

Математическое моделирование. Лабораторная Работа №1

Работа с git

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Информация

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- https://github.com/VARdamn/study_2024-2025_mathmod

Вводная часть

- Знакомство с системой контроля версий git

Выполнение лабораторной работы

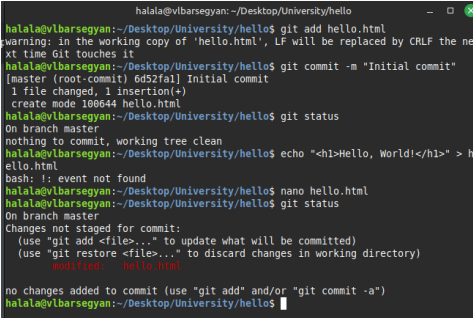
1. Настроим параметры установки окончаний строк и отображения unicode для устройства Linux. После, в папке *hello* создадим файл *hello.html* с содержимым, и инициализируем пустой git-репозиторий

```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~$ git config --global core.autocrlf input
halala@vlbarsegyan:~$ git config --global core.autocrlf true
halala@vlbarsegyan:~$ git config --global core.quotePath off
halala@vlbarsegyan:~$ cd D
Desktop/ Documents/ Downloads/
halala@vlbarsegyan:~$ cd Desktop/University/
halala@vlbarsegyan:~/Desktop/University$ mkdir hello && cd hello
halala@vlbarsegyan:~/Desktop/University/hello$ touch hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ echo "Hello, World!" > hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git init
hint: Using 'master' as the name for the initial branch. This default branch name
hint: is subject to change. To configure the initial branch name to use in all
hint: of your new repositories, which will suppress this warning, call:
hint:
hint:   git config --global init.defaultBranch <name>
hint:
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and
hint: 'development'. The just-created branch can be renamed via this command:
hint:
hint:   git branch -m <name>
Initialized empty Git repository in /home/halala/Desktop/University/hello/.git/
halala@vlbarsegyan:~/Desktop/University/hello$
```

Рис. 1: Настройка git, инициализация репозитория

2. Добавим файл в репозиторий.

Проверим текущее состояние репозитория командой *git status*

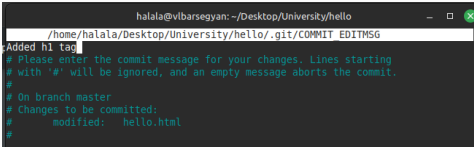
A terminal window with a dark background and green text. The window title is 'halala@vlbarsegyan: ~/Desktop/University/hello'. The user enters 'git add hello.html', followed by a warning about LF vs CRLF. Then 'git commit -m "Initial commit"', which shows the commit hash '6d52fa1'. Then 'git status', which shows the working tree is clean. Then 'echo "<h1>Hello, World!</h1>" > hello.html'. Then 'nano hello.html'. Finally, 'git status' again, which shows 'hello.html' as modified. The prompt is always 'halala@vlbarsegyan:~/Desktop/University/hello\$'.

```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git add hello.html
warning: in the working copy of 'hello.html', LF will be replaced by CRLF the next time Git touches it
halala@vlbarsegyan:~/Desktop/University/hello$ git commit -m "Initial commit"
[master (root-commit) 6d52fa1] Initial commit
1 file changed, 1 insertion(+)
create mode 100644 hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git status
On branch master
nothing to commit, working tree clean
halala@vlbarsegyan:~/Desktop/University/hello$ echo "<h1>Hello, World!</h1>" > hello.html
bash: !: event not found
halala@vlbarsegyan:~/Desktop/University/hello$ nano hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   hello.html

no changes added to commit (use "git add" and/or "git commit -a")
halala@vlbarsegyan:~/Desktop/University/hello$
```

Рис. 2: Добавление файла в репозиторий и проверка состояния репозитория

3. Текущее содержимое файла *hello.html*

A screenshot of a terminal window with a dark background. The title bar shows the user 'halala@vibarseggyan' and the directory '~/Desktop/University/hello'. The terminal content shows the output of a git commit command, including the file path, a commit message prompt, and a summary of changes to be committed.

```
halala@vibarseggyan: ~/Desktop/University/hello
/home/halala/Desktop/University/hello/.git/COMMIT_EDITMSG
Added hi tag
# Please enter the commit message for your changes. Lines starting
# with '#' will be ignored, and an empty message aborts the commit.
#
# On branch master
# Changes to be committed:
#   modified:   hello.html
#
```

Рис. 3: hello.html

4. Индексирую изменения командой `git add hello.html` и проверяю. Теперь изменения проиндексированы.

Коммичу изменения командой `git commit` и снова проверяю

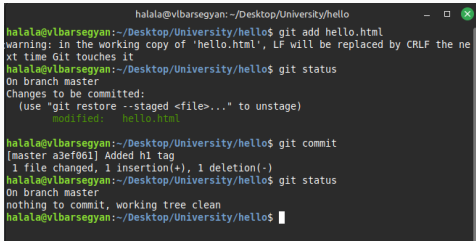
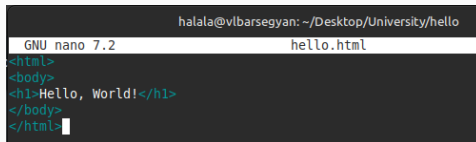
A screenshot of a terminal window with a dark background. The window title is 'halala@vlbarsegyan: ~/Desktop/University/hello'. The terminal shows the following sequence of commands and outputs:
1. Command: `git add hello.html`
Output: `warning: in the working copy of 'hello.html', LF will be replaced by CRLF the next time Git touches it`
2. Command: `git status`
Output: `On branch master
Changes to be committed:
 (use "git restore --staged <file>..." to unstage)
 modified: hello.html`
3. Command: `git commit`
Output: `[master a3ef061] Added h1 tag
1 file changed, 1 insertion(+), 1 deletion(-)`
4. Command: `git status`
Output: `On branch master
nothing to commit, working tree clean`
The prompt `halala@vlbarsegyan:~/Desktop/University/hello$` is visible at the end of the last output line.

Рис. 4: Индексация и коммит изменений

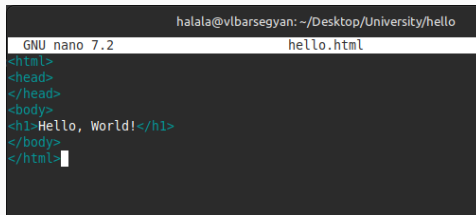
5. Обновляю содержимое *hello.html*



```
halala@vlbarsegyan: ~/Desktop/University/hello
GNU nano 7.2 hello.html
<html>
<body>
<h1>Hello, World!</h1>
</body>
</html>
```

Рис. 5: hello.html

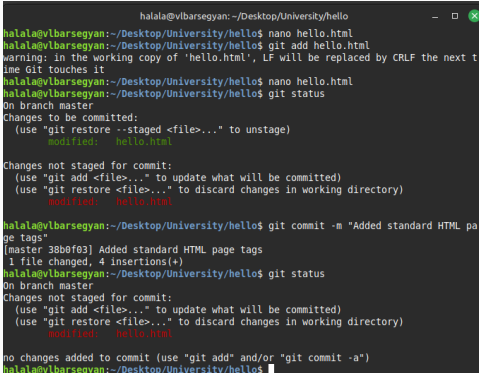
6. Добавляю это изменение в индекс командой `git add hello.html`. Снова обновляю `hello.html`



```
halala@vlbarsegyan: ~/Desktop/University/hello
GNU nano 7.2 hello.html
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>
```

Рис. 6: Обновление hello.html

7. Проверяю текущие изменения. Добавляю последние изменения и коммичу. Снова проверяю статус



```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ nano hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git add hello.html
warning: in the working copy of 'hello.html', LF will be replaced by CRLF the next time Git touches it
halala@vlbarsegyan:~/Desktop/University/hello$ nano hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   hello.html

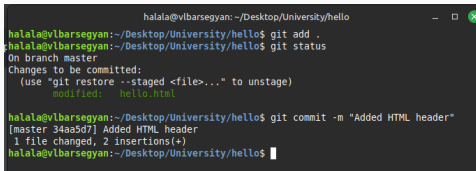
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   hello.html

halala@vlbarsegyan:~/Desktop/University/hello$ git commit -m "Added standard HTML page tags"
[master 38b0f03] Added standard HTML page tags
1 file changed, 4 insertions(+)
halala@vlbarsegyan:~/Desktop/University/hello$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   hello.html

no changes added to commit (use "git add" and/or "git commit -a")
halala@vlbarsegyan:~/Desktop/University/hello$
```

Рис. 7: Проверка статуса и коммит

8. Добавляю второе изменение в индекс и проверяю

A terminal window with a dark background and light green text. The window title is 'halala@vlbarsegyan: ~/Desktop/University/hello'. The terminal shows the following commands and output:

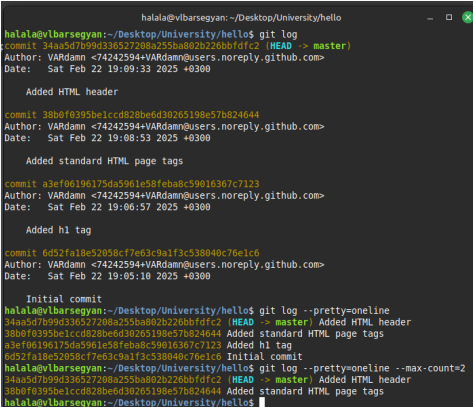
```
halala@vlbarsegyan:~/Desktop/University/hello$ git add .
halala@vlbarsegyan:~/Desktop/University/hello$ git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   hello.html

halala@vlbarsegyan:~/Desktop/University/hello$ git commit -m "Added HTML header"
[master 34aa5d7] Added HTML header
1 file changed, 2 insertions(+)
halala@vlbarsegyan:~/Desktop/University/hello$
```

Рис. 8: Добавление второго изменения в индекс, проверка

9. Получим список изменений командой *git log*

Для однострочного формата введем *git log --pretty=oneline*



```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git log
commit 34aa5d7b99d336527208a255ba802b226bbdfc2 (HEAD -> master)
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:09:33 2025 +0300

    Added HTML header

commit 38b0f0395be1ccd828be6d30265198e57b824644
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:08:53 2025 +0300

    Added standard HTML page tags

commit a3ef06196175da5961e58feba8c59016367c7123
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:06:57 2025 +0300

    Added h1 tag

commit 6d52fa18e52058cf7e63c9a1f3c538040c76e1c6
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:05:10 2025 +0300

    Initial commit
halala@vlbarsegyan:~/Desktop/University/hello$ git log --pretty=oneline
34aa5d7b99d336527208a255ba802b226bbdfc2 (HEAD -> master) Added HTML header
38b0f0395be1ccd828be6d30265198e57b824644 Added standard HTML page tags
a3ef06196175da5961e58feba8c59016367c7123 Added h1 tag
6d52fa18e52058cf7e63c9a1f3c538040c76e1c6 Initial commit
halala@vlbarsegyan:~/Desktop/University/hello$ git log --pretty=oneline --max-count=2
34aa5d7b99d336527208a255ba802b226bbdfc2 (HEAD -> master) Added HTML header
38b0f0395be1ccd828be6d30265198e57b824644 Added standard HTML page tags
halala@vlbarsegyan:~/Desktop/University/hello$
```

Рис. 9: Список изменений

10. Выведем справочную информацию командой *man git-log*



```
halala@vlbarsegyan: ~/Desktop/University/hello
GIT-LOG(1)                               Git Manual                               GIT-LOG(1)

NAME
  git-log - Show commit logs

SYNOPSIS
  git log [<options>] [<revision-range>] [[-] <path>...]

DESCRIPTION
  Shows the commit logs.

  List commits that are reachable by following the parent links from the given
  commit(s), but exclude commits that are reachable from the one(s) given with
  a ^ in front of them. The output is given in reverse chronological order by
  default.

  You can think of this as a set operation. Commits reachable from any of the
  commits given on the command line form a set, and then commits reachable
  from any of the ones given with ^ in front are subtracted from that set. The
  remaining commits are what comes out in the command's output. Various other
  options and paths parameters can be used to further limit the result.

  Thus, the following command:

      $ git log foo bar ^baz

  means "list all the commits which are reachable from foo or bar, but not
  from baz".

  A special notation "<commit1>..<commit2>" can be used as a short-hand for
  "^<commit1> <commit2>". For example, either of the following may be used
  interchangeably:

Manual page git-log(1) line 1 (press h for help or q to quit)
```

Рис. 10: man git-log

11. Ввожу команду *git checkout* , где хэш - хэш первого коммита. Также просматриваю содержимое файла - оно равняется содержимому первого коммита

```
halala@vibarsegyan: ~/Desktop/University/hello
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:06:57 2025 +0300

Added h1 tag

commit 6d52fal8e52058cf7e63c9a1f3c538040c76e1c6
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:05:10 2025 +0300

Initial commit
halala@vibarsegyan:~/Desktop/University/hello$ git checkout 6d52fal8e52058cf7e63c9a1f3c538040c76e1c6
Note: switching to '6d52fal8e52058cf7e63c9a1f3c538040c76e1c6'.

You are in 'detached HEAD' state. You can look around, make experimental
changes and commit them, and you can discard any commits you make in this
state without impacting any branches by switching back to a branch.

If you want to create a new branch to retain commits you create, you may
do so (now or later) by using -c with the switch command. Example:

    git switch -c <new-branch-name>

Or undo this operation with:

    git switch -

Turn off this advice by setting config variable advice.detachedHead to false

HEAD is now at 6d52fal Initial commit
halala@vibarsegyan:~/Desktop/University/hello$ cat hello.html
Hello, World!
halala@vibarsegyan:~/Desktop/University/hello$
```

Рис. 11: Переход к первому коммиту

12. Перехожу к последней версии ветки командой `git checkout master` и просматриваю содержимое файла - теперь оно актуальное. Создаю тег первой версии командой `git tag v1`. Перехожу к версии, предшествующей `v1`, командой `git checkout v1^`.

```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout master
Previous HEAD position was 6d52fal Initial commit
Switched to branch 'master'
halala@vlbarsegyan:~/Desktop/University/hello$ cat hello.html
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>
halala@vlbarsegyan:~/Desktop/University/hello$ git tag v1
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout v1^
Note: switching to 'v1^'.

You are in 'detached HEAD' state. You can look around, make experimental
changes and commit them, and you can discard any commits you make in this
state without impacting any branches by switching back to a branch.

If you want to create a new branch to retain commits you create, you may
do so (now or later) by using -c with the switch command. Example:

    git switch -c <new-branch-name>

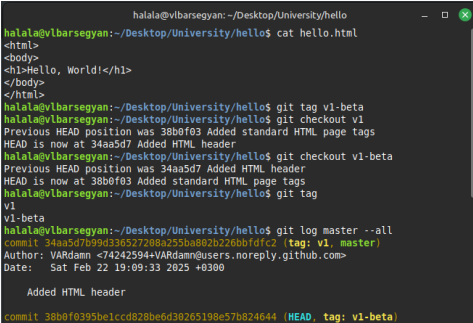
Or undo this operation with:

    git switch -

Turn off this advice by setting config variable advice.detachedHead to false

HEAD is now at 38b0f03 Added standard HTML page tags
halala@vlbarsegyan:~/Desktop/University/hello$
```

13. Создаю для предшествующей версии тэг *v1-beta*. Перехожу к версии *v1* и просматриваю все доступные тэги. Также просматриваю тэги в логе командой *git log master --all*



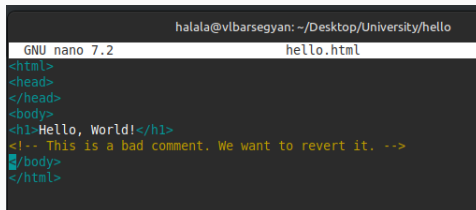
```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ cat hello.html
<html>
<body>
<h1>Hello, World!</h1>
</body>
</html>
halala@vlbarsegyan:~/Desktop/University/hello$ git tag v1-beta
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout v1
Previous HEAD position was 38b0f03 Added standard HTML page tags
HEAD is now at 34aa5d7 Added HTML header
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout v1-beta
Previous HEAD position was 34aa5d7 Added HTML header
HEAD is now at 38b0f03 Added standard HTML page tags
halala@vlbarsegyan:~/Desktop/University/hello$ git tag
v1
v1-beta
halala@vlbarsegyan:~/Desktop/University/hello$ git log master --all
commit 34aa5d7b99d336527208a255ba802b226bbdfdc2 (tag: v1, master)
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:09:33 2025 +0300

    Added HTML header

commit 38b0f0395be1ccd828be6d30265198e57b824644 (HEAD, tag: v1-beta)
```

Рис. 13: Создание тэга предшествующей версии, просмотр

14. Обновляю содержимое hello.html



```
halala@vlbarsegyan: ~/Desktop/University/hello
GNU nano 7.2 hello.html
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
<!-- This is a bad comment. We want to revert it. -->
</body>
</html>
```

Рис. 14: hello.html

Отмена локальных изменений (до индексации)

15. Проверяю состояние рабочего каталога (hello.html был изменен, но еще не проиндексирован).

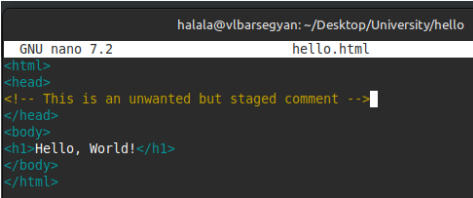
Командой *git checkout* переключаю версии файла hello.html в репозитории

Команда *git status* показывает нам, что не было произведено никаких изменений, не зафиксированных в рабочем каталоге.

```
halala@vlbarsegyan: ~/Desktop/University/hello
Switched to branch 'master'
halala@vlbarsegyan:~/Desktop/University/hello$ nano hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   hello.html

no changes added to commit (use "git add" and/or "git commit -a")
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout hello.html
Updated 1 path from the index
halala@vlbarsegyan:~/Desktop/University/hello$ git status
On branch master
nothing to commit, working tree clean
halala@vlbarsegyan:~/Desktop/University/hello$ cat hello.html
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>
halala@vlbarsegyan:~/Desktop/University/hello$
```

16. Изменяю содержимое hello.html

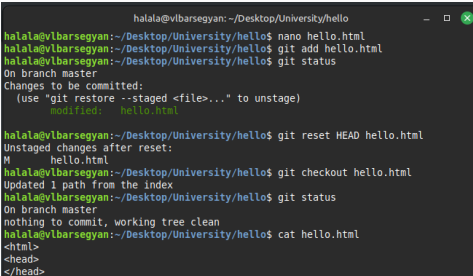


```
halala@vlbarsegyan: ~/Desktop/University/hello
GNU nano 7.2 hello.html
<html>
<head>
<!-- This is an unwanted but staged comment -->
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>
```

Рис. 16: hello.html

Отмена проиндексированных изменений (перед коммитом)

17. Индексирую изменения командой `git add hello.html`. Проверяю состояние изменения, после чего сбрасываю буферную зону командой `git reset HEAD hello.html`. Переключаюсь на версию коммита командой `git checkout hello.html` и снова проверяю статус. Проверяю содержимой файла - изменений теперь нет.

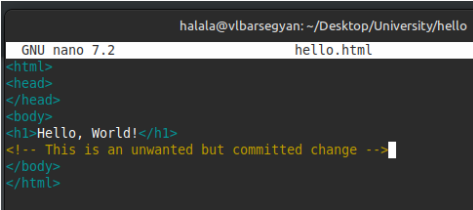


```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ nano hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git add hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    modified:   hello.html

halala@vlbarsegyan:~/Desktop/University/hello$ git reset HEAD hello.html
Unstaged changes after reset:
M   hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout hello.html
Updated 1 path from the index
halala@vlbarsegyan:~/Desktop/University/hello$ git status
On branch master
nothing to commit, working tree clean
halala@vlbarsegyan:~/Desktop/University/hello$ cat hello.html
<html>
<head>
</head>
```

Рис. 17: Отмена проиндексированных изменений перед коммитом

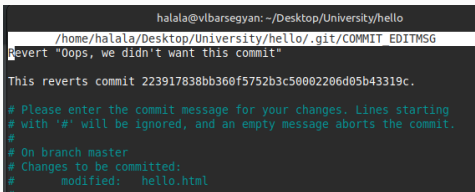
18. Изменяю содержимое hello.html



```
halala@vlbarsegyan: ~/Desktop/University/hello
GNU nano 7.2 hello.html
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
<!-- This is an unwanted but committed change -->
</body>
</html>
```

Рис. 18: hello.html

19. Индексирую изменения и коммичу их командой `git commit -m "Oops, we didn't want this commit"`. Отменяю коммит командой `git revert HEAD` - в результате получаю такой коммит



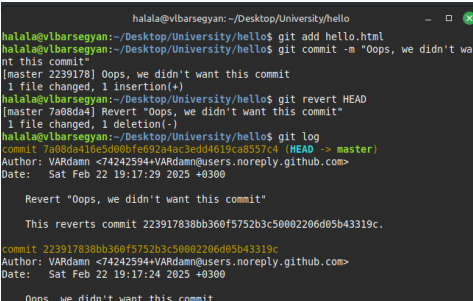
```
halala@vlbarsegyan: ~/Desktop/University/hello
/home/halala/Desktop/University/hello/.git/COMMIT_EDITMSG
Revert "Oops, we didn't want this commit"

This reverts commit 223917838bb360f5752b3c50002206d05b43319c.

# Please enter the commit message for your changes. Lines starting
# with '#' will be ignored, and an empty message aborts the commit.
#
# On branch master
# Changes to be committed:
#   modified:   hello.html
#
```

Рис. 19: Отмена коммита

20. Проверяю логи

A terminal window with a dark background and green text. The window title is 'halala@vlbarsegyan: ~/Desktop/University/hello'. The user performs the following sequence of commands: 1. 'git add hello.html' 2. 'git commit -m "Oops, we didn't want this commit"' which results in a message '[master 2239178] Oops, we didn't want this commit' and '1 file changed, 1 insertion(+)' 3. 'git revert HEAD' which results in a message '[master 7a08da4] Revert "Oops, we didn't want this commit"' and '1 file changed, 1 deletion(-)' 4. 'git log' which shows the commit history, including the revert commit. The revert commit message is displayed in a larger font: 'Revert "Oops, we didn't want this commit"' followed by 'This reverts commit 223917838bb360f5752b3c50002206d05b43319c.' and the commit details for the revert.

```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git add hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git commit -m "Oops, we didn't want this commit"
[master 2239178] Oops, we didn't want this commit
1 file changed, 1 insertion(+)
halala@vlbarsegyan:~/Desktop/University/hello$ git revert HEAD
[master 7a08da4] Revert "Oops, we didn't want this commit"
1 file changed, 1 deletion(-)
halala@vlbarsegyan:~/Desktop/University/hello$ git log
commit 7a08da416e5d00bfe692a4ac3edd4619ca8557c4 (HEAD -> master)
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:17:29 2025 +0300

    Revert "Oops, we didn't want this commit"

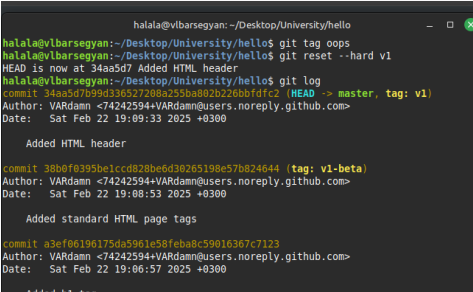
    This reverts commit 223917838bb360f5752b3c50002206d05b43319c.

commit 223917838bb360f5752b3c50002206d05b43319c
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:17:24 2025 +0300

    Oops, we didn't want this commit
```

Рис. 20: Проверка логов

21. Отмечаю последний коммит тэгом командой `git tag oops`. Сбрасываю ветку до точки `v1` командой `git reset --hard v1`. Проверяю логи - информация о двух последних коммитах пропала

A screenshot of a terminal window with a dark background. The window title is 'halala@vlbarsegyan: ~/Desktop/University/hello'. The terminal shows the following sequence of commands and output:
1. Command: `git tag oops`
2. Command: `git reset --hard v1`
3. Output: `HEAD is now at 34aa5d7 Added HTML header`
4. Command: `git log`
5. Output (truncated):
 `commit 34aa5d7b99d336527208a255ba802b226bbdfc2 (HEAD -> master, tag: v1)`
 `Author: VARdamn <74242594+VARdamn@users.noreply.github.com>`
 `Date: Sat Feb 22 19:09:33 2025 +0300`

 `Added HTML header`

 `commit 38b0f0395be1ccd828be6d30265198e57b824644 (tag: v1-beta)`
 `Author: VARdamn <74242594+VARdamn@users.noreply.github.com>`
 `Date: Sat Feb 22 19:08:53 2025 +0300`

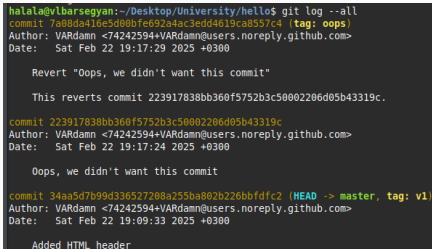
 `Added standard HTML page tags`

 `commit a3ef06196175da5961e58feba8c59016367c7123`
 `Author: VARdamn <74242594+VARdamn@users.noreply.github.com>`
 `Date: Sat Feb 22 19:06:57 2025 +0300`

 `Added h1 tag`

Рис. 21: Сброс ветки и проверка логов

22. Просматриваю все коммиты командой `git log --all` - здесь есть и последние два коммита

A terminal window showing the output of the command 'git log --all'. The output lists three commits. The first commit is a revert of a previous commit, with a message 'Revert "Oops, we didn't want this commit"'. The second commit is another revert, with a message 'Oops, we didn't want this commit'. The third commit is a new commit with the message 'Added HTML header'. The terminal text is as follows:

```
halala@vlbarseggyan:~/Desktop/University/hello$ git log --all
commit 7a08da416e5d80bfe692a4ac3edd4619ca8557c4 (tag: oops)
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:17:29 2025 +0300

    Revert "Oops, we didn't want this commit"

    This reverts commit 223917838bb360f5752b3c50002206d05b43319c.

commit 223917838bb360f5752b3c50002206d05b43319c
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:17:24 2025 +0300

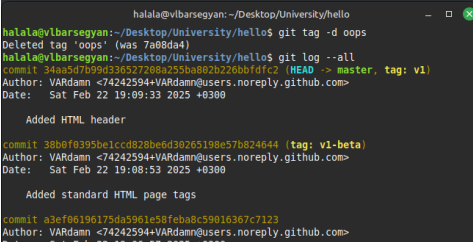
    Oops, we didn't want this commit

commit 34aa5d7b99d336527208a255ba802b226bbdfdc2 (HEAD -> master, tag: v1)
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:09:33 2025 +0300

    Added HTML header
```

Рис. 22: Все коммиты

23. Удаляю тэг оорс командой `git tag -d оорс` и проверяю

A terminal window with a dark background and green text. The prompt is 'halala@vlbarsegyan: ~/Desktop/University/hello'. The user enters 'git tag -d оорс', and the output is 'Deleted tag 'oops' (was 7a08da4)'. Then the user enters 'git log --all', and the output shows three commits. The first commit is '34aa5d7b99d336527208a255ba802b226bbfdff2 (HEAD -> master, tag: v1)' with the message 'Added HTML header'. The second commit is '38bf0f0395be1ccd828be6d30765198e57b824644 (tag: v1-beta)' with the message 'Added standard HTML page tags'. The third commit is 'a3ef06196175da5961e58feba8c59016367c7123' with the message 'Added standard HTML page tags'.

```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git tag -d оорс
Deleted tag 'oops' (was 7a08da4)
halala@vlbarsegyan:~/Desktop/University/hello$ git log --all
commit 34aa5d7b99d336527208a255ba802b226bbfdff2 (HEAD -> master, tag: v1)
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:09:33 2025 +0300

    Added HTML header

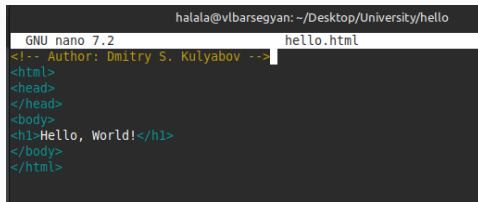
commit 38bf0f0395be1ccd828be6d30765198e57b824644 (tag: v1-beta)
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:08:53 2025 +0300

    Added standard HTML page tags

commit a3ef06196175da5961e58feba8c59016367c7123
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:08:53 2025 +0300
```

Рис. 23: Удаление тега

24. Изменяю содержимое hello.html



```
halala@vlbarsegyan: ~/Desktop/University/hello
GNU nano 7.2 hello.html
<!-- Author: Dmitry S. Kulyabov -->
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>
```

Рис. 24: hello.html

25. Индексирую изменения и коммичу их. После, снова редактирую файл, добавляя почту, и коммичу изменения командой `git commit -m "Add an author/email comment"`, т.е. изменяя последний коммит. Проверяю логи и вижу один новый коммит

```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git add hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git commit -m "Add an author commit"
[master c5470bb] Add an author commit
1 file changed, 1 insertion(+)
halala@vlbarsegyan:~/Desktop/University/hello$ git add hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ nano hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git add hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git commit --amend -m "Add an author/email comment"
[master b6f3165] Add an author/email comment
Date: Sat Feb 22 19:20:29 2025 +0300
1 file changed, 1 insertion(+)
halala@vlbarsegyan:~/Desktop/University/hello$ git log
commit b6f31650ebc5cc5eb5001acbd3fd50f6d782e0c (HEAD -> master)
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:20:29 2025 +0300

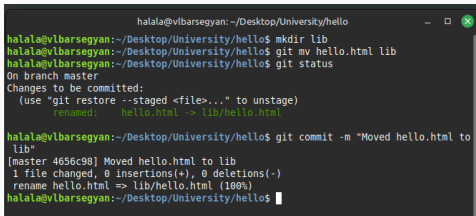
    Add an author/email comment

commit 34aa5d7b99d336527208a255ba802b226bbdfc2 (tag: v1)
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:09:33 2025 +0300

    Added HTML header
```

Рис. 25: Создание коммита и его изменение

26. Создаю папку `lib` и переношу страницу в каталог `lib` командой `git mv`. Проверяю изменения командой `git status`. Коммичу изменения

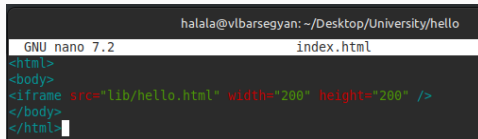
A terminal window with a dark background and light green text. The window title is 'halala@vlbarsegyan: ~/Desktop/University/hello'. The terminal shows the following commands and output:

```
halala@vlbarsegyan:~/Desktop/University/hello$ mkdir lib
halala@vlbarsegyan:~/Desktop/University/hello$ git mv hello.html lib
halala@vlbarsegyan:~/Desktop/University/hello$ git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    renamed:   hello.html -> lib/hello.html

halala@vlbarsegyan:~/Desktop/University/hello$ git commit -m "Moved hello.html to lib"
[master 4656c98] Moved hello.html to lib
1 file changed, 0 insertions(+), 0 deletions(-)
rename hello.html => lib/hello.html (100%)
halala@vlbarsegyan:~/Desktop/University/hello$
```

Рис. 26: Перемещение файла в папку `lib`

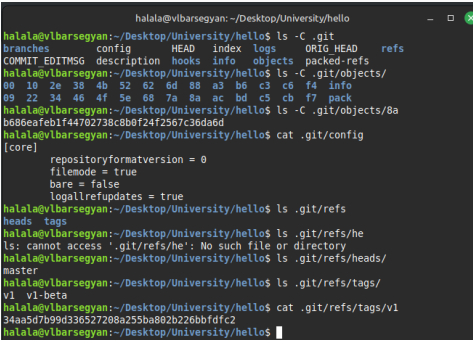
27. Создаю в корне файл *index.html* и заполняю его. Коммичу изменения



```
halala@vlbarsegyan: ~/Desktop/University/hello
GNU nano 7.2 index.html
<html>
<body>
<iframe src="lib/hello.html" width="200" height="200" />
</body>
</html>
```

Рис. 27: index.html

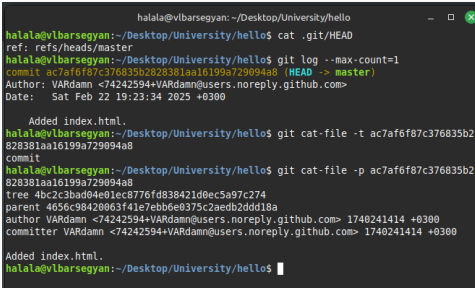
28. Просматриваю каталог со всей информацией о git командой `ls -C .git`. Выполняю команду `ls -C .git/objects`. Также просматриваю один из каталогов с именем из 2 букв. Просматриваю файл конфигурации командой `cat .git/config`



```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ ls -C .git
branches      config        HEAD          index        logs          ORIG HEAD    refs
COMMIT_EDITMSG description  hooks         info         objects       packed-refs
halala@vlbarsegyan:~/Desktop/University/hello$ ls -C .git/objects/
00 10 2e 38 4b 52 62 6d 88 a3 b6 c3 c6 f4 info
09 22 34 46 4f 5e 68 7a 8a ac bd c5 cb f7 pack
halala@vlbarsegyan:~/Desktop/University/hello$ ls -C .git/objects/8a
b686eafeb1f44702738c8b0f24f2567c36da6d
halala@vlbarsegyan:~/Desktop/University/hello$ cat .git/config
[core]
  repositoryformatversion = 0
  filemode = true
  bare = false
  logallrefupdates = true
halala@vlbarsegyan:~/Desktop/University/hello$ ls .git/refs
heads tags
halala@vlbarsegyan:~/Desktop/University/hello$ ls .git/refs/he
ls: cannot access '.git/refs/he': No such file or directory
halala@vlbarsegyan:~/Desktop/University/hello$ ls .git/refs/heads/
master
halala@vlbarsegyan:~/Desktop/University/hello$ ls .git/refs/tags/
v1 v1-beta
halala@vlbarsegyan:~/Desktop/University/hello$ cat .git/refs/tags/v1
34aa5d7b99d336527208a255ba802b226bbdfdc2
halala@vlbarsegyan:~/Desktop/University/hello$
```

Рис. 28: Просмотр каталога .git

29. Выполняю команду `cat .git/HEAD` - содержится ссылка на ветку master. Просматриваю последний коммит командой `git log --max-count=1`. Также вывожу последний коммит с помощью хэша командой `git cat-file`



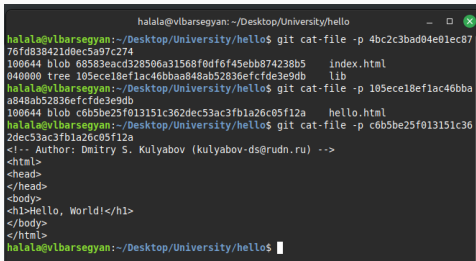
```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ cat .git/HEAD
ref: refs/heads/master
halala@vlbarsegyan:~/Desktop/University/hello$ git log --max-count=1
commit ac7af6f87c376835b2828381aa16199a729094a8 (HEAD -> master)
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:23:34 2025 +0300

    Added index.html.
halala@vlbarsegyan:~/Desktop/University/hello$ git cat-file -t ac7af6f87c376835b2
828381aa16199a729094a8
commit
halala@vlbarsegyan:~/Desktop/University/hello$ git cat-file -p ac7af6f87c376835b2
828381aa16199a729094a8
tree 4bc2c3bad04e01ec8776fd838421d0ec5a97c274
parent 4656c98420063f41e7ebb6e0375c2aedb2ddd18a
author VARdamn <74242594+VARdamn@users.noreply.github.com> 1740241414 +0300
committer VARdamn <74242594+VARdamn@users.noreply.github.com> 1740241414 +0300

    Added index.html.
halala@vlbarsegyan:~/Desktop/University/hello$
```

Рис. 29: Просмотр последнего коммита

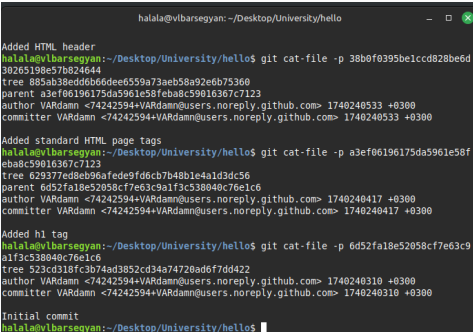
30. Произвожу поиск дерева командой `git cat-file`, указав хеш дерева. Аналогично вывожу каталог `lib` и файл `hello.html`

A screenshot of a terminal window with a dark background. The window title is 'halala@vlbarsegyan: ~/Desktop/University/hello'. The terminal shows a series of commands and their outputs. The first command is 'git cat-file -p 4bc2c3bad04e01ec8776fd838421d0ec5a97c274', which outputs '100644 blob 68583eacd328506a31568f0df6f45ebb874238b5 index.html'. The second command is 'git cat-file -p 105ece18eflac46bbaa848ab52836efcfe3e9db', which outputs '040000 tree 105ece18eflac46bbaa848ab52836efcfe3e9db lib'. The third command is 'git cat-file -p c6b5be25f013151c362dec53ac3fbl2a26c05f12a', which outputs '100644 blob c6b5be25f013151c362dec53ac3fbl2a26c05f12a hello.html'. The fourth command is 'git cat-file -p c6b5be25f013151c362dec53ac3fbl2a26c05f12a', which outputs the HTML content of the file: '<!-- Author: Dmitry S. Kulyabov (kulyabov-ds@rudn.ru) -->
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>'. The prompt 'halala@vlbarsegyan:~/Desktop/University/hello\$' is visible at the bottom.

```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git cat-file -p 4bc2c3bad04e01ec8776fd838421d0ec5a97c274
100644 blob 68583eacd328506a31568f0df6f45ebb874238b5    index.html
040000 tree 105ece18eflac46bbaa848ab52836efcfe3e9db      lib
halala@vlbarsegyan:~/Desktop/University/hello$ git cat-file -p 105ece18eflac46bbaa848ab52836efcfe3e9db
100644 blob c6b5be25f013151c362dec53ac3fbl2a26c05f12a    hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git cat-file -p c6b5be25f013151c362dec53ac3fbl2a26c05f12a
<!-- Author: Dmitry S. Kulyabov (kulyabov-ds@rudn.ru) -->
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>
halala@vlbarsegyan:~/Desktop/University/hello$
```

Рис. 30: Поиск по хэшу

31. Исследую репозиторий самостоятельно: перехожу к последующему коммиту по хэшу родителя



```
halala@vlbarsegyan: ~/Desktop/University/hello

Added HTML header
halala@vlbarsegyan:~/Desktop/University/hello$ git cat-file -p 38b0f0395be1ccd828be6d30265198e57b024644
tree 885ab38edd6b66dee6559a73aeb58a92e6b75360
parent a3ef06196175da5961e58feba8c59016367c7123
author VARdamn <74242594+VARdamn@users.noreply.github.com> 1740240533 +0300
committer VARdamn <74242594+VARdamn@users.noreply.github.com> 1740240533 +0300

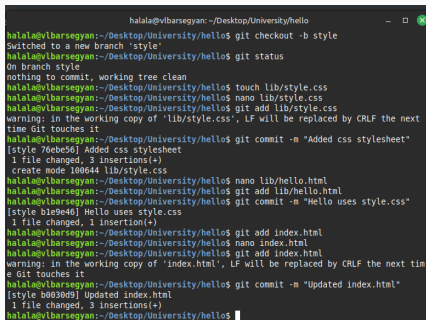
Added standard HTML page tags
halala@vlbarsegyan:~/Desktop/University/hello$ git cat-file -p a3ef06196175da5961e58feba8c59016367c7123
tree 629377ed8eb96afede9fd6cb7b48b1e4a1d3dc56
parent 6d52fa18e52058cf7e63c9a1f3c538040c76e1c6
author VARdamn <74242594+VARdamn@users.noreply.github.com> 1740240417 +0300
committer VARdamn <74242594+VARdamn@users.noreply.github.com> 1740240417 +0300

Added h1 tag
halala@vlbarsegyan:~/Desktop/University/hello$ git cat-file -p 6d52fa18e52058cf7e63c9a1f3c538040c76e1c6
tree 523cd318fc3b74ad3852cd34a74720ad6f7dd422
author VARdamn <74242594+VARdamn@users.noreply.github.com> 1740240310 +0300
committer VARdamn <74242594+VARdamn@users.noreply.github.com> 1740240310 +0300

Initial commit
halala@vlbarsegyan:~/Desktop/University/hello$
```

Рис. 31: Исследование репозитория

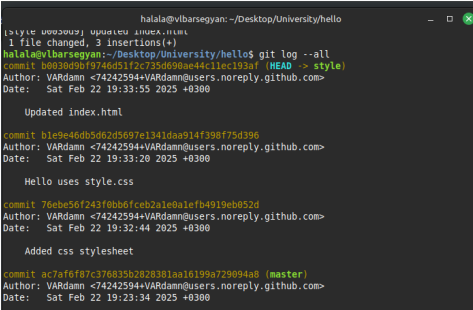
32. Создаю ветку командой `git checkout -b style` и проверяю ее статус. Создаю файл `style.css` в папке `lib`, заполняю его, индексирую и коммичу. Обновляю файл `lib/hello.html`, добавляя в него ссылку на `css`-файл, и также индексирую и коммичу изменения. Обновляю файл `index.html`, индексирую и коммичу изменения



```
halala@vlbarsegan: ~/Desktop/University/hello
halala@vlbarsegan:~/Desktop/University/hello$ git checkout -b style
Switched to a new branch 'style'
halala@vlbarsegan:~/Desktop/University/hello$ git status
On branch style
nothing to commit, working tree clean
halala@vlbarsegan:~/Desktop/University/hello$ touch lib/style.css
halala@vlbarsegan:~/Desktop/University/hello$ nano lib/style.css
halala@vlbarsegan:~/Desktop/University/hello$ git add lib/style.css
warning: in the working copy of 'lib/style.css', LF will be replaced by CRLF the next time Git touches it
halala@vlbarsegan:~/Desktop/University/hello$ git commit -m "Added css stylesheet"
[style 76ebe56] Added css stylesheet
1 file changed, 3 insertions(+)
create mode 100644 lib/style.css
halala@vlbarsegan:~/Desktop/University/hello$ nano lib/hello.html
halala@vlbarsegan:~/Desktop/University/hello$ git add lib/hello.html
halala@vlbarsegan:~/Desktop/University/hello$ git commit -m "Hello uses style.css"
[style ble9e46] Hello uses style.css
1 file changed, 1 insertion(+)
halala@vlbarsegan:~/Desktop/University/hello$ git add index.html
halala@vlbarsegan:~/Desktop/University/hello$ nano index.html
halala@vlbarsegan:~/Desktop/University/hello$ git add index.html
warning: in the working copy of 'index.html', LF will be replaced by CRLF the next time Git touches it
halala@vlbarsegan:~/Desktop/University/hello$ git commit -m "Updated index.html"
[style b0030d9] Updated index.html
1 file changed, 3 insertions(+)
halala@vlbarsegan:~/Desktop/University/hello$
```

Рис. 32: Обновление файлов, индексация и коммиты

33. Проверяю логи последних коммитов, вижу все созданные коммиты, они в ветке style

A terminal window with a dark background and light text. The window title is 'halala@vlbarsegyan: ~/Desktop/University/hello'. The terminal shows the output of a 'git log --all' command. The output lists four commits in reverse chronological order. The first commit is on the 'style' branch, and the others are on the 'master' branch. The commits show the creation of 'index.html', 'style.css', and 'css stylesheet'.

```
halala@vlbarsegyan: ~/Desktop/University/hello
[style 0000000] updated index.html
1 file changed, 3 insertions(+)
halala@vlbarsegyan:~/Desktop/University/hello$ git log --all
commit b0030d9b19746d51f2c735d690ae44c11ec193af (HEAD -> style)
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:33:55 2025 +0300

    Updated index.html

commit b1e9e46db5d62d5697e1341daa914f398f75d396
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:33:20 2025 +0300

    Hello uses style.css

commit 76ebe56f243f0bb6fceb2a1e0a1efb4919eb052d
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:32:44 2025 +0300

    Added css stylesheet

commit ac7af6f87c376835b2828381aa16199a729094a8 (master)
Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
Date: Sat Feb 22 19:23:34 2025 +0300
```

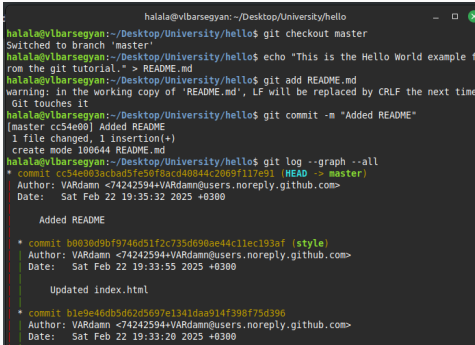
Рис. 33: Проверка логов

34. Перехожу в ветку master и просматриваю содержимое файла lib/hello.html - в нем нет последних изменений. Просматриваю тот же файл в ветке style - изменения есть

```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout master
Switched to branch 'master'
halala@vlbarsegyan:~/Desktop/University/hello$ cat lib/hello.html
<!-- Author: Dmitry S. Kulyabov (kulyabov-ds@rudn.ru) -->
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout style
Switched to branch 'style'
halala@vlbarsegyan:~/Desktop/University/hello$ cat lib/hello.html
<!-- Author: Dmitry S. Kulyabov (kulyabov-ds@rudn.ru) -->
<html>
<head>
<link type="text/css" rel="stylesheet" media="all" href="style.css" />
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>
halala@vlbarsegyan:~/Desktop/University/hello$
```

Рис. 34: Проверка файла в разных ветках

35. Перехожу в ветку master и создаю файл README.md командой `echo "This is the Hello World example from the git tutorial." > README.md`. Коммичу изменения и просматриваю логи, включая различия между ветками.



```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout master
Switched to branch 'master'
halala@vlbarsegyan:~/Desktop/University/hello$ echo "This is the Hello World example from the git tutorial." > README.md
halala@vlbarsegyan:~/Desktop/University/hello$ git add README.md
warning: in the working copy of 'README.md', LF will be replaced by CRLF the next time Git touches it
halala@vlbarsegyan:~/Desktop/University/hello$ git commit -m "Added README"
[master cc54e00] Added README
1 file changed, 1 insertion(+)
create mode 100644 README.md
halala@vlbarsegyan:~/Desktop/University/hello$ git log --graph --all
* commit cc54e003acbad5fe50f8acd40844c2069f117e91 (HEAD -> master)
  Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
  Date: Sat Feb 22 19:35:32 2025 +0300

    Added README

* commit b0030d9bf9746d51f2c735d690ae44c11ec193af (style)
  Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
  Date: Sat Feb 22 19:33:55 2025 +0300

    Updated index.html

* commit b1e9e46db5d62d5697e1341daa914f398f75d396
  Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
  Date: Sat Feb 22 19:33:20 2025 +0300
```

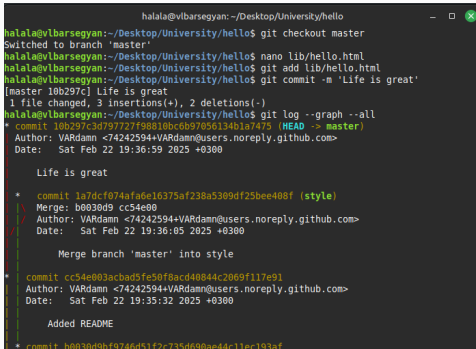
Рис. 35: Создание README в ветке master, проверка дерева веток

36. Перехожу в ветку `style` командой `git checkout style`. Сливаю `master` с `style` командой `git merge master`. Вывожу логи с деревом всех веток

```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout style
Switched to branch 'style'
halala@vlbarsegyan:~/Desktop/University/hello$ git merge master
Merge made by the 'ort' strategy.
 README.md | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 README.md
halala@vlbarsegyan:~/Desktop/University/hello$ git log --graph --all
*   commit 1a7dcf074afa6e16375af238a5309df25bee408f (HEAD -> style)
  \  Merge: b0030d9 cc54e00
   \ Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
    \ Date: Sat Feb 22 19:36:05 2025 +0300
     \
      Merge branch 'master' into style
      *   commit cc54e003acbad5fe50f8acd40844c2069f117e91 (master)
       \ Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
        \ Date: Sat Feb 22 19:35:32 2025 +0300
         \
          Added README
          *   commit b0030d9bf9746d51f2c735d690ae44c11ec193af
           \ Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
            \ Date: Sat Feb 22 19:33:55 2025 +0300
             \
              Updated index.html
              *   commit ble9e46db5d62d5697e1341daa914f398f75d396
```

Рис. 36: Слияние `master` с `style`

37. Возвращаюсь в ветку master и редактирую файл lib/hello.html. Коммичу изменения, просматриваю логи



```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout master
Switched to branch 'master'
halala@vlbarsegyan:~/Desktop/University/hello$ nano lib/hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git add lib/hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git commit -m 'Life is great'
[master 10b297c] Life is great
1 file changed, 3 insertions(+), 2 deletions(-)
halala@vlbarsegyan:~/Desktop/University/hello$ git log --graph --all
* commit 10b297c3d797727f98810bc6b97056134b1a7475 (HEAD -> master)
  Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
  Date:   Sat Feb 22 19:36:59 2025 +0300

    Life is great

* commit 1a7dcf074afa6e16375af238a5309df25bee408f (style)
  Merge: b0030d9 cc54e00
  Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
  Date:   Sat Feb 22 19:36:05 2025 +0300

    Merge branch 'master' into style

* commit cc54e003acbad5fe50f8acd40844c2069f117e91
  Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
  Date:   Sat Feb 22 19:35:32 2025 +0300

    Added README

* commit b0030d9bf9746d51f2c735d690ae44c11ec193af
```

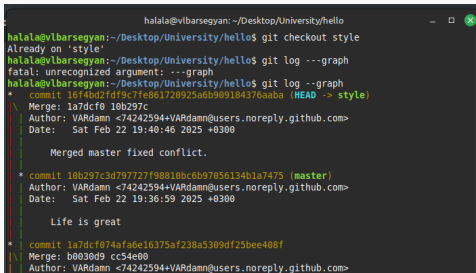
Рис. 37: Редактирование lib/hello.html в master

38. Перехожу в ветку style и пытаюсь слить master с style. В файле lib/hello.html возникли конфликты. Разрешаю конфликты и коммичу изменения

```
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout style
Switched to branch 'style'
halala@vlbarsegyan:~/Desktop/University/hello$ git merge master
Auto-merging lib/hello.html
CONFLICT (content): Merge conflict in lib/hello.html
Automatic merge failed; fix conflicts and then commit the result.
halala@vlbarsegyan:~/Desktop/University/hello$ nano lib/hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git add lib/hello.html
halala@vlbarsegyan:~/Desktop/University/hello$ git commit -m "Merged master fixed conflict."
[style 16f4bd2] Merged master fixed conflict.
halala@vlbarsegyan:~/Desktop/University/hello$
```

Рис. 38: Разрешение конфликта

39. Перехожу в ветку style и просматриваю логи изменений

A terminal window with a dark background and light green text. The window title is 'halala@vlbarsegyan: ~/Desktop/University/hello'. The user enters 'git checkout style' and receives 'Already on 'style''. Then they enter 'git log ---graph' and get a 'fatal: unrecognized argument: ---graph' error. Finally, they enter 'git log --graph' and see a log showing a merge of master into style, followed by a commit with the message 'Life is great'.

```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout style
Already on 'style'
halala@vlbarsegyan:~/Desktop/University/hello$ git log ---graph
fatal: unrecognized argument: ---graph
halala@vlbarsegyan:~/Desktop/University/hello$ git log --graph
*   commit 16f4bd2fdf9c77fe861720925a6b909184376aaba (HEAD -> style)
    Merge: 1a7dcf0 10b297c
    Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
    Date: Sat Feb 22 19:40:46 2025 +0300

    Merged master fixed conflict.

*   commit 10b297c3d797727f98810bc6b97056134b1a7475 (master)
    Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
    Date: Sat Feb 22 19:36:59 2025 +0300

    Life is great

*   commit 1a7dcf074afa6e16375af238a5309df25bee408f
    Merge: b0030d9 cc54e00
    Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
```

Рис. 39: Логи изменений ветки style

40. Сбрасываю ветку к коммиту «Updated index.html» командой `git reset --hard` с использованием хэша коммита. Снова проверяю лог ветки style

```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git reset --hard b0030d9bf9746d51f2c73d690ae44c11ec193af
HEAD is now at b0030d9 Updated index.html
halala@vlbarsegyan:~/Desktop/University/hello$ git log --graph --all
* commit 10b297c3d797727f98810bc6b97056134b1a7475 (master)
  Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
  Date: Sat Feb 22 19:36:59 2025 +0300

    Life is great

* commit cc54e003acbad5fe50f8acd40844c2069f117e91
  Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
  Date: Sat Feb 22 19:35:32 2025 +0300

    Added README

* commit b0030d9bf9746d51f2c73d690ae44c11ec193af (HEAD -> style)
  Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
  Date: Sat Feb 22 19:33:55 2025 +0300

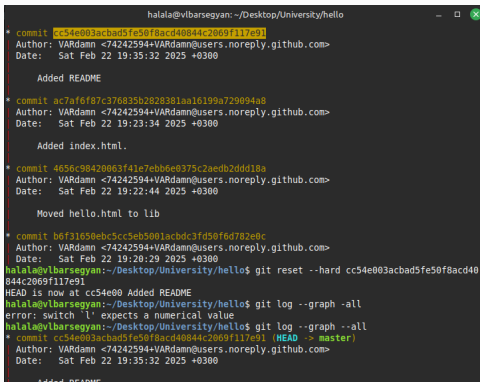
    Updated index.html

* commit ble9e46db5d62d5697e1341daa914f398f75d396
  Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
  Date: Sat Feb 22 19:33:20 2025 +0300

    Hello uses style.css
```

Рис. 40: Сброс ветки style с помощью `git reset`

41. Перехожу в ветку master и аналогичным образом сбрасываю ее к коммиту «Added README». Просматриваю лог ветки master



```
halala@vlbarsegyan: ~/Desktop/University/hello
* commit cc54e003acbad5fe50f8acd40844c2069f117e91
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:35:32 2025 +0300

    Added README

* commit ac7af6f87c376835b2828381aa16199a729094a8
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:23:34 2025 +0300

    Added index.html.

* commit 4656c98420063f41e7ebb6e0375c2aedb2ddd18a
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:22:44 2025 +0300

    Moved hello.html to lib

* commit b6f31650ebc5cc5eb5001acbd3fd50f6d782e0c
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:20:29 2025 +0300
halala@vlbarsegyan:~/Desktop/University/hello$ git reset --hard cc54e003acbad5fe50f8acd40844c2069f117e91
HEAD is now at cc54e00 Added README
halala@vlbarsegyan:~/Desktop/University/hello$ git log --graph --all
error: switch `l' expects a numerical value
halala@vlbarsegyan:~/Desktop/University/hello$ git log --graph --all
* commit cc54e003acbad5fe50f8acd40844c2069f117e91 (HEAD -> master)
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:35:32 2025 +0300

    Added README
```

Рис. 41: Сброс ветки master

42. Перехожу в ветку `style` и использую вместо слияния команду `git rebase master`.
Просматриваю лог ветки.

```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout style
Switched to branch 'style'
halala@vlbarsegyan:~/Desktop/University/hello$ git rebase master
Successfully rebased and updated refs/heads/style.
halala@vlbarsegyan:~/Desktop/University/hello$ git log --graph
* commit 6e965428b89f4a7293122e82a6a43e3f024fa2ab (HEAD -> style)
  Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
  Date: Sat Feb 22 19:33:55 2025 +0300

    Updated index.html

* commit 065205de484420b98facccd474eb1c27cc9d9192
  Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
  Date: Sat Feb 22 19:33:20 2025 +0300

    Hello uses style.css

* commit 85ea8708102279486ac63e722ece2c5db712bca9
  Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
  Date: Sat Feb 22 19:32:44 2025 +0300

    Added css stylesheet

* commit cc54e003acbad5fe50f8acd40844c2069f117e91 (master)
  Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
  Date: Sat Feb 22 19:35:32 2025 +0300

    Added README

* commit ac7af6f87c376835b2828381aa16199a729094a8
  Author: VARDamn <74242594+VARDamn@users.noreply.github.com>
  Date: Sat Feb 22 19:23:34 2025 +0300
```

Рис. 42: Перебазирование ветки

43. Перехожу в ветку master и сливаю style с master. Просматриваю лог - теперь ветки style и master идентичны.

```
halala@vlbarsegyan: ~/Desktop/University/hello
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout master
Switched to branch 'master'
halala@vlbarsegyan:~/Desktop/University/hello$ git merge style
Updating cc54e00..6e96542
Fast-forward
   index.html      | 3 +++
   lib/hello.html  | 1 +
   lib/style.css    | 3 +++
   3 files changed, 7 insertions(+)
   create mode 100644 lib/style.css
halala@vlbarsegyan:~/Desktop/University/hello$ git log
commit 6e965428b89f4a7293122e82a6a43e3f024fa2ab (HEAD -> master, style)
Author: VARdamm <74242594+VARdamm@users.noreply.github.com>
Date: Sat Feb 22 19:33:55 2025 +0300

    Updated index.html

commit 065205de484428b98faccdd474eb1c27cc9d9192
Author: VARdamm <74242594+VARdamm@users.noreply.github.com>
Date: Sat Feb 22 19:33:20 2025 +0300

    Hello uses style.css

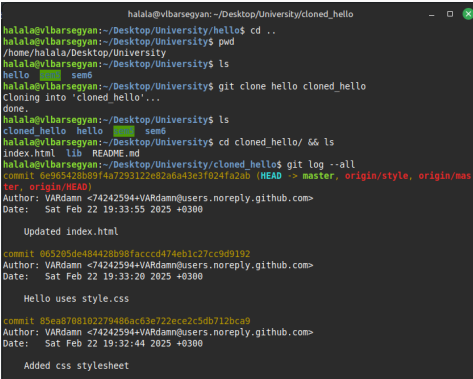
commit 85ea8708102279486ac63e722ece2c5db712bca9
Author: VARdamm <74242594+VARdamm@users.noreply.github.com>
Date: Sat Feb 22 19:32:44 2025 +0300

    Added css stylesheet

commit cc54e003acbad5fe50f8acd40844c2069f117e91
Author: VARdamm <74242594+VARdamm@users.noreply.github.com>
Date: Sat Feb 22 19:35:32 2025 +0300
```

Рис. 43: Слияние style с master

44. Перехожу в родительский каталог. Создаю клон репозитория `hello` в папке `cloned_hello` командой `git clone hello cloned_hello`. Перехожу в `cloned_hello` и просматриваю папки и файлы. Вывожу список всех коммитов командой `git log -all`



```
halala@vlbarsegyan: ~/Desktop/University/cloned_hello
halala@vlbarsegyan:~/Desktop/University/hello$ cd ..
halala@vlbarsegyan:~/Desktop/University$ pwd
/home/halala/Desktop/University
halala@vlbarsegyan:~/Desktop/University$ ls
hello  hello sem6
halala@vlbarsegyan:~/Desktop/University$ git clone hello cloned_hello
Cloning into 'cloned_hello'...
done.
halala@vlbarsegyan:~/Desktop/University$ ls
cloned_hello  hello  hello sem6
halala@vlbarsegyan:~/Desktop/University$ cd cloned_hello/ && ls
index.html  lib  README.md
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git log --all
commit 6e965428b89f4a7293122e82a6a43e3f024fa2ab (HEAD -> master, origin/master, origin/HEAD)
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:33:55 2025 +0300

    Updated index.html

commit 065205de484428b98facccd474eb1c27cc9d9192
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:33:20 2025 +0300

    Hello uses style.css

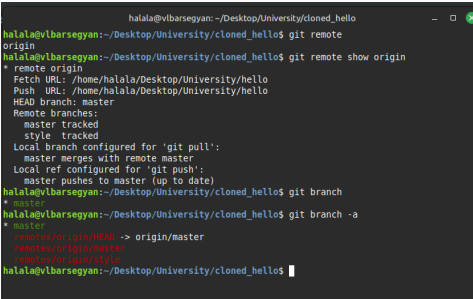
commit 85ea8708102279486ac63e722ece2c5db712bca9
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:32:44 2025 +0300

    Added css stylesheet
```

Рис. 44: Создание и просмотр клонированного репозитория

Что такое origin? Удаленные ветки

45. Выполняю команды `git remote` и `git remote show origin` для более подробной информации. Просматриваю ветки, доступные в клонированном репозитории, командой `git branch`. Просматриваю все ветки командой `git branch -a`

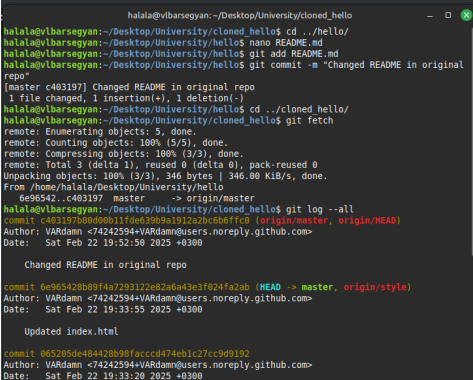
A screenshot of a terminal window with a dark background. The window title is 'halala@vlbarsegyan: ~/Desktop/University/cloned_hello'. The terminal shows the following commands and output:

```
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git remote
origin
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git remote show origin
* remote origin
  Fetch URL: /home/halala/Desktop/University/hello
  Push  URL: /home/halala/Desktop/University/hello
  HEAD branch: master
  Remote branches:
    master tracked
    style tracked
  Local branch configured for 'git pull':
    master merges with remote master
  Local ref configured for 'git push':
    master pushes to master (up to date)
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git branch
* master
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git branch -a
* master
  remotes/origin/HEAD -> origin/master
  remotes/origin/master
  remotes/origin/style
halala@vlbarsegyan:~/Desktop/University/cloned_hello$
```

Рис. 45: git remote, просмотр веток

Изменение оригинального репозитория

46. Редактирую README.md в репозитории hello и коммичу изменения. В клонированном репозитории выполняю *git fetch* для извлечения изменений, проверяю лог - вижу последний сделанный коммит

A terminal window with a dark background and light-colored text. The window title is 'halala@vlbarsegyan: ~/Desktop/University/cloned_hello'. The user is in a directory where they have cloned a repository. They run 'cd ../hello/' to move to the original repository directory. Then they use 'nano README.md' to edit the file. After saving, they run 'git add README.md' and 'git commit -m "Changed README in original repo"'. The terminal shows the commit process with details like '1 file changed, 1 insertion(+), 1 deletion(-)'. Then they run 'cd ../cloned_hello/' and 'git fetch'. The terminal shows the fetch process, including object enumeration and counting. Finally, they run 'git log --all' to view the commit history. The output shows the commit they just made as the latest one, with details like 'commit c403197b80d00b11fde639b9a1912a2bc6b6ffc0 (origin/master, origin/HEAD)' and the author 'VARdamn <74242594+VARdamn@users.noreply.github.com>'. The commit message is 'Changed README in original repo'. Below this, it shows 'Updated index.html' and another commit 'commit 065205de484428b98facccd474eb1c27cc9d9192' by the same author.

```
halala@vlbarsegyan: ~/Desktop/University/cloned_hello
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ cd ../hello/
halala@vlbarsegyan:~/Desktop/University/hello$ nano README.md
halala@vlbarsegyan:~/Desktop/University/hello$ git add README.md
halala@vlbarsegyan:~/Desktop/University/hello$ git commit -m "Changed README in original
repo"
[master c403197] Changed README in original repo
1 file changed, 1 insertion(+), 1 deletion(-)
halala@vlbarsegyan:~/Desktop/University/hello$ cd ../cloned_hello/
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git fetch
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 346 bytes | 346.00 KiB/s, done.
From /home/halala/Desktop/University/hello
6e96542..c403197 master -> origin/master
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git log --all
commit c403197b80d00b11fde639b9a1912a2bc6b6ffc0 (origin/master, origin/HEAD)
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:52:50 2025 +0300

    Changed README in original repo

commit 6e965428b89f4a7293122e82a6a43e3f024fa2ab (HEAD -> master, origin/style)
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:33:55 2025 +0300

    Updated index.html

commit 065205de484428b98facccd474eb1c27cc9d9192
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:33:20 2025 +0300
```

47. Проверяю клонированный файл README.md - он не изменился. Выполняю слияние извлеченных изменений командой `git merge origin/master`. Снова проверяю содержимое файла - теперь оно обновилось.

```
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ cat README.md
This is the Hello World example from the git tutorial.
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git merge origin/master
Updating 6e96542..c403197
Fast-forward
 README.md | 2 +-
 1 file changed, 1 insertion(+), 1 deletion(-)
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ cat README.md
This is the Hello World example from the git tutorial.
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git pull
Already up to date.
```

Рис. 47: Проверка файла до и после слияния изменений

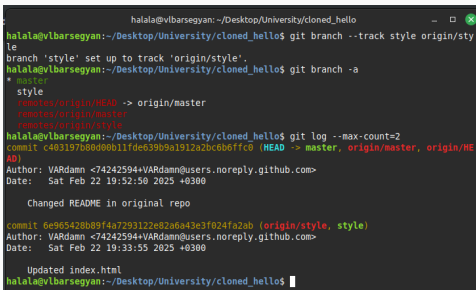
48. Выполняю:

```
git branch --track style origin/style
```

```
git branch -a
```

```
git log --max-count=2
```

Теперь можно видеть ветку style в списке веток и логе



```
halala@vlbarsegyan: ~/Desktop/University/cloned_hello
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git branch --track style origin/style
branch 'style' set up to track 'origin/style'.
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git branch -a
* master
  style
  remotes/origin/HEAD -> origin/master
  remotes/origin/master
  remotes/origin/style
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git log --max-count=2
commit c403197b80d00b11fde639b9a1912a2bc6b6ffc0 (HEAD -> master, origin/master, origin/HEAD)
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:52:50 2025 +0300

    Changed README in original repo

commit 6e965428b89f4a7293122e82a6a43e3f024fa2ab (origin/style, style)
Author: VARdamn <74242594+VARdamn@users.noreply.github.com>
Date: Sat Feb 22 19:33:55 2025 +0300

    Updated index.html
halala@vlbarsegyan:~/Desktop/University/cloned_hello$
```

Рис. 48: Добавление ветки наблюдения

Создание чистого репозитория, добавление удаленного репозитория

49. Создаю чистый репозиторий командой `git clone --bare hello hello.git` и перехожу в него. Добавляю удаленный репозиторий командой `git remote add shared ../hello.git`. Редактирую файл README.md и отправляю изменения в общий репозиторий. В клонированном репозитории добавляю командой `git remote add shared ../hello.git`, и извлекаю сделанные изменения командой `git pull shared master`, проверяю файл

```
halala@vlbarsegyan: ~/Desktop/University/cloned_hello
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ cd ..
halala@vlbarsegyan:~/Desktop/University$ git clone --bare hello hello.git
Cloning into bare repository 'hello.git'...
done.
halala@vlbarsegyan:~/Desktop/University$ ls hello.git
branches  config  description  HEAD  hooks  info  objects  packed-refs  refs
halala@vlbarsegyan:~/Desktop/University$ cd hello
halala@vlbarsegyan:~/Desktop/University/hello$ git remote add shared ../hello.git
halala@vlbarsegyan:~/Desktop/University/hello$ nano README.md
halala@vlbarsegyan:~/Desktop/University/hello$ git checkout master
M README.md
Already on 'master'
halala@vlbarsegyan:~/Desktop/University/hello$ git add README.md
halala@vlbarsegyan:~/Desktop/University/hello$ git commit -m "Added shared comment to readme"
[master f19acd8] Added shared comment to readme
1 file changed, 2 insertions(+), 1 deletion(-)
halala@vlbarsegyan:~/Desktop/University/hello$ git push shared master
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 12 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 420 bytes | 420.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To ../hello.git
c403197..f19acd8 master -> master
halala@vlbarsegyan:~/Desktop/University/hello$ cd ../cloned_hello/
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git remote add shared ../hello.git
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git branch --track shared master
branch 'shared' set up to track 'master'.
halala@vlbarsegyan:~/Desktop/University/cloned_hello$ git pull shared master
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 420 bytes | 133.00 KiB/s, done.
```

Выводы

Я настроил git, научился с ним работать, узнал про различные ветки, слияние, перебазирование, чистые репозитории.