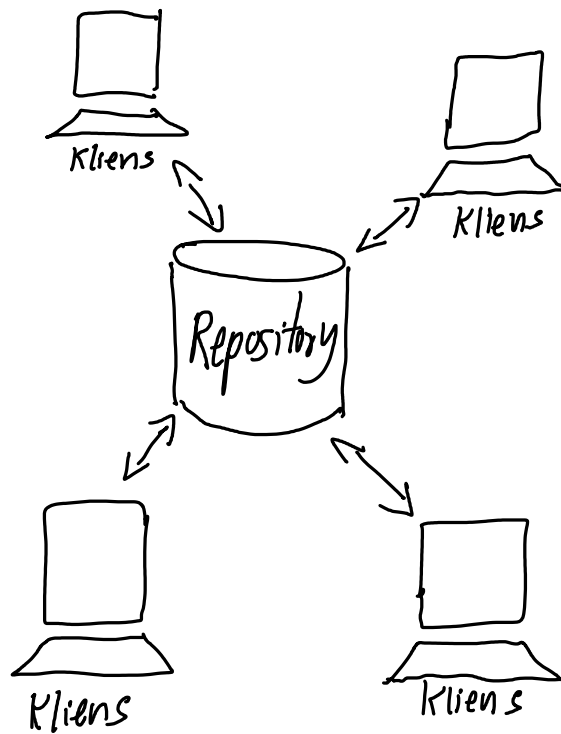
Filter files... Diff with parent ee75ff0e

- ChemoTracker/Helpers/LinkerEvaluationHelper.cs
- ChemoTracker/Helpers/LivePolylineLinkerHelper.cs
- ChemoTracker/Operations/LinkerEvaluationOperations.cs
- ChemoTracker/Operations/LivePolylineLinkerOperations.cs**
- ChemoTracker/Operations/PathOperation.cs
- ChemoTrackerTests/BlobLocationHelperTests.cs
- ChemoTrackerTests/ChemoTrackerTests.csproj

```
24 26 {
@@ -46,7 +48,7 @@ namespace ChemoTracker.Operations
{
    base.OnCanvasMouseDown(sender, e, entity, canvasPosition);
49 - if (!IsAssignableBlob(entity))
51 + if (!LivePolylineLinkerHelper.IsAssignableBlob(entity))
    return;
50 52
51 53
52 54 var activeParticle = Container.GetEntityByTag(LivePolylineLinkerO
```



Centralizált vagy decentralizált



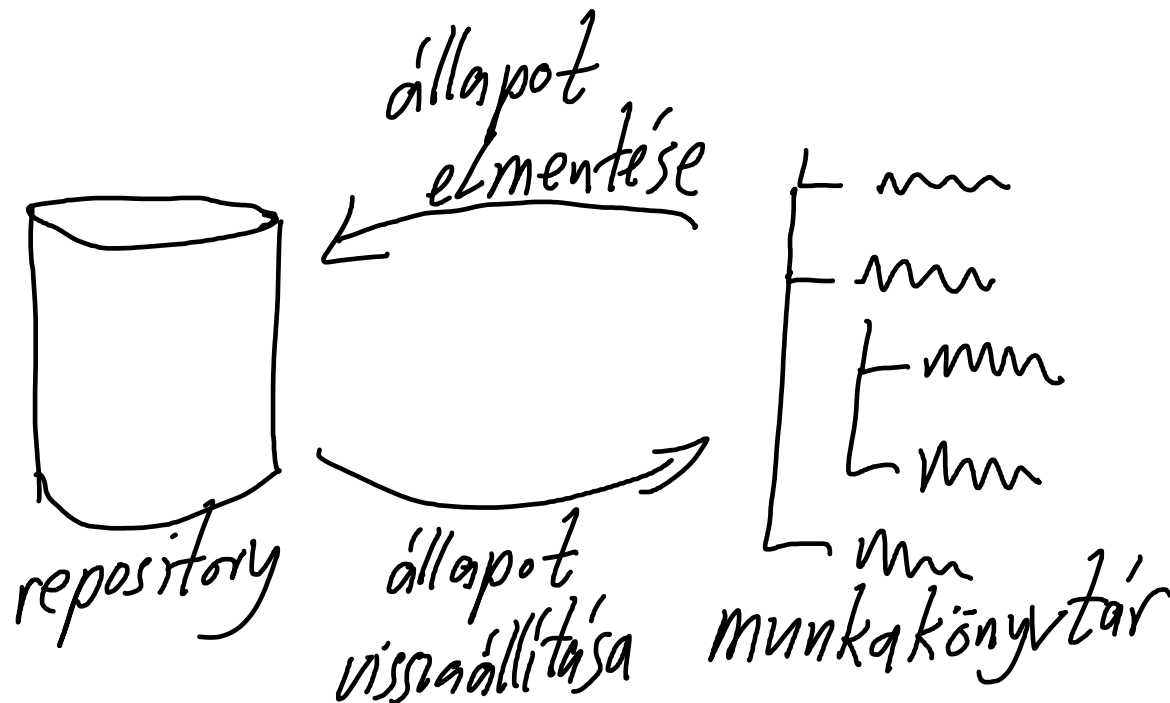
Mit verziókezelünk?

IGEN (ami a fordításhoz kell)	NEM (ami generálódik vagy felhasználó specifikus)
forráskód fájlok (LaTeX diplomaterv) projekt fájlok (pro, pri, sln...) erőforrások: ico, svg, png... .gitignore	fordítás eredményei *.obj, *.o, *.exe (ami generálódik) Felhasználói beállítások: *.user, *.filter



Repository és munkakönyvtár

 ..[..]	<DIR>
 [.git]	<DIR>
 [PanicButton]	<DIR>
 .gitignore	90

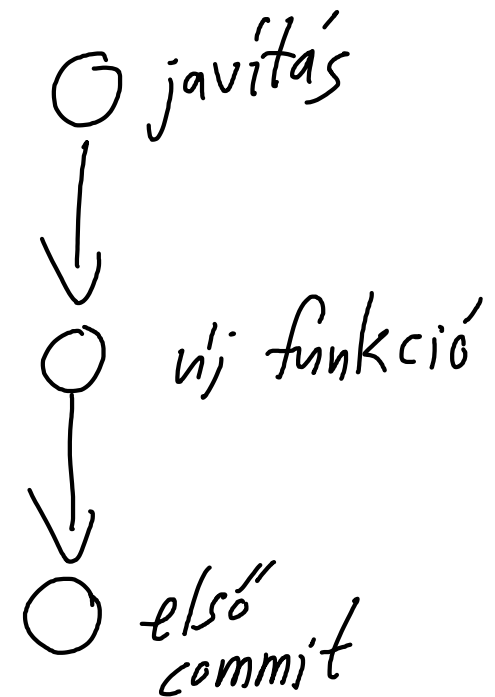


Commitok és gráfjuk

```
diff --git a/PanicButton/state.c b/PanicButton/state.c
index 695d993..413ad58 100644
--- a/PanicButton/state.c
+++ b/PanicButton/state.c
@@ -1,7 +1,7 @@
#include "state.h"

const char *stateStrings[] =
-{ "Init", "Normal", "SendSick" };
+{ "Init", "Normal", "SendSick", "SendPanic" };

const char *state2text(State currentState)
{
```



history: korábbi commitok sorozata

Hogyan lesz nekem ilyen?

- Git (win: saját shell, parancssoros), GitExtensions, pl. GitHub (student license)

<https://git-scm.com/>

<http://code.google.com/p/gitextensions/>

<https://github.com/>

GitExt



Git ↔ GitHub.com

```
$ git init  
Initialized empty Git repository in c:/temp/.git/
```

vagy clone...



GitHub.com

- Public és private repository (student license)
- Git server
- issue tracker (assignee, labels, milestone)
- Wiki



Snippetek

- Snippetek: <http://bmeaut.github.io/snippets/#git>
- Pro.Git könyv: <https://git-scm.com/book/en/v2>
- Kulcsgenerálás, GitExtensions, github első lépések
<https://www.youtube.com/watch?v=OntibzA4038>
- Git első fejlesztési lépések (merge, rebase)
<https://youtu.be/OOHnNx1M2aY>
- Demó (színekkel):
<https://youtu.be/OOHnNx1M2aY>

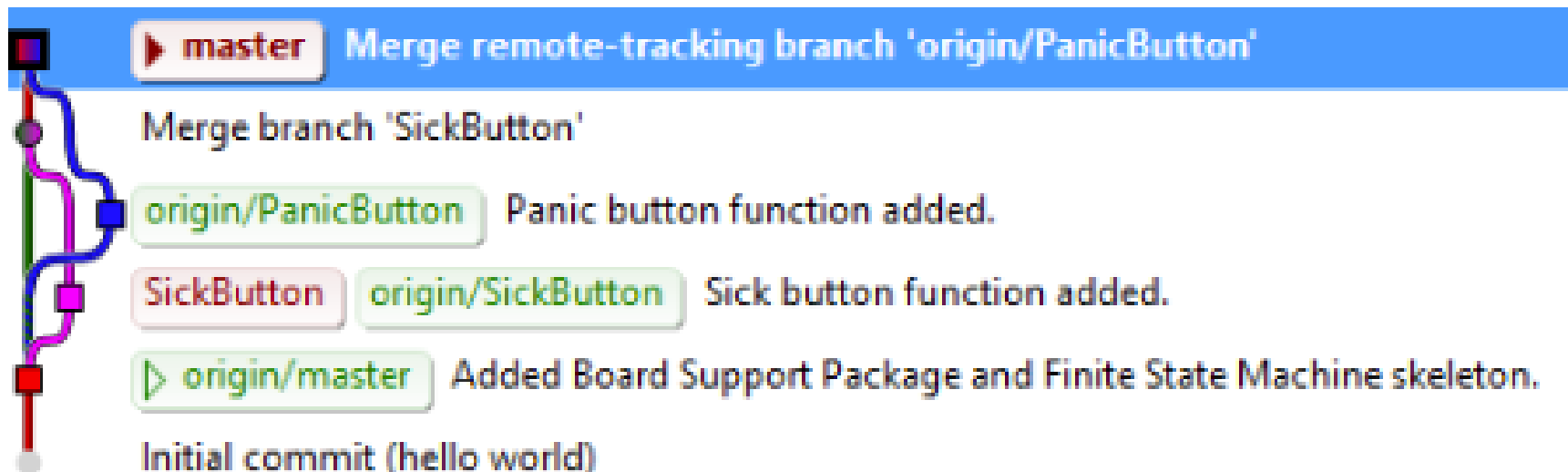


A commit gráf, alapműveletek



A commit gráf (fa, merge commit)

- Commitok és szülő(k)
- Branchek (local, remote)
- Merge commit



Műveletek: Staging, commit (push)

The screenshot shows the Git GUI window titled "Commit to master (E:\Oktatas\AlkFejl\GitPelda\Andezit\)".

Working dir changes:

- + PanicButton/main.c.orig
- + PanicButton/state.c.orig
- + PanicButton/state.h.orig

Unstaged changes:

- PanicButton/main.c
- PanicButton/state.c
- PanicButton/state.h

Diff view:

```
1 diff --git a/PanicButton/state.c b/PanicButton/state.c
2 index 695d993..413ad58 100644
3 --- a/PanicButton/state.c
4 +++ b/PanicButton/state.c
5 @@ -1,7 +1,7 @@
6  #include "state.h"
7
8  const char *stateStrings[] =
9  -{ "Init", "Normal", "SendSick" };
10 +{ "Init", "Normal", "SendSick", "SendPanic" };
11
12 const char *state2text(State currentState)
13 {
14
```

Commit actions:

- Commit
- Commit & push
- Reset changes
- ☐ Amend Commit

Commit message: Merge remote-tracking branch 'origin/PanicButton'

Conflicts:

- PanicButton/main.c
- PanicButton/state.c
- PanicButton/state.h

Hand-drawn annotations:

- A stack of papers icon is drawn over the "Working dir changes" list.
- A box icon is drawn over the "Unstaged changes" list.
- A box icon is drawn over the "Conflicts" list.



A commit message...

“töröltem a default.ini-t”

“áthelyeztem az InitSettings osztályt”

“már majdnem kész...”



Ez egy kicsit fagy...

“javítások”

“small fixes”



“Új kezdőlap” 

néha előfordul

“ADC init hiba javítva”

“#1344 könyvtár jogosultság javítva”

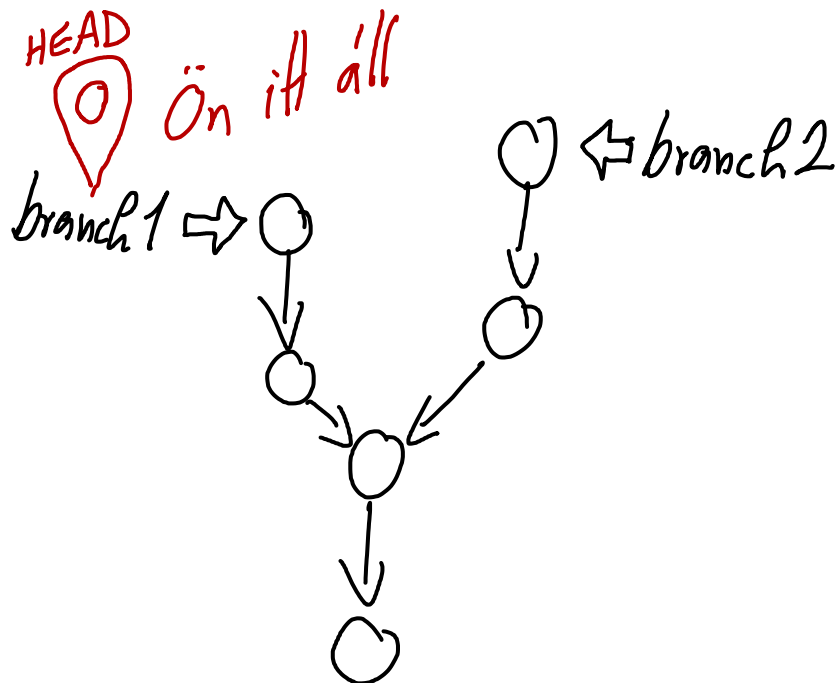
Issue number ☺

Nem mit (az látszik), hanem miért!



Branchek, vagyis ágak...

- A branch csak egy hivatkozás egy commit-ra.
- A tag is ilyen, csak nem mozog vele tovább
- HEAD referencia: amire commitolni fogok

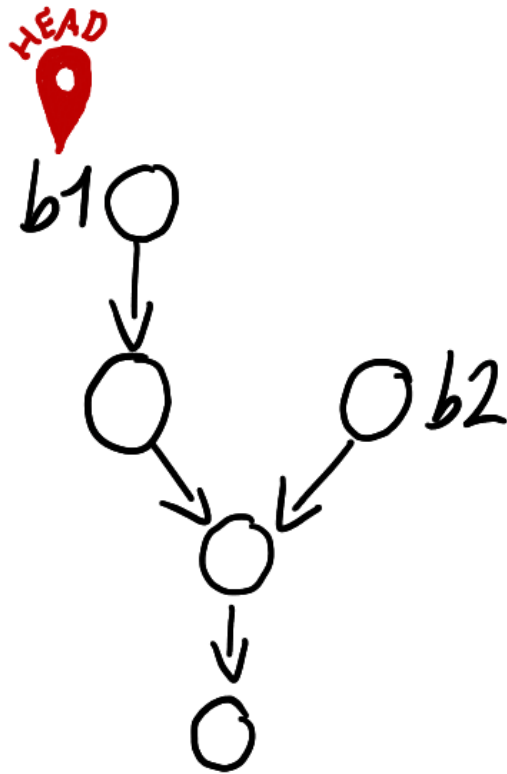


“Most akkor hol is tartok/tartunk?”

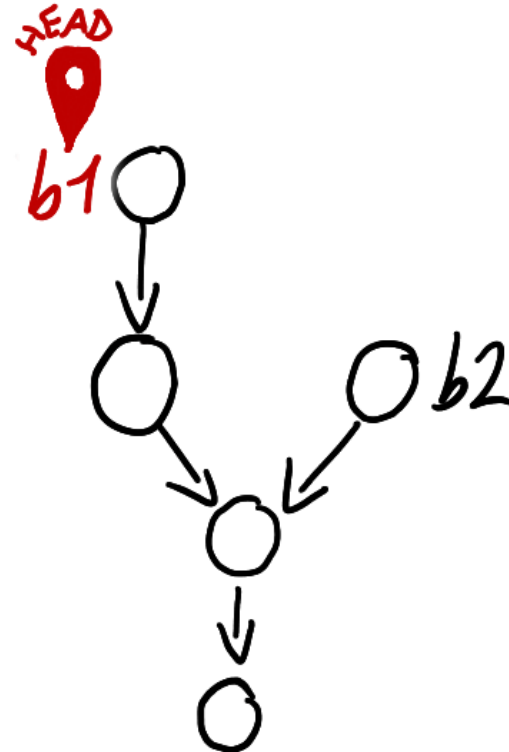


Branchek: mozgás, mozgatás

Checkout



Reset



A checkout új branchet is létre tud hozni adott commitra.



Reset

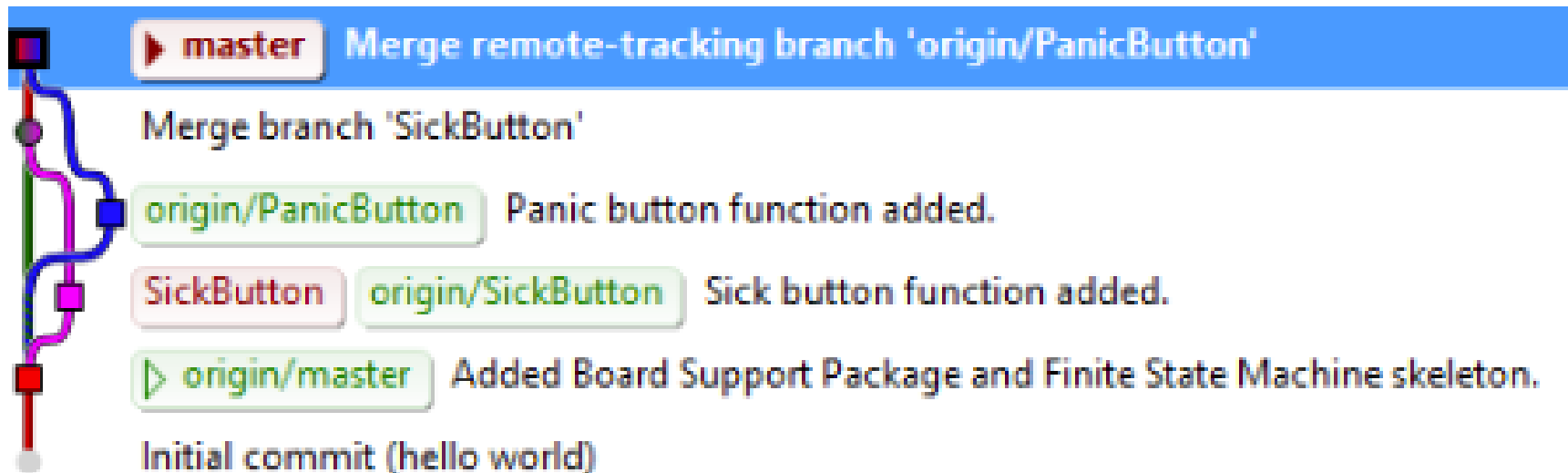
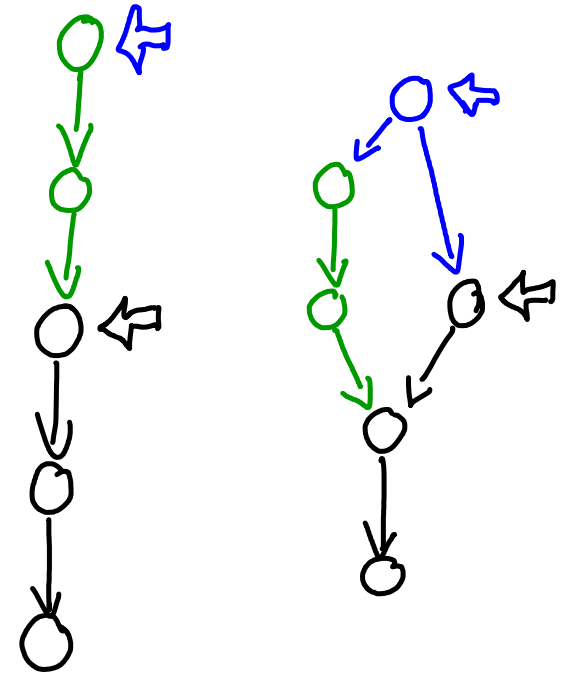
Reset type

- ☐ Soft: leave working dir and index untouched
- ☐ Mixed: leave working dir untouched, reset index
- ☒ Hard: reset working dir and index (discard ALL local changes, even uncommitted changes)



Műveletek: merge

Merge commit vagy fast forward...



Műveletek: 3-way merge (KDiff3)

state.h.BASE <-> state.h.LOCAL <-> state.h.REMOTE - KDiff3

File Edit Directory Movement Diffview Merge Window Settings Help

A (Base): kktatas\AlkFej\GitPelda\Andezit\PanicButton\state.h.BASE
Top line 1 Encoding: System Line end style: DOS
/** Finite state machine state definitions
#pragma once
#ifndef STATE_H
#define STATE_H

typedef enum
{
Init = 0,
Normal
} State;

const char *state2text(State currentState)
#endif // STATE_H

B: E:\Oktatas\AlkFej\GitPelda\Andezit\PanicButton\state.h.LOCAL
Top line 1 Encoding: System Line end style: DOS
/** Finite state machine state definitions
#pragma once
#ifndef STATE_H
#define STATE_H

typedef enum
{
Init = 0,
Normal,
SendSick
} State;

const char *state2text(State currentState)
#endif // STATE_H

C: E:\Oktatas\AlkFej\GitPelda\Andezit\PanicButton\state.h.REMOTE
Top line 1 Encoding: System Line end style: DOS
/** Finite state machine state definitions
#pragma once
#ifndef STATE_H
#define STATE_H

typedef enum
{
Init = 0,
Normal,
SendPanic
} State;

const char *state2text(State currentState)
#endif // STATE_H

Output: PanicButton\state.h [Modified] Encoding for saving: Codec from C: System Line end style: DOS (A, B, C)

/** Finite state machine state definitions. */
#pragma once
#ifndef STATE_H
#define STATE_H

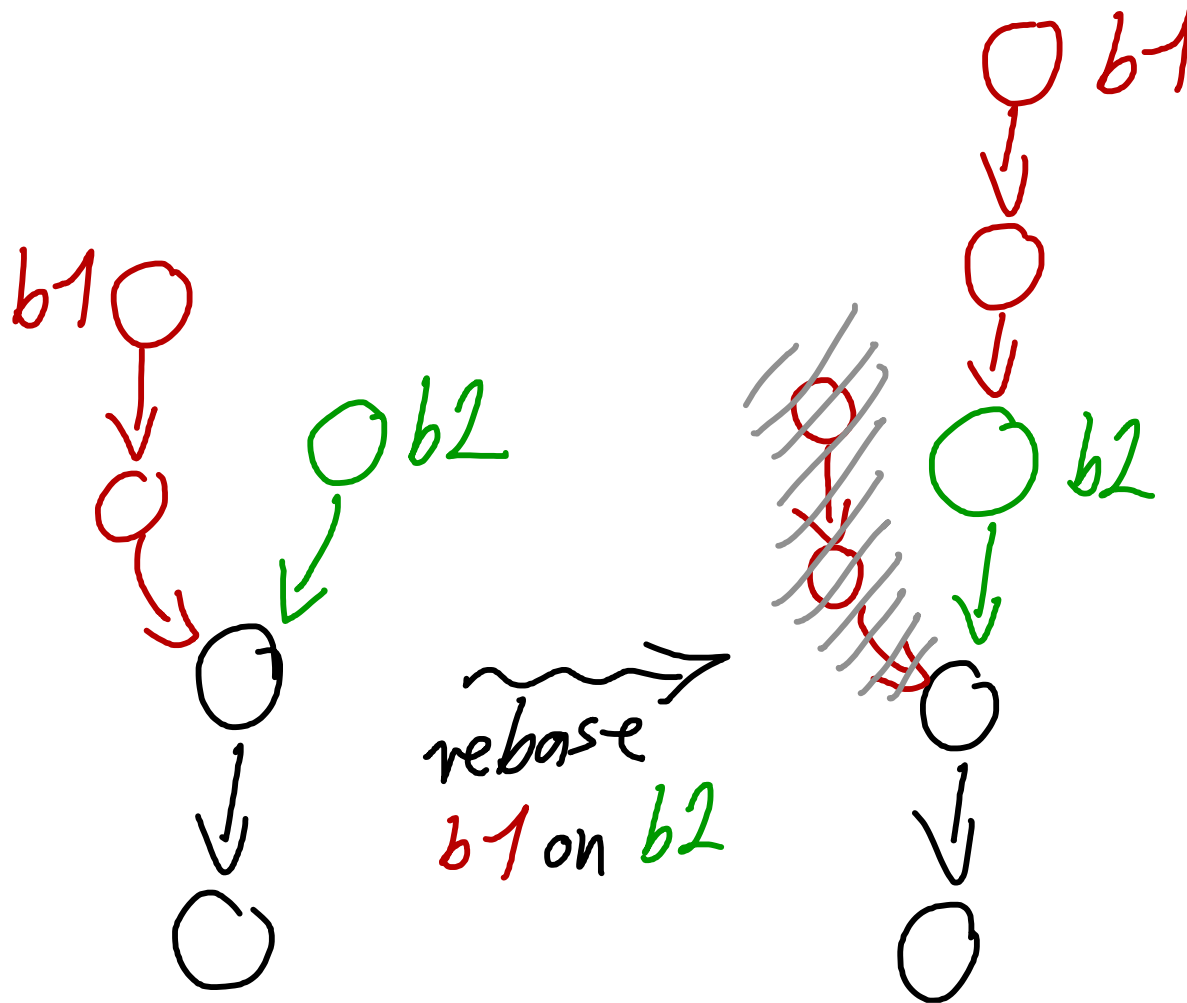
typedef enum
{
Init = 0,
Normal,
SendSick
SendPanic
} State;

const char *state2text(State currentState);
#endif // STATE_H

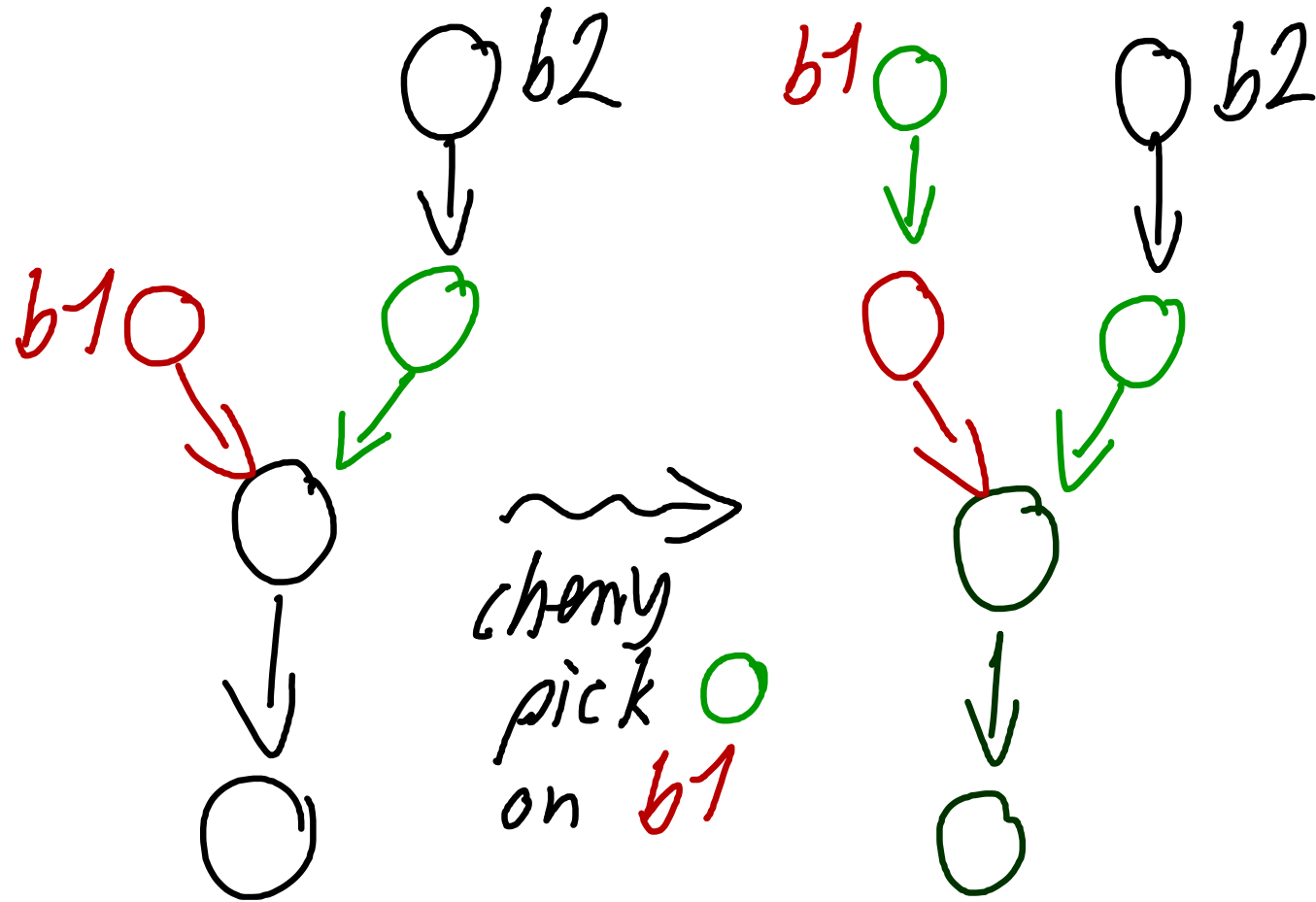
eredmény

remote
local
base

Rebase

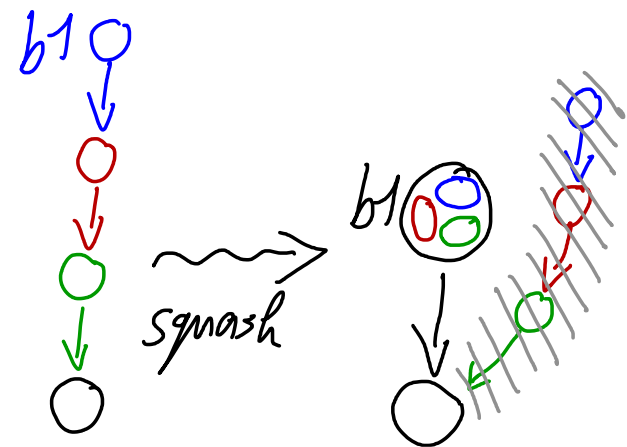


Cherry picking



git rebase -i HEAD~3

(Squashing)



```
pick 5b74f4a Uj nulladik sor es modosított masodik sor.  
s 3c234c5 Negyedik sor  
s 2c18aaf Otodik sor
```

```
# Rebase 5a1b6e1..2c18aaf onto 5a1b6e1
```

```
#
```

```
# Commands:
```

```
# p, pick = use commit
```

```
# r, reword = use commit, but edit the commit message
```

```
# e, edit = use commit, but stop for amending
```

```
# s, squash = use commit, but meld into previous commit
```

```
# f, fixup = like "squash", but discard this commit's log message
```

```
# x, exec = run command (the rest of the line) using shell
```

```
#
```

```
# These lines can be re-ordered; they are executed from top to bottom.
```

```
#
```

```
# If you remove a line here THAT COMMIT WILL BE LOST.
```

```
#
```

```
# However, if you remove everything, the rebase will be aborted.
```

```
#
```

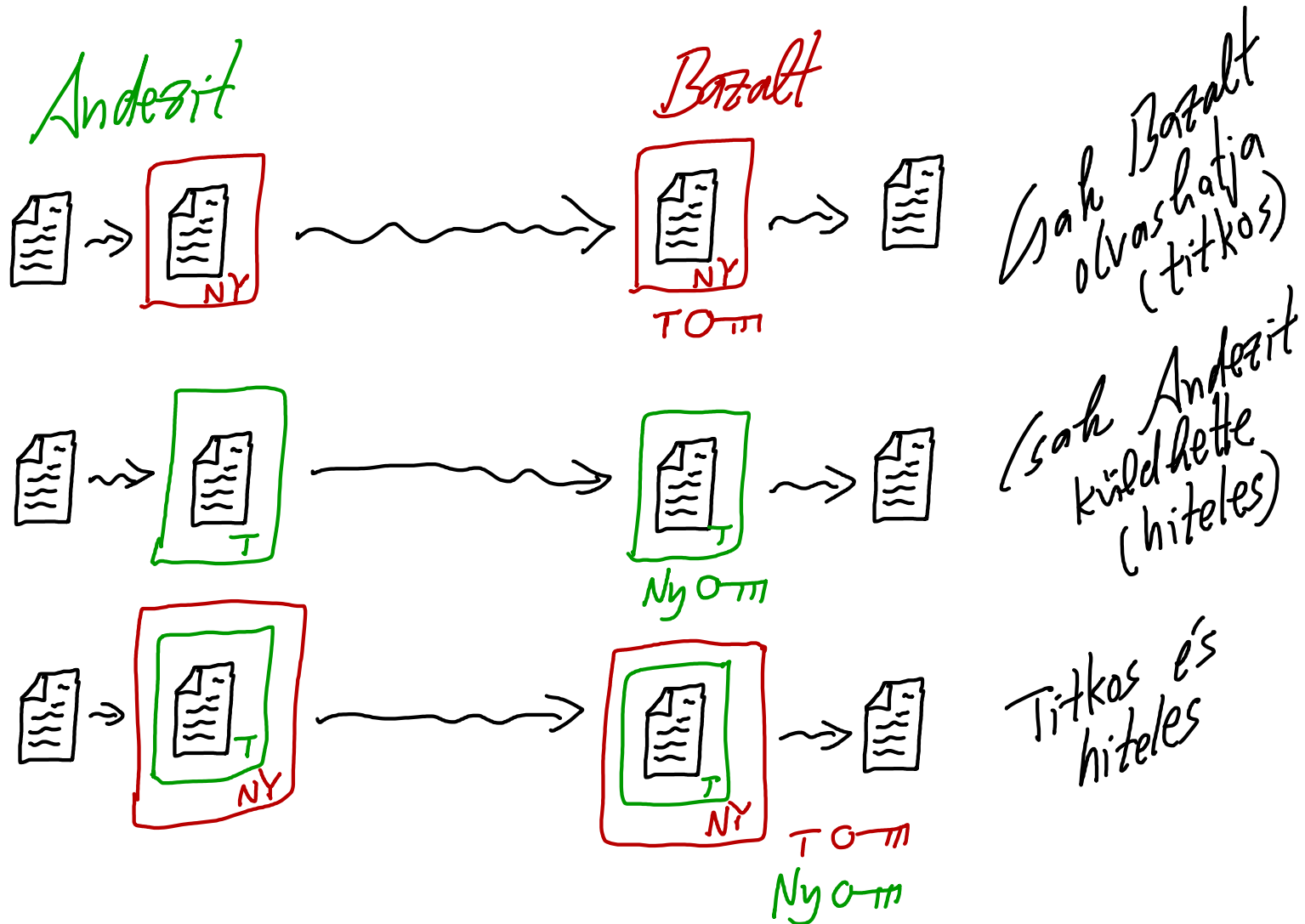
```
# Note that empty commits are commented out
```



Jogosultság kezelés, remote

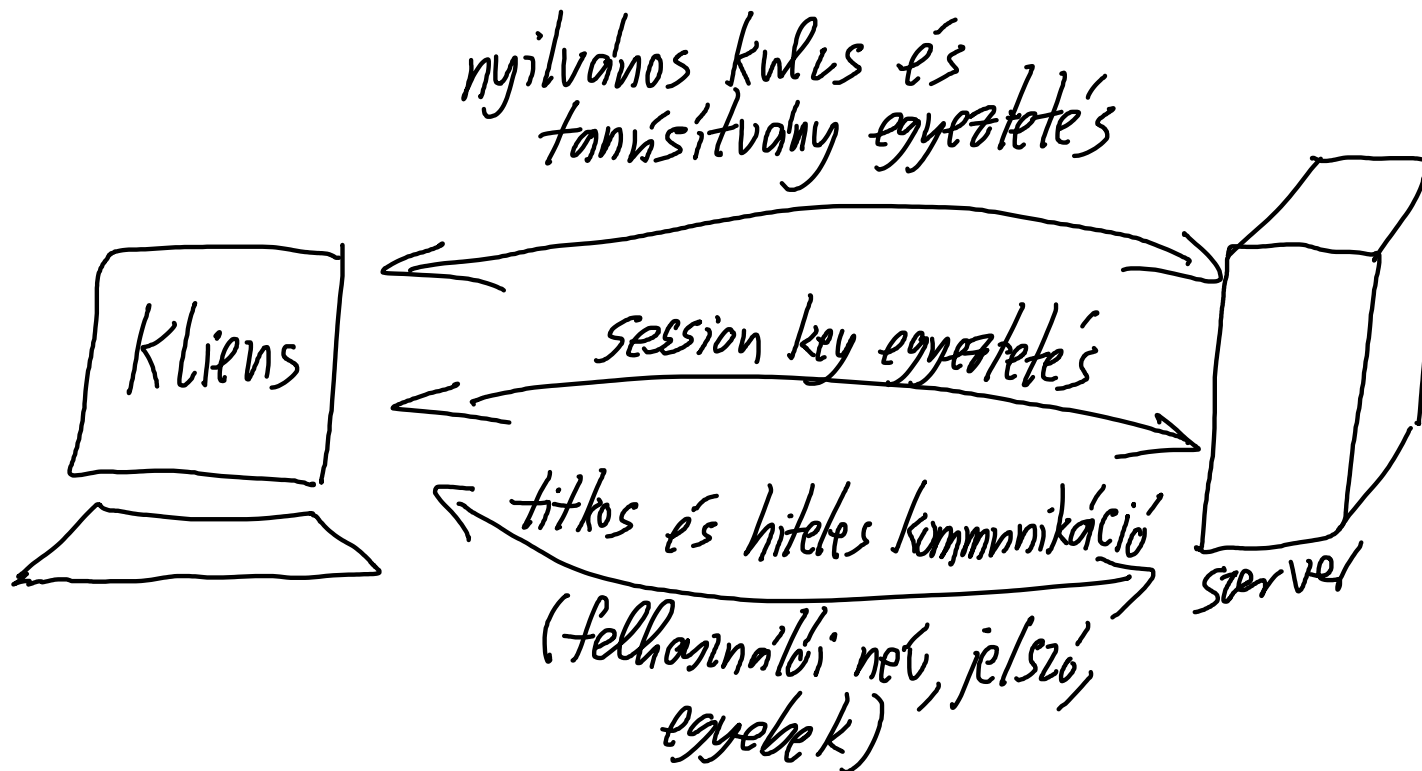


Kitérő: nyilvános kulcsú titkosítás



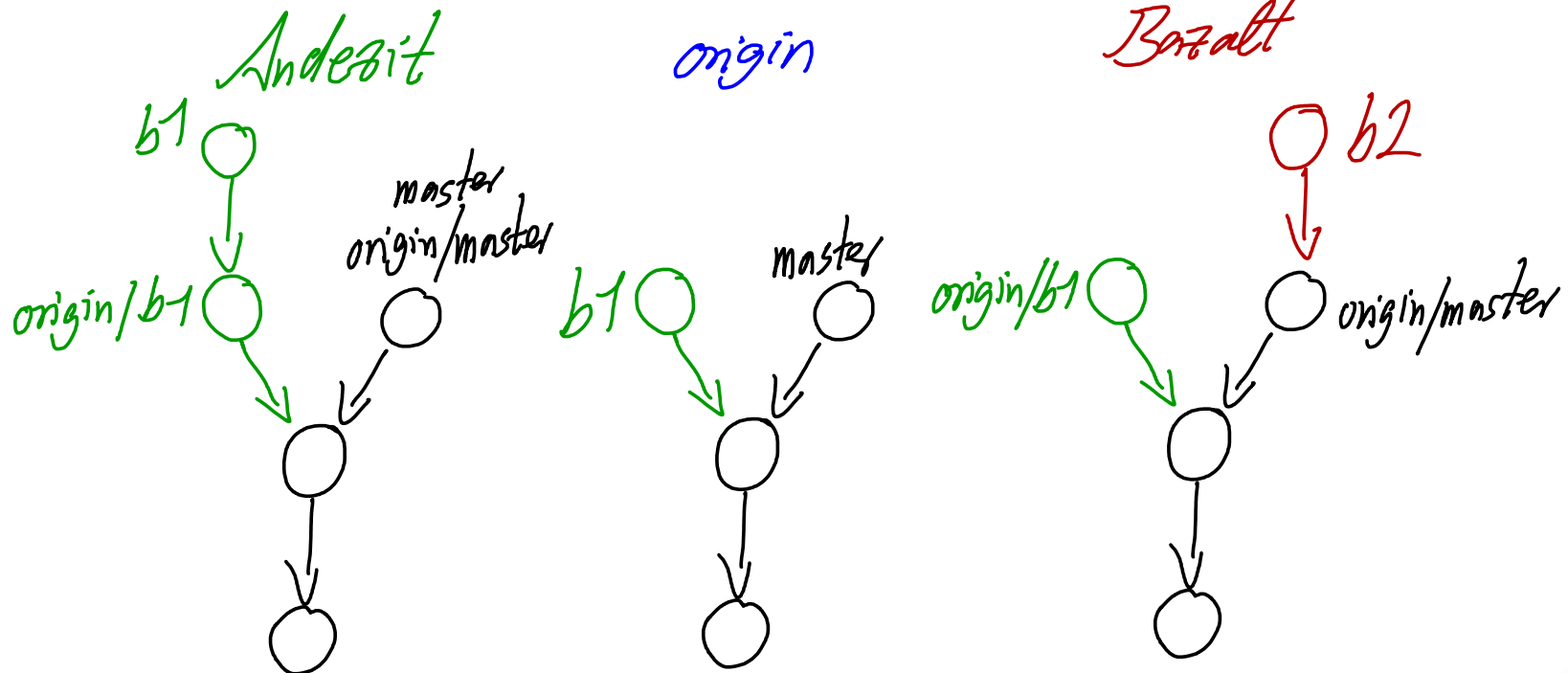
Git autentikáció

- SSH kulcs alapú
- felhasználói név és jelszó

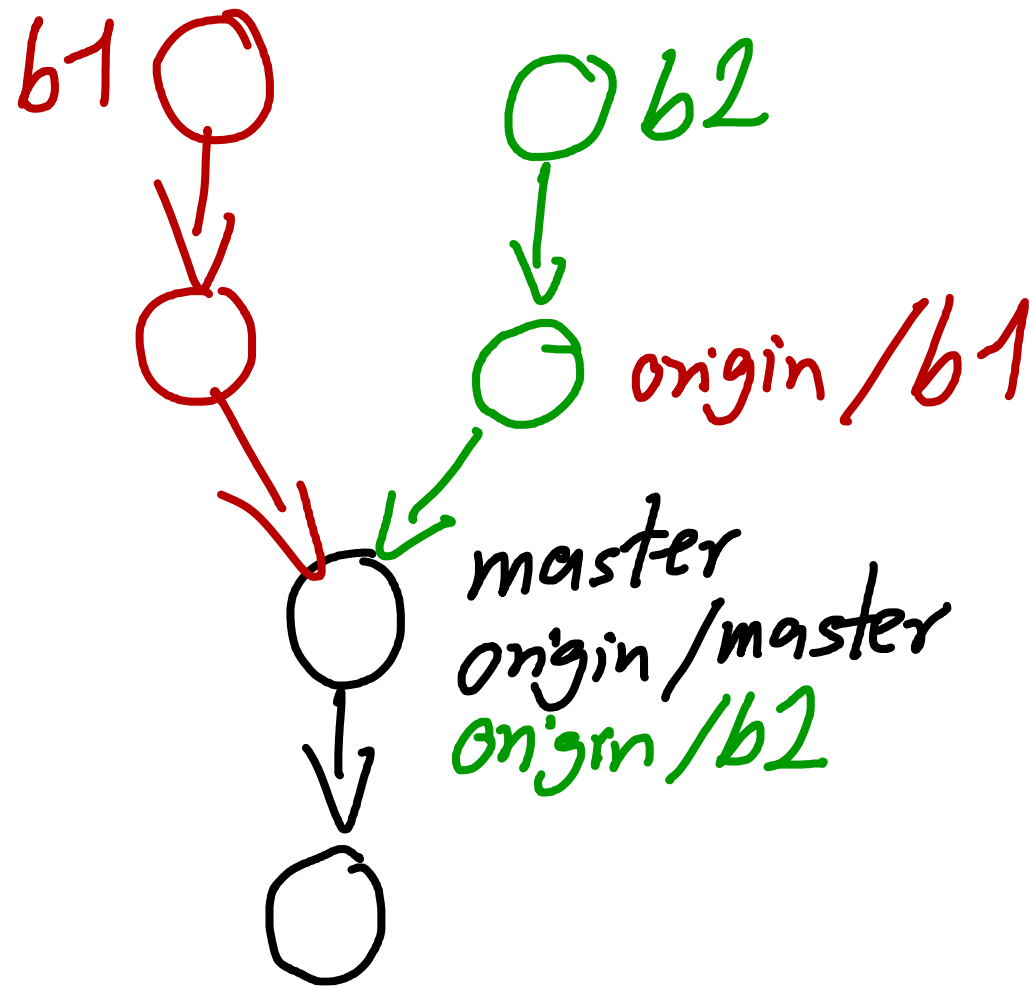


Remote

- Egy vagy több (origin)
- bare repository: nincs munkakönyvtár (origin)
- push, fetch, pull (=fetch+merge)



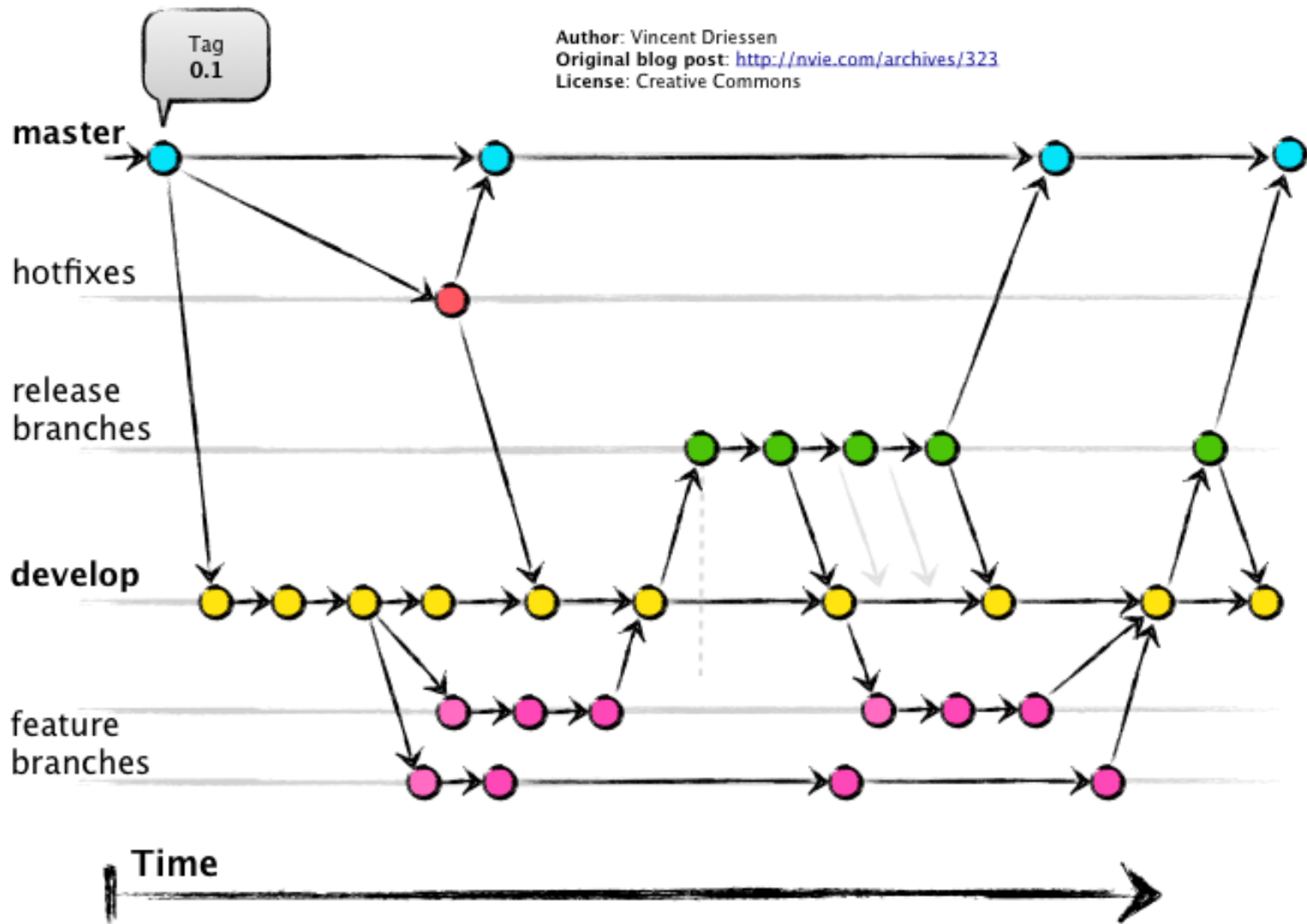
Push és force push



Hogyan használjuk?



Git Flow



Feature flagek és master branch

- Minden feature branch a master-re mergelődik.
- Feature flag-ek kikapcsolják, ami még nincs készen.
 - > Feature flag logika, pl. publikus, alfa és beta teszterek, A-B testing



Félelmek, és amikor megbomlik a rend

Mikor tűnik el valami véglegesen?

Hova tűnt a tegnapi munkám???

Ezt most miért vontad vissza???

Waaaa, nem megy semmi a merge után!

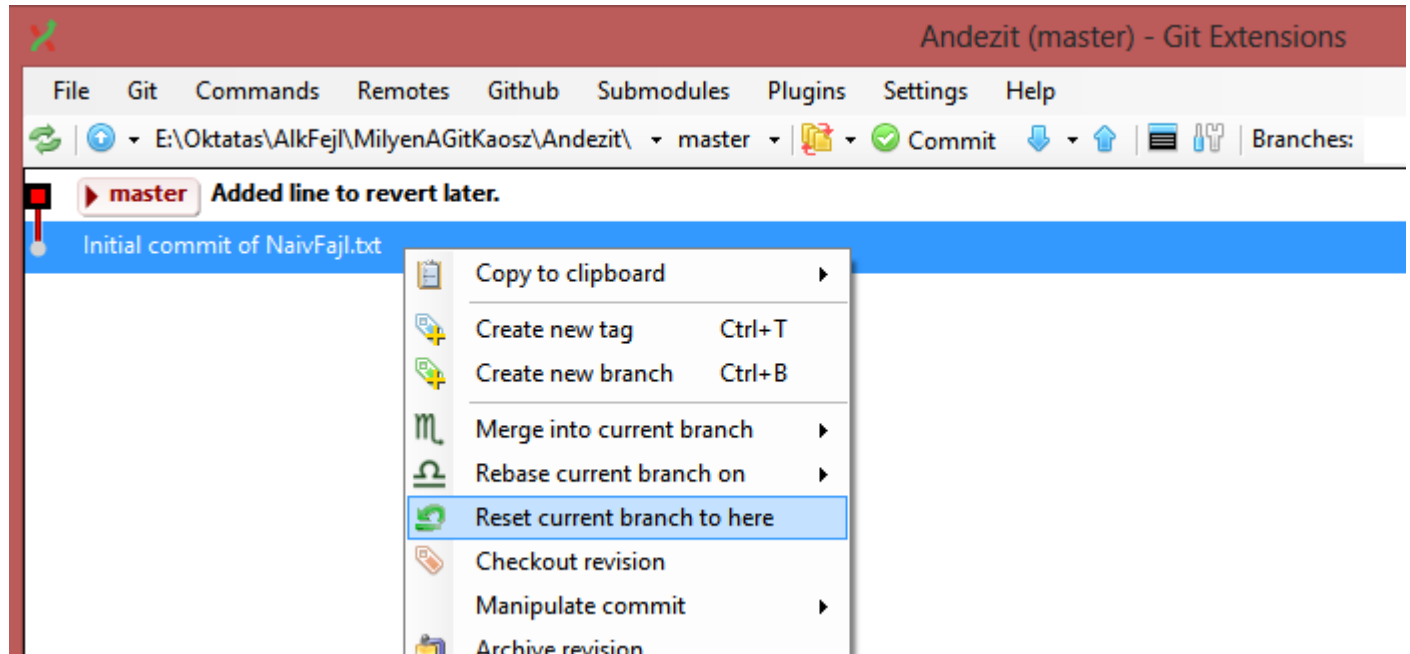
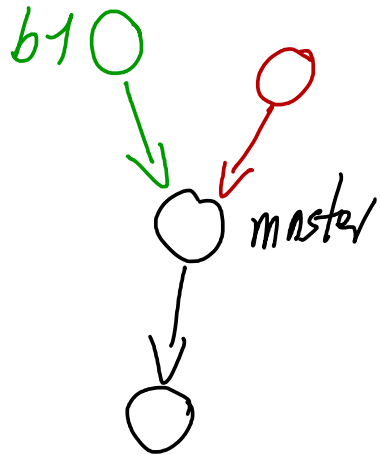
Ne oda commitolj, te!

Na most mi vaaaaan????

Lord Meldrum: “A világ megbolondult. Megyek, lefekszem!”



Elveszített commit



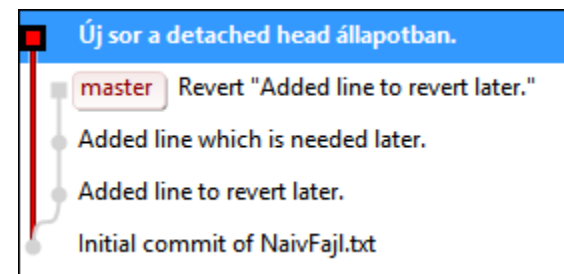
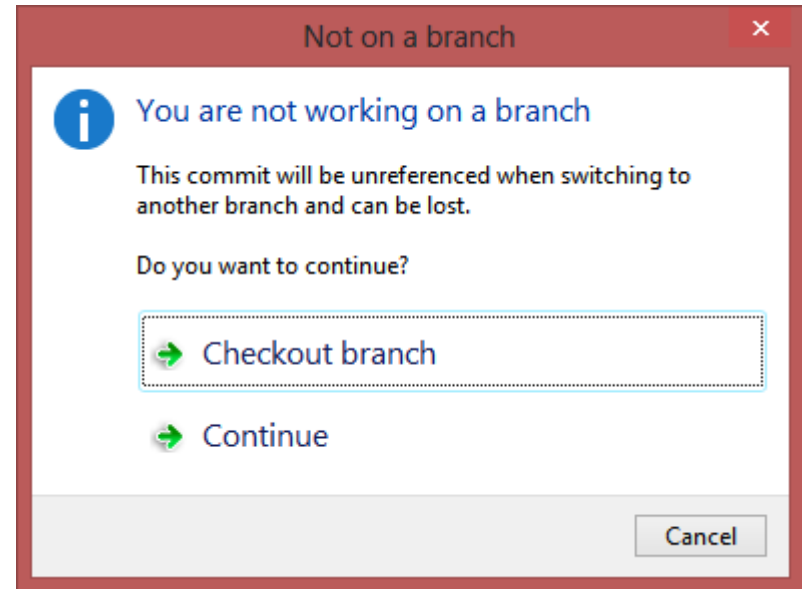
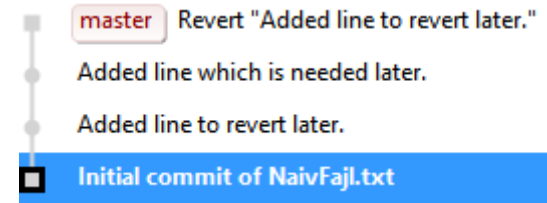
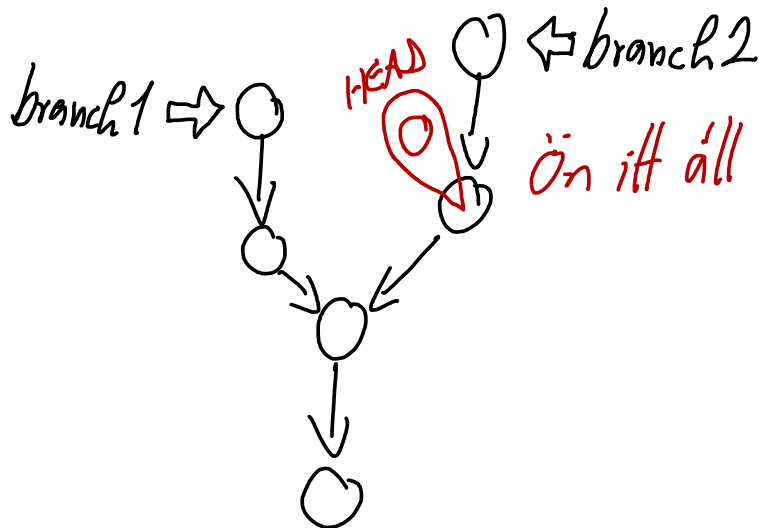
```
$ git reflog
af6290e HEAD@{0}: reset: moving to af6290ef74fdf4696d9da1319d7f33cdc3ab1b33
6c10c8e HEAD@{1}: commit: Added line to revert later.
af6290e HEAD@{2}: commit (initial): Initial commit of NaivFajl.txt
```

```
$ git reset 6c10c8e
```

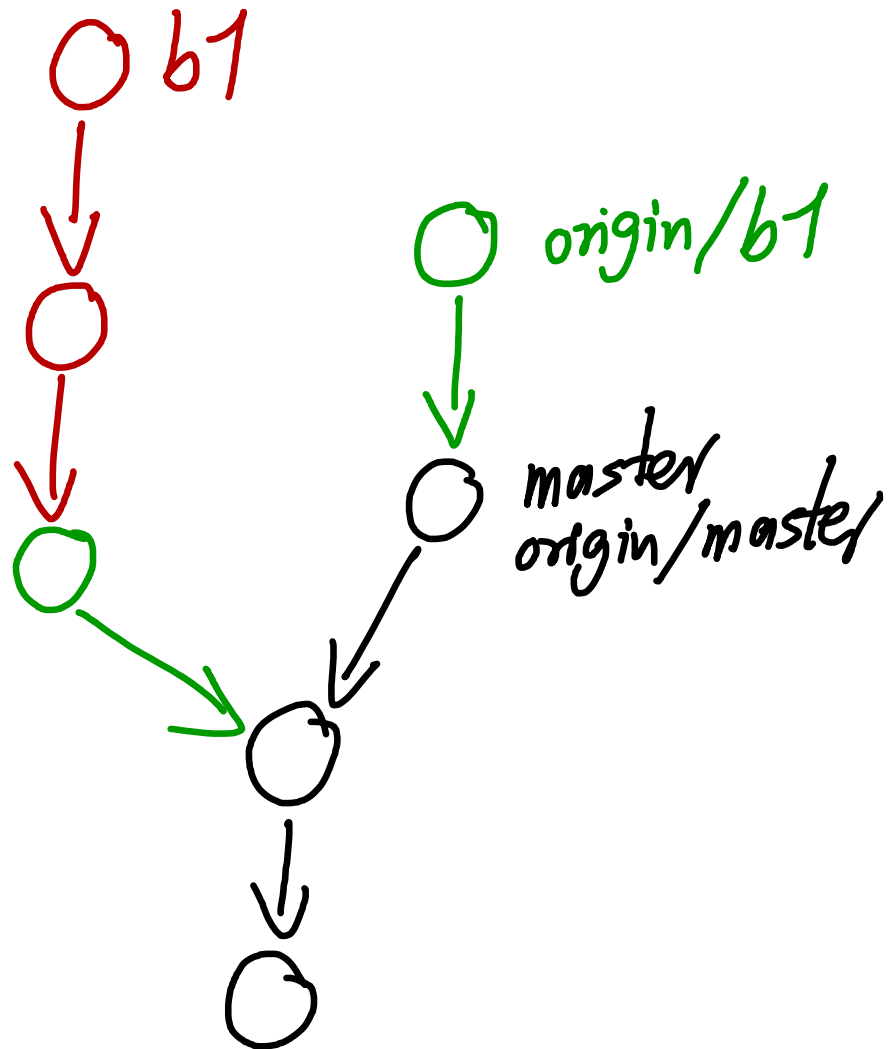


Detached head

- HEAD: amire commitolunk checkout
(nem “reset current branch to here”!)

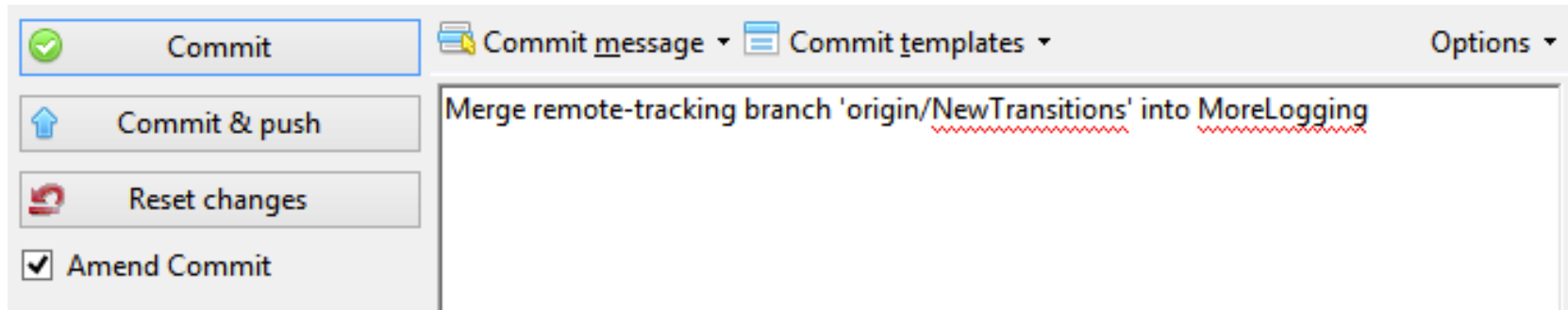
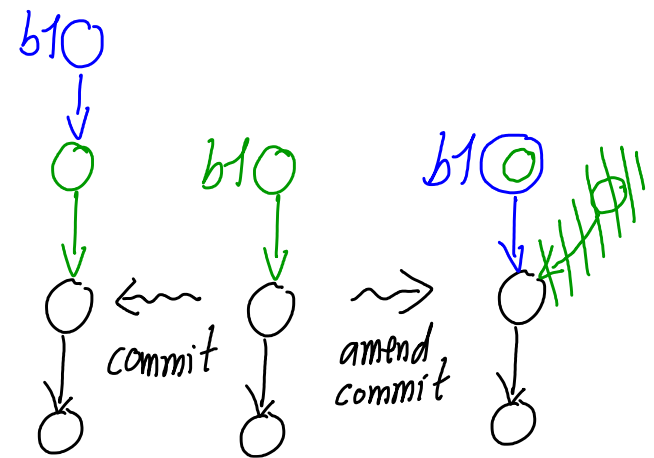


Push rebase előtt



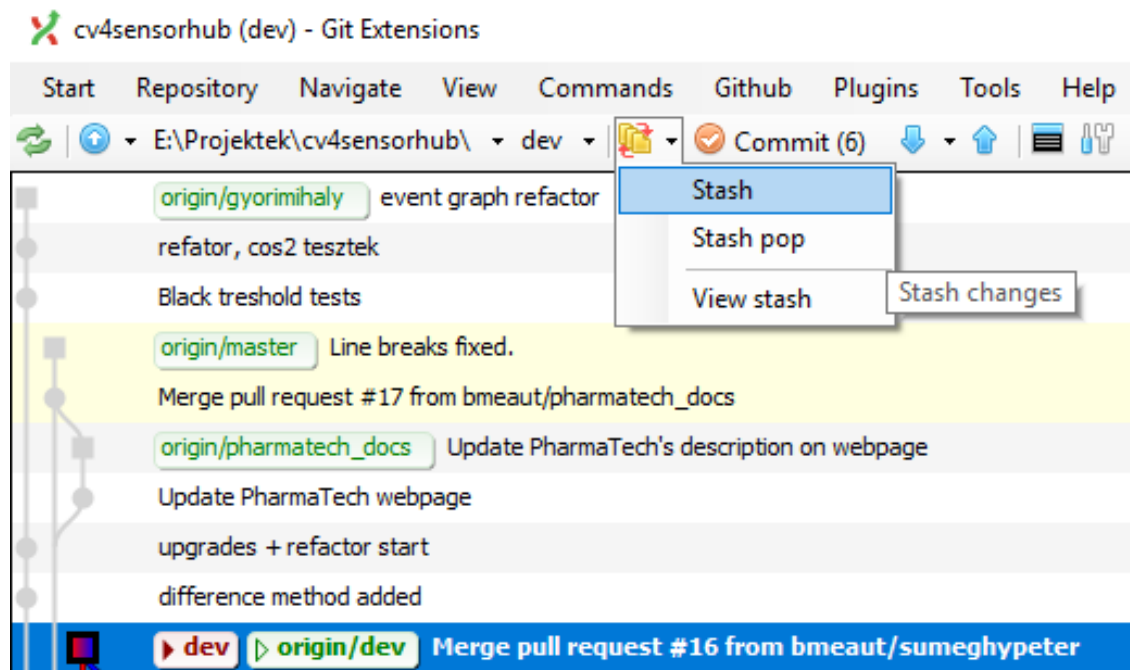
Amend commit

Csak ha még nem push-oltunk!

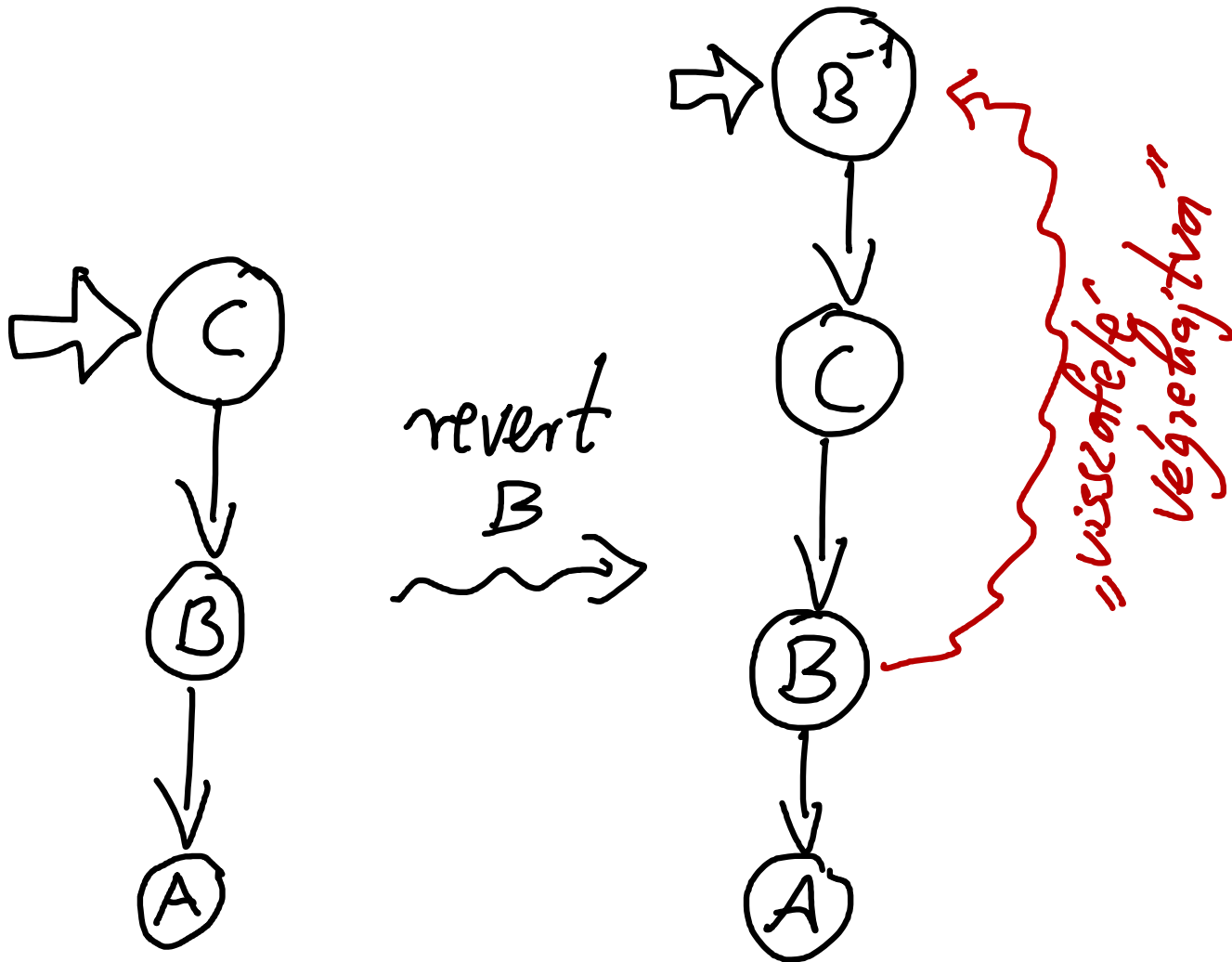


Stash

- Még nem commitolt változásokat “félrerakja”
- stash push (félrerakás)
- stash pop (visszeszedés)



revert



Ha már késő reset-elni...



Köszönöm a figyelmet!

