

Лабораторная работа №1

Работа с git

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Информация

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

Вводная часть

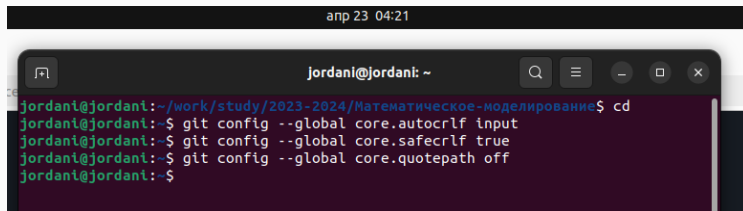
Цель работы

Приобретение практических навыков работы с системой управления версиями Git.

Задачи

- Создать репозиторий
- Изменить его содержимое, изучить работу с коммитами, версиями и тегами
- Поработать с объектами Git
- Создать дополнительную ветку, провести слияние, разрешение конфликтов
- Создать клон репозитория и слить его с оригинальным
- Залить и извлечь изменения

Выполнение лабораторной работы



The image shows a terminal window with a dark background. The title bar at the top reads "anp 23 04:21". The terminal window itself has a title bar that says "Jordani@Jordani: ~" and includes standard window control buttons (search, menu, zoom, maximize, close). The terminal content shows the following commands and their outputs:

```
Jordani@Jordani:~/work/study/2023-2024/Математическое-моделирование$ cd
Jordani@Jordani:~$ git config --global core.autocrlf input
Jordani@Jordani:~$ git config --global core.safecrlf true
Jordani@Jordani:~$ git config --global core.quotepath off
Jordani@Jordani:~$
```

Figure 1: Настройка git

Создание проекта

```
ies  Terminal  anp 23 04:33
Jordani@Jordani: ~/hello

Jordani@Jordani:~$ mkdir hello
Jordani@Jordani:~$ cd hello
Jordani@Jordani:~/hello$ touch hello.html
Jordani@Jordani:~/hello$ echo "Hello, World!" > hello.html
Jordani@Jordani:~/hello$ cat hello
cat: hello: No such file or directory
Jordani@Jordani:~/hello$ cat hello.html
Hello, World!
Jordani@Jordani:~/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/jordani/hello/.git/
Jordani@Jordani:~/hello$ git add hello.html
Jordani@Jordani:~/hello$ git commit -m "Initial Commit"
Author identity unknown

*** Please tell me who you are.

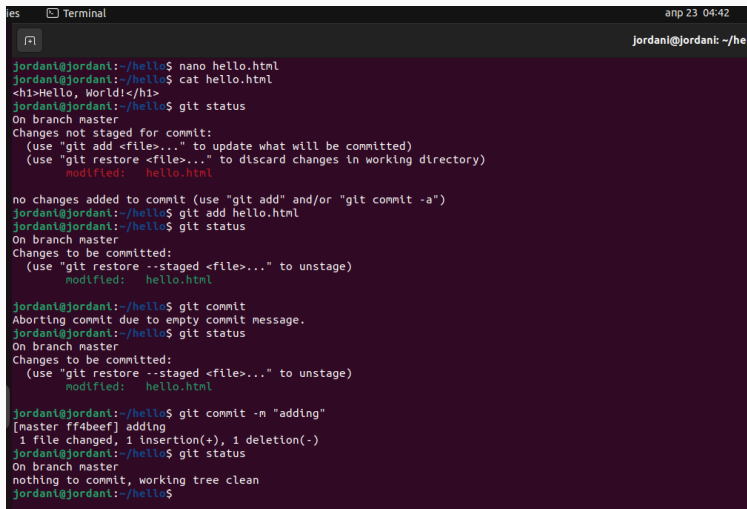
Run

    git config --global user.email "you@example.com"
    git config --global user.name "Your Name"

to set your account's default identity.
Omit --global to set the identity only in this repository.

fatal: unable to auto-detect email address (got 'Jordani@Jordani.(none)')
Jordani@Jordani:~/hello$ git config --global user.name "Jordaniakondzo"
Jordani@Jordani:~/hello$ git config --global user.email "jordaniakondzo3438@gmail.com"
Jordani@Jordani:~/hello$ git add hello.html
Jordani@Jordani:~/hello$ git commit -m "Initial Commit"
[master (root-commit) 39958c5] Initial Commit
 1 file changed, 1 insertion(+)
 create mode 100644 hello.html
Jordani@Jordani:~/hello$ git status
On branch master
nothing to commit, working tree clean
Jordani@Jordani:~/hello$
```


Внесение изменений



```
ies Terminal anp 23 04:42
Jordani@Jordani: ~/he

jordani@jordani:~/hello$ nano hello.html
jordani@jordani:~/hello$ cat hello.html
<h1>Hello, World!</h1>
jordani@jordani:~/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")
jordani@jordani:~/hello$ git add hello.html
jordani@jordani:~/hello$ git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   hello.html

jordani@jordani:~/hello$ git commit
Aborting commit due to empty commit message.
jordani@jordani:~/hello$ git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   hello.html

jordani@jordani:~/hello$ git commit -m "adding"
[master ff4beef] adding
1 file changed, 1 insertion(+), 1 deletion(-)
jordani@jordani:~/hello$ git status
On branch master
nothing to commit, working tree clean
jordani@jordani:~/hello$
```

Figure 3: Внесение изменений в содержимое репозитория

```
Terminal
arp 23 04:49
JordanI@JordanI: ~/h

JordanI@JordanI:~/hello$ nano hello.html
JordanI@JordanI:~/hello$ cat hello.html
<html>
<body>
<h1>Hello, World!</h1>
</body>
</html>

JordanI@JordanI:~/hello$ git add hello.html
JordanI@JordanI:~/hello$ nano hello.html
JordanI@JordanI:~/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

JordanI@JordanI:~/hello$ git commit -m "Added standard HTML page tags"
[master ebfd4b] Added standard HTML page tags
1 file changed, 5 insertions(+)
JordanI@JordanI:~/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")
JordanI@JordanI:~/hello$ git add .
JordanI@JordanI:~/hello$ git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   hello.html

JordanI@JordanI:~/hello$ git commit -m "Added HTML header"
[master b2fa00b] Added HTML header
1 file changed, 2 insertions(+), 1 deletion(-)
JordanI@JordanI:~/hello$
```

Figure 4: Внесение нескольких изменений в содержимое репозитория

```
bles  Terminal  anp 23 04:55
Jordani@Jordani: ~/hello

Jordani@Jordani: ~/hello$ git log
commit b2fa60b03336f33e373591cd09314c571de0f413 (HEAD -> master)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:49:10 2024 +0300

    Added HTML header

commit ebfd4b1ad859356256cccc14248c29842fbaee54
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:47:24 2024 +0300

    Added standard HTML page tags

commit ff4bee7bd3f7647fe9eca37f5a947616ef15c4
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:41:49 2024 +0300

    adding

commit 39958c5c335173e07fceb1b5d4159139d4aae245
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:31:47 2024 +0300

    Initial Commit

Jordani@Jordani: ~/hello$ git log --pretty=oneline
b2fa60b03336f33e373591cd09314c571de0f413 (HEAD -> master) Added HTML header
ebfd4b1ad859356256cccc14248c29842fbaee54 Added standard HTML page tags
ff4bee7bd3f7647fe9eca37f5a947616ef15c4 adding
39958c5c335173e07fceb1b5d4159139d4aae245 Initial Commit
Jordani@Jordani: ~/hello$ git log --pretty=oneline --max-count=2
b2fa60b03336f33e373591cd09314c571de0f413 (HEAD -> master) Added HTML header
ebfd4b1ad859356256cccc14248c29842fbaee54 Added standard HTML page tags
Jordani@Jordani: ~/hello$ git log --pretty=oneline --since='5 minutes ago'
b2fa60b03336f33e373591cd09314c571de0f413 (HEAD -> master) Added HTML header
ebfd4b1ad859356256cccc14248c29842fbaee54 Added standard HTML page tags
Jordani@Jordani: ~/hello$ git log --pretty=oneline --until='5 minutes ago'
ff4bee7bd3f7647fe9eca37f5a947616ef15c4 adding
39958c5c335173e07fceb1b5d4159139d4aae245 Initial Commit
Jordani@Jordani: ~/hello$ git log --pretty=oneline --author=Jordaniakondzo
b2fa60b03336f33e373591cd09314c571de0f413 (HEAD -> master) Added HTML header
ebfd4b1ad859356256cccc14248c29842fbaee54 Added standard HTML page tags
ff4bee7bd3f7647fe9eca37f5a947616ef15c4 adding
39958c5c335173e07fceb1b5d4159139d4aae245 Initial Commit
Jordani@Jordani: ~/hello$ git log --pretty=oneline --all
b2fa60b03336f33e373591cd09314c571de0f413 (HEAD -> master) Added HTML header
ebfd4b1ad859356256cccc14248c29842fbaee54 Added standard HTML page tags
ff4bee7bd3f7647fe9eca37f5a947616ef15c4 adding
39958c5c335173e07fceb1b5d4159139d4aae245 Initial Commit
```

Figure 5: Просмотр истории

Получение старых версий

```
ties  Terminal  anp 23 05:02
Jordani@Jordani: ~/hello

Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:41:49 2024 +0300

    adding

commit 39958c5c335173e87fceb1b5d4159139d4aae245
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:31:47 2024 +0300

    Initial Commit
Jordani@Jordani:~/hello$ git checkout b2fa60b033
Note: switching to 'b2fa60b033'.

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>

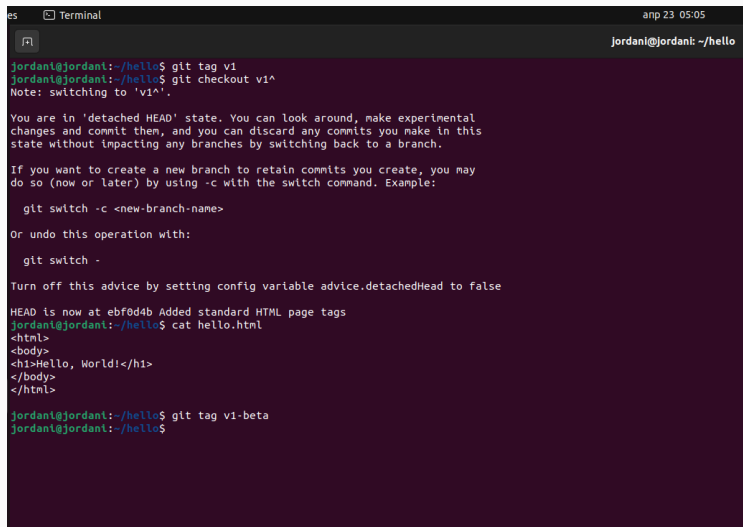
Or undo this operation with:

    git switch -

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

HEAD is now at b2fa60b Added HTML header
Jordani@Jordani:~/hello$ cat hello.html
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>
Jordani@Jordani:~/hello$ git checkout master
Switched to branch 'master'
Jordani@Jordani:~/hello$ cat hello.html
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>
Jordani@Jordani:~/hello$
```

Создание тегов версий



```
es Terminal anp 23 05:05
Jordani@Jordani: ~/hello

Jordani@Jordani:~/hello$ git tag v1
Jordani@Jordani:~/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 ebf0d4b Added standard HTML page tags
Jordani@Jordani:~/hello$ cat hello.html
<html>
<body>
<h1>Hello, World!</h1>
</body>
</html>

Jordani@Jordani:~/hello$ git tag v1-beta
Jordani@Jordani:~/hello$
```

Figure 7: Создание тегов версий

Создание тегов версий

```
es Terminal anp 23 05:07
Jordani@Jordani: ~/hello

Jordani@Jordani:~/hello$ git checkout v1
Previous HEAD position was ebf0d4b Added standard HTML page tags
HEAD is now at b2fa60b Added HTML header
Jordani@Jordani:~/hello$ git checkout v1-beta
Previous HEAD position was b2fa60b Added HTML header
HEAD is now at ebf0d4b Added standard HTML page tags
Jordani@Jordani:~/hello$ git tag
v1
v1-beta
Jordani@Jordani:~/hello$ git log master --all
commit b2fa60b03336f33e373591c0d9314c571de0f413 (tag: v1, master)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:49:10 2024 +0300

    Added HTML header

commit ebf0d4b1ad859356256ccc14248c29842fbaee54 (HEAD, tag: v1-beta)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:47:24 2024 +0300

    Added standard HTML page tags

commit ff4beef7bd3f7647fe69eca37f5a947616ef15c4
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:41:49 2024 +0300

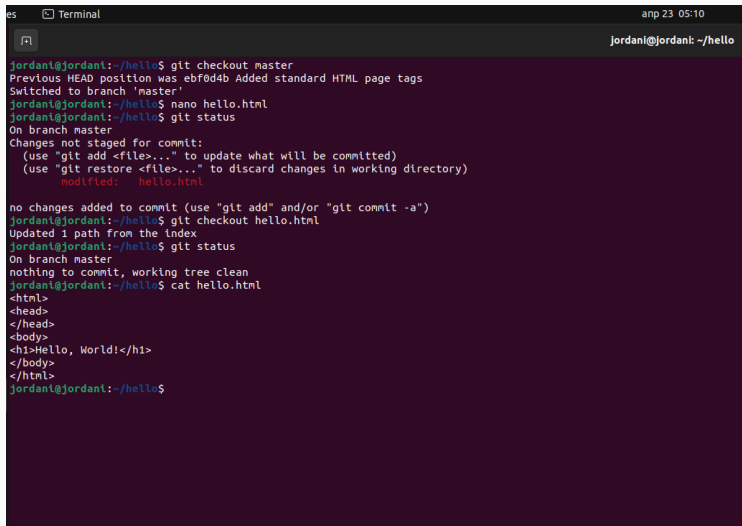
    adding

commit 39958c5c335173e87fceb1b5d4159139d4aae245
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:31:47 2024 +0300

    Initial Commit
Jordani@Jordani:~/hello$
```

Figure 8: Переключение по имени тега и просмотр доступных тегов

Отмена локальных изменений (до индексации)

A terminal window titled 'Terminal' with a dark background and light-colored text. The window shows a series of Git commands and their outputs. The user is in a directory named 'hello'. The commands executed are: 'git checkout master', 'nano hello.html', 'git status', and 'git checkout hello.html'. The output shows the previous HEAD position, the switch to the master branch, the status of the working directory (no changes staged), and the successful checkout to the hello.html branch. The terminal also shows the content of the hello.html file, which is a simple HTML page with 'Hello, World!'.

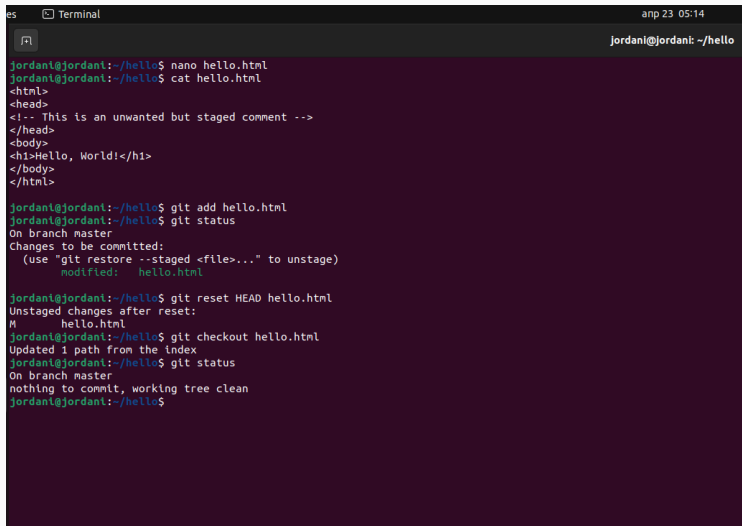
```
es Terminal anp 23 05:10
Jordani@Jordani: ~/hello

Jordani@Jordani:~/hello$ git checkout master
Previous HEAD position was ebf0d4b Added standard HTML page tags
Switched to branch 'master'
Jordani@Jordani:~/hello$ nano hello.html
Jordani@Jordani:~/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")
Jordani@Jordani:~/hello$ git checkout hello.html
Updated 1 path from the index
Jordani@Jordani:~/hello$ git status
On branch master
nothing to commit, working tree clean
Jordani@Jordani:~/hello$ cat hello.html
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>
Jordani@Jordani:~/hello$
```

Figure 9: Отмена локальных изменений (до индексации)

Отмена проиндексированных изменений (перед коммитом)

A terminal window titled "Terminal" with a dark background and light green text. The window shows a series of commands and their outputs in a shell. The user is at a prompt "jordani@jordani: ~/hello". They create a file "hello.html" with "nano", view its contents with "cat", stage it with "git add", check the status, and then unstage it with "git reset HEAD hello.html". Finally, they check the status again, showing it is clean.

```
es  Terminal  anp 23 05:14  Jordani@Jordani: ~/hello

jordani@jordani:~/hello$ nano hello.html
jordani@jordani:~/hello$ cat hello.html
<html>
<head>
<!-- This is an unwanted but staged comment -->
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>

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

jordani@jordani:~/hello$ git reset HEAD hello.html
Unstaged changes after reset:
M       hello.html
jordani@jordani:~/hello$ git checkout hello.html
Updated 1 path from the index
jordani@jordani:~/hello$ git status
On branch master
nothing to commit, working tree clean
jordani@jordani:~/hello$
```

Figure 10: Отмена проиндексированных изменений (перед коммитом)

Отмена коммитов

```
es Terminal anp 23 05:19
JordanI@JordanI: ~/hello

JordanI@JordanI:~/hello$ nano hello.html
JordanI@JordanI:~/hello$ cat hello.html
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
<!-- This is an unwanted but committed change -->
</body>
</html>
JordanI@JordanI:~/hello$ git add hello.html
JordanI@JordanI:~/hello$ git commit -m "Oops, we didn't want this commit"
[master 9e765fe] Oops, we didn't want this commit
 1 file changed, 1 insertion(+)
JordanI@JordanI:~/hello$ git revert HEAD
[master caf1ae7] Revert "Oops, we didn't want this commit"
 1 file changed, 1 deletion(-)
JordanI@JordanI:~/hello$ git log
commit caf1ae7b657f2f05f330b9c285a6af23119f878d (HEAD -> master)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 05:18:04 2024 +0300

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

    This reverts commit 9e765fec26c7bd0e43776a32b63845e70057578e.

commit 9e765fec26c7bd0e43776a32b63845e70057578e
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 05:17:40 2024 +0300

    Oops, we didn't want this commit

commit b2fa60b03336f33e373591c0d9314c571de0f413 (tag: v1)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:49:10 2024 +0300

    Added HTML header

commit ebf0d4b1ad859356256ccc14248c29842fbaee54 (tag: v1-beta)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:47:24 2024 +0300

    Added standard HTML page tags

commit ff4beef7bd3f7647fe69eca37f5a947616ef15c4
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
```

Удаление коммитов из ветки

```
os Terminal
Jordani@Jordani:~/hello$ git tag oops
Jordani@Jordani:~/hello$ git reset --hard v1
HEAD is now at b2f608b Added HTML header
Jordani@Jordani:~/hello$ git log
commit b2f608b136f73e373591cd9314c571de0f413 (HEAD -> master, tag: v1)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:49:10 2024 +0300

    Added HTML header

commit eb70d4b1d859358256ccc14248c39842fbaee54 (tag: v1-beta)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:47:24 2024 +0300

    Added standard HTML page tags

commit ff4bee77b3f7e47f6b9eca37f5a94761eef15c4
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:41:49 2024 +0300

    adding

commit 39958c335173e87fceb1b5d415913b44aee245
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:31:47 2024 +0300

    Initial Commit

Jordani@Jordani:~/hello$ git log --all
commit c0f6eb3a3727f81f30b9c235a0a3119707bd (tag: oops)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 05:18:04 2024 +0300

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

    This reverts commit 9e765fec26c7bd0e43776a32b63845e78b57578e.

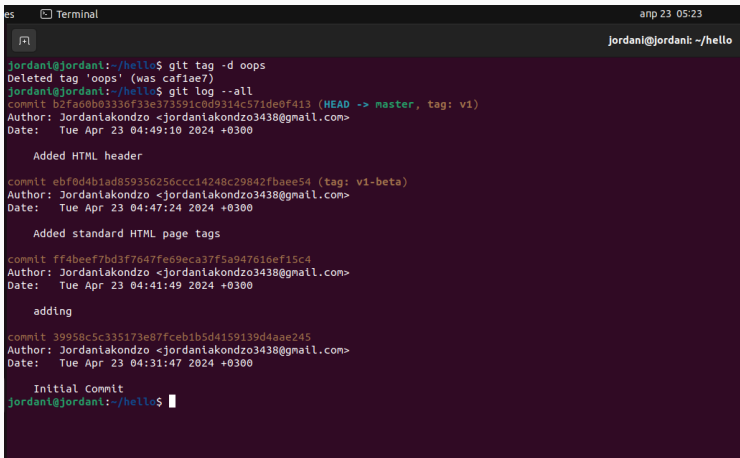
commit 9e765fec26c7bd0e43776a32b63845e78b57578e
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 05:17:40 2024 +0300

    Oops, we didn't want this commit

commit b2f608b136f73e373591cd9314c571de0f413 (HEAD -> master, tag: v1)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:49:10 2024 +0300

    Added HTML header
```

Figure 12: Удаление коммитов из ветки



```
es  Terminal  anp 23 05:23
Jordani@Jordani: ~/hello

Jordani@Jordani:~/hello$ git tag -d oops
Deleted tag 'oops' (was caf1ae7)
Jordani@Jordani:~/hello$ git log --all
commit b2fa60b03336f33e373591c0d9314c571de0f413 (HEAD -> master, tag: v1)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:49:10 2024 +0300

    Added HTML header

commit ebf0d4b1ad859356256ccc14248c29842fbaee54 (tag: v1-beta)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:47:24 2024 +0300

    Added standard HTML page tags

commit ff4beef7bd3f7647fe69eca37f5a947616ef15c4
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:41:49 2024 +0300

    adding

commit 39958c5c335173e87fceb1b5d4159139d4aae245
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:31:47 2024 +0300

    Initial Commit
Jordani@Jordani:~/hello$
```

Figure 13: Удаление тега oops

Изменение предыдущего коммита

```
Jordani@jordant: ~/hello

jordani@jordant:~/hello$ nano hello.html
jordani@jordant:~/hello$ cat hello.html
<!-- Author: Dmitry S. Kulyabov -->
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
</html>

jordani@jordant:~/hello$ git add hello.html
jordani@jordant:~/hello$ git commit -m "Add an author comment"
[master 052f605] Add an author comment
1 file changed, 2 insertions(+)
jordani@jordant:~/hello$ nano hello.html
jordani@jordant:~/hello$ git add hello.html
jordani@jordant:~/hello$ git commit --amend -m "Add an author/email comment"
[master 8909a5f] Add an author/email comment
Date: Tue Apr 23 05:25:12 2024 +0300
1 file changed, 2 insertions(+)
jordani@jordant:~/hello$ git log
commit 8909a5f9427a1b520b32a5367da5a4ec239d0324 (HEAD -> master)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 05:25:12 2024 +0300

    Add an author/email comment

commit b2fa60b03336f33e373591c0d0314c571de0f413 (tag: v1)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:49:10 2024 +0300

    Added HTML header

commit ebfd0db1ed859350250ccc14248c29847fbaec54 (tag: v1-beta)
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:47:24 2024 +0300

    Added standard HTML page tags

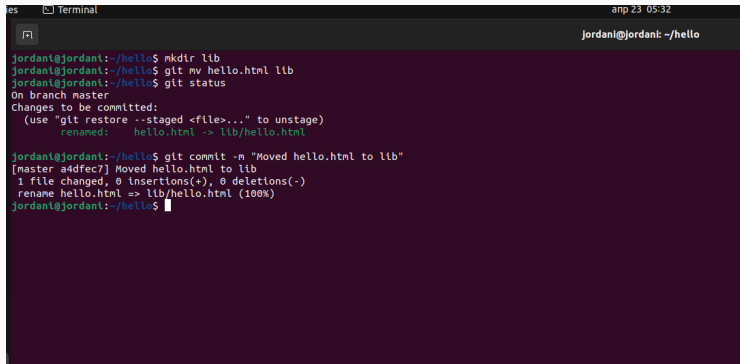
commit ff4beef7bd3f7647fe69eca37f5a947610ef15c4
Author: Jordaniakondzo <jordaniakondzo3438@gmail.com>
Date: Tue Apr 23 04:41:49 2024 +0300

    adding

commit 30850c5c3301f3e07f7c9b1b5d415d130d6aac745
```

Figure 14: Изменение предыдущего коммита

Перемещение файлов

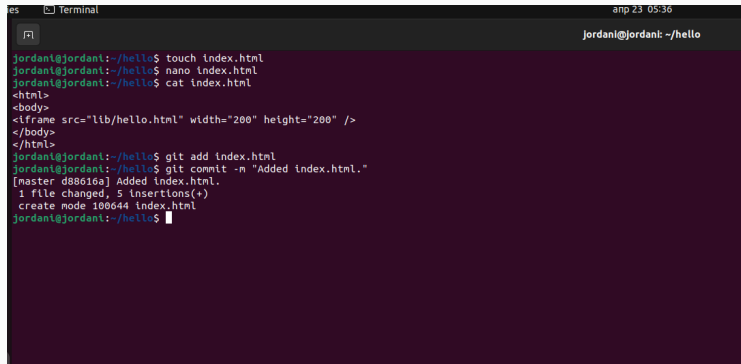
A terminal window titled 'Terminal' with a dark background and light green text. The window shows a series of commands and their outputs. The user 'jordanl' is in the directory '~/hello'. They create a subdirectory 'lib', move 'hello.html' to 'lib', check the git status, and commit the change. The status shows a rename of 'hello.html' to 'lib/hello.html'. The commit message is 'Moved hello.html to lib'.

```
es  Terminal  anp 23 05:32
Jordanl@Jordanl: ~/hello

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

jordanl@jordanl:~/hello$ git commit -m "Moved hello.html to lib"
[master a4dfec7] Moved hello.html to lib
1 file changed, 0 insertions(+), 0 deletions(-)
rename hello.html => lib/hello.html (100%)
jordanl@jordanl:~/hello$
```

Figure 15: Перемещение файлов

A terminal window titled 'Terminal' with a dark background and light green text. The user 'jordanl@jordanl' is in the directory '~/hello'. The commands and their outputs are as follows:

```
jordanl@jordanl:~/hello$ touch index.html
jordanl@jordanl:~/hello$ nano index.html
jordanl@jordanl:~/hello$ cat index.html
<html>
<body>
<iframe src="lib/hello.html" width="200" height="200" />
</body>
</html>
jordanl@jordanl:~/hello$ git add index.html
jordanl@jordanl:~/hello$ git commit -m "Added index.html."
[master d88616a] Added index.html.
1 file changed, 5 insertions(+)
create mode 100644 index.html
jordanl@jordanl:~/hello$
```

Figure 16: Добавление нового файла в репозиторий

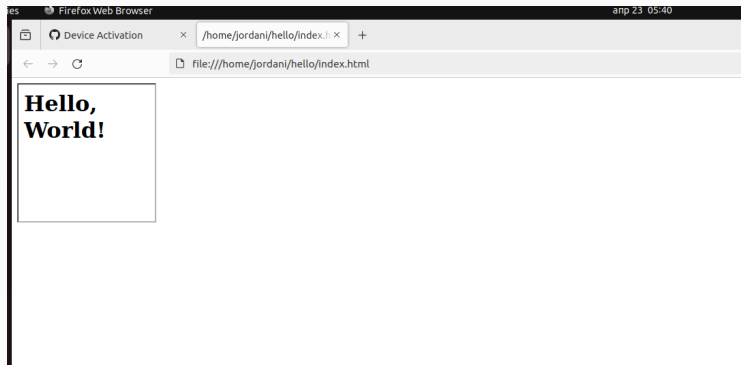


Figure 17: Добавление нового файла в репозиторий

Git внутри: Каталог .git

```
es Terminal anp 23 05:47
Jordanl@Jordanl: ~/hello

jordanl@jordanl:~/hello$ ls -C .git
branches COMMIT_EDITMSG config description HEAD hooks index info logs objects ORIG_HEAD packed-refs refs
jordanl@jordanl:~/hello$ ls -C .git/objects
00 09 11 28 39 3a 4a 4f 52 62 68 89 8a 95 9e a4 b2 b6 bd bf c8 ca d8 eb f7 f9 ff info pack
jordanl@jordanl:~/hello$ cat .git/config
[core]
    repositoryformatversion = 0
    filemode = true
    bare = false
    logallrefupdates = true
jordanl@jordanl:~/hello$ ls .git/refs
heads tags
jordanl@jordanl:~/hello$ ls .git/refs/heads
master
jordanl@jordanl:~/hello$ ls .git/refs/tags
v1 v1-beta
jordanl@jordanl:~/hello$ cat .git/refs/tags/v1
b2fa60b03336f33e373591c0d9314c571de0f413
jordanl@jordanl:~/hello$ cat .git/HEAD
ref: refs/heads/master
jordanl@jordanl:~/hello$
```

Figure 18: Каталог .git

Работа непосредственно с объектами git

```
es Terminal anp 23 05:56
Jordan@jordan: ~/hello
Date: Tue Apr 23 05:35:51 2024 +0300

Added index.html.
Jordan@jordan:~/hello$ git cat-file -t d88616aad363bfadf39cf558c4c72355631f2668
commit
Jordan@jordan:~/hello$ git cat-file -p git cat-file -p <hash>
bash: syntax error near unexpected token 'newline'
Jordan@jordan:~/hello$ git cat-file -p git cat-file -p d88616aad363bfadf39cf558c4c72355631f2668
usage: git cat-file [-t [--allow-unknown-type] | -s [--allow-unknown-type] | -e | -p | <type> | --textconv | --filters] [--path=<path>] <object>
or: git cat-file [--batch[=<format>] | --batch-check[=<format>]] [--follow-symlinks] [--textconv | --filters]

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

Jordan@jordan:~/hello$ git cat-file -p d88616aad363bfadf39cf558c4c72355631f2668
tree bd8fb150c62d4b97a629224a4ad98199acab1b03
parent a4dfec7d0b431f4ff62a57f225744bdb762cd2e5
author JordanIakondzo <jordanlakondzo3438@gmail.com> 1713839751 +0300
committer JordanIakondzo <jordanlakondzo3438@gmail.com> 1713839751 +0300

Added index.html.
Jordan@jordan:~/hello$ git cat-file -p bd8fb150c62d4b97a629224a4ad98199acab1b03
100644 blob 68583eacd320506a31568f0df6f45ebb874238b5 index.html
040000 tree 3ab5e480ec562a80130aa003b1881b14725acc8a lib
Jordan@jordan:~/hello$ git cat-file -p 3ab5e480ec562a80130aa003b1881b14725acc8a
100644 blob c8adc0a091d74b719bfff0e7b004b7180e586c8f8 hello.html
Jordan@jordan:~/hello$ git cat-file -p c8adc0a091d74b719bfff0e7b004b7180e586c8f8
<!-- Author: Dmitry S. Kulyabov (kulyabov-ds@rudn.ru) -->
<html>
<head>
</head>
<body>
<h1>Hello, World!</h1>
</body>
```

Figure 19: Работа непосредственно с объектами git

Работа непосредственно с объектами git

```

parent a4dfec7d0b431f4ff62a57f225744db762cd2e5
author JordanLakondo <jordanlakondo3438@gmail.com> 1713839751 +0300
committer JordanLakondo <jordanlakondo3438@gmail.com> 1713839751 +0300

Added index.html.
JordanLakondo:~/hell$ git cat-file -p d8861a6d363bfedf39cf558c4c7235631f2068
tree bdf8f158c624b97a0292344ad8199ec03b03
parent a4dfec7d0b431f4ff62a57f225744db762cd2e5
author JordanLakondo <jordanlakondo3438@gmail.com> 1713839751 +0300
committer JordanLakondo <jordanlakondo3438@gmail.com> 1713839751 +0300

Added index.html.
JordanLakondo:~/hell$ git cat-file -p a4dfec7d0b431f4ff62a57f225744db762cd2e5
tree 4ac9e02bfff8ad739f158d64a2deba8c9e76f
parent b999a5f9427a1b520b32a5367da54ec239d0324
author JordanLakondo <jordanlakondo3438@gmail.com> 1713839529 +0300
committer JordanLakondo <jordanlakondo3438@gmail.com> 1713839529 +0300

Moved hello.html to lib
JordanLakondo:~/hell$ git cat-file -p 8099a5f9427a1b520b32a5367da54ec239d0324
tree 3ab5e408ec562a88130a0030b1881b147250cc8b
parent b2fa08b03336f31e373591cd9314c571de0f413
author JordanLakondo <jordanlakondo3438@gmail.com> 1713839112 +0300
committer JordanLakondo <jordanlakondo3438@gmail.com> 1713839223 +0300

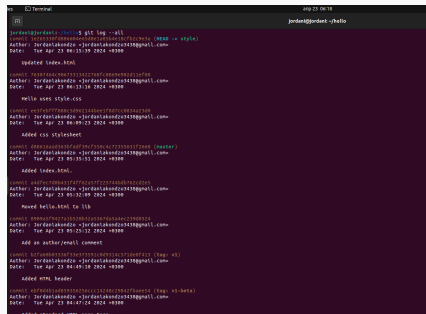
Add an author/email comment
JordanLakondo:~/hell$ git cat-file -p b3fa60b03336f33e373591cd9314c571de0f413
tree 4f40eef7f62a57f225744db762cd2e5
parent eb78db1a0859356256ccc14248c29842fbaee54
author JordanLakondo <jordanlakondo3438@gmail.com> 1713836950 +0300
committer JordanLakondo <jordanlakondo3438@gmail.com> 1713836950 +0300

Added HTML header
JordanLakondo:~/hell$ git cat-file -p eb78db1a0859356256ccc14248c29842fbaee54
tree b7be14df1469cea586fcec19129492d0077224519
parent ff4bee7bd3f7647fe69eca37f5a947616ef15c4
author JordanLakondo <jordanlakondo3438@gmail.com> 1713836844 +0300
committer JordanLakondo <jordanlakondo3438@gmail.com> 1713836844 +0300

Added standard HTML page tags
JordanLakondo:~/hell$ git cat-file -p ff4bee7bd3f7647fe69eca37f5a947616ef15c4
tree 029377ed8b96afed9fdec7b748b1e41d1dc56
parent 399583c335173e87fceb1b5d4159139d4aae245
author JordanLakondo <jordanlakondo3438@gmail.com> 1713836599 +0300
committer JordanLakondo <jordanlakondo3438@gmail.com> 1713836599 +0300

adding
JordanLakondo:~/hell$
```

Figure 20: Поиск оригинального файла hello.html



```

Jordan@Jordan: ~/hello$ git log --all
commit 3c20518f0f08080d0c10900c10f722c931 (HEAD -> style)
Author: JordanLahondze <jordanlahondze343@gmail.com>
Date:   Tue Apr 23 00:13:39 2024 +0300

    updated index.html

commit 7d307d6c1067333d22707f08a94902313ef08
Author: JordanLahondze <jordanlahondze343@gmail.com>
Date:   Tue Apr 23 00:13:38 2024 +0300

    hello uses style.css

commit e43f61ff080c306c31d0e03f820f1003d21305
Author: JordanLahondze <jordanlahondze343@gmail.com>
Date:   Tue Apr 23 00:09:23 2024 +0300

    Added css stylesheet

commit 0801d6d2013f0cf30cf330c4c723306372d09 (master)
Author: JordanLahondze <jordanlahondze343@gmail.com>
Date:   Tue Apr 23 00:10:51 2024 +0300

    Added index.html.

commit 0a0f9c70060374ff010107327040b09101d095
Author: JordanLahondze <jordanlahondze343@gmail.com>
Date:   Tue Apr 23 00:12:09 2024 +0300

    Moved hello.html to lib

commit 8909a704213c10035203070030d04c3300324
Author: JordanLahondze <jordanlahondze343@gmail.com>
Date:   Tue Apr 23 00:25:12 2024 +0300

    Add an author/email comment

commit 527a0000330f33a27393100931c177d0ef319 (tag: v1)
Author: JordanLahondze <jordanlahondze343@gmail.com>
Date:   Tue Apr 23 00:40:38 2024 +0300

    Added html header

commit e0b06d10000000000000000000000000 (tag: v1-beta)
Author: JordanLahondze <jordanlahondze343@gmail.com>
Date:   Tue Apr 23 04:47:24 2024 +0300

    added standard html page tags

```

Figure 22: Просмотр логов новой ветки

Выводы

В результате выполнения лабораторной работы были приобретены практические навыки работы с системой управления версиями Git.

Список литературы

1. GitHub [Электронный ресурс]. GitHub, Inc., 2024. URL: <https://github.com/>.