

# Лабораторная работа №1

## Работа с git

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## Информация

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- <https://github.com/nnnefedova>

## Вводная часть

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- Научиться полному взаимодействию с git и разобрать основные его особенности.

## Основная часть

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# Подготовка

```
[nata@MacBook-Air-Nata ~ % cd Desktop  
[nata@MacBook-Air-Nata Desktop % cd Machine_learning  
[nata@MacBook-Air-Nata Machine_learning % mkdir hello  
[nata@MacBook-Air-Nata Machine_learning % cd hello  
[nata@MacBook-Air-Nata hello % touch hello.html  
[nata@MacBook-Air-Nata hello % echo "Hello, World!" > hello.html
```

Рис. 1: Параметры установки окончаний строк

```
nata ~/Users/nata/Desktop/git% 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 /Users/nata/Desktop/git/.git/
```

Рис. 2: Создание репозитория

## Создание проекта

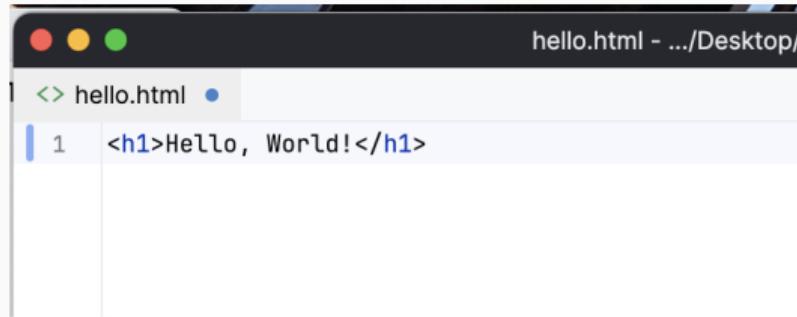
```
nata ~/Users/nata/Desktop/git% git add hello.html
nata ~/Users/nata/Desktop/git% git commit -m "Initial Commit"
[master (root-commit) 0eca96f] Initial Commit
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 hello.html
nata ~/Users/nata/Desktop/git%
```

Рис. 3: Создание страницы «Hello, World»

```
[nata /Users/nata/Desktop/git% git status  
On branch master  
nothing to commit, working tree clean]
```

Рис. 4: Проверка статуса

## Создание проекта



A screenshot of a code editor window titled "hello.html - .../Desktop/c". The window shows a single line of HTML code: "`<h1>Hello, World!</h1>`". The code is highlighted in blue, and the line number "1" is visible to the left of the code.

Рис. 5: Добавление файла в репозиторий

## Создание проекта

---

```
nata /Users/nata/Desktop/git/hello% vim hello.html
nata /Users/nata/Desktop/git/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")
```

Рис. 6: Проверка состояния репозитория

## Внесение изменений

```
<html>
  <head>
  </head>
  <body>
    <h1>Hello, World!</h1>
  </body>
</html>
~  
~  
!t status
```

Рис. 7: Проверка состояния рабочего каталога

## Внесение изменений

```
nata /Users/nata/Desktop/git/hello% git add hello.html  
nata /Users/nata/Desktop/git/hello% git status  
On branch master  
Changes to be committed:  
(use "git restore --staged <file>..." to unstage)  
modified:   hello.html
```

Рис. 8: Проверка состояния рабочего каталога

# Индексация изменений

```
nata ~/Users/nata/Desktop/git/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
```

Рис. 9: Индексация изменений

# Индексация изменений

```
nata ~/Users/nata/Desktop/git/hello% git commit -m "Added standard HTML page tags"
[master e97efbd] Added standard HTML page tags
 1 file changed, 5 insertions(+)
nata ~/Users/nata/Desktop/git/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")
nata ~/Users/nata/Desktop/git/hello% git add .
nata ~/Users/nata/Desktop/git/hello% git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    modified:   hello.html

nata ~/Users/nata/Desktop/git/hello% git commit -m "Added HTML header"
[master 5cf00b3] Added HTML header
 1 file changed, 2 insertions(+)
nata ~/Users/nata/Desktop/git/hello%
```

Рис. 10: Коммит изменений

# Индексация изменений

The screenshot shows a terminal window on the left and a file browser window on the right.

**Terminal Output (git log):**

```
nata /Users/nata/Desktop/git/hello% git log
commit 5cf00b38bb86db48d2cd7055928163f3830900e7 (HEAD -> master)
Author: nnnefedova <132226537@pfur.ru>
Date:   Sat Feb 15 13:46:22 2025 +0300

    Added HTML header

commit e97efbd25755a87d910b7ddc4b58746cc84a51ba
Author: nnnefedova <132226537@pfur.ru>
Date:   Sat Feb 15 13:45:23 2025 +0300

    Added standard HTML page tags

commit 2b315ace5b35329076bf2832536b4ef9ddf4f663 (origin/master)
Author: nnnefedova <132226537@pfur.ru>
Date:   Sat Feb 15 13:36:11 2025 +0300

    Initial Commit
nata /Users/nata/Desktop/git/hello%
```

**File Browser:**

- Favourites
- Recents
- Name
- hello.html
- Desktop
- Documents
- Downloads

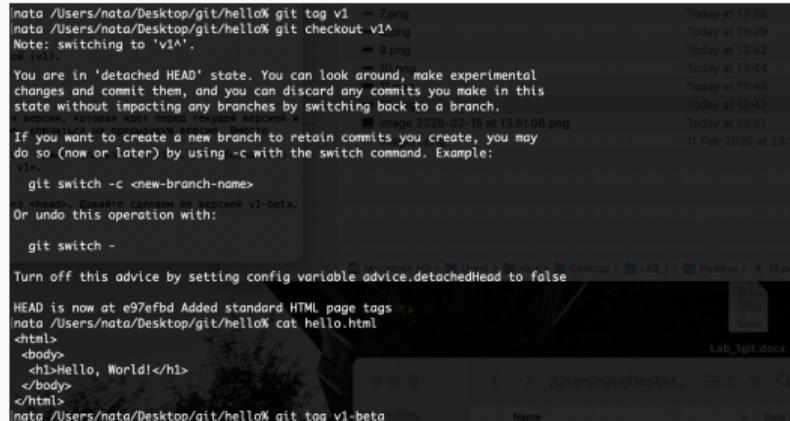
Рис. 11: Изменение страницы «Hello, World» и просмотр git log

# Индексация изменений

```
initial commit
nata ~/Users/nata/Desktop/git/hello% git checkout 2b315ace5b
Note: switching to '2b315ace5b'
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 -m 1
Turn off this advice by setting config variable advice.detachedHead to false
HEAD is now at 2b315ac Initial Commit
nata ~/Users/nata/Desktop/git/hello% cat hello.html
nata ~/Users/nata/Desktop/git/hello%
nata ~/Users/nata/Desktop/git/hello%
nata ~/Users/nata/Desktop/git/hello%
nata ~/Users/nata/Desktop/git/hello%
nata ~/Users/nata/Desktop/git/hello% -git checkout master~/Users/Desktop...
zsh: command not found: -git
nata ~/Users/nata/Desktop/git/hello% git checkout master
Previous HEAD position was 2b315ac Initial Commit
Switched to branch 'master'
nata ~/Users/nata/Desktop/git/hello% cat hello.html
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>
nata ~/Users/nata/Desktop/git/hello%
```

Рис. 12: Добавление изменения в индекс git

# Индексация изменений



```
nata /Users/nata/Desktop/git/hello% git tag v1 -- 7.png
nata /Users/nata/Desktop/git/hello% git checkout v1^
Note: switching to 'v1^'.
暗示 (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.
HEAD is now at e97efbd Added standard HTML page tags
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 e97efbd Added standard HTML page tags
nata /Users/nata/Desktop/git/hello% cat hello.html
<html>
<body>
<h1>Hello, World!</h1>
</body>
</html>
nata /Users/nata/Desktop/git/hello% git tag v1-beta
nata /Users/nata/Desktop/git/hello% git tag v1-beta
```

Рис. 13: Переключение по имени тега

## Индексация изменений

```
nata ~/Users/nata/Desktop/git/hello% git checkout v1
Previous HEAD position was e97efbd Added standard HTML page tags
HEAD is now at 5cf00b3 Added HTML header
nata ~/Users/nata/Desktop/git/hello% git checkout v1-beta
Previous HEAD position was 5cf00b3 Added HTML header
HEAD is now at e97efbd Added standard HTML page tags
```

Рис. 14: Переключение по имени тега

## Отмена локальных изменений (до индексации)

```
|nata /Users/nata/Desktop/git/hello% git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    modified:   hello.html

|nata /Users/nata/Desktop/git/hello% git reset HEAD hello.html
Unstaged changes after reset:
 M      hello.html

|nata /Users/nata/Desktop/git/hello% git checkout hello.html hello.html
Updated 1 path from the index
|nata /Users/nata/Desktop/git/hello% git status
On branch master
nothing to commit, working tree clean
nata /Users/nata/Desktop/git/hello%
```

Рис. 15: Переключитесь на ветку master

## Отмена локальных изменений (до индексации)

```
Revert "Oops, we didn't want this commit" /png
      — 8.png
This reverts commit ab9728f353fc0b3dcaeb7f8c89b76cd1fc90baee.
И удаляет изменения, сохраненные
# Please enter the commit message for your changes. Lines starting
# with '#' will be ignored, and an empty message aborts the commit.
# бщение по умолчанию или оставить
# On branch master
# Changes to be committed:
#       modified:   hello.html
#
# Untracked files:
#       .DS_Store
#
#
~#
~#
~#
~#
```

Чтк. добавл. комм. мкты в логозапомин.

Рис. 16: Изменение hello.html

## Отмена локальных изменений (до индексации)

```
nata /Users/nata/Desktop/git/hello% git log --oneline
commit 557c3e91f1bb22df7d0505ac864a3ee6c120a18 (HEAD -> master)
Author: nnnefedova <1132226537@pfur.ru> - 10.png
Date:   Sat Feb 15 18:40:09 2025 +0300
    наилегчайший
        Revert "Oops, we didn't want this commit"
        └── image 2025-02-15 at 18.34.06.png
    This reverts commit ab9728f353fc0b3dcaeb7f8c89b76cd1fc90baee.png
        └── image 2025-02-15 at 18.38.02.png
commit ab9728f353fc0b3dcaeb7f8c89b76cd1fc90baee (tag: v1)
Author: nnnefedova <1132226537@pfur.ru> - image 2025-02-15 at 18.40.18.png
Date:   Sat Feb 15 18:38:37 2025 +0300
    было бы неплохо иметь команду
    для отмены
    Оoops, we didn't want this commit
    └── image/1.png
    └── image/13.png
    └── image/14.png
commit 5cf00b38bbb6db48d2cd7059528163f3830900e7 (tag: v1)
Author: nnnefedova <1132226537@pfur.ru> - image 2025-02-15 at 18.40.18.png
Date:   Sat Feb 15 13:46:22 2025 +0300
    Added HTML header

commit e97efbd25755a87d910b7ddc4b58746cc84a51ba (tag: v1-beta)
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 13:45:23 2025 +0300
    Added standard HTML page tags

commit 2b315ace5b35329076bf2832536b4ef9ddf4f663
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 13:36:11 2025 +0300
    Initial Commit
nata /Users/nata/Desktop/git/hello%
```

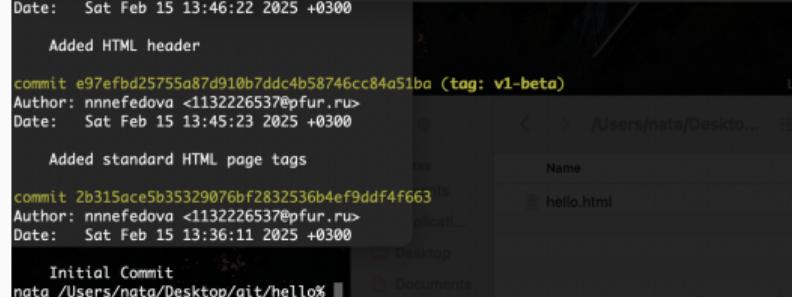


Рис. 17: Проверка состояния

## Отмена локальных изменений (до индексации)

```
nata /Users/nata/Desktop/git/hello% git log --oneline
commit 557c3e91f1bb22df7d0505ac864a3ee6c120a18 (HEAD -> master)
Author: nnnefedova <1132226537@pfur.ru> - 10.png
Date:   Sat Feb 15 18:40:09 2025 +0300
    наилегчайший
        Revert "Oops, we didn't want this commit"
        └── image 2025-02-15 at 18.34.06.png
    This reverts commit ab9728f353fc0b3dcaeb7f8c89b76cd1fc90baee.png
        └── image 2025-02-15 at 18.38.02.png
commit ab9728f353fc0b3dcaeb7f8c89b76cd1fc90baee (2025-02-15 at 18.38.49.png)
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 18:38:37 2025 +0300
    было бы неплохо иметь команду
    для отмены
   Oops, we didn't want this commit
    данного коммита в истории git log.
commit 5cf00b38bbb6db48d2cd7059528163f3830900e7 (tag: v1)
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 13:46:22 2025 +0300
    Added HTML header

commit e97efbd25755a87d910b7ddc4b58746cc84a51ba (tag: v1-beta)
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 13:45:23 2025 +0300
    Added standard HTML page tags

commit 2b315ace5b35329076bf2832536b4ef9ddf4f663
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 13:36:11 2025 +0300
    Initial Commit
nata /Users/nata/Desktop/git/hello%
```

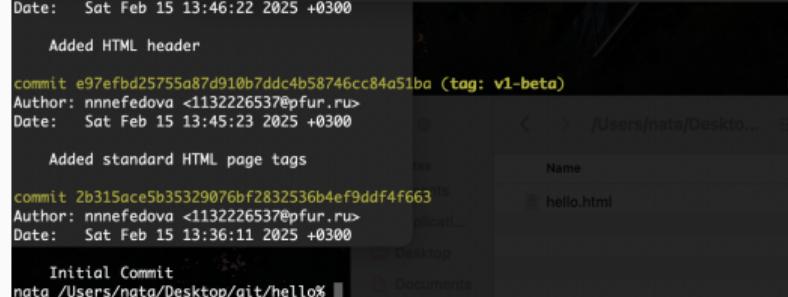
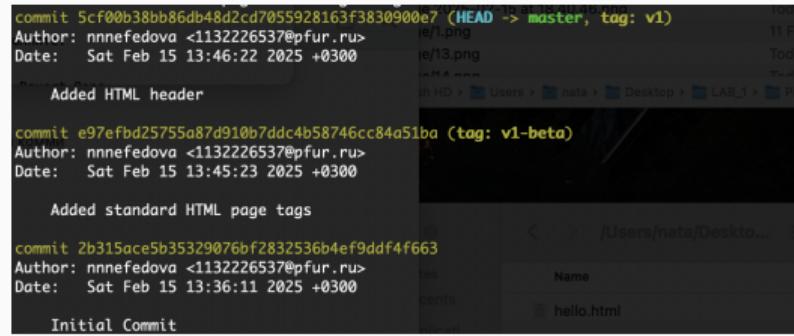
A screenshot of a terminal window and a file browser window. The terminal window shows a git log output with several commits. The first commit is a revert of an earlier commit that contained an image. The second commit is a new commit with the same message, adding an image. The third commit is a tag named 'v1'. The fourth commit is a tag named 'v1-beta'. The fifth commit is another revert, this time of the 'v1-beta' commit. The file browser window shows a directory structure with files like 'hello.html' and 'image1.png'.

Рис. 18: Изменения в рабочем каталоге

## Отмена коммитов



```
commit 5cf00b38bb86db48d2cd7055928163f3830900e7 (HEAD -> master, tag: v1)
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 13:46:22 2025 +0300
        Added HTML header

commit e97efbd25755a87d910b7ddc4b58746cc84a51ba (tag: v1-beta)
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 13:45:23 2025 +0300
        Added standard HTML page tags

commit 2b315ace5b35329076bf2832536b4ef9ddf4f663
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 13:36:11 2025 +0300
        Initial Commit
```

Рис. 19: Удаление тега oops

## Внесение изменений в коммиты

```
nata /Users/nata/Desktop/git/hello% git log --all
commit 557c3e91fb22d4f7d0505ac864a3ee6c120a18 (tag: oops)
Author: nnnefedova <1132226537@fufur.ru> 9.png
Date:   Sat Feb 15 18:40:09 2025 +0300 - 10.png
        С любой «запарой» как правило, можно
        ⚡ Revert "Oops, we didn't want this commit"
        избавиться вот так:
This reverts commit ab9728f353fc0b3dcaebe7f8c89b76cd1fc90baee.
commit ab9728f353fc0b3dcaebe7f8c89b76cd1fc90baee 025-02-15 at 18.38.42.png
Author: nnnefedova <1132226537@fufur.ru> - Image 2025-02-15 at 18.38.49.png
Date:   Sat Feb 15 18:38:37 2025 +0300 - image 2025-02-15 at 18.40.18.png
        Oops, we didn't want this commit ↗ 2025-02-15 at 18.40.46.png
commit 5cf00b38bb86db48d2cd7055928163f3830900e7 (HEAD -> master, tag: v1)
Author: nnnefedova <1132226537@fufur.ru>
Date:   Sat Feb 15 13:46:22 2025 +0300
        Added HTML header
        КОММИТ
commit e97efbd25755a87d910b7ddc4b58746cc84d51ba (tag: v1-beta)
Author: nnnefedova <1132226537@fufur.ru>
Date:   Sat Feb 15 13:45:23 2025 +0300
        Added standard HTML page tags
commit 2b315ace5b35329076bf2832536b4ef9ddf4f663
Author: nnnefedova <1132226537@fufur.ru>
Date:   Sat Feb 15 13:36:11 2025 +0300
        Initial Commit
```

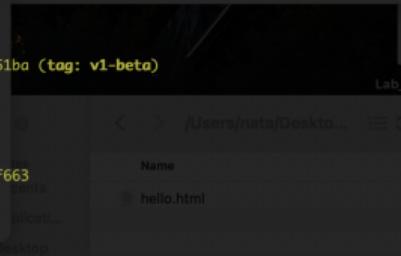
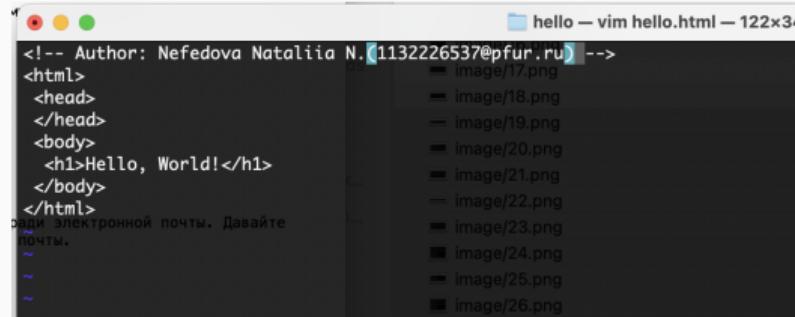


Рис. 20: Просмотр всех коммитов

## Внесение изменений в коммиты



```
<!-- Author: Nefedova Natalia N. (113222653@pfur.ru) -->
<html>
  <head>
  </head>
  <body>
    <h1>Hello, World!</h1>
  </body>
</html>

~
```

Рис. 21: Добавление email

## Внесение изменений в коммиты

```
|nata /Users/nata/Desktop/git/hello% git log
commit e23b474eef11412e1c51e6b7ca74bd653d20d2 (HEAD -> master)
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 18:47:19 2025 +0300
        - image/25.png
        Add an author/email comment
        - image/26.png
commit 5cf00b38bb86db48d2cd7055928163f3830900e7 (tag: v1)
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 13:46:22 2025 +0300
        - image/27.png
        Added HTML header
commit e97efbd25755a87d910b7ddc4b58746cc84a51ba (tag: v1-beta)
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 13:45:23 2025 +0300
        - image/28.png
        Added standard HTML page tags
commit 2b315ace5b35329076bf2832536b4ef9ddf4f663 Name
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 13:36:11 2025 +0300
        - hello.html
Initial Commit
```

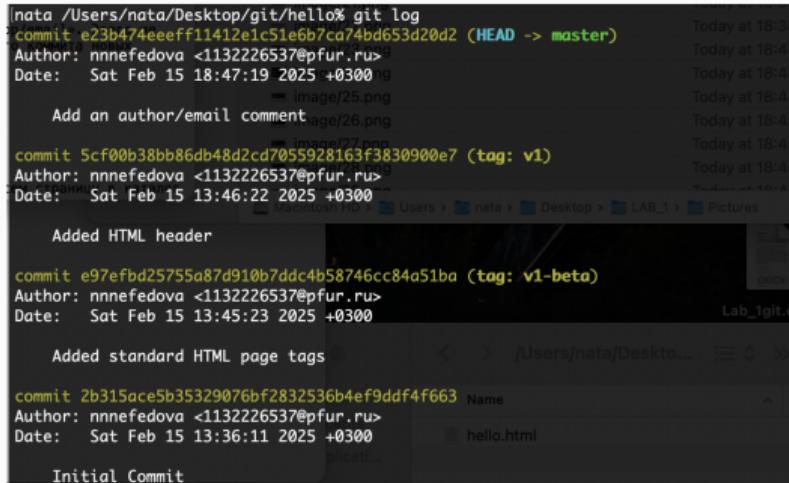


Рис. 22: Просмотр истории

## Перемещение файлов

```
nata /Users/nata/Desktop/git% mkdir lib
nata /Users/nata/Desktop/git% cd lib
nata /Users/nata/Desktop/git/lib% cd ..
nata /Users/nata/Desktop/git% cd hello
nata /Users/nata/Desktop/git/hello% git mv hello.html lib
nata /Users/nata/Desktop/git/hello% git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    renamed:   hello.html -> lib
Untracked files:
  (use "git add <file>..." to include in what will be committed)
    .DS_Store
nata /Users/nata/Desktop/git/hello%
```

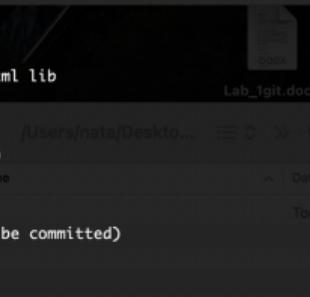
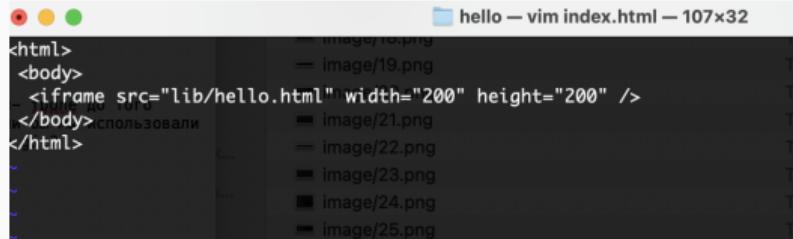


Рис. 23: Перемещение файла hello.html в каталог lib

## Подробнее о структуре



The screenshot shows a terminal window with the vim editor open. The file being edited is named 'index.html'. The code inside the file is:

```
<html>
  <body>
    <iframe src="lib/hello.html" width="200" height="200" />
  </body>
</html>
```

On the right side of the terminal window, there is a file browser pane showing a directory structure. The directory is named 'hello' and contains several files: 'index.html', 'image/10.png', 'image/19.png', 'image/21.png', 'image/22.png', 'image/23.png', 'image/24.png', and 'image/25.png'. The file 'index.html' is currently selected.

Рис. 24: Добавление index.html

## Подробнее о структуре

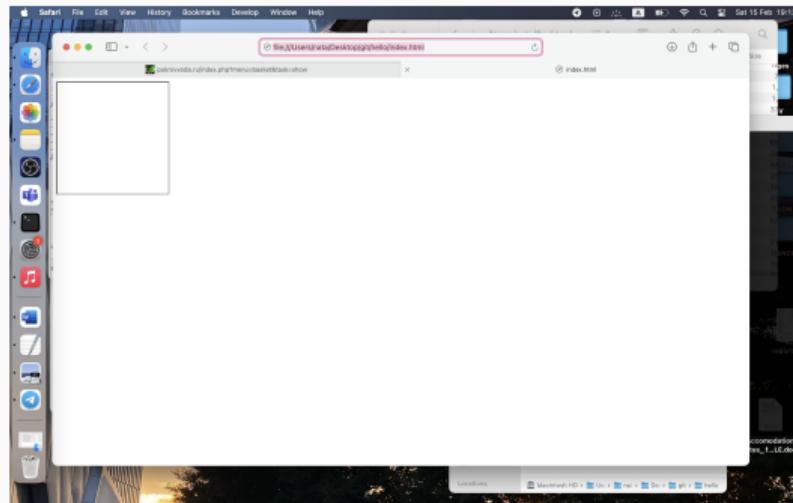


Рис. 25: Новое окно в браузере

## Git внутри: Каталог .git

```
nata /Users/nata/Desktop/git/hello% ls -C .git  
COMMIT_EDITMSG  ORIG_HEAD      description    index      logs      refs  
HEAD           config        hooks          info      objects      Today a  
nata /Users/nata/Desktop/git/hello%
```

Рис. 26: Каталог .git

## Git внутри: Каталог .git

```
nata /Users/nata/Desktop/git/hello% ls -C .git/objects ||| Today at 10:30 AM
02      2b      4d      61      72      ab      d9      e9      f8      pack
10      31      55      62      a4      ac      e2      f2      f9
27      47      5c      66      a9      cc      e6      f7      info
nata /Users/nata/Desktop/git/hello% ||| Today at 10:30 AM
```

Рис. 27: Просмотр базы данных объектов

## Git внутри: Каталог .git

```
nata /Users/nata/Desktop/git/hello% ls .git/refs  
heads tags  
nata /Users/nata/Desktop/git/hello% -ls .git/refs/heads  
zsh: command not found: -ls  
nata /Users/nata/Desktop/git/hello% ls .git/refs/heads  
master  
nata /Users/nata/Desktop/git/hello% ls .git/refs/tags  
v1 v1-beta  
nata /Users/nata/Desktop/git/hello% cat .git/refs/tags/v1  
5cf00b38bb86db48d2cd7055928163f3830900e7  
nata /Users/nata/Desktop/git/hello%
```

Рис. 28: Углубление в базу данных объектов

## Git внутри: Каталог .git

```
nata /Users/nata/Desktop/git/hello% ls -C .git  
COMMIT_EDITMSG  ORIG_HEAD      description    index      logs       refs  
HEAD           config        hooks          info      objects     Today a  
nata /Users/nata/Desktop/git/hello%
```

Рис. 29: Изучение веток и тегов

## Git внутри: Каталог .git

```
|nata /Users/nata/Desktop/git/hello% git log --max-count=1           /Users/nata/Desktop...
|commit d992254c2a5a732576c68fb7566b855052a7194e (HEAD -> master)
|Author: nnnefedova <132226537@pfur.ru>
|Date:   Sat Feb 15 19:12:55 2025 +0300
|
|    Added index.html.
|nata /Users/nata/Desktop/git/hello%
```

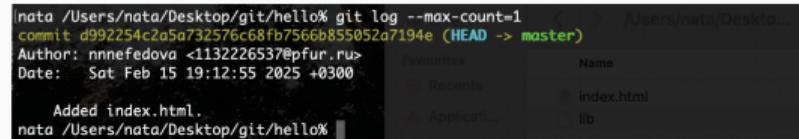
A screenshot of a terminal window and a file browser. The terminal window shows a Git log command with one commit. The commit message is 'Added index.html.' and it was made by 'nnnefedova' on Saturday, February 15, 2025, at 19:12:55. The commit hash is 'd992254c2a5a732576c68fb7566b855052a7194e'. The log ends with the command 'nata /Users/nata/Desktop/git/hello%'. To the right of the terminal is a small file browser window showing two files: 'index.html' and 'lib'.

Рис. 30: Файл HEAD

## Работа непосредственно с объектами git

```
nata /Users/nata/Desktop/git/hello% git cat-file -t d992254c2a5a7
commit
nata /Users/nata/Desktop/git/hello% git cat-file -p d992254c2a5a7
tree cc4c999575ca7ec59d55221ca40f314ba6a4567d <-- /Users/nata/Desktop/
parent 66b1dd9f2807d4c1cf9996215d24065074013d98
author nnnefedova <1132226537@pfur.ru> 1739635975 +0300
committer nnnefedova <1132226537@pfur.ru> 1739635975 +0300
Name
index.html
index.html
lib
lib
Added index.html.
nata /Users/nata/Desktop/git/hello%
```

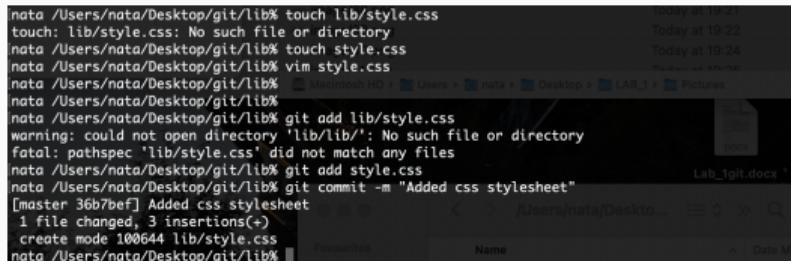
Рис. 31: Поиск последнего коммита

## Работа непосредственно с объектами git

```
nata /Users/nata/Desktop/git/hello% git cat-file -p d992254c2a5
tree cc4c999575ca7ec59d55221ca40f314ba6a4567d
parent 66b1dd9f2807d4c1cf9996215d24065074013d98
author nnnefedova <1132226537@pfur.ru> 1739635975 +0300
committer nnnefedova <1132226537@pfur.ru> 1739635975 +0300
< > /Users/nata/
Added index.html.
```

Рис. 32: Вывод последнего коммита с помощью SHA1 хэша

## Создание ветки



```
nata /Users/nata/Desktop/git/lib% touch lib/style.css
touch: lib/style.css: No such file or directory
nata /Users/nata/Desktop/git/lib% touch style.css
nata /Users/nata/Desktop/git/lib% vim style.css
nata /Users/nata/Desktop/git/lib% 
nata /Users/nata/Desktop/git/lib% git add lib/style.css
warning: could not open directory 'lib/lib/': No such file or directory
fatal: pathspec 'lib/style.css' did not match any files
nata /Users/nata/Desktop/git/lib% git add style.css
nata /Users/nata/Desktop/git/lib% git commit -m "Added css stylesheet"
[master 36b7bef] Added css stylesheet
 1 file changed, 3 insertions(+)
 create mode 100644 lib/style.css
nata /Users/nata/Desktop/git/lib%
```

Рис. 33: Добавление содержимого в файл

## Создание ветки

```
nata ~/Users/nata/Desktop/git/lib% touch lib/style.css           Today at 19:21
touch: lib/style.css: No such file or directory
nata ~/Users/nata/Desktop/git/lib% touch style.css             Today at 19:22
nata ~/Users/nata/Desktop/git/lib% vim style.css              Today at 19:24
nata ~/Users/nata/Desktop/git/lib%                               Troublesome
Macintosh HD > Users > nata > Desktop > LAB_1 > Pictures
nata ~/Users/nata/Desktop/git/lib%
nata ~/Users/nata/Desktop/git/lib% git add lib/style.css        Today at 19:24
warning: could not open directory 'lib/lib/': No such file or directory
fatal: pathspec 'lib/style.css' did not match any files
nata ~/Users/nata/Desktop/git/lib% git add style.css           Troublesome
nata ~/Users/nata/Desktop/git/lib% git commit -m "Added css stylesheet" Lab_1git.docx
[master 36b7bef] Added css stylesheet                         Today at 19:24
 1 file changed, 3 insertions(+)
 create mode 100644 lib/style.css
nata ~/Users/nata/Desktop/git/lib%
```

Рис. 34: Коммит

## Создание ветки

```
nata /Users/nata/Desktop/git/lib% vim hello.html
nata /Users/nata/Desktop/git/lib% Macintosh HD > Users > nata > Desktop > LAB_1 >
nata /Users/nata/Desktop/git/lib%
nata /Users/nata/Desktop/git/lib% git add lib/hello.html
warning: could not open directory 'lib/lib/': No such file or directory
fatal: pathspec 'lib/hello.html' did not match any files
nata /Users/nata/Desktop/git/lib% git add hello.html
nata /Users/nata/Desktop/git/lib% git commit -m "Hello uses style.css"
[master 2571c3d] Hello uses style.css
 1 file changed, 9 insertions(+)
 create mode 100644 lib/hello.html
nata /Users/nata/Desktop/git/lib%
```

Рис. 35: Обновление файла hello.html

## Создание ветки

---

```
nata ~/Users/nata/Desktop/git% cd hello
nata ~/Users/nata/Desktop/git/hello% vim index.html
nata ~/Users/nata/Desktop/git/hello% git add index.html
nata ~/Users/nata/Desktop/git/hello% git commit -m "Updated index.html"
[style ff4f132] Updated index.html
  1 file changed, 3 insertions(+)
nata ~/Users/nata/Desktop/git/hello% Today at 19:03
```

Рис. 36: Обновление файла index.html

## Создание ветки

---

```
nata /Users/nata/Desktop/git% cd hello
nata /Users/nata/Desktop/git/hello% vim index.html
nata /Users/nata/Desktop/git/hello% git add index.html
nata /Users/nata/Desktop/git/hello% git commit -m "Updated index.html"
[style ff4f132] Updated index.html
  1 file changed, 3 insertions(+)
nata /Users/nata/Desktop/git/hello% Today at 19:03
```

Рис. 37: Коммит

## Навигация по веткам

---

```
nata ~/Users/nata/Desktop/git/hello% git log --all  
commit ff4f13206c4f88530f04ea8678f2624e7354385c (HEAD -> style)  
Author: nnnefedova <l32226537@pfur.ru> |git/26.png  
Date:   Sat Feb 15 19:34:55 2025 +0300  
        └─ image/23.png  
        Updated index.html  
          └─ image/27.png  
          └─ image/28.png  
commit d992254c2a5a732576c68fb7566b855052a7194e (master)  
Author: nnnefedova <l32226537@pfur.ru> |git/30.png  
Date:   Sat Feb 15 19:12:55 2025 +0300  
        └─ image/31.png  
        Added index.html  
          └─ image/32.png  
          └─ image/33.png  
commit 66b1ad9f2807d4c1cf9996215d24065074013d987  
Author: nnnefedova <l32226537@pfur.ru> |git/30.png  
Date:   Sat Feb 15 19:10:35 2025 +0300  
        └─ image/30.png
```

Рис. 38: Навигация по веткам

## Навигация по веткам

```
nata ~/Users/nata/Desktop/git/hello% git checkout master
D     lib                         image/45.png          Today at 19:3
Switched to branch 'master'      image/46.png          Today at 19:3
nata ~/Users/nata/Desktop/git/hello% cat lib/hello.html
cat: lib/hello.html: No such file or directory  ~/Users/nata/Desktop/LAB_1/Pictures
nata ~/Users/nata/Desktop/git/hello% cat hello.html
<!-- Author: Nefedova Natalia N.(1132226537@pfur.ru) -->
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>
```

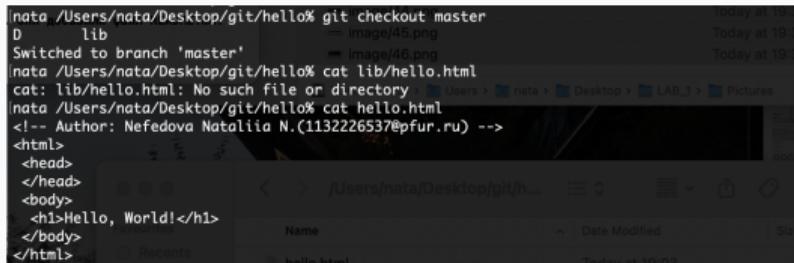
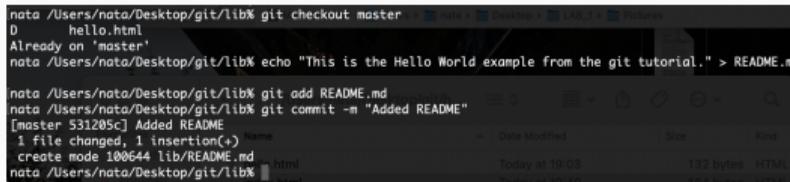


Рис. 39: Переключение на ветку master

## Изменения в ветке master



```
nata /Users/nata/Desktop/git/lib% git checkout master
D    hello.html
Already on 'master'
nata /Users/nata/Desktop/git/lib% echo "This is the Hello World example from the git tutorial." > README.md
nata /Users/nata/Desktop/git/lib% git add README.md
nata /Users/nata/Desktop/git/lib% git commit -m "Added README"
[master 531205c] Added README
 1 file changed, 1 insertion(+)
 create mode 100644 lib/README.md
nata /Users/nata/Desktop/git/lib%
```

Рис. 40: Создание файла README.md

## Сделайте коммит изменений README.md в ветку master

```
nata /Users/nata/Desktop/git/lib% git log --graph --all
* commit 531205cb1a218dc541ba299002149b892c9a0da (HEAD -> master) Today
| Author: nnnefedova <1132226537@pfur.ru> Today
| Date: Sat Feb 15 19:42:30 2025 +0300 Today
|
|     Added README Today
|     --- image/33.png Today
|     --- image/34.png Today
|     --- image/35.png Today
|     --- image/36.png Today
|
* commit '2571c3d3424c393ca92f2518db0cf1117377113d' Today
| Author: nnnefedova <1132226537@pfur.ru> ge/38.png Today
| Date: Sat Feb 15 19:33:07 2025 +0300 image/39.png Today
|
|    コミット с помощью простых ASCII Today
|     master Hello uses style.css image/40.png Today
|     --- image/41.png Today
|
|     Демонстрация показывается только Today
* commit 36b7bef3c4df7e519226db176eb9d16dfa3a0fe Today
| Author: nnnefedova <1132226537@pfur.ru> ge/43.png Today
| Date: Sat Feb 15 19:28:36 2025 +0300 image/44.png Today
|
|     Added css stylesheet Macintosh HD > Users > nata > Desktop > LAB_1 > Pictures
|
* commit 0eca96fce814efde04766883bf5adf1856da5f85 Today
| Author: nnnefedova <1132226537@pfur.ru> image/45.png Today
| Date: Sat Feb 15 13:30:17 2025 +0300 image/46.png Today
|
|     Initial Commit
```

Рис. 41: Коммит изменений README.md в ветку master

# Слияние

```
nata ~/Users/nata/Desktop/git% git checkout style
error: pathspec 'style' did not match any file(s) known to git
nata ~/Users/nata/Desktop/git% cd hello
nata ~/Users/nata/Desktop/git/hello% git checkout style
D       lib                         image/31.png
Already on 'style'.
nata ~/Users/nata/Desktop/git/hello% git merge master
Already up to date.
nata ~/Users/nata/Desktop/git/hello% git log --graph --all
* commit ff4f1320664f88530f04e8678f2624e7354385c (HEAD -> style)
| Author: nnnefedova <1132226537@pfur.ru> +oe/36.png
| Date:   Sat Feb 15 19:34:55 2025 +0300 image/37.png
|           Updated index.html          image/38.png
|           ---                         image/39.png
* commit d992254c2a5a732576c68fb7566b855052a7194d (master)
| Author: nnnefedova <1132226537@pfur.ru> +oe/41.png
| Date:   Sat Feb 15 19:12:55 2025 +0300 image/42.png
| style
|       Added index.html
Macintosh HD > Users > nata > Desktop > LAb_1
```

Рис. 42: Слияние веток

## Создание конфликта

```
nata /Users/nata/Desktop/git% git commit -m "Merged master fixed conflict."
[master a799bde] Merged master fixed conflict.
 1 file changed, 1 insertion(+), 1 deletion(-)
```

Рис. 43: Внесение изменений в файл

## Разрешение конфликтов

```
nata /Users/nata/Desktop/git/hello% cat hello.html      Today at 20:33
nata /Users/nata/Desktop/git/hello/lib% cat hello.html      Today at 20:33
<-- Author: Nefedova Natalia N.(1132226537@pfur.ru) --> Today at 20:37
<html>
<head>
<link type="text/css" rel="stylesheet" media="all" href="style.css" />
<!-- no style -->
<>>>> master:hello.html
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html> More
```

Рис. 44: Попытка объединения

## Разрешение конфликтов

```
|nata /Users/nata/Desktop/git/hello% git checkout style           Today at 19:42
|Switched to branch 'style'
|nata /Users/nata/Desktop/git/hello% git rebase master           Today at 19:43
|Successfully rebased and updated refs/heads/style.           Today at 19:45
|nata /Users/nata/Desktop/git/hello% git log --graph           Today at 20:07
* commit caaf289fc8274803915265adf6fa9f2e9f4506d1 (HEAD -> style) Today at 20:26
| Author: nnnefedova <1132226537@pfur.ru> Today at 20:33
| Date:   Sat Feb 15 21:51:56 2025 +0300 Today at 20:37
|       └── image/56.png Today at 20:41
|         Updated index.html Today at 22:01
|
* commit 6d54ca18e9315bb6ec141f18328f1bdf52175755 LAB_1 > Pictures > + image/56.png
| Author: nnnefedova <1132226537@pfur.ru>
| Date:   Sat Feb 15 21:50:56 2025 +0300
|       Hello uses style.css
|
* commit e78061dae0df86df7efa70c6ef5ba9f84e7c2d7c Size | Kind
| Author: nnnefedova <1132226537@pfur.ru>
| Date:   Sat Feb 15 21:49:07 2025 +0300
```

Рис. 45: Решение конфликта

## Слияние в ветку master

```
|nata /Users/nata/Desktop/git/hello% git log
commit caaf289fc8274803915265adf6fa9f2e9f4506d1 (HEAD -> master, style)
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 21:51:56 2025 +0300
        └── image/44.png
    Updated index.html
        └── image/45.png

commit 6d54ca18e9315bb6ec141f18328f1bdff52175755
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 21:50:56 2025 +0300
        └── image/49.png
    Hello uses style.css
        └── image/50.png
commit e78061da0df86df7efa70c6ef5ba9f84e7c2d7c
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 21:49:07 2025 +0300
        └── image/54.png
    Added css stylesheet
        └── image/51.png
commit f51b8ef0920b03237c20f399f81fa9a5fdd0406b
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 21:41:50 2025 +0300
        └── index.html
    Added index.html.

commit 856a879431ec74eb2b7d76a07ca89c3c59512e98
Author: nnnefedova <1132226537@pfur.ru>
Date:   Sat Feb 15 21:40:39 2025 +0300
        └── index.html
    Merged remote changes
        └── index.html
```

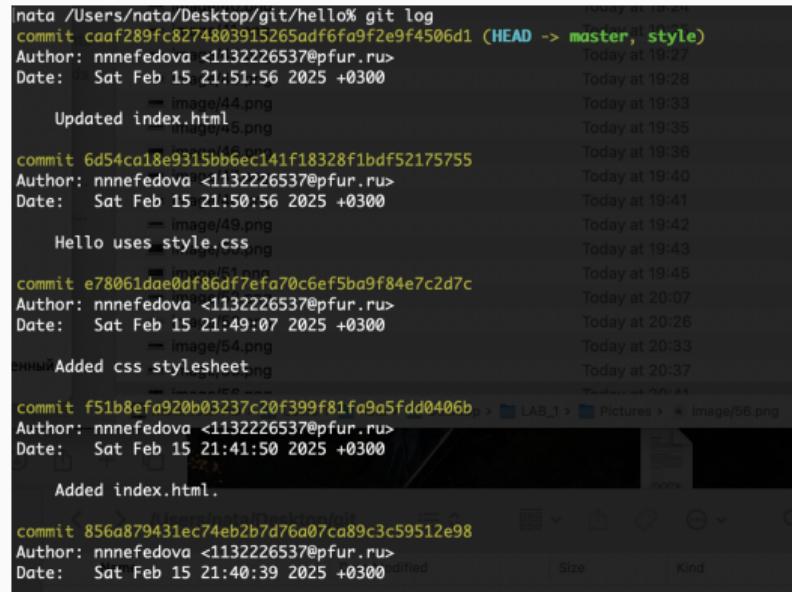


Рис. 46: Слияние style в master - ветки идентичны

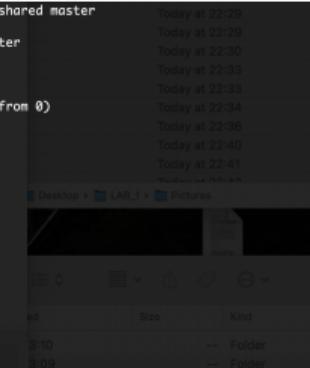
## Клонирование репозиториев

```
nata /Users/nata/Desktop/git/hello% cd .. Desktop > LAB_1 > Pictures > image/56.png
nata /Users/nata/Desktop/git% pwd
/Users/nata/Desktop/git
nata /Users/nata/Desktop/git% ls
hello
nata /Users/nata/Desktop/git% git clone hello cloned_hello
Cloning into 'cloned_hello'...
done.
nata /Users/nata/Desktop/git% ls Date Modified Size Kind
cloned_hello hello
nata /Users/nata/Desktop/git%
```

Рис. 47: Создание клона репозитория hello

# Отправка изменений

```
nata ~/Users/nata/Desktop/git/cloned_hello% git branch --track shared master
branch 'shared' set up to track 'master'.
nata ~/Users/nata/Desktop/git/cloned_hello% git pull shared master
remote: Enumerating objects: 11, done.
remote: Counting objects: 100% (11/11), done.
remote: Compressing objects: 100% (9/9), done.
remote: Total 9 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (9/9), 986 bytes | 246.00 KiB/s, done.
From ../hello
 * branch      master    -> FETCH_HEAD
 * [new branch] shared     -> shared/master
Updating 4af9501...7e7250a
Fast-forward
 README.md | 2 ++
 1 file changed, 2 insertions(+)
nata ~/Users/nata/Desktop/git/cloned_hello% cat README.md
This is the Hello World example from the git tutorial.
!!!Changed in the original and pushed to shared
This is the Hello World example from the git tutorial.
nata ~/Users/nata/Desktop/git/cloned_hello%
```



The terminal window shows the command 'git pull shared master' being run. It displays the progress of fetching objects from the remote repository and updating the local 'shared' branch. A file comparison tool is overlaid on the terminal window, comparing the local 'README.md' file with its version on the 'shared' branch. The tool shows two changes: a new line '!!!Changed in the original and pushed to shared' and the addition of the line 'This is the Hello World example from the git tutorial.'

Рис. 48: Коммит и отправка изменений в общий репозиторий

## Выводы

---

- В результате выполнения лабораторной работы мы научились полному взаимодействию с git и разобрали основные его особенности.