

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

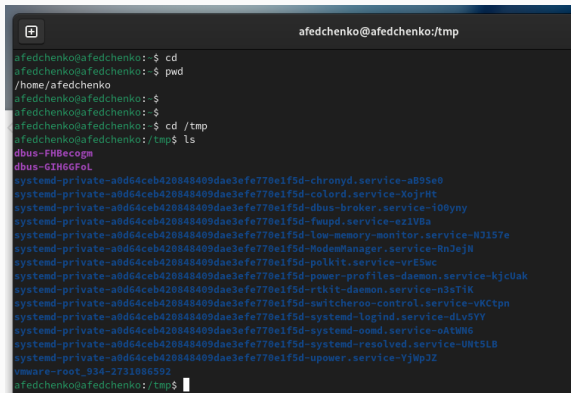
Имя и путь к домашнему каталогу



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

Рис. 1: Путь к домашнему каталогу

Опции команды ls



```
afedchenko@afedchenko:/tmp
afedchenko@afedchenko:~$ cd /home/afedchenko
afedchenko@afedchenko:~$ pwd
/home/afedchenko
afedchenko@afedchenko:~$ cd /tmp
afedchenko@afedchenko:~/tmp$ ls
dbus-FHBecogm
dbus-GIH6GFoL
systemd-private-a0d64ceb420848409dae3efe770elf5d-chrond.service-aB9Se0
systemd-private-a0d64ceb420848409dae3efe770elf5d-colord.service-XojrHt
systemd-private-a0d64ceb420848409dae3efe770elf5d-dbus-broker.service-i00yn
systemd-private-a0d64ceb420848409dae3efe770elf5d-fwupd.service-ez1VBA
systemd-private-a0d64ceb420848409dae3efe770elf5d-low-memory-monitor.service-NJ157e
systemd-private-a0d64ceb420848409dae3efe770elf5d-ModemManager.service-RnJezH
systemd-private-a0d64ceb420848409dae3efe770elf5d-polkit.service-vrE5wc
systemd-private-a0d64ceb420848409dae3efe770elf5d-power-profiles-daemon.service-kjcUak
systemd-private-a0d64ceb420848409dae3efe770elf5d-rtkit-daemon.service-n3sT4k
systemd-private-a0d64ceb420848409dae3efe770elf5d-switcheroo-control.service-vKCTpn
systemd-private-a0d64ceb420848409dae3efe770elf5d-systemd-logind.service-dLv5YY
systemd-private-a0d64ceb420848409dae3efe770elf5d-systemd-oomd.service-oAtWN6
systemd-private-a0d64ceb420848409dae3efe770elf5d-systemd-resolved.service-Unt5LB
systemd-private-a0d64ceb420848409dae3efe770elf5d-upower.service-YjWpJZ
vmware-root_934-2731086592
afedchenko@afedchenko:~/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
afedchenko@afedchenko:/tmp$ ls -la
.
..
dbus-FHBecogm
dbus-GIH6GFoL
.font-unix
.ICE-unix
systemd-private-a0d64ceb420848409dae3efe770elf5d-chrond.service-a89Se0
systemd-private-a0d64ceb420848409dae3efe770elf5d-colord.service-XoJrHt
systemd-private-a0d64ceb420848409dae3efe770elf5d-dbus-broker.service-i08yny
systemd-private-a0d64ceb420848409dae3efe770elf5d-fwupd.service-ez1VBa
systemd-private-a0d64ceb420848409dae3efe770elf5d-low-memory-monitor.service-NJ157e
systemd-private-a0d64ceb420848409dae3efe770elf5d-ModemManager.service-RnJeJN
systemd-private-a0d64ceb420848409dae3efe770elf5d-polkit.service-vrE5wc
systemd-private-a0d64ceb420848409dae3efe770elf5d-power-profiles-daemon.service-kjcUa
systemd-private-a0d64ceb420848409dae3efe770elf5d-rtkit-daemon.service-n3sTiK
systemd-private-a0d64ceb420848409dae3efe770elf5d-switcheroo-control.service-vKCTpn
systemd-private-a0d64ceb420848409dae3efe770elf5d-systemd-logind.service-dLv5YY
systemd-private-a0d64ceb420848409dae3efe770elf5d-systemd-oomd.service-oAtWN6
systemd-private-a0d64ceb420848409dae3efe770elf5d-systemd-resolved.service-UNT5LB
systemd-private-a0d64ceb420848409dae3efe770elf5d-upower.service-YjWpJZ
vmware-root_934-2731086592
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
afedchenko@afedchenko:/tmp$
```

Рис. 3: Команда ls -la

Опции команды ls

```
afedchenko@fedchenko: /tmp$ ls -l
итого 0
srw-rw-rw-. 1 root root 0 map 9 12:56 dbus-FHBecogn
srw-rw-rw-. 1 root root 0 map 9 12:56 dbus-G1H6Gful
drwx----- 3 root root 60 map 9 12:56 systemd-private-a0d64ceb420843409dae3efe770e1f5d-chrpynd.service-a095e0
drwx----- 3 root root 60 map 9 12:56 systemd-private-a0d64ceb420843409dae3efe770e1f5d-colored.service-koJrHt
drwx----- 3 root root 60 map 9 12:56 systemd-private-a0d64ceb420843409dae3efe770e1f5d-dbus-broker.service-100ymy
drwx----- 3 root root 60 map 9 12:57 systemd-private-a0d64ceb420843409dae3efe770e1f5d-fuupd.service-ez1V8a
drwx----- 3 root root 60 map 9 12:56 systemd-private-a0d64ceb420843409dae3efe770e1f5d-low-memory-monitor.service-N3137e
drwx----- 3 root root 60 map 9 12:56 systemd-private-a0d64ceb420843409dae3efe770e1f5d-ModemManager.service-RnDeJH
drwx----- 3 root root 60 map 9 12:56 systemd-private-a0d64ceb420843409dae3efe770e1f5d-polkit.service-veBwc
drwx----- 3 root root 60 map 9 12:56 systemd-private-a0d64ceb420843409dae3efe770e1f5d-power-profiles-daemon.service-kjclak
drwx----- 3 root root 60 map 9 12:56 systemd-private-a0d64ceb420843409dae3efe770e1f5d-rtkit-daemon.service-n3eTK
drwx----- 3 root root 60 map 9 12:56 systemd-private-a0d64ceb420843409dae3efe770e1f5d-switcheroo-control.service-wKtpm
drwx----- 3 root root 60 map 9 12:56 systemd-private-a0d64ceb420843409dae3efe770e1f5d-systemd-logind.service-dLvSVY
drwx----- 3 root root 60 map 9 12:56 systemd-private-a0d64ceb420843409dae3efe770e1f5d-systemd-oomd.service-oATW06
drwx----- 3 root root 60 map 9 12:56 systemd-private-a0d64ceb420843409dae3efe770e1f5d-systemd-resolved.service-UMtSLB
drwx----- 2 root root 40 map 9 12:56 systemd-private-a0d64ceb420843409dae3efe770e1f5d-upower.service-1Jnp2L
afedchenko@fedchenko: /tmp$
```

Рис. 4: Команда ls -l

Опции команды ls

```
afedchenko@afedchenko: /tmp$  
afedchenko@afedchenko: /tmp$ ls -f  
.  
..  
.X11-unix  
.ICE-unix  
.XIM-unix  
.font-unix  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-systemd-oomd.service-oAtWN6  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-systemd-resolved.service-UNt5LB  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-dbus-broker.service-i00yny  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-chronyd.service-aB9Se0  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-low-memory-monitor.service-NJ157e  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-polkit.service-vrE5wc  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-power-profiles-daemon.service-kjcUak  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-rtkit-daemon.service-n3sTiK  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-switcheroo-control.service-vKCTpn  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-systemd-logind.service-dLv5YV  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-upower.service-VjWpJZ  
vmware-root_934-2731086592  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-ModemManager.service-RnJeJn  
dbus-FHBecogm  
dbus-GIH6GFoL  
.X1024-lock  
.X1025-lock  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-colord.service-XojrHt  
.X0-lock  
.X1-lock  
systemd-private-a0d64ceb420848409dae3efe770e1f5d-fwupd.service-ez1VBa  
afedchenko@afedchenko: /tmp$
```

Рис. 5: Команда ls -f

Каталог /var/spool

```
afedchenko@afedchenko:/tmp$  
afedchenko@afedchenko:/tmp$ cd /var/spool/  
afedchenko@afedchenko:/var/spool$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 1510 мар  8 19:18 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 1222 мар  8 17:40 mail  
drwxr-xr-x. 1 root root   0 июл 21 2023 plymouth  
afedchenko@afedchenko:/var/spool$
```

Рис. 6: Каталог /var/spool

```
afedchenko@afedchenko: /var/spool$  
afedchenko@afedchenko: /var/spool$ cd  
afedchenko@afedchenko: $ ls  
  git-extended  work  Видео  Документы  Загрузки  Изображения  Музыка  Общедоступные  'Рабочий стол'  Шаблоны  
afedchenko@afedchenko: $ ls -al  
итого 20  
drwx----- 1 afedchenko afedchenko 498 мар 3 12:11 .  
drwxr-xr-x 1 root root 1216 мар 8 17:40 ..  
-rw----- 1 afedchenko afedchenko 1566 мар 3 12:11 .bash_history  
-rw-r--r-- 1 afedchenko afedchenko 18 июл 19 2023 .bash_logout  
-rw-r--r-- 1 afedchenko afedchenko 144 июл 19 2023 .bash_profile  
-rw-r--r-- 1 afedchenko afedchenko 680 мар 3 12:00 .bashrc  
drwx----- 1 afedchenko afedchenko 452 мар 9 12:57 .cache  
drwx----- 1 afedchenko afedchenko 424 мар 3 12:02 .config  
-rw-r--r-- 1 afedchenko afedchenko 238 мар 3 12:11 .gitconfig  
drwxr-xr-x 1 afedchenko afedchenko 74 мар 3 12:05 git-extended  
drwx----- 1 afedchenko afedchenko 136 мар 3 12:01 gnupg  
drwx----- 1 afedchenko afedchenko 20 фев 23 10:30 .local  
drwxr-xr-x 1 afedchenko afedchenko 48 фев 23 10:46 .mozilla  
drwx----- 1 afedchenko afedchenko 132 фев 23 10:56 .ssh  
drwxr-xr-x 1 afedchenko afedchenko 10 фев 23 10:55 work  
drwxr-xr-x 1 afedchenko afedchenko 0 фев 23 10:30 Видео  
drwxr-xr-x 1 afedchenko afedchenko 0 фев 23 10:30 Документы  
drwxr-xr-x 1 afedchenko afedchenko 0 фев 23 10:30 Загрузки  
drwxr-xr-x 1 afedchenko afedchenko 0 фев 23 10:30 Изображения  
drwxr-xr-x 1 afedchenko afedchenko 0 фев 23 10:30 Музыка  
drwxr-xr-x 1 afedchenko afedchenko 0 фев 23 10:30 Общедоступные  
drwxr-xr-x 1 afedchenko afedchenko 0 фев 23 10:30 'Рабочий стол'  
drwxr-xr-x 1 afedchenko afedchenko 0 фев 23 10:30 Шаблоны  
afedchenko@afedchenko: $
```

Рис. 7: Файлы в домашнем каталоге

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

Рис. 8: Действия с каталогами

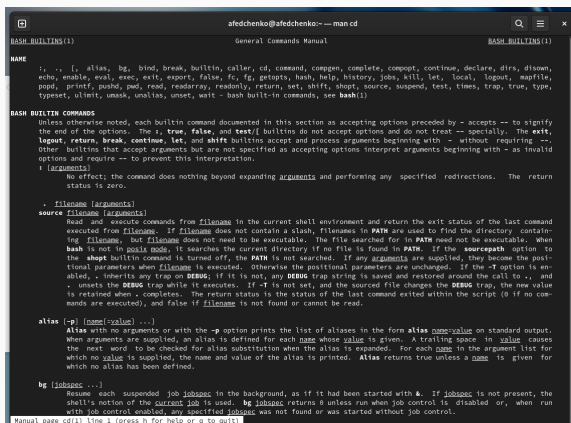
Опции команды ls

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

./Видео:
./Документы:
./Загрузки:
./Изображения:
./Музыка:
./Общедоступные:
'./Рабочий стол':
./Шаблоны:
afedchenko@afedchenko:~$ ls -t
git-extended work Files Документы Изображения Музыка Загрузки Общедоступные 'Рабочий стол' Шаблоны
afedchenko@afedchenko:~$
```

Рис. 9: Команда ls -R и ls -t

Справка по командам



```
afedchenko@afedchenko:~ — man cd
BASH_BUILTINS(1)                                General Commands Manual                                BASH_BUILTINS(1)

NAME
:, ., [, alias, bg, bind, break, builtin, caller, cd, command, compgen, complete, compopt, continue, declare, dirs, disown,
echo, enable, eval, exec, exit, export, false, fg, fg, getopts, hash, help, history, jobs, kill, let, local, logout, mapfile,
pmap, printf, pushd, popd, read, readarray, readonly, return, set, shift, shopt, source, suspend, test, times, trap, true, type,
typeset, ulimit, unset, unalias, unset, wait - bash built-in commands, see bash(1)

BASH BUILTIN COMMANDS
Unless otherwise noted, each builtin command documented in this section as accepting options preceded by - accepts -- to signify
the end of the options. The x, true, false, and test(1) builtins do not accept options and do not treat -- specially. The exit,
logout, return, break, continue, let, and shift builtins accept and process arguments beginning with - without requiring --.
Other builtins that accept arguments but are not specified as accepting options interpret arguments beginning with - as invalid
options and require -- to prevent this interpretation.
  [ arguments ]
    No effect; the command does nothing beyond expanding arguments and performing any specified redirections. The return
    status is zero.
  . filename [ arguments ]
source filename [ arguments ]
  Read and execute commands from filename in the current shell environment and return the exit status of the last command
  executed from filename. If filename does not contain a slash, filenames in PATH are used to find the directory contain-
  ing filename, but filename does not need to be executable. The file searched for in PATH need not be executable. When
  bash is not in posix mode, it searches the current directory if no file is found in PATH. If the sourcepath option to
  the shopt builtin command is turned off, the PATH is not searched. If any arguments are supplied, they become the posi-
  tional parameters when filename is executed. Otherwise the positional parameters are unchanged. If the -t option is en-
  abled, . inherits any trap on DEBUG; if it is not, any DEBUG trap string is saved and restored around the call to ., and
  . unsets the DEBUG trap while it executes. If -T is not set, and the sourced file changes the DEBUG trap, the new value
  is retained when . completes. The return status is the status of the last command exited within the script (0 if no com-
  mands are executed), and false if filename is not found or cannot be read.

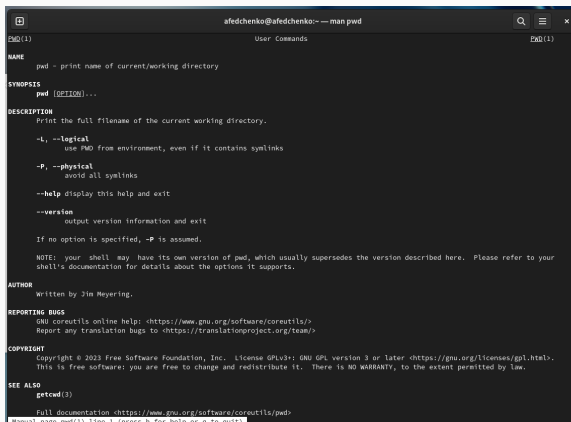
alias [-p] [name[=value] ...]
  Alias with no arguments or with the -p option prints the list of aliases in the form alias name=value on standard output.
  When arguments are supplied, an alias is defined for each name whose value is given. A trailing space in value causes
  the next word to be checked for alias substitution when the alias is expanded. For each name in the argument list for
  which no value is supplied, the name and value of the alias is printed. Alias returns true unless a name is given for
  which no alias has been defined.

bg [jobspec ...]
  Resume each suspended job jobspec in the background, as if it had been started with &. If jobspec is not present, the
  shell's notion of the current job is used. bg jobspec returns 0 unless run when job control is disabled or, when run
  with job control enabled, any specified jobspec was not found or was started without job control.

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

Рис. 10: Справка по команде cd

Справка по командам



```
afedchenko@afedchenko:~$ 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.

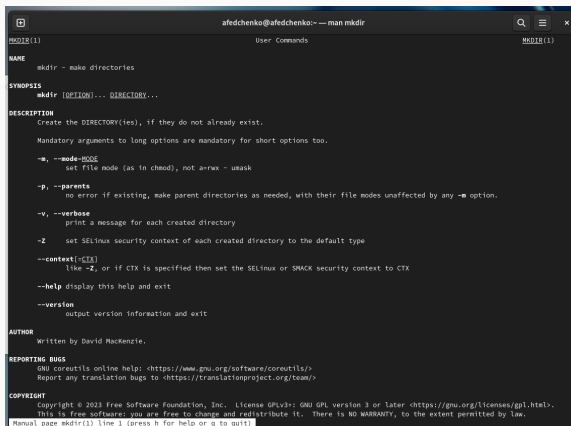
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  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
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SEE ALSO
  getcwd(3)

  Full documentation <https://www.gnu.org/software/coreutils/pwd>
  Manual page pwd(1) line 1 (press h for help or q to quit)
```

Рис. 11: Справка по команде pwd



```
afedchenko@afedchenko:~ — man mkdir
User Commands
MKDIR(1)

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

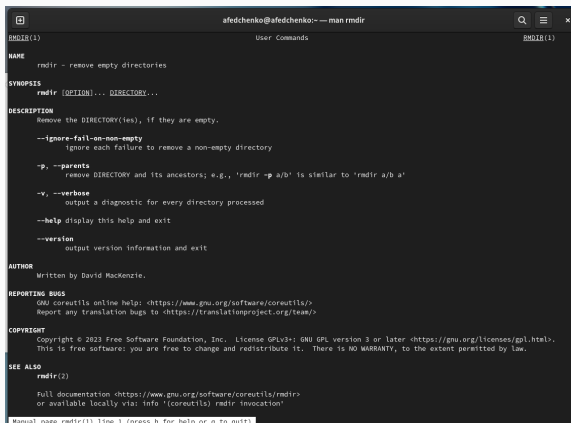
AUTHOR
Written by David MacKenzie.

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

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

Рис. 12: Справка по команде mkdir



```
afedchenko@afedchenko:~ — 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/>
  Report any translation bugs to <https://translationproject.org/team/>

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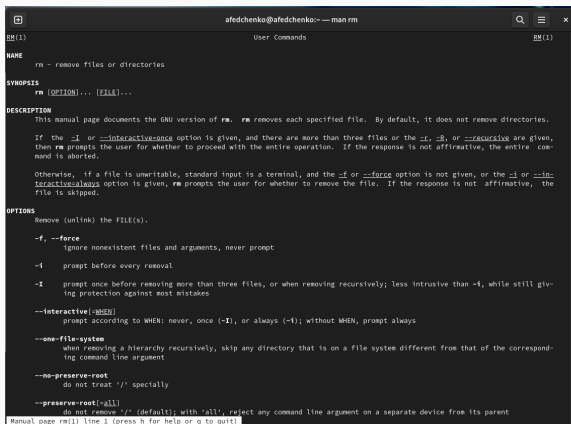
SEE ALSO
  rmdir(2)

  Full documentation <https://www.gnu.org/software/coreutils/rmdir>
  or available locally via: info '(coreutils) rmdir invocation'

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

Рис. 13: Справка по команде rmdir

Справка по командам



```
afedchenko@afedchenko:~ -- 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, -R, 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 command line argument

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

--preserve-root[=all]
    do not remove '/' (default); with 'all', reject any command line argument on a separate device from its parent

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

Рис. 14: Справка по команде rm

История командной строки

```
79 ls -a
80 ls -l
81 ls -f
82 cd /var/spool/
83 ls -l
84 cd
85 ls
86 ls -al
87 mkdir newdir
88 mkdir newdir/morefun
89 mkdir letters memos misk
90 ls
91 rm letters/ memos/ misk
92 rm -r letters/ memos/ misk/
93 rm -r newdir/
94 ls
95 ls -R
96 ls -t
97 man cd
98 man pwd
99 man mkdir
100 man rmdir
101 man rm
102 history
afedchenko@afedchenko:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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