

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

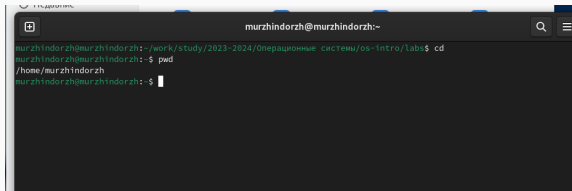
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

Задачи лабораторной работы

- 1 Определить имя и путь домашнего каталога
- 2 Изучить команду `ls`.
- 3 Выполнить действия с каталогами.
- 4 Получить дополнительные сведения при помощи справки по командам.
- 5 Изучить команду `history`.

Процесс выполнения лабораторной работы

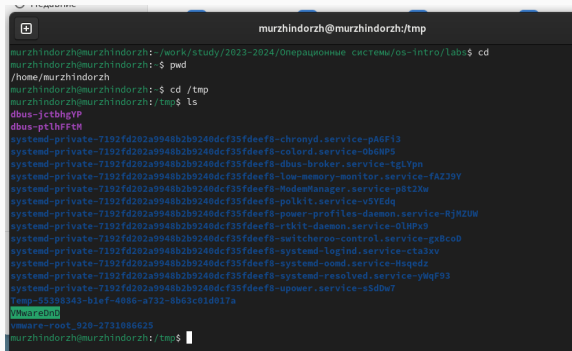
Имя и путь к домашнему каталогу



```
murzhindorzh@murzhindorzh:~  
murzhindorzh$ cd /work/study/2023-2024/Операционные системы/os-intro/labs  
murzhindorzh$ pwd  
/home/murzhindorzh  
murzhindorzh$
```

Рис. 1: Путь к домашнему каталогу

Опции команды ls



```
murzhindorz@murzhindorz:/tmp$ cd /work/study/2023-2024/Операционные системы/os-intro/labs$  
murzhindorz@murzhindorz:~$ pwd  
/home/murzhindorz  
murzhindorz@murzhindorz:~$ cd /tmp  
murzhindorz@murzhindorz:/tmp$ ls  
dbus-jctbHgVP  
dbus-ptlhFFtM  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-chrond.service-pA6Fi3  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-colord.service-0b6NP5  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-dbus-broker.service-tgLypn  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-low-memory-monitor.service-fAZ39Y  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-ModemManager.service-p8t2Xw  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-polkit.service-vSYEdq  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-power-profiles-daemon.service-RjMZUW  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-rtkit-daemon.service-0LHPx9  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-switcheroo-control.service-gx8coD  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-systemd-logind.service-cta3xv  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-systemd-oomd.service-Hsqedz  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-systemd-resolved.service-yMqF93  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-upower.service-s5dW7  
Temp-55398343-b1ef-4086-a732-8b63c81d017a  
VMwareDnD  
vmware-root_920-2731086625  
murzhindorz@murzhindorz:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
vmware-root_920-2731086625
murzhindorzh@murzhindorzh:/tmp$ ls -la
.
..
dbus-jctbHgYP
dbus-ptlhFFtM
.font-unix
.ICE-unix
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-chrond.service-pA6Fi3
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-colord.service-0bGNP5
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-dbus-broker.service-tgLYpn
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-low-memory-monitor.service-fAZJ9Y
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-ModemManager.service-p8t2Xw
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-polkit.service-v5YEdq
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-power-profiles-daemon.service-RjHZUW
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-rtkit-daemon.service-0LHPx9
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-switcheroo-control.service-gxBcoD
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-systemd-logind.service-cta3xv
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-systemd-oomd.service-Hsqedz
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-systemd-resolved.service-yWqF93
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-upower.service-sSdDw7
Temp-55398343-b1ef-4086-a732-8b63c01d017a
VMwareDnD
vmware-root_920-2731086625
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
murzhindorzh@murzhindorzh:/tmp$
```

Рис. 3: Команда ls -la

Опции команды ls

```
murchindorzh@murchindorzh:~$ ls -l
total 0
srwxrwxrwx. 1 root root      0 20 18:39 dbus-jctbgrvp
srwxrwxrwx. 1 root root      0 20 18:39 dbus-ptlhfFtM
drwx----- 3 root root    4096 20 18:39 systemd-private-7192f6202a9540b2b9240dcf35fde6fb-chromd.service-gd0f5
drwx----- 3 root root    4096 20 18:39 systemd-private-7192f6202a9540b2b9240dcf35fde6fb-chromd.service-mu0p5
drwx----- 3 root root    4096 20 18:39 systemd-private-7192f6202a9540b2b9240dcf35fde6fb-dbus-braker.service-gtYpn
drwx----- 3 root root    4096 20 18:39 systemd-private-7192f6202a9540b2b9240dcf35fde6fb-lss-memory-monitor.service-fAZ20V
drwx----- 3 root root    4096 20 18:39 systemd-private-7192f6202a9540b2b9240dcf35fde6fb-ModemManager.service-pst2w
drwx----- 3 root root    4096 20 18:39 systemd-private-7192f6202a9540b2b9240dcf35fde6fb-palvic.service-c5Tdq
drwx----- 3 root root    4096 20 18:39 systemd-private-7192f6202a9540b2b9240dcf35fde6fb-power-profiles-daemon.service-BjR2W
drwx----- 3 root root    4096 20 18:39 systemd-private-7192f6202a9540b2b9240dcf35fde6fb-rtkit-daemon.service-0Wp5
drwx----- 3 root root    4096 20 18:39 systemd-private-7192f6202a9540b2b9240dcf35fde6fb-swiftshader-control.service-gd8cd
drwx----- 3 root root    4096 20 18:39 systemd-private-7192f6202a9540b2b9240dcf35fde6fb-systemd-logind.service-ctasy
drwx----- 3 root root    4096 20 18:39 systemd-private-7192f6202a9540b2b9240dcf35fde6fb-systemd-sdmd.service-0uq6
drwx----- 3 root root    4096 20 18:39 systemd-private-7192f6202a9540b2b9240dcf35fde6fb-systemd-resolved.service-yuq93
drwx----- 3 root root    4096 20 18:39 systemd-private-7192f6202a9540b2b9240dcf35fde6fb-upower.service-sdbw7
drwxr-xr-x. 2 murchindorzh murchindorzh 4096 20 19:21 /tmp/ssh-343-61ef-4086-af32-0663c91d017s
drwx----- 2 root root    4096 20 18:39 /usr/sbin
drwx----- 2 root root    4096 20 18:39 /usr/share-root_920-2751086025
murchindorzh@murchindorzh:~$
```

Рис. 4: Команда ls -l

Опции команды ls

```
murzhindorzh@murzhindorzh: /tmp$  
murzhindorzh@murzhindorzh: /tmp$ ls -f  
.  
..  
.X11-unix  
.ICE-unix  
.XIM-unix  
.font-unix  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-systemd-oomd.service-Hsqedz  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-systemd-resolved.service-yMqF93  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-dbus-broker.service-tgLYpn  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-chrond.service-pA6Fi3  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-low-memory-monitor.service-fAZJ9Y  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-polkit.service-v5YEdq  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-power-profiles-daemon.service-RjMZUW  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-rtkit-daemon.service-0LHPx9  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-switcheroo-control.service-gxBcoD  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-systemd-logind.service-cta3xv  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-upower.service-sSdW7  
vmware-root_920-2731086625  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-ModemManager.service-p8t2Xw  
dbus-ptlhFFtM  
dbus-jctbhgYP  
.X1024-lock  
.X1025-lock  
systemd-private-7192fd202a9948b2b9240dcf35fdeef8-colord.service-0b6NP5  
.X0-lock  
.X1-lock  
VMwareDnD  
Temp-55398343-b1ef-4086-a732-8b63c01d017a  
murzhindorzh@murzhindorzh: /tmp$
```

Рис. 5: Команда ls -f

```
murzhindorzh@murzhindorzh:/tmp$  
murzhindorzh@murzhindorzh:/tmp$ cd /var/spool/  
murzhindorzh@murzhindorzh:/var/spool$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 1510 июн 10 10:47 abrt  
drwx----- 1 abrt abrt 0 июл 19 2023 abrt-upload  
drwx--x--- 1 root lp 6 фев 16 03:00 cups  
drwxr-xr-x. 1 root root 0 июл 21 2023 lpd  
drwxrwxr-x. 1 root mail 1280 июн 20 18:38 mail  
drwxr-xr-x. 1 root root 0 июл 21 2023 plymouth  
murzhindorzh@murzhindorzh:/var/spool$
```

Рис. 6: Каталог /var/spool

```
murzhindorzh@murzhindorzh: /var/spool$  
murzhindorzh@murzhindorzh: /var/spool$ cd  
murzhindorzh@murzhindorzh: $ ls  
git-extended work Ваканс Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны  
murzhindorzh@murzhindorzh: $ ls -al  
итого 24  
drwx----- 1 murzhindorzh murzhindorzh 510 июн 20 19:23 .  
drwxr-xr-x 1 root root 1274 июн 20 18:38 ..  
-rw----- 1 murzhindorzh murzhindorzh 2537 июн 20 19:34 .bash_history  
-rw-r--r-- 1 murzhindorzh murzhindorzh 18 июн 22 03:00 .bash_logout  
-rw-r--r-- 1 murzhindorzh murzhindorzh 144 июн 22 03:00 .bash_profile  
-rw-r--r-- 1 murzhindorzh murzhindorzh 682 июн 20 19:22 .bashrc  
drwx----- 1 murzhindorzh murzhindorzh 452 июн 20 19:24 .cache  
drwx----- 1 murzhindorzh murzhindorzh 376 июн 20 19:24 .config  
-rw-r--r-- 1 murzhindorzh murzhindorzh 334 мар 25 03:00 .emacs  
-rw-r--r-- 1 murzhindorzh murzhindorzh 242 июн 20 18:49 .gitconfig  
drwxr-xr-x 1 murzhindorzh murzhindorzh 74 июн 20 19:27 git-extended  
drwx----- 1 murzhindorzh murzhindorzh 136 июн 20 18:47 .gnupg  
drwx----- 1 murzhindorzh murzhindorzh 20 июн 20 18:40 .local  
drwxr-xr-x 1 murzhindorzh murzhindorzh 48 июн 20 18:42 .mozilla  
drwx----- 1 murzhindorzh murzhindorzh 132 июн 20 18:50 .ssh  
drwxr-xr-x 1 murzhindorzh murzhindorzh 10 июн 20 18:50 work  
drwxr-xr-x 1 murzhindorzh murzhindorzh 0 июн 20 18:40 Видео  
drwxr-xr-x 1 murzhindorzh murzhindorzh 0 июн 20 18:40 Документы  
drwxr-xr-x 1 murzhindorzh murzhindorzh 0 июн 20 18:40 Загрузки  
drwxr-xr-x 1 murzhindorzh murzhindorzh 0 июн 20 18:40 Изображения  
drwxr-xr-x 1 murzhindorzh murzhindorzh 0 июн 20 18:40 Музыка  
drwxr-xr-x 1 murzhindorzh murzhindorzh 0 июн 20 18:40 Общедоступные  
drwxr-xr-x 1 murzhindorzh murzhindorzh 0 июн 20 18:40 'Рабочий стол'  
drwxr-xr-x 1 murzhindorzh murzhindorzh 0 июн 20 18:40 Шаблоны  
murzhindorzh@murzhindorzh: $
```

Рис. 7: Файлы в домашнем каталоге

Работа с каталогами

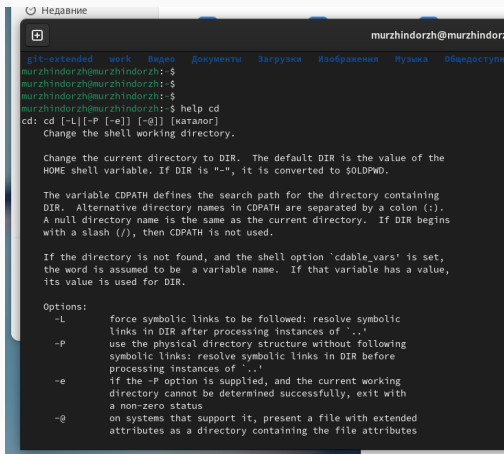
```
murzhindorzh@murzhindorzh:~$  
murzhindorzh@murzhindorzh:~$ mkdir newdir  
murzhindorzh@murzhindorzh:~$ mkdir newdir/forefun  
murzhindorzh@murzhindorzh:~$ mkdir letters memos msk  
murzhindorzh@murzhindorzh:~$ ls  
git-extended  letters  memos  msk  newdir  видео  документы  загрузки  изображения  музыка  общедоступные  'Рабочий стол'  шаблоны  
murzhindorzh@murzhindorzh:~$ rm letters/ memos/ msk/  
rm: невозможно удалить 'letters/': это каталог  
rm: невозможно удалить 'memos/': это каталог  
rm: невозможно удалить 'msk/': это каталог  
murzhindorzh@murzhindorzh:~$ rm -r letters/ memos/ msk/  
murzhindorzh@murzhindorzh:~$ rm -r newdir/  
murzhindorzh@murzhindorzh:~$ ls  
git-extended  newdir  видео  документы  загрузки  изображения  музыка  общедоступные  'Рабочий стол'  шаблоны  
murzhindorzh@murzhindorzh:~$
```

Рис. 8: Действия с каталогами

Опции команды ls

```
./Загрузки:  
./Изображения:  
./Музыка:  
./Общедоступные:  
./Рабочий стол:  
./Шаблоны:  
murzhindorzhdmurzhindorzh:~$ ls -t  
git-extended work Video документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны  
murzhindorzhdmurzhindorzh:~$
```

Рис. 9: Команда ls -R и ls -t



The screenshot shows a terminal window with a dark background. At the top, there is a title bar with a window icon and the text "Недавние". Below the title bar, there is a navigation bar with a "+" icon and the text "murzhindorzh@murzhindorzh". The main area of the terminal displays the command prompt "murzhindorzh@murzhindorzh:~\$" followed by the command "cd". The terminal then shows the help text for the "cd" command, which includes a description of the command, the CDPATH variable, and a list of options.

```
murzhindorzh@murzhindorzh:~$ cd
cd: cd [-L|[-P [-e]] [-@]] [катанор]
Change the shell working directory.

Change the current directory to DIR. The default DIR is the value of the
HOME shell variable. If DIR is "-", it is converted to $OLDPWD.

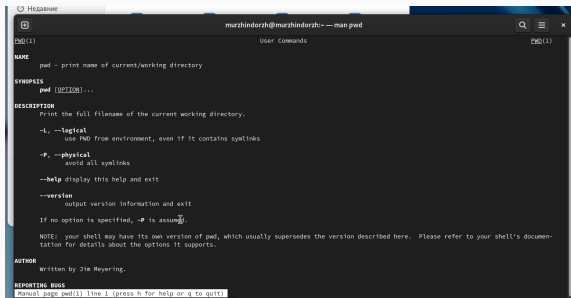
The variable CDPATH defines the search path for the directory containing
DIR. Alternative directory names in CDPATH are separated by a colon (:).
A null directory name is the same as the current directory. If DIR begins
with a slash (/), then CDPATH is not used.

If the directory is not found, and the shell option 'cdable_vars' is set,
the word is assumed to be a variable name. If that variable has a value,
its value is used for DIR.

Options:
-L      force symbolic links to be followed: resolve symbolic
links in DIR after processing instances of '..'
-P      use the physical directory structure without following
symbolic links: resolve symbolic links in DIR before
processing instances of '..'
-e      if the -P option is supplied, and the current working
directory cannot be determined successfully, exit with
a non-zero status
-@      on systems that support it, present a file with extended
attributes as a directory containing the file attributes
```

Рис. 10: Справка по команде cd

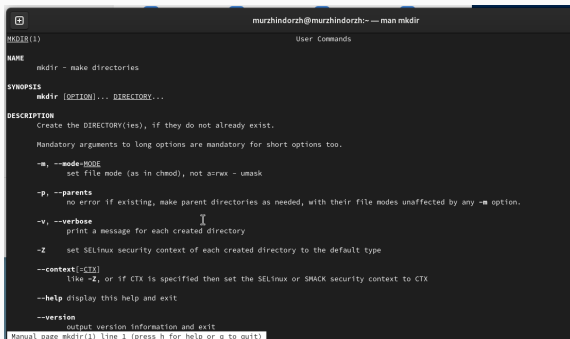
Справка по командам



```
murzhindorzh@murzhindorzh:~ -- man pwd
pwd(1)                                User Commands
NAME
    pwd - print name of current/working directory
SYNOPSIS
    pwd [OPTION]...
DESCRIPTION
    Print the full filename of the current working directory.
    -L, --logical
        use PwD from environment, even if it contains symlinks
    -P, --physical
        avoid all symlinks
    --help
        display this help and exit
    --version
        output version information and exit
    If no option is specified, -P is assumed.
NOTE: your shell may have its own version of pwd, which usually supersedes the version described here. Please refer to your shell's documentation for details about the options it supports.
AUTHOR
    Written by Dle Meyering.
REPORTING BUGS
    Manual page pwd(1) line 1 (press h for help or q to quit)
```

Рис. 11: Справка по команде pwd

Справка по командам



```
murzhindorzh@murzhindorzh:~ -- man mkdir
MKDIR(1)                                User Commands

NAME
    mkdir - make directories

SYNOPSIS
    mkdir [OPTION]... DIRECTORY...

DESCRIPTION
    Create the DIRECTORY(ies), if they do not already exist.

    Mandatory arguments to long options are mandatory for short options too.

    -m, --mode=MODE
        set file mode (as in chmod), not a=rwx - umask

    -p, --parents
        no error if existing, make parent directories as needed, with their file modes unaffected by any -m option.

    -v, --verbose
        print a message for each created directory

    -Z
        set SELinux security context of each created directory to the default type

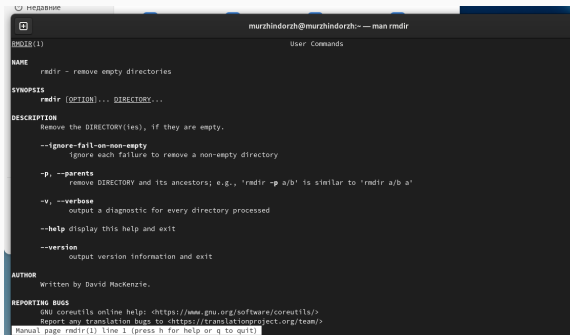
    --context[=CTX]
        like -Z, or if CTX is specified then set the SELinux or SMACK security context to CTX

    --help
        display this help and exit

    --version
        output version information and exit

Manual page mkdir(1) line 1 (press h for help or q to quit)
```

Рис. 12: Справка по команде mkdir



```
murzhindorzh@murzhindorzh:~ — man rmdir
rmdir(1)                                User Commands

NAME
    rmdir - remove empty directories

SYNOPSIS
    rmdir [OPTION]... DIRECTORY...

DESCRIPTION
    Remove the DIRECTORY(ies), if they are empty.

    --ignore-fail-on-non-empty
        ignore each failure to remove a non-empty directory

    -p, --parents
        remove DIRECTORY and its ancestors; e.g., 'rmdir -p a/b' is similar to 'rmdir a/b a'

    -v, --verbose
        output a diagnostic for every directory processed

    --help
        display this help and exit

    --version
        output version information and exit

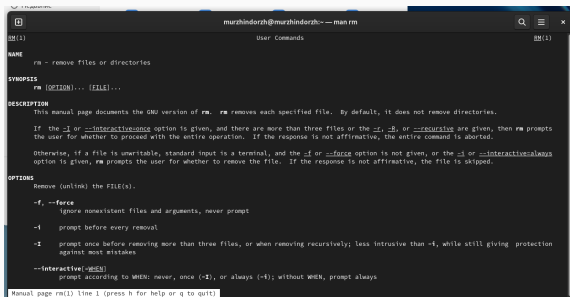
AUTHOR
    Written by David Mackenzie.

REPORTING BUGS
    GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
    Report any translation bugs to <https://translationproject.org/team/>

Manual page rmdir(1) line 1 (press h for help or q to quit)
```

Рис. 13: Справка по команде rmdir

Справка по командам



```
murzhinderzh@murzhinderzh:~$ man rm
rm(1)                                User Commands                                rm(1)

NAME
rm - remove files or directories

SYNOPSIS
rm [OPTION]... [FILE]...

DESCRIPTION
This manual page documents the GNU version of rm. rm removes each specified file. By default, it does not remove directories.

If the -i or --interactive=once option is given, and there are more than three files or the -f, -B, or --recursive are given, then rm prompts the user for whether to proceed with the entire operation. If the response is not affirmative, the entire command is aborted.

Otherwise, if a file is unwritable, standard input is a terminal, and the -f or --force option is not given, or the -i or --interactive=always option is given, rm prompts the user for whether to remove the file. If the response is not affirmative, the file is skipped.

OPTIONS
Remove (unlink) the FILE(s).

-f, --force
    ignore nonexistent files and arguments, never prompt

-i
    prompt before every removal

-I
    prompt once before removing more than three files, or when removing recursively; less intrusive than -f, while still giving protection against most mistakes

--interactive=[WHEN]
    prompt according to WHEN: never, once (-I), or always (-f); without WHEN, prompt always

Manual page rm(1) line 1 (press h for help or q to quit)
```

Рис. 14: Справка по команде rm

История командной строки

```
107 ls
108 ls -al
109 mkdir newdir
110 mkdir newdir/morefun
111 mkdir letters memos misk
112 ls
113 rm letters/ memos/ misk/
114 rm -r letters/ memos/ misk/
115 rm -r newdir/
116 ls
117 ls -R
118 ls -t
119 help cd
120 man pwd
121 man mkdir
122 man rmdir
123 man rm
124 history
murzhindorzh@murzhindorzh:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

Мы приобрели практические навыки взаимодействия пользователя с системой посредством командной строки.