

# Лабораторная работа №1

Математическое моделирование

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20 февраля 2025

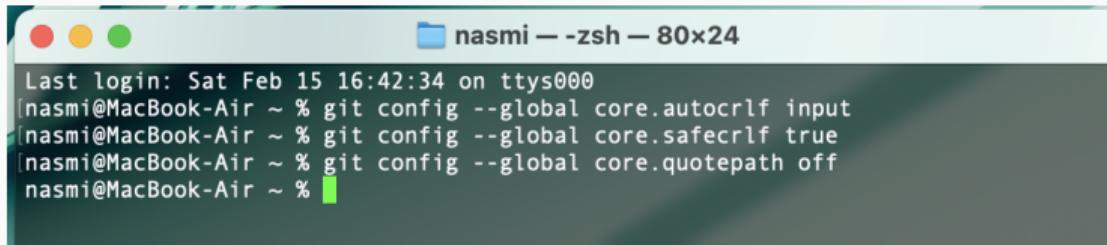
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- НПИбд-02-22
- <https://github.com/nasmi32>

- Приобрести практические навыки работы с системой управления версиями Git.

## Выполнение лабораторной работы

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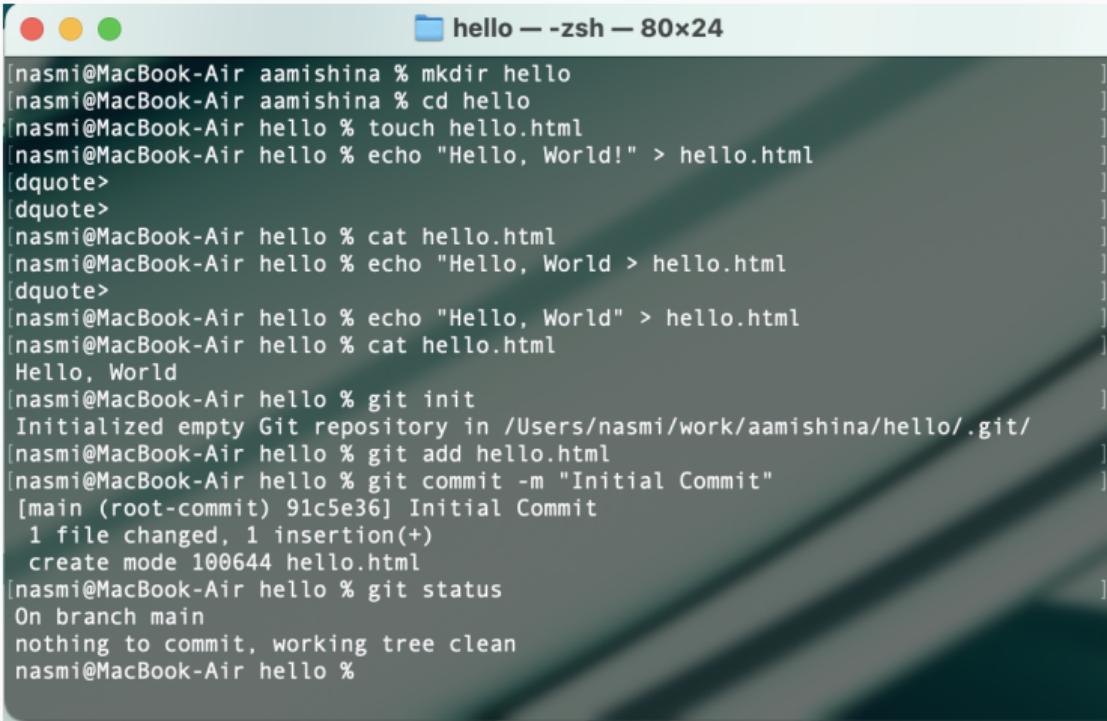
# Подготовка



```
Last login: Sat Feb 15 16:42:34 on ttys000
[nasmi@MacBook-Air ~ % git config --global core.autocrlf input
[nasmi@MacBook-Air ~ % git config --global core.safecrlf true
[nasmi@MacBook-Air ~ % git config --global core.quotepath off
nasmi@MacBook-Air ~ %
```

Рис. 1: Настройка git

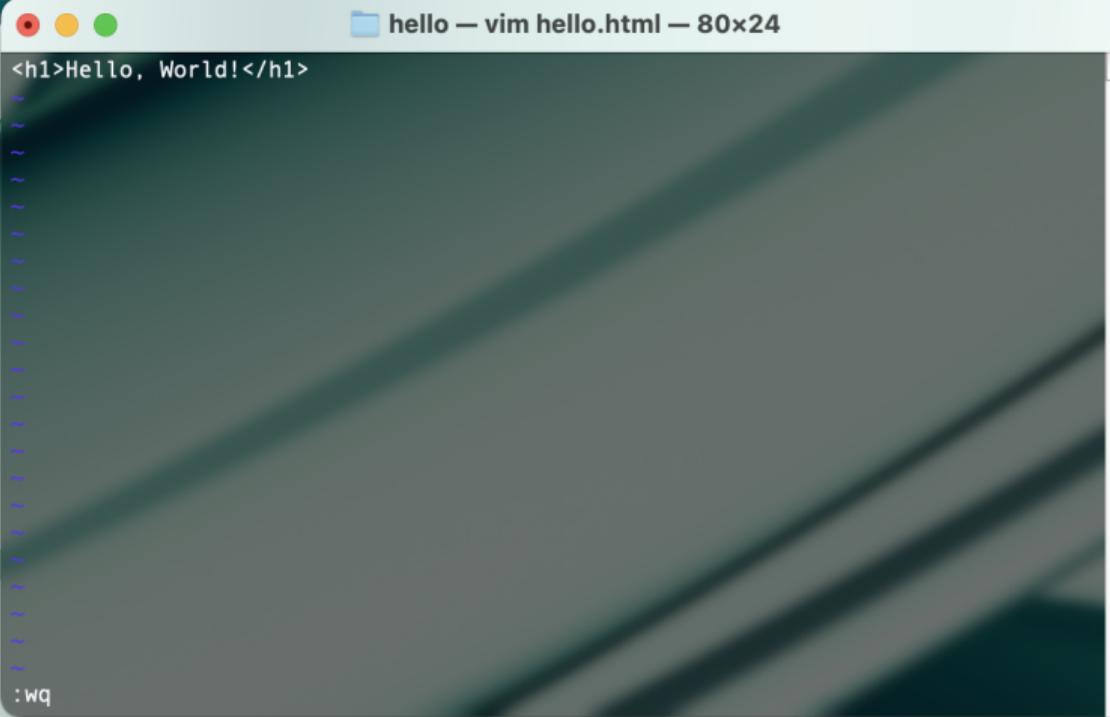
## Создание проекта



```
[nasmi@MacBook-Air aamishina % mkdir hello
[nasmi@MacBook-Air aamishina % cd hello
[nasmi@MacBook-Air hello % touch hello.html
[nasmi@MacBook-Air hello % echo "Hello, World!" > hello.html
dquote>
dquote>
[nasmi@MacBook-Air hello % cat hello.html
[nasmi@MacBook-Air hello % echo "Hello, World > hello.html
dquote>
[nasmi@MacBook-Air hello % echo "Hello, World" > hello.html
[nasmi@MacBook-Air hello % cat hello.html
Hello, World
[nasmi@MacBook-Air hello % git init
Initialized empty Git repository in /Users/nasmi/work/aamishina/hello/.git/
[nasmi@MacBook-Air hello % git add hello.html
[nasmi@MacBook-Air hello % git commit -m "Initial Commit"
[main (root-commit) 91c5e36] Initial Commit
 1 file changed, 1 insertion(+)
   create mode 100644 hello.html
[nasmi@MacBook-Air hello % git status
On branch main
nothing to commit, working tree clean
nasmi@MacBook-Air hello %
```

Рис. 2: Создание файла и репозитория. Добавление файла в репозиторий

## Внесение изменений



```
<h1>Hello, World!</h1>
:wq
```

Рис. 3: Файл hello.html

## Индексация изменений

```
[nasmi@MacBook-Air hello % vim hello.html
[nasmi@MacBook-Air hello % git status
On branch main
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")
[nasmi@MacBook-Air hello % git add hello.html
[nasmi@MacBook-Air hello % git status
On branch main
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    modified:   hello.html

[nasmi@MacBook-Air hello % git commit
[main 95fe699] Added h1 tag
  1 file changed, 1 insertion(+), 1 deletion(-)
[nasmi@MacBook-Air hello % git status
On branch main
nothing to commit, working tree clean
nasmi@MacBook-Air hello %
```

Рис. 4: Индексация и коммит изменений

## Индексация изменений

```
Added h1 tag
# Please enter the commit message for your changes. Lines starting
# with '#' will be ignored, and an empty message aborts the commit.
#
# On branch main
# Changes to be committed:
#       modified:   hello.html
#
~  
~  
~  
~  
~  
~
```

Рис. 5: Редактор

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

Рис. 6: Файл hello.html

# Индексация изменений

```
nasmi@MacBook-Air hello % vim hello.html
nasmi@MacBook-Air hello % git add hello.html
nasmi@MacBook-Air hello % vim hello.html
nasmi@MacBook-Air hello % git status
On branch main
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

nasmi@MacBook-Air hello % git commit -m "Added standard HTML page tags"
[main ee8ac54] Added standard HTML page tags
  1 file changed, 5 insertions(+), 1 deletion(-)
nasmi@MacBook-Air hello % git status
On branch main
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")
nasmi@MacBook-Air hello % git add .
nasmi@MacBook-Air hello % git status
On branch main
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    modified:   hello.html

nasmi@MacBook-Air hello % git commit -m "Added HTML header"
[main 42a2c8b] Added HTML header
  1 file changed, 2 insertions(+)
nasmi@MacBook-Air hello % █
```

Рис. 7: Индексация и коммит изменений

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

Рис. 8: Файл hello.html

# История

```
|nasmi@MacBook-Air hello % git log
commit 42a2c8baff8e7fd022528dbac6c92ed2008c9b35 (HEAD -> main)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:30:25 2025 +0300

    Added HTML header

commit ee8ac545d8e4074540635cfcc6e931a512fabed2a
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:29:24 2025 +0300

    Added standard HTML page tags

commit 95fe6996a31efc997f4886cd3f926d54e2456587
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:25:37 2025 +0300

    Added h1 tag

commit 91c5e3641148a96e37f855e5ed89e6cd611f05d6
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:10:54 2025 +0300

    Initial Commit
|nasmi@MacBook-Air hello % git log --pretty=oneline
42a2c8baff8e7fd022528dbac6c92ed2008c9b35 (HEAD -> main) Added HTML header
ee8ac545d8e4074540635cfcc6e931a512fabed2a Added standard HTML page tags
95fe6996a31efc997f4886cd3f926d54e2456587 Added h1 tag
91c5e3641148a96e37f855e5ed89e6cd611f05d6 Initial Commit
|nasmi@MacBook-Air hello %
|nasmi@MacBook-Air hello %
|nasmi@MacBook-Air hello %
```

Рис. 9: История

# История

```
[nasmi@MacBook-Air hello %  
nasmi@MacBook-Air hello % git checkout 91c5e36  
Note: switching to '91c5e36'.  
  
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 91c5e36 Initial Commit  
[nasmi@MacBook-Air hello % cat hello.html  
Hello, World  
[nasmi@MacBook-Air hello % git checkout main  
Previous HEAD position was 91c5e36 Initial Commit  
Switched to branch 'main'  
[nasmi@MacBook-Air hello % cat hello.html  
<html>  
  <head>  
  </head>  
  <body>  
    <h1>Hello, World!</h1>  
  </body>  
</html>  
nasmi@MacBook-Air hello %
```

Рис. 10: Просмотр разных версий репозитория

## Создание тегов версий

```
nasmi@MacBook-Air hello % git tag v1
nasmi@MacBook-Air 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 ee8ac54 Added standard HTML page tags
nasmi@MacBook-Air hello % cat hello.html
<html>
  <body>
    <h1>Hello, World!</h1>
  </body>
</html>
nasmi@MacBook-Air hello % git tag v1-beta
nasmi@MacBook-Air hello %
nasmi@MacBook-Air hello % git checkout v1
Previous HEAD position was ee8ac54 Added standard HTML page tags
HEAD is now at 42a2c8b Added HTML header
nasmi@MacBook-Air hello % cat hello.html
<html>
  <head>
  </head>
  <body>
    <h1>Hello, World!</h1>
  </body>
</html>
nasmi@MacBook-Air hello % git checkout v1-beta
Previous HEAD position was 42a2c8b Added HTML header
HEAD is now at ee8ac54 Added standard HTML page tags
nasmi@MacBook-Air hello % cat hello.html
<html>
  <body>
    <h1>Hello, World!</h1>
  </body>
</html>
```

Рис. 11: Создание тегов версий, переключение между ними

## Создание тегов версий

```
nasmi@MacBook-Air hello % git tag
v1
v1-beta
nasmi@MacBook-Air hello % git log main --all
commit 42a2c8baff8e7fd022528dbac6c92ed2008c9b35 (tag: v1, main)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:30:25 2025 +0300

    Added HTML header

commit ee8ac545d8e4074540635cfcc6e931a512fabed2a (HEAD, tag: v1-beta)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:29:24 2025 +0300

    Added standard HTML page tags

commit 95fe6996a31efc997f4886cd3f926d54e2456587
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:25:37 2025 +0300

    Added h1 tag

commit 91c5e3641148a96e37f855e5ed89e6cd611f05d6
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:10:54 2025 +0300

    Initial Commit
nasmi@MacBook-Air hello %
```

Рис. 12: Доступные теги

## Отмена локальных изменений (до индексации)

```
[nasmi@MacBook-Air hello % git checkout main
Previous HEAD position was ee8ac54 Added standard HTML page tags
Switched to branch 'main'
[nasmi@MacBook-Air hello % vim hello.html
[nasmi@MacBook-Air hello % git status
On branch main
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")
[nasmi@MacBook-Air hello % git checkout hello.html
Updated 1 path from the index
[nasmi@MacBook-Air hello % git status
On branch main
nothing to commit, working tree clean
[nasmi@MacBook-Air hello % cat hello.html
<html>
  <head>
  </head>
  <body>
    <h1>Hello, World!</h1>
  </body>
</html>
nasmi@MacBook-Air hello %
```

Рис. 13: Отмена локальных изменений (до индексации)

## Отмена локальных изменений (до индексации)

```
<html>
  <head>
  </head>
  <body>
    <h1>Hello, World!</h1>
    <!-- This is a bad comment. We want to revert it. -->
  </body>
</html>
~
```

Рис. 14: Изменения в файле hello.html

## Отмена проиндексированных изменений (перед коммитом)

```
<html>
  <head>
    <!-- This is an unwanted but staged comment --&gt;
  &lt;/head&gt;
  &lt;body&gt;
    &lt;h1&gt;Hello, World!&lt;/h1&gt;
  &lt;/body&gt;
&lt;/html&gt;
~
~</pre>
```

Рис. 15: Изменения в файле hello.html

## Отмена проиндексированных изменений (перед коммитом)

```
nasmi@MacBook-Air hello % vim hello.html
nasmi@MacBook-Air hello % git add hello.html
nasmi@MacBook-Air hello % git status
On branch main
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   hello.html

nasmi@MacBook-Air hello % git reset HEAD hello.html
Unstaged changes after reset:
M       hello.html
nasmi@MacBook-Air hello % cat hello.html
<html>
  <head>
    <!-- This is an unwanted but staged comment -->
  </head>
  <body>
    <h1>Hello, World!</h1>
  </body>
</html>
nasmi@MacBook-Air hello % git checkout hello.html
Updated 1 path from the index
nasmi@MacBook-Air hello % git status
On branch main
nothing to commit, working tree clean
nasmi@MacBook-Air hello % cat hello.html
<html>
  <head>
  </head>
  <body>
    <h1>Hello, World!</h1>
  </body>
</html>
nasmi@MacBook-Air hello %
```

Рис. 16: Отмена локальных изменений (перед коммитом)

## Отмена коммитов

```
nasm@MacBook-Air hello % vim hello.html
nasm@MacBook-Air hello % git add hello.html
nasm@MacBook-Air hello % git commit -m "Oops, we didn't want this commit"
[main eb0d0dae] Oops, we didn't want this commit
  1 file changed, 1 insertion(+)
nasm@MacBook-Air hello % git revert HEAD
[main b810357] Revert "Oops, we wanted this commit"
  1 file changed, 1 deletion(-)
nasm@MacBook-Air hello % git log
commit b810357ea07243e202c8d4fec599819fa1794768 (HEAD -> main)
Author: Анастасия Мишина <nastyum323@gmail.com>
Date: Tue Feb 18 12:46:28 2025 +0300

    Revert "Oops, we wanted this commit"

  This reverts commit eb0d0ae678c624ddd7c5b2cfa88e8bcf6b828d84.

commit eb0d0ae678c624ddd7c5b2cfa88e8bcf6b828d84
Author: Анастасия Мишина <nastyum323@gmail.com>
Date: Tue Feb 18 12:46:18 2025 +0300

    Oops, we didn't want this commit

commit 42a2c8baff8e7fd022528dbac6c92ed2088c9b35 (tag: v1)
Author: Анастасия Мишина <nastyum323@gmail.com>
Date: Tue Feb 18 12:30:25 2025 +0300

    Added HTML header

commit ee8ac545d8e4074540635cf6e931a512fabed2a (tag: v1-beta)
Author: Анастасия Мишина <nastyum323@gmail.com>
Date: Tue Feb 18 12:29:24 2025 +0300

    Added standard HTML page tags

commit 95fe6996a31efc997f4886cd3f926d54e2456587
Author: Анастасия Мишина <nastyum323@gmail.com>
Date: Tue Feb 18 12:25:37 2025 +0300

    Added h1 tag

commit 91c5e3641148a96e37f855e5ed89e6cd611f05d6
Author: Анастасия Мишина <nastyum323@gmail.com>
Date: Tue Feb 18 12:10:54 2025 +0300

    Initial Commit
nasm@MacBook-Air hello %
```

Рис. 17: Отмена коммитов

## Отмена коммитов

```
Revert "Oops, we wanted this commit"
This reverts commit eb0d0ae678c624ddd7c5b2cfa88e8bcf6b828d84.

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

Рис. 18: Редактор

## Удаление коммиттов из ветки

```
nasmi@MacBook-Air hello % git tag oops
nasmi@MacBook-Air hello % git reset --hard v1
HEAD is now at 42a2c8b Added HTML header
nasmi@MacBook-Air hello % git log
commit 42a2c8baff8e7fd022528dbac6c92ed2008c9b35 (HEAD -> main, tag: v1)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:30:25 2025 +0300

    Added HTML header

commit ee8ac545d8e4074540635cfcc6e931a512fabed2a (tag: v1-beta)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:29:24 2025 +0300

    Added standard HTML page tags

commit 95fe6996a31efc997f4886cd3f926d54e2456587
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:25:37 2025 +0300

    Added h1 tag

commit 91c5e3641148a96e37f855e5ed89e6cd611f05d6
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:10:54 2025 +0300

    Initial Commit
nasmi@MacBook-Air hello %
```

Рис. 19: Удаление коммиттов из ветки

## Удаление коммиттов из ветки

```
nasmi@MacBook-Air hello % git log --all
commit b018357ea07243e202cdddfec509919fa1794768 (tag: oops)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date: Tue Feb 18 12:46:28 2025 +0300

    Revert "Oops, we wanted this commit"

    This reverts commit eb0d8ae678c624ddd7c5b2cfa88e8bcf6b828d84.

commit eb0d8ae678c624ddd7c5b2cfa88e8bcf6b828d84
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date: Tue Feb 18 12:46:18 2025 +0300

    Oops, we didn't want this commit

commit 42a2c0baff8e7fd022528dbac6c92ed2008c9b35 (HEAD -> main, tag: v1)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date: Tue Feb 18 12:38:25 2025 +0300

    Added HTML header

commit ee8ac545d8e4874540635cfce931a512fabe2a (tag: v1-beta)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date: Tue Feb 18 12:29:24 2025 +0300

    Added standard HTML page tags

commit 95fc699631fc997f488cd3f932d54e2456507
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date: Tue Feb 18 12:25:37 2025 +0300

    Added h1 tag

commit 91c5e3641148a96e37fb855e5ed89e6cd611f05d6
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date: Tue Feb 18 12:18:54 2025 +0300

    Initial Commit
nasmi@MacBook-Air hello %
```

Рис. 20: Все коммиты

## Удаление тега oops

```
nasmi@MacBook-Air hello %
nasmi@MacBook-Air hello % git tag -d oops
Deleted tag 'oops' (was b810357)
nasmi@MacBook-Air hello % git log --all
commit 42a2c8baff8e7fd022528dbac6c92ed2008c9b35 (HEAD -> main, tag: v1)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:30:25 2025 +0300

    Added HTML header

commit ee8ac545d8e4074540635cf6e931a512fabeled2a (tag: v1-beta)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:29:24 2025 +0300

    Added standard HTML page tags

commit 95fe6996a31efc997f4886cd3f926d54e2456587
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:25:37 2025 +0300

    Added h1 tag

commit 91c5e3641148a96e37f855e5ed89e6cd611f05d6
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:10:54 2025 +0300

    Initial Commit
nasmi@MacBook-Air hello %
```

Рис. 21: Удаление тега oops

## Внесение изменений в коммиты

```
<!-- Author: Anastasiya A. Mishina -->
<html>
    <head>
    </head>
    <body>
        <h1>Hello, World!</h1>
    </body>
</html>
~
```

Рис. 22: Файл hello.html

## Внесение изменений в коммиты

```
<!-- Author: Anastasiya A. Mishina (1132226532@pfur.ru) -->
<html>
    <head>
    </head>
    <body>
        <h1>Hello, World!</h1>
    </body>
</html>
~
```

Рис. 23: Файл hello.html

# Внесение изменений в коммиты

```
nasm@MacBook-Air hello %
nasm@MacBook-Air hello % vim hello.html
nasm@MacBook-Air hello % git add hello.html
nasm@MacBook-Air hello % git commit -m "Add an author comment"
[main 0d64995] Add an author comment
Date: Tue Feb 18 12:52:38 2025 +0300
nasm@MacBook-Air hello % vim hello.html
nasm@MacBook-Air hello % git add hello.html
nasm@MacBook-Air hello % git commit -amend -m "Add an author/email comment"
[main 0162251] Add an author/email comment
Date: Tue Feb 18 12:52:38 2025 +0300
1 file changed, 1 insertion(+)
index 42a2c88af7a...7fd0d3528dbac6c97ed2908c9b35 (HEAD -> main)
commit 016225104ec019aeebd3730baa674bcc2d7cbcdd
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date: Tue Feb 18 12:52:38 2025 +0300
    Add an author/email comment

commit 42a2c88af7a...7fd0d3528dbac6c97ed2908c9b35 (tag: v1)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date: Tue Feb 18 12:30:25 2025 +0300
    Added HTML header

commit ee0a2c545d8e0874540635cfcc6e931a2512fabed2a (tag: v1-beta)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date: Tue Feb 18 12:29:24 2025 +0300
    Added standard HTML page tags

commit 95fe5996a1fc997ff8806cd3f924d4e2456587
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date: Tue Feb 18 12:10:54 2025 +0300
    Added h1 tag

commit 91c5e3641140a6e17785e1c5e88efcd611f05d6
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date: Tue Feb 18 12:10:54 2025 +0300
    Initial Commit
nasm@MacBook-Air hello %
```

Рис. 24: Внесение изменений в коммиты

## Перемещение файлов

```
[nasmi@MacBook-Air hello % mkdir lib
[nasmi@MacBook-Air hello % git mv hello.html lib
[nasmi@MacBook-Air hello % git status
On branch main
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    renamed:    hello.html -> lib/hello.html

[nasmi@MacBook-Air hello % git commit -m "Moved hello.html to lib"
[main c3afc7e] Moved hello.html to lib
  1 file changed, 0 insertions(+), 0 deletions(-)
   rename hello.html => lib/hello.html (100%)
nasmi@MacBook-Air hello %
```

Рис. 25: Перемещение файлов

## Подробнее о структуре

```
[nasmi@MacBook-Air hello %]
[nasmi@MacBook-Air hello % touch index.html]
[nasmi@MacBook-Air hello % vim index.html]
[nasmi@MacBook-Air hello % git add index.html]
[nasmi@MacBook-Air hello % git commit -m "Added index.html."
[main 8cdcfde] Added index.html.
  1 file changed, 5 insertions(+)
   create mode 100644 index.html
nasmi@MacBook-Air hello %
```

Рис. 26: Добавление файла index.html и его коммит

## Подробнее о структуре

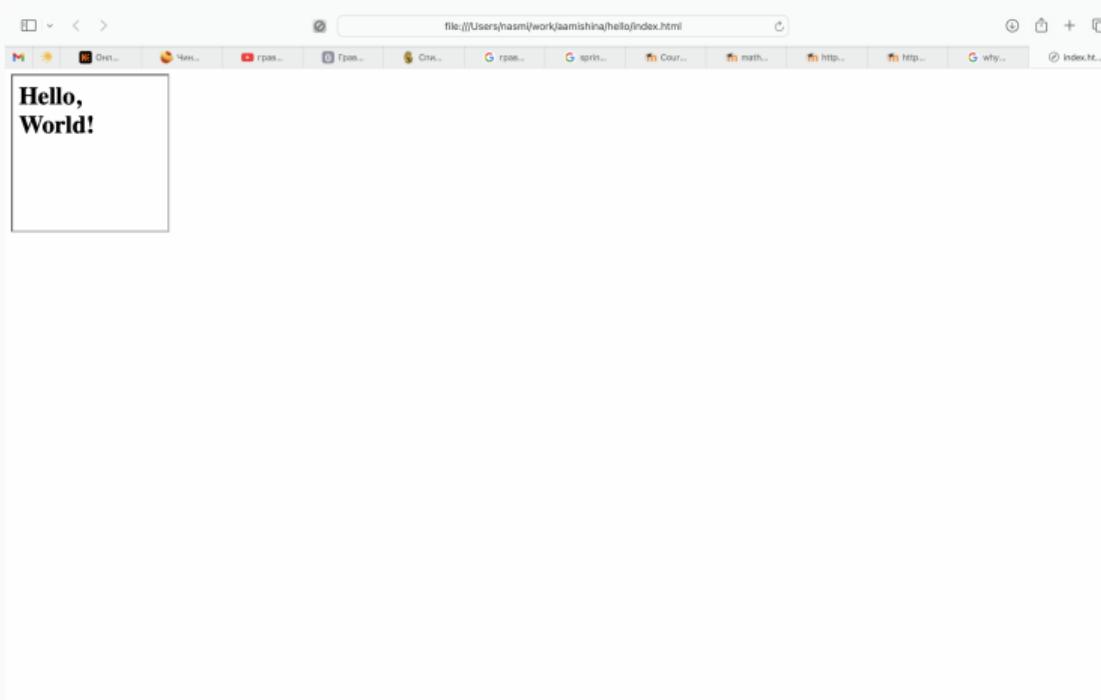


Рис. 27: Файл index.html

## Git внутри: Каталог .git

```
nasmi@MacBook-Air hello %
nasmi@MacBook-Air hello %
nasmi@MacBook-Air hello %
nasmi@MacBook-Air hello % ls -C .git
COMMIT_EDITMSG HEAD ORIG_HEAD config description hooks index info logs objects packed-refs refs
01 1c 3f 5a 65 8c 93 a4 b8 c3 d8 eb f3 ff pack
05 23 40 59 89 91 95 b6 b9 cf d7 ee f7 info
nasmi@MacBook-Air hello % ls -C .git/objects/01
6225104ec819aedb137880ab624bc2d7fbcd
nasmi@MacBook-Air hello % cat .git/config
[core]
    repositoryformatversion = 0
    filemode = true
    bare = false
    logallrefupdates = true
    ignorecase = true
    precomposeunicode = true
nasmi@MacBook-Air hello % ls .git/refs
heads tags
nasmi@MacBook-Air hello % ls .git/refs/heads
main
nasmi@MacBook-Air hello % ls .git/refs/tags
v1
v1-beta
nasmi@MacBook-Air hello % cat .git/refs/tags/v1
43a1cbafffe7fd92328dbac6c92ed2080c9b35
nasmi@MacBook-Air hello % cat .git/HEAD
ref: refs/heads/main
nasmi@MacBook-Air hello %
```

Рис. 28: Git внутри: Каталог .git

## Работа непосредственно с объектами git

```
nasmi@MacBook-Air hello % git log --max-count=1
commit 8cdcfdec9dbb2cf88ef0ddbc0c6e1faafff13b548 (HEAD -> main)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:57:17 2025 +0300

    Added index.html.
nasmi@MacBook-Air hello % git cat-file -t 8cdcfde
commit
nasmi@MacBook-Air hello % git cat-file -p 8cdcfde
tree b9c0dfd200152c603116e65d67bd08335d7595f7
parent c3afc7e5a32e704f9b13955c71582f455d5582e0
author Анастасия Мишина <nastyam3232@gmail.com> 1739872637 +0300
committer Анастасия Мишина <nastyam3232@gmail.com> 1739872637 +0300

    Added index.html.
nasmi@MacBook-Air hello % git cat-file -p b9c0dfd
100644 blob cf5bc0ea78289c0be141b578ca407f1159bd25bc    index.html
040000 tree 89261df5766304981e1fe85fefd2185d77885f52    lib
nasmi@MacBook-Air hello % git cat-file -p 89261df
100644 blob f35cd96667f12f71bf4b4bd430bdbdb65af83b01    hello.html
nasmi@MacBook-Air hello % git cat-file -p f35cd96
<!-- Author: Anastasiya A. Mishina (1132226532@pfur.ru) -->
<html>
    <head>
    </head>
    <body>
        <h1>Hello, World!</h1>
    </body>
</html>
nasmi@MacBook-Air hello %
```

Рис. 29: Работа с объектами git

## Создание ветки

```
[nasmi@MacBook-Air hello %  
[nasmi@MacBook-Air hello % git checkout -b style  
Switched to a new branch 'style'  
[nasmi@MacBook-Air hello % git status  
On branch style  
nothing to commit, working tree clean  
[nasmi@MacBook-Air hello % touch lib/style.css  
[nasmi@MacBook-Air hello % ls  
index.html      lib  
[nasmi@MacBook-Air hello % ls lib  
hello.html      style.css  
[nasmi@MacBook-Air hello % vim lib/style.css  
[nasmi@MacBook-Air hello % git add lib/style.css  
[nasmi@MacBook-Air hello % git commit -m "Added css stylesheet"  
[style f307117] Added css stylesheet  
 1 file changed, 3 insertions(+)  
  create mode 100644 lib/style.css  
nasmi@MacBook-Air hello %
```

Рис. 30: Создание ветки style и файла style.css

## Создание ветки

---

```
i<!-- Author: Anastasiya A. Mishina (1132226532@pfur.ru) -->
<html>
    <head>
        <link type="text/css" rel="stylesheet" media="all" href="style.css" />
    </head>
    <body>
        <h1>Hello, World!</h1>
    </body>
</html>
^
^
^
^
```

Рис. 31: Файл hello.html

## Создание ветки

```
[nasmi@MacBook-Air hello % vim lib/hello.html
[nasmi@MacBook-Air hello % git add lib/hello.html
[nasmi@MacBook-Air hello % git commit -m "Hello uses style.css"
[style bf2ec55] Hello uses style.css
  1 file changed, 2 insertions(+), 1 deletion(-)
[nasmi@MacBook-Air hello % vim index.html
[nasmi@MacBook-Air hello % git add index.html
[nasmi@MacBook-Air hello % git commit -m "Updated index.html"
[style 3b630d2] Updated index.html
  1 file changed, 3 insertions(+)
[nasmi@MacBook-Air hello %
```

Рис. 32: Файлы hello.html и index.html

# Навигация по веткам

```
nasmi@MacBook-Air hello % git log --all
commit 3b630d23658c4564e9512dfde52f50acdec673f (HEAD -> style)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 13:06:39 2025 +0300

    Updated index.html

commit bf2ec554cec7eebd6f60ba21f523aa7fb0447cb9
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 13:06:00 2025 +0300

    Hello uses style.css

commit f3071173549f41520c4d15462af1f7006d86a194
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 13:04:35 2025 +0300

    Added css stylesheet

commit 8cdcfdec9dbb2cf88ef0ddbc0c61faaff13b548 (main)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:57:17 2025 +0300

    Added index.html

commit c3afc7e5a32e784f9b13955c71582f455d5582e8
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:56:02 2025 +0300

    Moved hello.html to lib

commit 816225184ec819a9dh173380ab674bcc2d7chccd
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:52:30 2025 +0300

    Add an author/email comment

commit 42a2c2B8aff8e7fdB2528dbac6c92ed2008c9b35 (tag: v1)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:30:25 2025 +0300

    Added HTML header

commit ee8ac545d8e4074540635cf6e931a512fabeled2a (tag: v1-beta)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:29:24 2025 +0300

    Added standard HTML page tags
```

Рис. 33: Логи

## Навигация по веткам

```
[nasmi@MacBook-Air hello % git checkout main
Switched to branch 'main'
[nasmi@MacBook-Air hello % cat lib/hello.html
<!-- Author: Anastasiya A. Mishina (1132226532@pfur.ru) -->
<html>
    <head>
    </head>
    <body>
        <h1>Hello, World!</h1>
    </body>
</html>
[nasmi@MacBook-Air hello % git checkout style
Switched to branch 'style'
[nasmi@MacBook-Air hello % cat lib/hello.html
i<!-- Author: Anastasiya A. Mishina (1132226532@pfur.ru) -->
<html>
    <head>
        <link type="text/css" rel="stylesheet" media="all" href="style.css" />
    </head>
    <body>
        <h1>Hello, World!</h1>
    </body>
</html>
nasmi@MacBook-Air hello %
```

Рис. 34: Навигация по веткам

# Изменения в ветке main

```
nasim@MacBook-Air: hello $  
nasim@MacBook-Air: hello % git checkout main  
Switched to branch 'main'  
nasim@MacBook-Air: hello % touch README.md  
nasim@MacBook-Air: hello % echo "This is the Hello World example from the git tutorial." > README.md  
nasim@MacBook-Air: hello % git add README.md  
nasim@MacBook-Air: hello % git commit -m "Added README"  
(main d37a365) Added README  
 1 file changed, 1 insertion(+)  
create mode 100644 README.md  
nasim@MacBook-Air: hello % git log --graph --all  
* commit d37a365f0dc988ec0f7a3703d3134eaeb7b5791a4 (HEAD -> main)  
| Author: Анастасия Мишина <nastyan32@gmail.com>  
| Date: Tue Feb 18 13:09:46 2025 +0300  
|  
|     Added README  
|  
* commit b65bd2365bc4564e9512dfde52f50acdec673f (style)  
| Author: Анастасия Мишина <nastyan32@gmail.com>  
| Date: Tue Feb 18 13:06:39 2025 +0300  
|  
|     Updated index.html  
|  
* commit b72cc554cc7e0bd5f080a21ff23a770b447c09  
| Author: Анастасия Мишина <nastyan32@gmail.com>  
| Date: Tue Feb 18 13:06:00 2025 +0300  
|  
|     Hello uses style.css  
|  
* commit 136f1173349741520c4d15462af1f7096d06a194  
| Author: Анастасия Мишина <nastyan32@gmail.com>  
| Date: Tue Feb 18 13:04:35 2025 +0300  
|  
|     Added css stylesheet  
|  
* commit 8ddcfec9db02cf8e90dbc0c6elfaafff13b548  
| Author: Анастасия Мишина <nastyan32@gmail.com>  
| Date: Tue Feb 18 12:57:17 2025 +0300  
|  
|     Added index.html  
|  
* commit c1afcfe5e32e049b013955c71582f455d5582e0  
| Author: Анастасия Мишина <nastyan32@gmail.com>  
| Date: Tue Feb 18 12:56:02 2025 +0300  
|  
|     Moved hello.html to lib  
|  
* commit 01622510dec019aedb137308ab624bcc207cbcd  
| Author: Анастасия Мишина <nastyan32@gmail.com>  
| Date: Tue Feb 18 12:52:38 2025 +0300  
|  
|     Add an author/email comment
```

Рис. 35: Изменения в ветке main

# Слияние

```
nas@MacBook-Air: hello % git checkout style
Switched to branch 'style'
nas@MacBook-Air: hello % git merge main
Merge made by the 'ours' strategy.
 README.md | 1
 1 file changed, 1 insertion(+)
 create mode 100644 README.md
nas@MacBook-Air: hello % git log --graph --all
* commit 966dd6c3faca4f70a11dc9e0ed41274x23d68a (HEAD -> style)
| Merge: 3b638e2 0373a65
| Author: Анастасия Мишина <nastyam322@gmail.com>
| Date: Tue Feb 18 13:10:57 2025 +0300
|     Merge branch 'main' into style
|
* commit d37a36510dc980ec0ff3a703d11ea#0bb5791a4 (main)
| Author: Анастасия Мишина <nastyam322@gmail.com>
| Date: Tue Feb 18 13:09:46 2025 +0300
|     Added README
|
* commit 3b638e23358dc4564e5520fd612758acdec673f
| Author: Анастасия Мишина <nastyam322@gmail.com>
| Date: Tue Feb 18 13:06:39 2025 +0300
|     Updated index.html
|
* commit b72ec554ec7e00d5f60ea21f523aa7fb0447cb9
| Author: Анастасия Мишина <nastyam322@gmail.com>
| Date: Tue Feb 18 13:06:08 2025 +0300
|     Hello uses style.css
|
* commit f30711735494741520c4d15462af1f70960b6a194
| Author: Анастасия Мишина <nastyam322@gmail.com>
| Date: Tue Feb 18 13:04:35 2025 +0300
|     Added css stylesheet
|
* commit 8ddfcfecc9db2cf8ef0ddbc0c61eff13b548
| Author: Анастасия Мишина <nastyam322@gmail.com>
| Date: Tue Feb 18 13:03:17 2025 +0300
|     Added index.html
|
* commit c1fc7e9a32e70070f01335577527115560598a6
| Author: Анастасия Мишина <nastyam322@gmail.com>
| Date: Tue Feb 18 12:56:02 2025 +0300
|     Moved hello.html to lib
|
* commit 016225104ec819aeb137388ab624bcc2d7cbcd
```

Рис. 36: Слияние main с style

## Создание конфликта

---

```
<!-- Author: Anastasiya A. Mishina (1132226532@pfur.ru) -->
<html>
    <head>
        <!-- no style -->
    </head>
    <body>
        <h1>Hello, World!</h1>
    </body>
</html>
~
```

Рис. 37: Файл hello.html

# Создание конфликта

```
nasini@MacBook-Air:~/hello % 
nasini@MacBook-Air:~/hello % git checkout main
Switched to branch 'main'
nasini@MacBook-Air:~/hello % vim lib/hello.html
nasini@MacBook-Air:~/hello % vim lib/hello.html
nasini@MacBook-Air:~/hello % git add lib/hello.html
nasini@MacBook-Air:~/hello % git commit -m 'Life is great.'
[main 9fe2923] Life is great
 1 file changed, 2 insertions(+), 1 deletion(-)
nasini@MacBook-Air:~/hello % git log --graph --all
* commit 9fe29232748a92ba1248511809bb42e/b6a93d7 (HEAD -> main)
| Author: Анастасия Мишина <nastyam323@gmail.com>
| Date: Tue Feb 18 13:12:41 2025 +0300
|
|   Life is great
|
| * commit 866b66c3faacf479a31dca76ede41274a21d684 (style)
| | Merge: 3b6b36d2 d37a365
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 13:10:57 2025 +0300
| |
| |   Merge branch 'main' into style
|
| * commit d37a365f0dc908ec8ffa37863d3114ea7bb5791a4
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 13:09:46 2025 +0300
| |
| |   Added README
|
| * commit 3b630d23658dc4564e9512dfde52f58acdec673f
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 13:06:39 2025 +0300
| |
| |   Updated index.html
|
| * commit bf2ec554cec7eebd6f60ba21f523aa7fb8447cb9
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 13:06:00 2025 +0300
| |
| |   Hello uses style.css
|
| * commit f3071173549f41528c4d15462af1f7b00d06a194
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 13:04:35 2025 +0300
| |
| |   Added css stylesheet
|
| * commit 8cdcfd9dbb2cf88ef0ddbc0c6e1faaff13b548
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 12:57:17 2025 +0300
| |
```

Рис. 38: Создание конфликта

## Разрешение конфликтов

```
nasmi@MacBook-Air hello %
nasmi@MacBook-Air hello %
nasmi@MacBook-Air hello % git checkout style
Switched to branch 'style'
nasmi@MacBook-Air hello % git merge main
Auto-merging lib/hello.html
CONFLICT (content): Merge conflict in lib/hello.html
Automatic merge failed; fix conflicts and then commit the result.
nasmi@MacBook-Air hello % vim lib/hello.html
nasmi@MacBook-Air hello % vim lib/hello.html
nasmi@MacBook-Air hello % git add lib/hello.html
nasmi@MacBook-Air hello % git commit -m "Merged master fixed conflict."
[style fe5e09a] Merged master fixed conflict.
nasmi@MacBook-Air hello %
```

Рис. 39: Попытка объединения style с новой веткой main

## Разрешение конфликтов

```
1<!-- Author: Anastasiya A. Mishina (1132226532@pfur.ru) -->
2<html>
3    <head>
4        <<<<< HEAD
5            <link type="text/css" rel="stylesheet" media="all" href="style.css" />
6            =====
7            <!-- no style -->
8        >>>>> main
9            </head>
10           <body>
11               <h1>Hello, World! Life is great!</h1>
12           </body>
13       </html>
14   ~
15 ~
```

Рис. 40: Файл lib/hello.html

## Разрешение конфликтов

```
i<!-- Author: Anastasiya A. Mishina (1132226532@pfur.ru) -->
<html>
    <head>
        <link type="text/css" rel="stylesheet" media="all" href="style.css" />
    </head>
    <body>
        <h1>Hello, World! Life is great!</h1>
    </body>
</html>
~
```

Рис. 41: Файл lib/hello.html

# Сброс ветки style

```
nasim@MacBook-Air hello % git checkout style
Already on 'style'
nasim@MacBook-Air hello % git log --graph
* commit fe5e09a7baa02365e9e93088a3c37318cc9488851 (HEAD -> style)
| \ Merge: 866b66c 9fe2923
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 13:15:26 2025 +0300
|
|   Merged master fixed conflict.
|
* commit 9fe29232748a92baf12405118e99bb42e7b6a93d7 (main)
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 13:12:41 2025 +0300
|
|   Life is great
|
* commit 866b66c3f3aaf479a31dca76ede41274a21d684a
| | Merge: 3b63b02 d37a365
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 13:10:57 2025 +0300
|
|   Merge branch 'main' into style
|
* commit d37a365f0dc988ec0ffa3783d3114ea7bb5791a4
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 13:09:46 2025 +0300
|
|   Added README
|
* commit 3b63b02d2658dc4564e9512fd0e52f50acdec673f
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 13:08:39 2025 +0300
|
|   Updated index.html
|
* commit bf2ec554cec7eebd6f60ba21f523aa7fb0447cb9
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 13:06:00 2025 +0300
|
|   Hello uses style.css
|
* commit f3b71213549741528cd4f5462af1f7806d96a194
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 13:04:35 2025 +0300
|
|   Added css stylesheet
|
* commit 8dcdfdec9db02cf8bef8ddbc86c1faafff13b548
| | Author: Анастасия Мишина <nastyam323@gmail.com>
| | Date: Tue Feb 18 12:57:17 2025 +0300
```

Рис. 42: Возврат на ветку style

# Сброс ветки style

```
nasn@MacBook-Air hello % git reset --hard 3b638d2
HEAD is now at 3b638d2 Updated index.html
nasn@MacBook-Air hello % git log --graph -all
* commit 9fe29232748a92ba12485118899b42e7bb5791a4 (main)
| Author: Анастасия Мишина <nastyam323@gmail.com>
| Date: Tue Feb 18 13:12:41 2025 +0300
|
|     Life is great
|
* commit d37a365f0dc908ec0ffa3703d3114ea7bb5791a4
| Author: Анастасия Мишина <nastyam323@gmail.com>
| Date: Tue Feb 18 13:09:46 2025 +0300
|
|     Added README
|
* commit 3b638d23658dc4564e9512dfde52f50acde673f (HEAD -> style)
| Author: Анастасия Мишина <nastyam323@gmail.com>
| Date: Tue Feb 18 13:06:39 2025 +0300
|
|     Updated index.html
|
* commit bf2ec554cec7eebd6f60ba21f523aa7fb0447cb9
| Author: Анастасия Мишина <nastyam323@gmail.com>
| Date: Tue Feb 18 13:06:00 2025 +0300
|
|     Hello uses style.css
|
* commit f3871173549f41520c4d15462af1f7006d06a194
| Author: Анастасия Мишина <nastyam323@gmail.com>
| Date: Tue Feb 18 13:04:35 2025 +0300
|
|     Added css stylesheet
|
* commit 8dcfcfdec9dbb2cf88ef0ddbc0c6elfafafl3b548
| Author: Анастасия Мишина <nastyam323@gmail.com>
| Date: Tue Feb 18 12:57:17 2025 +0300
|
|     Added index.html
|
* commit c3afc7e5a32e704f9b13955c71582f455d5582e0
| Author: Анастасия Мишина <nastyam323@gmail.com>
| Date: Tue Feb 18 12:56:02 2025 +0300
|
|     Moved hello.html to lib
```

Рис. 43: Сброс ветки style

# Сброс ветки main

```
nasmit@MacBook-Air hello %  
nasmit@MacBook-Air hello % git checkout main  
Switched to branch 'main'  
nasmit@MacBook-Air hello % git log --graph  
* commit 5fe03933274d920bf1f1380992e706a93d7 (HEAD -> main)  
Author: Анастасия Мишина <nastyaem3232@gmail.com>  
Date: Tue Feb 18 13:12:41 2025 +0300  
  
    Life is great  
  
* commit d37365f0dc998ec0ffaf37903d3114ea7b05791a4  
Author: Анастасия Мишина <nastyaem3232@gmail.com>  
Date: Tue Feb 18 13:09:46 2025 +0300  
  
    Added README  
  
* commit 8cdcfdec9db2fcf88ef90ddc9c6e1faafff13b548  
Author: Анастасия Мишина <nastyaem3232@gmail.com>  
Date: Tue Feb 18 12:57:17 2025 +0300  
  
    Added index.html  
  
* commit 3a9fc7e5a17e704f9b1395c71582f455d582e8  
Author: Анастасия Мишина <nastyaem3232@gmail.com>  
Date: Tue Feb 18 12:56:02 2025 +0300  
  
    Moved hello.html to lib  
  
* commit 01625104ec0199ndh11730a0ad624bcc2d7cbcd  
Author: Анастасия Мишина <nastyaem3232@gmail.com>  
Date: Tue Feb 18 12:52:39 2025 +0300  
  
    Add an author/email comment  
  
* commit 42ac2bafff7e7fd022528dac6c52ed2000c9b35 (tag: v1)  
Author: Анастасия Мишина <nastyaem3232@gmail.com>  
Date: Tue Feb 18 12:38:25 2025 +0300  
  
    Added HTML header  
  
* commit ee8ac4545de84074540635ccfc6e931a512fabed2a (tag: v1-beta)  
Author: Анастасия Мишина <nastyaem3232@gmail.com>  
Date: Tue Feb 18 12:29:24 2025 +0300  
  
    Added standard HTML page tags  
  
* commit 95fe699631efc997744806c3f926d54e2456587  
Author: Анастасия Мишина <nastyaem3232@gmail.com>  
Date: Tue Feb 18 12:25:37 2025 +0300  
  
    Added h1 tag  
  
* commit 91c5e1641148a956e37f855e5ed89e6cd611f05d6  
Author: Анастасия Мишина <nastyaem3232@gmail.com>  
Date: Tue Feb 18 12:18:54 2025 +0300  
  
    Initial Commit  
nasmit@MacBook-Air hello %
```

Рис. 44: Ветка main

# Сброс ветки main

```
nasmi@MacBook-Air hello % git reset --hard d37a365
HEAD is now at d37a365 Added README
nasmi@MacBook-Air hello % git log --graph --all
* commit d37a365f0d998ec0fa37893d3114ea7bb05791a4 (HEAD -> main)
| Author: Анастасия Мишина <nastyam3232@gmail.com>
| Date: Tue Feb 18 13:09:46 2025 +0300
|
|     Added README
|
| * commit 3b630d23658dc4564e9512dfde52f50acdec673f (style)
| | Author: Анастасия Мишина <nastyam3232@gmail.com>
| | Date: Tue Feb 18 13:06:39 2025 +0300
| |
| |     Updated index.html
|
| * commit bf2ec554cec7eebd6f60ba21f253aa7fb0447cb9
| | Author: Анастасия Мишина <nastyam3232@gmail.com>
| | Date: Tue Feb 18 13:06:00 2025 +0300
| |
| |     Hello uses style.css
|
| * commit f3071173549f41520c4d15462af1f7806d86a194
| / Author: Анастасия Мишина <nastyam3232@gmail.com>
| Date: Tue Feb 18 13:04:35 2025 +0300
|
|     Added css stylesheet
|
| * commit 8cdcfdec9dbb2cf88ef0ddbc0c61faaff13b548
| | Author: Анастасия Мишина <nastyam3232@gmail.com>
| | Date: Tue Feb 18 12:57:17 2025 +0300
| |
| |     Added index.html.
|
| * commit c3afc7e5a32e704f9b13955c71582f455d5582e0
| | Author: Анастасия Мишина <nastyam3232@gmail.com>
| | Date: Tue Feb 18 12:56:02 2025 +0300
| |
| |     Moved hello.html to lib
|
| * commit 016225104ec819aedb137388ab624bcc2d7cbcd
| | Author: Анастасия Мишина <nastyam3232@gmail.com>
| | Date: Tue Feb 18 12:52:38 2025 +0300
| |
| |     Add an author/email comment
|
| * commit 42a2c8baff8e7fd022528dbac6c92ed2008c9b35 (tag: v1)
| | Author: Анастасия Мишина <nastyam3232@gmail.com>
| | Date: Tue Feb 18 12:30:25 2025 +0300
| |
| |     Added HTML header
|
| * commit ee8ac545d8e4074540635cfc5e931a512fabed2a (tag: v1-beta)
| | Author: Анастасия Мишина <nastyam3232@gmail.com>
```

Рис. 45: Сброс ветки main

# Перебазирование

```
nasen@MacBook-Air:hello % git checkout style
Switched to branch 'style'
nasen@MacBook-Air:hello % git release main
Switched to branch 'main'
Successfully released refs/heads/main.
nasen@MacBook-Air:hello % git log --graph
* commit 0316491f6d922e7e000c39c5c00a877c3e79e000
  Author: Анастасия Меняева <instasty@mail22@gmail.com>
  Date: Tue Feb 18 13:06:39 2025 +0300
    Updated index.html
* commit 0316491f6d922e7e000c39c5c00a877c3e79e000
  Author: Анастасия Меняева <instasty@mail22@gmail.com>
  Date: Tue Feb 18 13:06:08 2025 +0300
    Hello uses style.css
* commit 0316491f6d922e7e000c39c5c00a877c3e79e000
  Author: Анастасия Меняева <instasty@mail22@gmail.com>
  Date: Tue Feb 18 13:04:35 2025 +0300
    Added css stylesheet
* commit 0316491f6d922e7e000c39c5c00a877c3e79e000
  Author: Анастасия Меняева <instasty@mail22@gmail.com>
  Date: Tue Feb 18 13:04:35 2025 +0300
    Added README
* commit 0316491f6d922e7e000c39c5c00a877c3e79e000
  Author: Анастасия Меняева <instasty@mail22@gmail.com>
  Date: Tue Feb 18 13:02:57 2025 +0300
    Added index.html
* commit 0316491f6d922e7e000c39c5c00a877c3e79e000
  Author: Анастасия Меняева <instasty@mail22@gmail.com>
  Date: Tue Feb 18 13:02:57 2025 +0300
    Added index.html
* commit 0316491f6d922e7e000c39c5c00a877c3e79e000
  Author: Анастасия Меняева <instasty@mail22@gmail.com>
  Date: Tue Feb 18 13:02:57 2025 +0300
    Moved hello.html to lls
* commit 0316491f6d922e7e000c39c5c00a877c3e79e000
  Author: Анастасия Меняева <instasty@mail22@gmail.com>
  Date: Tue Feb 18 13:02:36 2025 +0300
    Add an author/email comment
* commit 0316491f6d922e7e000c39c5c00a877c3e79e000
  Author: Анастасия Меняева <instasty@mail22@gmail.com>
  Date: Tue Feb 18 13:02:36 2025 +0300
    Add an author/email comment
* commit 0316491f6d922e7e000c39c5c00a877c3e79e000
  Author: Анастасия Меняева <instasty@mail22@gmail.com>
  Date: Tue Feb 18 13:02:36 2025 +0300
    Add an author/header
* commit 0316491f6d922e7e000c39c5c00a877c3e79e000
  Author: Анастасия Меняева <instasty@mail22@gmail.com>
  Date: Tue Feb 18 13:02:36 2025 +0300
    Added standard HTML page tags
* commit 0316491f6d922e7e000c39c5c00a877c3e79e000
  Author: Анастасия Меняева <instasty@mail22@gmail.com>
  Date: Tue Feb 18 13:02:36 2025 +0300
```

Рис. 46: Перенос изменений

## Слияние в ветку main

```
nasmi@MacBook-Air hello % git checkout main
Switched to branch 'main'
nasmi@MacBook-Air hello % git merge style
Updating d37a365..e12313f
Fast-forward
 index.html    | 3 +++
 lib/hello.html | 3 +++
 lib/style.css  | 3 +++
 3 files changed, 8 insertions(+), 1 deletion(-)
 create mode 100644 lib/style.css
nasmi@MacBook-Air hello % git log
commit e12313f7a3cbc63e3f9f8952375c1488032bc621 (HEAD -> main, style)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 13:86:39 2025 +0300

    Updated index.html

commit 8536491ff68d2a7e4ebcb94c528b5687c2e79a009
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 13:86:08 2025 +0300

    Hello uses stylesheet

commit 68378bf9d4b47d18473b019d63c3aa045439b3c9
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 13:84:35 2025 +0300

    Added css stylesheet

commit d37a365f0dc908ec0ffa3703d3114ea7bb5791a4
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 13:89:46 2025 +0300

    Added README

commit 8dc1cdcc9dbb7cf88ef8ddbc0c6e1faaff13b548
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:57:17 2025 +0300

    Added index.html.

commit c3afc7e5a32e784f9b13955c71582f455d558e0
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 12:56:02 2025 +0300

    Moved hello.html to lib
```

Рис. 47: Слияние style в main

# Клонирование репозиториев

```
masni@MacBook-Air hello % cd ..
masni@MacBook-Air aamishina % pwd
/Users/masni/work/aamishina
masni@MacBook-Air aamishina % ls
hello
masni@MacBook-Air aamishina % git clone hello cloned_hello
Cloning into 'cloned_hello'...
done.
masni@MacBook-Air aamishina % ls
cloned_hello    hello
masni@MacBook-Air aamishina % cd cloned_hello
masni@MacBook-Air cloned_hello % ls
README.md      index.html  lib
masni@MacBook-Air cloned_hello % git log --all
commit 12311177a3bc63e3f978952375c14800012bc621 (HEAD -> main, origin/style, origin/main, origin/HEAD)
Author: Анастасия Мишина <nastyan123@gmail.com>
Date: Tue Feb 18 13:86:39 2025 +0300

    Updated index.html

commit 0536491f68d2a7e4ebcb94c528b5667c2e79a089
Author: Анастасия Мишина <nastyan123@gmail.com>
Date: Tue Feb 18 13:86:08 2025 +0300

    Hello uses style.css

commit 683780f9d4047d18473b019d63c8ae0d5439b0c9
Author: Анастасия Мишина <nastyan123@gmail.com>
Date: Tue Feb 18 13:84:35 2025 +0300

    Added css stylesheet

commit d37a3b5f8d988ecff3703d3114ea7bb5791a4
Author: Анастасия Мишина <nastyan123@gmail.com>
Date: Tue Feb 18 13:89:46 2025 +0300

    Added README

commit 8dcfcfdec9dbb2cf88ef8ddbc9c6elfaff13b548
Author: Анастасия Мишина <nastyan123@gmail.com>
Date: Tue Feb 18 12:57:17 2025 +0300

    Added index.html

commit c3afc7e5a2e704f901395c71582f45565582e0
Author: Анастасия Мишина <nastyan123@gmail.com>
Date: Tue Feb 18 12:56:02 2025 +0300

    Moved hello.html to lib

commit 016225104ec019ed0137388ab624bcc2d7cbcc0
Author: Анастасия Мишина <nastyan123@gmail.com>
Date: Tue Feb 18 12:52:38 2025 +0300

    Add an author/email comment

commit 42a2c2baff8e7fd0225780bac6c92ed2008c9b35 (tag: v1)
Author: Анастасия Мишина <nastyan123@gmail.com>
```

Рис. 48: Клонирование репозитория

## Что такое origin?

```
nasmi@MacBook-Air cloned_hello % git remote
origin
nasmi@MacBook-Air cloned_hello % git remote show origin
* remote origin
  Fetch URL: /Users/nasmi/work/aamishina/hello
  Push URL: /Users/nasmi/work/aamishina/hello
  HEAD branch: main
  Remote branches:
    main tracked
    style tracked
  Local branch configured for 'git pull':
    main merges with remote main
  Local ref configured for 'git push':
    main pushes to main (up to date)
nasmi@MacBook-Air cloned_hello % git branch
* main
nasmi@MacBook-Air cloned_hello % git branch -a
* main
  remotes/origin/HEAD -> origin/main
  remotes/origin/main
  remotes/origin/style
nasmi@MacBook-Air cloned_hello %
```

Рис. 49: Информация о репозитории и ветках

## Изменение оригинального репозитория

```
nasmi@MacBook-Air cloned_hello %  
cd ../hello  
[nasmi@MacBook-Air hello % vim README.md  
[nasmi@MacBook-Air hello % git add README.md  
[nasmi@MacBook-Air hello % git commit -m "Changed README in original repo"  
[main aac6281] Changed README in original repo  
 1 file changed, 1 insertion(+)  
nasmi@MacBook-Air hello %
```

Рис. 50: Изменение оригинального репозитория

# Изменение оригинального репозитория

```
nasmi@MacBook-Air hello % cd ../cloned_hello
nasmi@MacBook-Air 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 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 392 bytes | 78.00 KiB/s, done.
From /Users/nasmi/work/aaamishina/hello
  e12313f..aac6281 main      -> origin/main
nasmi@MacBook-Air cloned_hello % git log --all
commit aac6281cbc4baefb8ce0c3f08d44a386cfbb1b2c (origin/main, origin/HEAD)
Author: Анастасия Мишина <nastyam323@gmail.com>
Date: Tue Feb 18 13:25:44 2025 +0300

    Changed README in original repo

commit e12313f7a3cbc63e3f9f8952375c1480032bc621 (HEAD -> main, origin/style)
Author: Анастасия Мишина <nastyam323@gmail.com>
Date: Tue Feb 18 13:06:39 2025 +0300

    Updated index.html

commit 0536491f60d2a7e4ebcb94c528b5607c2e79a009
Author: Анастасия Мишина <nastyam323@gmail.com>
Date: Tue Feb 18 13:06:00 2025 +0300

    Hello uses style.css

commit 68378bf9dd4b7d18473b019d63c8ae045439b3c9
Author: Анастасия Мишина <nastyam323@gmail.com>
Date: Tue Feb 18 13:04:35 2025 +0300

    Added css stylesheet

commit d37a365f0dc908ec0ffa3703d3114ea7bb5791a4
Author: Анастасия Мишина <nastyam323@gmail.com>
Date: Tue Feb 18 13:09:46 2025 +0300

    Added README

commit 8cdcfdec9dbb2cf88ef0ddbc0c6elfaafff13b548
Author: Анастасия Мишина <nastyam323@gmail.com>
Date: Tue Feb 18 12:57:17 2025 +0300

    Added index.html.
```

Рис. 51: Извлечение изменений

## Изменение оригинального репозитория

---

```
[nasmi@MacBook-Air cloned_hello % cat README.md
This is the Hello World example from the git tutorial.
nasmi@MacBook-Air cloned_hello %
```

Рис. 52: README.md

## Слияние извлеченных изменений

```
[nasmi@MacBook-Air cloned_hello % cat README.md
This is the Hello World example from the git tutorial.
[nasmi@MacBook-Air cloned_hello % git merge origin/main
Updating e12313f..aac6281
Fast-forward
 README.md | 1 +
 1 file changed, 1 insertion(+)
[nasmi@MacBook-Air cloned_hello % cat README.md
This is the Hello World example from the git tutorial.
This is the Hello World example from the git tutorial.
[nasmi@MacBook-Air cloned_hello % git pull
Already up to date.
nasmi@MacBook-Air cloned_hello % ]
```

Рис. 53: Слияние извлеченных изменений

## Добавление ветки наблюдения

```
[nasmr@MacBook-Air cloned_hello %]
[nasmr@MacBook-Air cloned_hello %] git branch --track style origin/style
branch 'style' set up to track 'origin/style'.
[nasmr@MacBook-Air cloned_hello %] git branch -a
* main
  style
    remotes/origin/HEAD -> origin/main
    remotes/origin/main
    remotes/origin/style
[nasmr@MacBook-Air cloned_hello %] git log --max-count=2
commit aac6281cbc4baf8ce0c3fd8d44a386cfbb1b2c (HEAD -> main, origin/main, origin/HEAD)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 13:25:44 2025 +0300

    Changed README in original repo

commit e12313f7a3cbc63e3f9f8952375c1480032bc621 (origin/style, style)
Author: Анастасия Мишина <nastyam3232@gmail.com>
Date:   Tue Feb 18 13:06:39 2025 +0300

    Updated index.html
[nasmr@MacBook-Air cloned_hello %]
```

Рис. 54: Добавление ветки наблюдения

## Создайте чистый репозиторий

```
nasmi@MacBook-Air cloned_hello %
nasmi@MacBook-Air cloned_hello % cd ..
nasmi@MacBook-Air aamishina % git clone --bare hello hello.git
Cloning into bare repository 'hello.git'...
done.
nasmi@MacBook-Air aamishina % ls hello.git
HEAD      config      description      hooks      info      objects      packed-refs      refs
nasmi@MacBook-Air aamishina %
```

Рис. 55: Создание чистого репозитория

## Добавление удаленного репозитория

```
[nasmi@MacBook-Air aamishina %  
[nasmi@MacBook-Air aamishina % cd hello  
[nasmi@MacBook-Air hello % git remote add shared ../hello.git  
[nasmi@MacBook-Air hello % vim README.md  
[nasmi@MacBook-Air hello % git checkout main  
M README.md  
Already on 'main'  
[nasmi@MacBook-Air hello % git add README.md  
[nasmi@MacBook-Air hello % git commit -m "Added shared comment to readme"  
[main 1c79a44] Added shared comment to readme  
 1 file changed, 1 insertion(+), 1 deletion(-)  
[nasmi@MacBook-Air hello % git push shared main  
Enumerating objects: 5, done.  
Counting objects: 100% (5/5), done.  
Delta compression using up to 8 threads  
Compressing objects: 100% (3/3), done.  
Writing objects: 100% (3/3), 435 bytes | 435.00 KiB/s, done.  
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0  
To ../hello.git  
    aac6281..1c79a44  main -> main  
nasmi@MacBook-Air hello %
```

Рис. 56: Добавление удаленного репозитория. Отправка изменений

## Извлечение общих изменений

```
[nasmi@MacBook-Air hello %  
[nasmi@MacBook-Air hello % cd ../cloned_hello  
[nasmi@MacBook-Air cloned_hello % git remote add shared ../hello.git  
[nasmi@MacBook-Air cloned_hello % git branch --track shared main  
  branch 'shared' set up to track 'main'.  
[nasmi@MacBook-Air cloned_hello % git pull shared main  
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), 415 bytes | 138.00 KiB/s, done.  
From ../hello  
 * branch           main      -> FETCH_HEAD  
 * [new branch]     main      -> shared/main  
Updating aac6281..1c79a44  
Fast-forward  
 README.md | 2 +-  
 1 file changed, 1 insertion(+), 1 deletion(-)  
[nasmi@MacBook-Air cloned_hello % cat README.md  
This is the Hello World example from the git tutorial.  
(Changed in the original and pushed to shared)  
nasmi@MacBook-Air cloned_hello %
```

Рис. 57: Извлечение общих изменений

## Вывод

---

- В ходе выполнения данной лабораторной работы я приобрела практические навыки работы с системой управления версиями Git.