

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

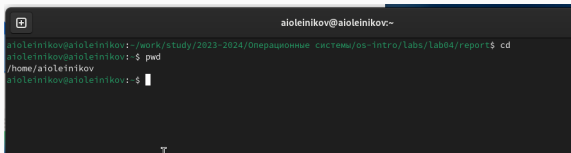
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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

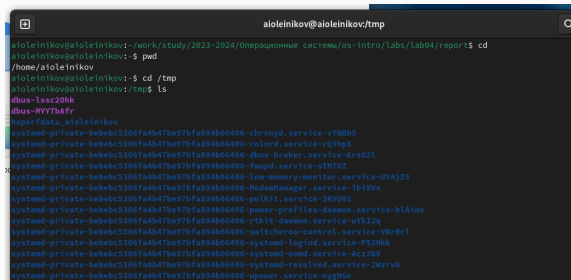
Имя и путь к домашнему каталогу



```
aioleinikov@aioleinikov:~  
aioleinikov@aioleinikov:~/work/study/2023-2024/Операционные системы/os-intro/labs/lab04/report$ cd  
aioleinikov@aioleinikov:~$ pwd  
/home/aioleinikov  
aioleinikov@aioleinikov:~$
```

Рис. 1: Путь к домашнему каталогу

Опции команды ls



```
aioleinikov@aioleinikov:tmp
aioleinikov@aioleinikov: /work/study/2023-2024/Операционные системы/os-Intro/Labs/lab04/report$ cd
aioleinikov@aioleinikov:~$ pwd
/home/aioleinikov
aioleinikov@aioleinikov:~$ cd /tmp
aioleinikov@aioleinikov:/tmp$ ls
dbus-1-ssc20hk
dbus-MYVTbAfr
huperfdata_aioleinikov
systemd-private-bebebc5306fa4b47be97bfa94b06406-chronyd.service-v7N8h5
systemd-private-bebebc5306fa4b47be97bfa94b06406-colord.service-rQ1hpX
systemd-private-bebebc5306fa4b47be97bfa94b06406-dbus-broker.service-Krs02l
systemd-private-bebebc5306fa4b47be97bfa94b06406-fuupd.service-oTM70Z
systemd-private-bebebc5306fa4b47be97bfa94b06406-low-memory-monitor.service-Ut4jZS
systemd-private-bebebc5306fa4b47be97bfa94b06406-ModemManager.service-ibISVx
systemd-private-bebebc5306fa4b47be97bfa94b06406-palkit.service-3KVU85
systemd-private-bebebc5306fa4b47be97bfa94b06406-power-profiles-daemon.service-hLAine
systemd-private-bebebc5306fa4b47be97bfa94b06406-rtkit-daemon.service-uYkI7q
systemd-private-bebebc5306fa4b47be97bfa94b06406-switcheroo-control.service-VReRcl
systemd-private-bebebc5306fa4b47be97bfa94b06406-systemd-logind.service-PS2Hkk
systemd-private-bebebc5306fa4b47be97bfa94b06406-systemd-oomd.service-Acz2b8
systemd-private-bebebc5306fa4b47be97bfa94b06406-systemd-resolved.service-2WzrvG
systemd-private-bebebc5306fa4b47be97bfa94b06406-upower.service-nypH66
```

Рис. 2: Команда ls

Опции команды ls

```
airoleinikov@airoleinikov:/tmp$  
airoleinikov@airoleinikov:/tmp$ ls -la  
.  
..  
dbus-lsssc20hk  
dbus-MYtBAfr  
font-unix  
hsperrdata_airoleinikov  
ICE-unix  
systemd-private-bebebc5306fa4b47be97bfa894b06406-chrond.service-v7NBh5  
systemd-private-bebebc5306fa4b47be97bfa894b06406-colord.service-rQihpX  
systemd-private-bebebc5306fa4b47be97bfa894b06406-dbus-broker.service-Krs02l  
systemd-private-bebebc5306fa4b47be97bfa894b06406-fwupd.service-oTH70Z  
systemd-private-bebebc5306fa4b47be97bfa894b06406-low-memory-monitor.service-Ut4jZS  
systemd-private-bebebc5306fa4b47be97bfa894b06406-ModemManager.service-ibiSVx  
systemd-private-bebebc5306fa4b47be97bfa894b06406-polkit.service-3KVU0S  
systemd-private-bebebc5306fa4b47be97bfa894b06406-power-profiles-daemon.service-hlAine  
systemd-private-bebebc5306fa4b47be97bfa894b06406-rtkit-daemon.service-uYkIJq  
systemd-private-bebebc5306fa4b47be97bfa894b06406-switcheroo-control.service-VRRcl  
systemd-private-bebebc5306fa4b47be97bfa894b06406-systemd-logind.service-PS2Hkk  
systemd-private-bebebc5306fa4b47be97bfa894b06406-systemd-oomd.service-Acz2b8  
systemd-private-bebebc5306fa4b47be97bfa894b06406-systemd-resolved.service-2WzrvG  
systemd-private-bebebc5306fa4b47be97bfa894b06406-upower.service-nygHGe  
VMwareDnD  
vmware-root_931-3988621659  
.X0-lock  
.X1024-lock  
.X1025-lock  
.X11-unix  
.X1-lock  
.XIM-unix  
airoleinikov@airoleinikov:/tmp$
```

Рис. 3: Команда ls -la


```
atoleinikov@atoleinikov:~/tmp$ ls -l
total 8
drwxr-xr-x. 1 root    root      8 июн 16 08:04 dbus-1ssc20hk
drwxr-xr-x. 1 root    root      8 июн 16 08:04 dbus-HVYTBafr
drwxr-xr-x. 2 atoleinikov atoleinikov 40 июн 16 08:20 haperfdata_atoleinikov
drwx-----. 3 root    root     60 июн 16 08:03 system-private-bebebc3306fa4b47be97bfaf894b06440e-chewyd.service-v78BN5
drwx-----. 3 root    root     60 июн 16 08:04 system-private-bebebc3306fa4b47be97bfaf894b06440e-color.service-q1lup
drwx-----. 3 root    root     60 июн 16 08:03 system-private-bebebc3306fa4b47be97bfaf894b06440e-dbus-broker.service-krv2L
drwx-----. 3 root    root     60 июн 16 08:06 system-private-bebebc3306fa4b47be97bfaf894b06440e-fwupd.service-0T970Z
drwx-----. 3 root    root     60 июн 16 08:03 system-private-bebebc3306fa4b47be97bfaf894b06440e-low-memory-monitor.service-0t4JZ5
drwx-----. 3 root    root     60 июн 16 08:03 system-private-bebebc3306fa4b47be97bfaf894b06440e-nodemanager.service-lb15Vx
drwx-----. 3 root    root     60 июн 16 08:03 system-private-bebebc3306fa4b47be97bfaf894b06440e-polkat.service-2K00N5
drwx-----. 3 root    root     60 июн 16 08:03 system-private-bebebc3306fa4b47be97bfaf894b06440e-power-profiles-daemon.service-bLAine
drwx-----. 3 root    root     60 июн 16 08:03 system-private-bebebc3306fa4b47be97bfaf894b06440e-rtkit-daemon.service-wK1Zq
drwx-----. 3 root    root     60 июн 16 08:03 system-private-bebebc3306fa4b47be97bfaf894b06440e-switcheroo-control.service-VW8e1
drwx-----. 3 root    root     60 июн 16 08:03 system-private-bebebc3306fa4b47be97bfaf894b06440e-system-logind.service-F120Kk
drwx-----. 3 root    root     60 июн 16 08:03 system-private-bebebc3306fa4b47be97bfaf894b06440e-systemd.service-k223k
drwx-----. 3 root    root     60 июн 16 08:03 system-private-bebebc3306fa4b47be97bfaf894b06440e-system-resolved.service-2Mrv6
drwx-----. 3 root    root     60 июн 16 08:03 system-private-bebebc3306fa4b47be97bfaf894b06440e-upower.service-nyg8u
drwxrwxrwt. 2 atoleinikov atoleinikov 140 июн 16 08:50 vmware001
drwxrwxrwt. 2 root      root      40 июн 16 08:04 vmware-root_921-308021059
atoleinikov@atoleinikov:~/tmp$
```

Рис. 4: Команда ls -l

Опции команды ls

```
ai@oleinikov@aioleinikov:~/tmp$  
ai@oleinikov@aioleinikov:~/tmp$ ls -f  
.  
..  
X11-unix  
XICE-unix  
XIM-unix  
font-unix  
systemd-private-bebebc5306fa4b47be97bfa894b06406-systemd-oomd.service-Acz2b8  
systemd-private-bebebc5306fa4b47be97bfa894b06406-systemd-resolved.service-2WzrvG  
systemd-private-bebebc5306fa4b47be97bfa894b06406-dbus-broker.service-Krs02l  
systemd-private-bebebc5306fa4b47be97bfa894b06406-chronyd.service-v7NBh5  
systemd-private-bebebc5306fa4b47be97bfa894b06406-low-memory-monitor.service-Ut4jZS  
systemd-private-bebebc5306fa4b47be97bfa894b06406-polkit.service-3KvU0S  
systemd-private-bebebc5306fa4b47be97bfa894b06406-power-profiles-daemon.service-hlAine  
systemd-private-bebebc5306fa4b47be97bfa894b06406-rtkit-daemon.service-uYkIJq  
systemd-private-bebebc5306fa4b47be97bfa894b06406-switcheroo-control.service-VRrRcl  
systemd-private-bebebc5306fa4b47be97bfa894b06406-systemd-logind.service-PS2Hkk  
systemd-private-bebebc5306fa4b47be97bfa894b06406-upower.service-nyGHge  
systemd-private-bebebc5306fa4b47be97bfa894b06406-ModemManager.service-ib1SVx  
vmware-root_931-3988621659  
dbus-lssc20hk  
dbus-MYYTbAfr  
.X1024-lock  
.X1025-lock  
systemd-private-bebebc5306fa4b47be97bfa894b06406-colord.service-rQihpX  
.X0-lock  
.X1-lock  
systemd-private-bebebc5306fa4b47be97bfa894b06406-fwupd.service-oTM70Z  
hspcrdata_ai@oleinikov  
VMwareDnD  
ai@oleinikov@aioleinikov:~/tmp$
```

Рис. 5: Команда ls -f

```
aioleinikov@aioleinikov:/tmp$  
aioleinikov@aioleinikov:/tmp$ cd /var/spool/  
aioleinikov@aioleinikov:/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 1562 июн 15 17:20 mail  
drwxr-xr-x. 1 root root 0 июл 21 2023 plymouth  
aioleinikov@aioleinikov:/var/spool$
```

Рис. 6: Каталог /var/spool

```
airoleinikov@airoleinikov:~/var/spool$  
airoleinikov@airoleinikov:~/var/spool$ cd  
airoleinikov@airoleinikov:~$ ls  
git-extended  work  Видео  Документы  Загрузки  Изображения  Музыка  Общедоступные  'Рабочий стол'  Шаблоны  
airoleinikov@airoleinikov:~$ ls -al  
итого 24  
drwx-----. 1 airoleinikov airoleinikov 510 июн 16 08:49 .  
drwxr-xr-x. 1 root root 1556 июн 15 17:20 ..  
-rw-----. 1 airoleinikov airoleinikov 2609 июн 16 09:15 .bash_history  
-rw-r--r--. 1 airoleinikov airoleinikov 18 янв 22 03:00 .bash_logout  
-rw-r--r--. 1 airoleinikov airoleinikov 144 янв 22 03:00 .bash_profile  
-rw-r--r--. 1 airoleinikov airoleinikov 681 июн 16 08:37 .bashrc  
drwx-----. 1 airoleinikov airoleinikov 452 июн 16 08:39 .cache  
drwx-----. 1 airoleinikov airoleinikov 424 июн 16 08:39 .config  
-rw-r--r--. 1 airoleinikov airoleinikov 334 мар 25 03:00 .emacs  
-rw-r--r--. 1 airoleinikov airoleinikov 235 июн 16 08:49 .gitconfig  
drwxr-xr-x. 1 airoleinikov airoleinikov 74 июн 16 08:44 git-extended  
drwx-----. 1 airoleinikov airoleinikov 136 июн 16 08:35 .gnupg  
drwx-----. 1 airoleinikov airoleinikov 20 июн 15 17:22 .local  
drwxr-xr-x. 1 airoleinikov airoleinikov 48 июн 15 17:43 .mozilla  
drwx-----. 1 airoleinikov airoleinikov 132 июн 15 17:50 .ssh  
drwxr-xr-x. 1 airoleinikov airoleinikov 10 июн 15 17:50 work  
drwxr-xr-x. 1 airoleinikov airoleinikov 0 июн 15 17:22 Видео  
drwxr-xr-x. 1 airoleinikov airoleinikov 0 июн 15 17:22 Документы  
drwxr-xr-x. 1 airoleinikov airoleinikov 0 июн 15 17:22 Загрузки  
drwxr-xr-x. 1 airoleinikov airoleinikov 0 июн 15 17:22 Изображения  
drwxr-xr-x. 1 airoleinikov airoleinikov 0 июн 15 17:22 Музыка  
drwxr-xr-x. 1 airoleinikov airoleinikov 0 июн 15 17:22 Общедоступные  
drwxr-xr-x. 1 airoleinikov airoleinikov 0 июн 15 17:22 'Рабочий стол'  
drwxr-xr-x. 1 airoleinikov airoleinikov 0 июн 15 17:22 Шаблоны  
airoleinikov@airoleinikov:~$
```

Рис. 7: Файлы в домашнем каталоге

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

Рис. 8: Действия с каталогами

Опции команды ls

```
"/work/study/2023-2024/Операционные системы/os-intro/template/report/report/pandoc/filters":
pandoc_eqnos.py  pandoc_fignos.py  pandoc_secnos.py  pandoc_tablenos.py  pandocxnos
"/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:

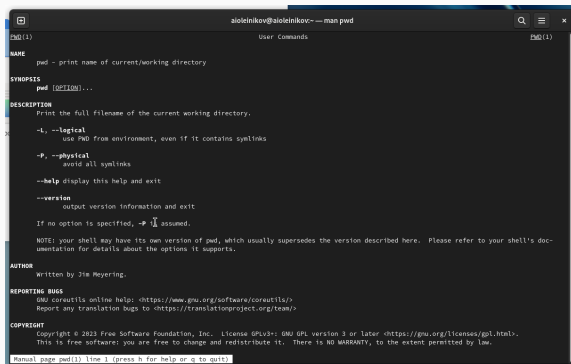
./Рабочий стол:

./Шаблоны:
stoletnikov@stoletnikov: $ ls -lt
git-extended  work  Видео  Изображения  Документы  Загрузки  Музыка  Общедоступные  'Рабочий стол'  Шаблоны
stoletnikov@stoletnikov: $
```

Рис. 9: Команда ls -R и ls -t

```
ai@oleinikov@ai@oleinikov:~$  
ai@oleinikov@ai@oleinikov:~$ help cd  
cd: cd [-L|[-P [-e]] [-@]] [karanor]  
    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 $PWD is set successfully when  
-P is used; non-zero otherwise.  
ai@oleinikov@ai@oleinikov:~$
```

Рис. 10: Справка по команде cd



```
aioleinikov@aioleinikov:~$ man pwd
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.

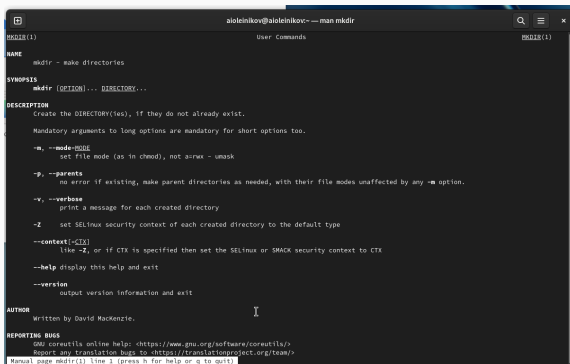
AUTHOR
    Written by Jim Meyering.

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



```
aiolelnikov@aiolelnikov:~$ 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

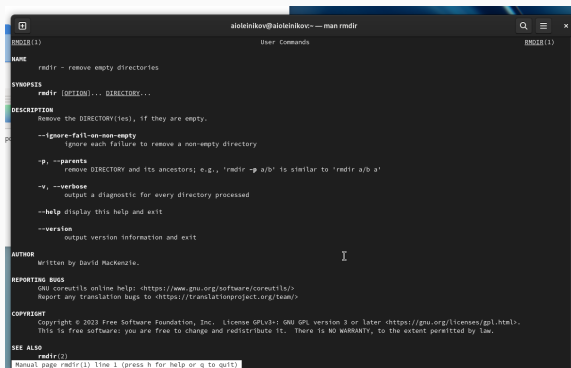
  --version
      output version information and exit

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

Рис. 12: Справка по команде mkdir



```
aiolainkov@aiolainkov:~$ man rmdir
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.

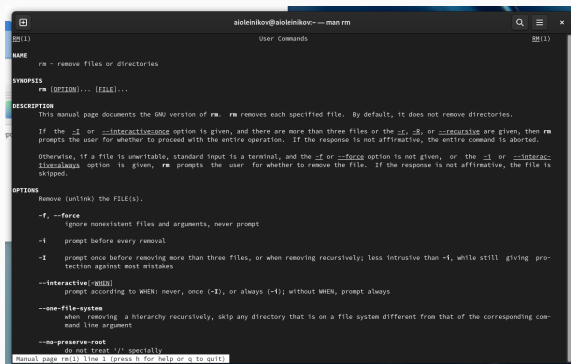
REPORTING BUGS
    GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
    Report any translation bugs to <https://translationproject.org/team/>

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SEE ALSO
    rmdir(2)

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

Рис. 13: Справка по команде rmdir



```
aioleinkov@aioleinkov:~ -- 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 -r, -s, 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=live-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 command line argument

--no-preserve-root
    do not treat '/' specially

Manual page rm(1) line 3 (press h for help or q to quit)
```

Рис. 14: Справка по команде rm

История командной строки

```
107 ls
108 ls -a
109 ls -l
110 ls -f
111 cd /var/spool/
112 ls -l
113 cd
114 ls
115 ls -al
116 mkdir newdir
117 mkdir newdir/morefun
118 mkdir letters memos misk
119 ls
120 rm letters/ memos/ misk/
121 rm -r letters/ memos/ misk/
122 rm -r newdir/
123 ls
124 ls -R
125 ls -t
126 help cd
127 man pwd
128 man mkdir
129 man rmdir
130 man rm
131 history
aioleinikov@aioleinikov:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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