

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

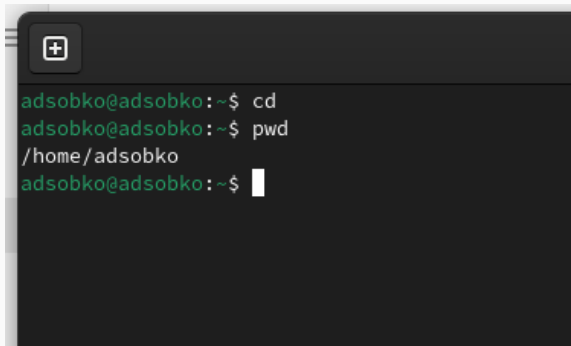
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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



```
adsobko@adsobko:~$ cd
adsobko@adsobko:~$ pwd
/home/adsobko
adsobko@adsobko:~$
```

A terminal window with a dark background and a plus icon in the top-left corner. It shows a series of commands and their outputs: 'cd' is executed, then 'pwd' is executed, resulting in the output '/home/adsobko'. The prompt returns to '~\$'.

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
adsobko@adsobko:~$ cd /tmp
adsobko@adsobko:/tmp$ ls
dbus-Ljb4VL2q
dbus-$6YbU3Mc
hsperfdata_adsobko
systemd-private-eb61783ee3584289a07623baca35d101-chronyd.service-HwGAnu
systemd-private-eb61783ee3584289a07623baca35d101-colord.service-YSeC6q
systemd-private-eb61783ee3584289a07623baca35d101-dbus-broker.service-UgbupW
systemd-private-eb61783ee3584289a07623baca35d101-low-memory-monitor.service-73UFTJ
systemd-private-eb61783ee3584289a07623baca35d101-ModemManager.service-ItFemt
systemd-private-eb61783ee3584289a07623baca35d101-plocate-updatedb.service-oVLDqQ
systemd-private-eb61783ee3584289a07623baca35d101-polkit.service-SegarN
systemd-private-eb61783ee3584289a07623baca35d101-power-profiles-daemon.service-54bILX
systemd-private-eb61783ee3584289a07623baca35d101-rtkit-daemon.service-PK4LQY
systemd-private-eb61783ee3584289a07623baca35d101-switcheroo-control.service-KmHkVc
systemd-private-eb61783ee3584289a07623baca35d101-systemd-logind.service-RwPZ96
systemd-private-eb61783ee3584289a07623baca35d101-systemd-oomd.service-dA85TJ
systemd-private-eb61783ee3584289a07623baca35d101-systemd-resolved.service-sk7rwG
systemd-private-eb61783ee3584289a07623baca35d101-upower.service-lyVu73
Iemp-2d69e6e7-54c6-41ab-b408-1ed372607c7b
VMwareDnD
vmware-root_918-2697532712
adsobko@adsobko:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
adsobko@adsobko: /tmp$  
adsobko@adsobko: /tmp$ ls -la  
.  
..  
dbus-Ljb4VL2q  
dbus-S6YbU3Mc  
font-unix  
hspcrdata_adsobko  
ICE-unix  
systemd-private-eb61783ee3584289a07623baca35d101-chrond.service-HwGAnu  
systemd-private-eb61783ee3584289a07623baca35d101-colord.service-YSeC6q  
systemd-private-eb61783ee3584289a07623baca35d101-dbus-broker.service-UgbupW  
systemd-private-eb61783ee3584289a07623baca35d101-low-memory-monitor.service-73UFTJ  
systemd-private-eb61783ee3584289a07623baca35d101-ModemManager.service-1tFemt  
systemd-private-eb61783ee3584289a07623baca35d101-polkit.service-SegarN  
systemd-private-eb61783ee3584289a07623baca35d101-power-profiles-daemon.service-54bILX  
systemd-private-eb61783ee3584289a07623baca35d101-rtkit-daemon.service-PK4LQY  
systemd-private-eb61783ee3584289a07623baca35d101-switcheroo-control.service-KmHkVc  
systemd-private-eb61783ee3584289a07623baca35d101-systemd-logind.service-RwPZ96  
systemd-private-eb61783ee3584289a07623baca35d101-systemd-oomd.service-dA85TJ  
systemd-private-eb61783ee3584289a07623baca35d101-systemd-resolved.service-sk7rwG  
systemd-private-eb61783ee3584289a07623baca35d101-upower.service-lyVu73  
Temp-2d69e6e7-54c6-41ab-b400-1ed372607c7b  
VMwareDnD  
vmware-root_918-2697532712  
X0-lock  
X1024-lock  
X1025-lock  
X11-unix  
X1-lock  
XIM-unix  
adsobko@adsobko: /tmp$
```

Рис. 3: Команда ls -la

Опции команды ls

```
adsobko@adsobko: /tmp$  
adsobko@adsobko: /tmp$ ls -l  
total 0  
srwx-rw-rw-. 1 root root 0 10:58 dbus-f3b4VL2q  
srwx-rw-rw-. 1 root root 0 10:58 dbus-56YbU2Mc  
drwxr-xr-x. 2 adsobko adsobko 40 11:12 haperfdata_adsobko  
drwx-----. 3 root root 60 10:58 systemd-private-ebb1783ee3584289a07623baca35d181-chromyd.service-HedAnu  
drwx-----. 3 root root 60 10:58 systemd-private-ebb1783ee3584289a07623baca35d181-coldvd.service-YSeC6q  
drwx-----. 3 root root 60 10:58 systemd-private-ebb1783ee3584289a07623baca35d181-dbus-broker.service-0pnpq  
drwx-----. 3 root root 60 10:58 systemd-private-ebb1783ee3584289a07623baca35d181-low-memory-monitor.service-71uFL3  
drwx-----. 3 root root 60 10:58 systemd-private-ebb1783ee3584289a07623baca35d181-ModemManager.service-lF8eet  
drwx-----. 3 root root 60 10:58 systemd-private-ebb1783ee3584289a07623baca35d181-polkit.service-SegacH  
drwx-----. 3 root root 60 10:58 systemd-private-ebb1783ee3584289a07623baca35d181-power-profiles-daemon.service-54b1Lx  
drwx-----. 3 root root 60 10:58 systemd-private-ebb1783ee3584289a07623baca35d181-rfkill-daemon.service-PKALGT  
drwx-----. 3 root root 60 10:58 systemd-private-ebb1783ee3584289a07623baca35d181-switcheroo-control.service-8a08Vc  
drwx-----. 3 root root 60 10:58 systemd-private-ebb1783ee3584289a07623baca35d181-systemd-logind.service-HuF298  
drwx-----. 3 root root 60 10:58 systemd-private-ebb1783ee3584289a07623baca35d181-systemd-sdmd.service-dA8573  
drwx-----. 3 root root 60 10:58 systemd-private-ebb1783ee3584289a07623baca35d181-systemd-resolved.service-ek7w6d  
drwx-----. 2 adsobko adsobko 40 10:59 systemd-private-ebb1783ee3584289a07623baca35d181-upower.service-ly0U73  
drwxrwxrwt. 2 adsobko adsobko 240 11:48 tmp.1.607ee7-54cc-41ab-b408-1ed372607c7b  
drwx-----. 2 root root 40 10:58 vmware-root_918-2697532712  
adsobko@adsobko: /tmp$
```

Рис. 4: Команда ls -l

Опции команды ls

```
adsobko@adsobko: /tmp$  
adsobko@adsobko: /tmp$ ls -f  
.  
..  
.X11-unix  
.ICE-unix  
.XIM-unix  
.font-unix  
systemd-private-eb61783ee3584289a07623baca35d101-systemd-oond.service-dA85TJ  
systemd-private-eb61783ee3584289a07623baca35d101-systemd-resolved.service-sk7rwG  
systemd-private-eb61783ee3584289a07623baca35d101-dbus-broker.service-UgbupW  
systemd-private-eb61783ee3584289a07623baca35d101-chronyd.service-HwGAnu  
systemd-private-eb61783ee3584289a07623baca35d101-low-memory-monitor.service-73UftJ  
systemd-private-eb61783ee3584289a07623baca35d101-polkit.service-SegarN  
systemd-private-eb61783ee3584289a07623baca35d101-power-profiles-daemon.service-S4bIlX  
systemd-private-eb61783ee3584289a07623baca35d101-rtkit-daemon.service-PK4LQY  
systemd-private-eb61783ee3584289a07623baca35d101-switcheroo-control.service-KmhKvc  
systemd-private-eb61783ee3584289a07623baca35d101-systemd-logind.service-RwPZ96  
systemd-private-eb61783ee3584289a07623baca35d101-upower.service-lyVu73  
vmware-root_918-2697532712  
systemd-private-eb61783ee3584289a07623baca35d101-ModemManager.service-1tFemt  
dbus-S6YbU3Mc  
dbus-Ljb4VL2q  
.X1024-lock  
.X1025-lock  
systemd-private-eb61783ee3584289a07623baca35d101-colord.service-YSeC6q  
.X0-lock  
.X1-lock  
Temp-2d69e6e7-54c6-41ab-b400-1ed372607c7b  
VMwareDnD  
hsperfdata_adsobko  
adsobko@adsobko: /tmp$
```

Рис. 5: Команда ls -f

```
adsobko@adsobko: /tmp$  
adsobko@adsobko: /tmp$  
adsobko@adsobko: /tmp$ cd /var/spool  
adsobko@adsobko: /var/spool$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 1438 авг 26 11:49 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 1504 июн 3 10:49 mail  
drwxr-xr-x. 1 root root 0 июл 21 2023 plymouth  
adsobko@adsobko: /var/spool$
```

Рис. 6: Каталог /var/spool

```
adsobko@adsobko:~/var/spool$ cd
adsobko@adsobko:~$ ls
git-extended  work  Видео  Документы  Загрузки  Изображения  Музыка  Общедоступные  'Рабочий стол'  Шаблоны
adsobko@adsobko:~$ ls -al
итого 24
drwx-----, 1 adsobko adsobko 510 июн 3 11:39 .
drwxr-xr-x, 1 root root 1498 июн 3 10:49 ..
-rw-----, 1 adsobko adsobko 2486 июн 3 11:44 .bash_history
-rw-r--r--, 1 adsobko adsobko 18 янв 22 03:00 .bash_logout
-rw-r--r--, 1 adsobko adsobko 144 янв 22 03:00 .bash_profile
-rw-r--r--, 1 adsobko adsobko 677 июн 3 11:26 .bashrc
drwx-----, 1 adsobko adsobko 452 июн 3 11:29 .cache
drwx-----, 1 adsobko adsobko 398 июн 3 11:29 .config
-rw-r--r--, 1 adsobko adsobko 334 мар 25 03:00 .emacs
-rw-r--r--, 1 adsobko adsobko 412 июн 3 11:39 .gitconfig
drwxr-xr-x, 1 adsobko adsobko 74 июн 3 11:36 git-extended
drwx-----, 1 adsobko adsobko 136 июн 3 10:58 .gnupg
drwx-----, 1 adsobko adsobko 20 июн 3 10:52 local
drwxr-xr-x, 1 adsobko adsobko 48 июн 3 10:59 mozilla
drwx-----, 1 adsobko adsobko 132 июн 3 11:03 .ssh
drwxr-xr-x, 1 adsobko adsobko 10 июн 3 11:01 work
drwxr-xr-x, 1 adsobko adsobko 0 июн 3 10:52 Видео
drwxr-xr-x, 1 adsobko adsobko 0 июн 3 10:52 Документы
drwxr-xr-x, 1 adsobko adsobko 0 июн 3 10:52 Загрузки
drwxr-xr-x, 1 adsobko adsobko 0 июн 3 10:52 Изображения
drwxr-xr-x, 1 adsobko adsobko 0 июн 3 10:52 Музыка
drwxr-xr-x, 1 adsobko adsobko 0 июн 3 10:52 Общедоступные
drwxr-xr-x, 1 adsobko adsobko 0 июн 3 10:52 'Рабочий стол'
drwxr-xr-x, 1 adsobko adsobko 0 июн 3 10:52 Шаблоны
adsobko@adsobko:~$
```

Рис. 7: Файлы в домашнем каталоге

```
adsobko@adsobko:~$  
adsobko@adsobko:~$ mkdir newdir  
adsobko@adsobko:~$ mkdir newdir/morefun  
adsobko@adsobko:~$ mkdir letters memos misk  
adsobko@adsobko:~$ ls  
git-extended  memos  newdir  Видео  Загрузки  Музыка  'Рабочий стол'  
letters       misk   work   Документы  Изображения  Общедоступные  Шаблоны  
adsobko@adsobko:~$ rm letters/ memos/ misk/  
rm: невозможно удалить 'letters/': Это каталог  
rm: невозможно удалить 'memos/': Это каталог  
rm: невозможно удалить 'misk/': Это каталог  
adsobko@adsobko:~$ rm -r letters/ memos/ misk/  
adsobko@adsobko:~$ rm -r newdir/  
adsobko@adsobko:~$ ls  
git-extended  work  Видео  Документы  Загрузки  Изображения  Музыка  Общедоступные  'Рабочий стол'  Шаблоны  
adsobko@adsobko:~$
```

Рис. 8: Действия с каталогами

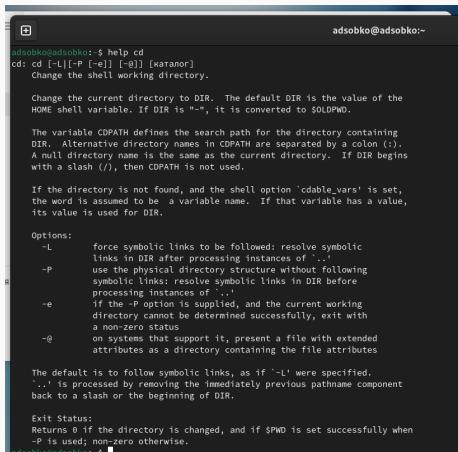
Опции команды ls

```
./work/study/2023-2024/Операционные системы/os-intro/template/report/report/pandoc/filters/pandocxnos':
core.py __init__.py main.py pandocattributes.py

./work/study/2023-2024/Операционные системы/os-intro/template/report/scripts':
image-report mpv-shot

./Видео:
./Документы:
./Загрузки:
./Изображения:
./Музыка:
./Общедоступные:
./Рабочий стол':
./Шаблоны:
astobkqadspbko: $ ls -lt
-rw-r--r-- 1 user user 4096 12 янв 2024 12:00 video
-rw-r--r-- 1 user user 4096 12 янв 2024 12:00 documents
-rw-r--r-- 1 user user 4096 12 янв 2024 12:00 images
-rw-r--r-- 1 user user 4096 12 янв 2024 12:00 music
-rw-r--r-- 1 user user 4096 12 янв 2024 12:00 downloads
-rw-r--r-- 1 user user 4096 12 янв 2024 12:00 public
-rw-r--r-- 1 user user 4096 12 янв 2024 12:00 desktop
-rw-r--r-- 1 user user 4096 12 янв 2024 12:00 templates
astobkqadspbko: $
```

Рис. 9: Команда ls -R и ls -t



```
adsobko@adsobko:~$ help cd
cd: cd [-L][-P [-e]] [-@] [xaranor]
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.

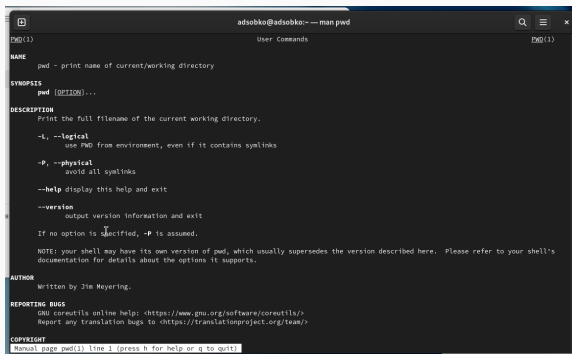
Options:
  -L      force symbolic links to be followed: resolve symbolic
          links in DIR after processing instances of '..'
  -P      use the physical directory structure without following
          symbolic links: resolve symbolic links in DIR before
          processing instances of '..'
  -e      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

The default is to follow symbolic links, as if '-L' were specified.
'..' is processed by removing the immediately previous pathname component
back to a slash or the beginning of DIR.

Exit Status:
Returns 0 if the directory is changed, and if $PWD is set successfully when
-P is used; non-zero otherwise.
```

Рис. 10: Справка по команде cd

Справка по командам



```
adsobko@adsobko:~ -- man pwd
pwd(1)                                User Commands                                pwd(1)

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.

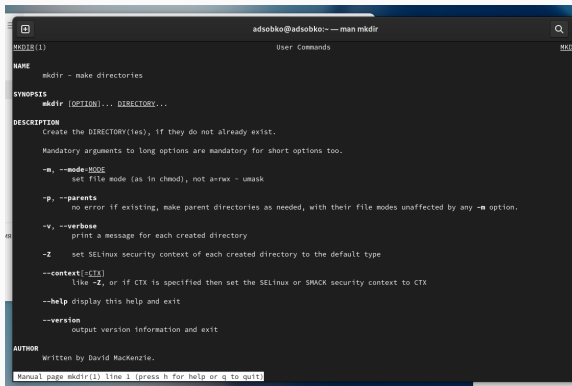
AUTHOR
  Written by Jim Meyering.

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

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

Рис. 11: Справка по команде pwd

Справка по командам



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

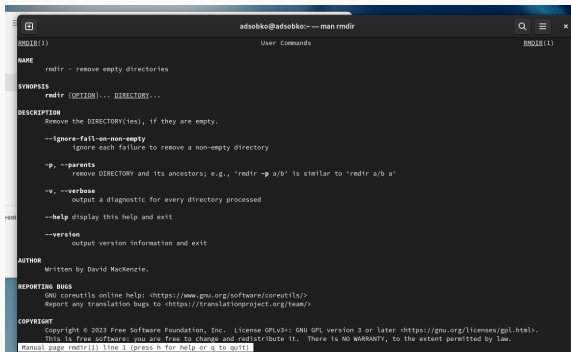
    --version
        output version information and exit

AUTHOR
    Written by David MacKenzie.

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

Рис. 12: Справка по команде mkdir

Справка по командам



```
adsobko@adsobko:~ -- man rmdir
rmdir(1)                                User Commands                                rmdir(1)

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

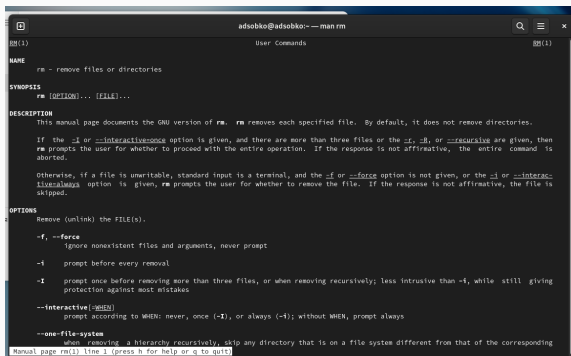
  --version
      output version information and exit

AUTHOR
  Written by David MacKenzie.

REPORTING BUGS
  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
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  Manual page rmdir(1), line 1 (press h for help or q to quit)
```

Рис. 13: Справка по команде rmdir



```
adsobko@adsobko:~$ man rm
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 -r, -d, 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 -i, while still giving protection against most mistakes

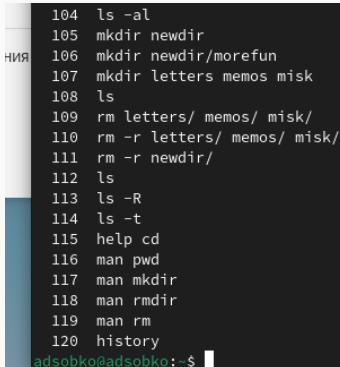
--interactive=WHEN
    prompt according to WHEN: never, once (-I), or always (-i); without WHEN, prompt always

--one-file-system
    when removing a hierarchy recursively, skip any directory that is on a file system different from that of the corresponding
```

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

Рис. 14: Справка по команде rm

История командной строки

A screenshot of a Linux terminal window with a dark background. The terminal shows a list of 17 commands numbered 104 to 120. The commands are: 104 ls -al, 105 mkdir newdir, 106 mkdir newdir/morefun, 107 mkdir letters memos misk, 108 ls, 109 rm letters/ memos/ misk/, 110 rm -r letters/ memos/ misk/, 111 rm -r newdir/, 112 ls, 113 ls -R, 114 ls -t, 115 help cd, 116 man pwd, 117 man mkdir, 118 man rmdir, 119 man rm, and 120 history. At the bottom, the prompt 'adsobko@adsobko:~\$' is visible with a cursor. On the left side of the terminal, the word 'НИЯ' is partially visible.

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

Рис. 15: Команда history

Выводы по проделанной работе

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