

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

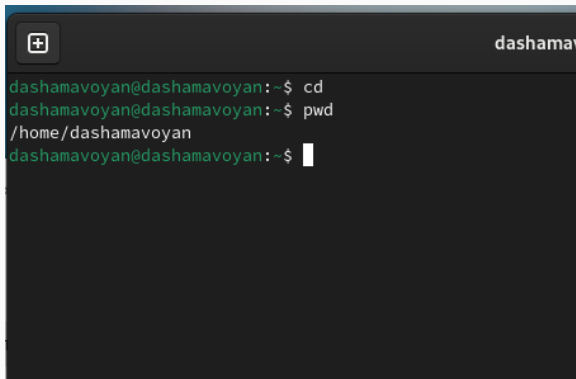
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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



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

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
dashamavoyan@dashamavoyan:~$ cd /tmp
dashamavoyan@dashamavoyan: /tmp$ ls
dbus-Ki4xwC7I
dbus-L4Co6dt7
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-chronyd.service-0lxJhA
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-colord.service-zHNDvB
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-dbus-broker.service-PjKJUM
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-fwupd.service-VUIFM1
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-low-memory-monitor.service-YSzcRD
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-ModemManager.service-NyNORu
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-polkit.service-b09sho
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-power-profiles-daemon.service-lpdGTP
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-rtkit-daemon.service-CTq4i4
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-switcheroo-control.service-0ckqPl
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-systemd-hostnamed.service-7C8DKA
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-systemd-logind.service-hTf2eq
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-systemd-oond.service-zEwdGx
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-systemd-resolved.service-2KqpNA
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-upower.service-hnk5k0
vmware-root_929-3980167385
dashamavoyan@dashamavoyan: /tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
dashamavoyan@dashamavoyan: /tmp$ ls -la
.
..
dbus-Ki4xwC7I
dbus-L4Co6dt7
.font-unix
.ICE-unix
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-chrond.service-0lxJhA
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-colord.service-zHMDvB
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-dbus-broker.service-PjK3UM
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-fwupd.service-VUIFH1
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-low-memory-monitor.service-YSzcRD
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-ModemManager.service-NyNORu
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-polkit.service-b09sho
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-power-profiles-daemon.service-lpdc
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-rtkit-daemon.service-CTq4i4
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-switcheroo-control.service-0ckqPl
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-systemd-logind.service-hTf2eq
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-systemd-oomd.service-zEwdGx
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-systemd-resolved.service-2KqPNA
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-upower.service-hnk5k0
vmware-root_929-3980167385
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
dashamavoyan@dashamavoyan: /tmp$
```

Рис. 3: Команда ls -a

Опции команды ls

```
dashavoyan@dashavoyan: /tmp$ ls -l
итого 0
srwx-rw-rw-. 1 root root 0 map 9 17:13 dbus-K14xwC7I
srwx-rw-rw-. 1 root root 0 map 9 17:13 dbus-L4C6ddt7
drwx----- 3 root root 60 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-chrompd.service-01x2ha
drwx----- 3 root root 60 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-colord.service-2090v8
drwx----- 3 root root 60 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-dbus-broker.service-PjK3UM
drwx----- 3 root root 60 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-fwupd.service-VU1FR1
drwx----- 3 root root 60 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-low-memory-monitor.service-V5zCRD
drwx----- 3 root root 60 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-ModemManager.service-Hy8ORu
drwx----- 3 root root 60 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-polkit.service-b094bu
drwx----- 3 root root 60 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-power-profiles-daemon.service-lp60TP
drwx----- 3 root root 60 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-rtkit-daemon.service-CTq414
drwx----- 3 root root 60 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-switcheroo-control.service-0ckqPl
drwx----- 3 root root 60 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-systemd-logind.service-htf2eq
drwx----- 3 root root 60 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-systemd-oomd.service-zWd6x
drwx----- 3 root root 60 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-systemd-resolved.service-2KqPNA
drwx----- 2 root root 40 map 9 17:13 systemd-private-94ded037aeeb41ec91cf1bafed15e5d-upower.service-hn45x0
drwx----- 2 root root 40 map 9 17:13 vmware-root_929-3901671255
dashavoyan@dashavoyan: /tmp$
```

Рис. 4: Команда ls -l

Опции команды ls

```
dashamavoyan@dashamavoyan: /tmp$  
dashamavoyan@dashamavoyan: /tmp$ ls -f  
.  
..  
.X11-unix  
.ICE-unix  
.XIM-unix  
Hi .font-unix  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-systemd-oomb.service-zEwdGx  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-systemd-resolved.service-2KqpNA  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-dbus-broker.service-PjKJUM  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-chronyd.service-0lxJhA  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-low-memory-monitor.service-YSzcRD  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-polkit.service-b09sho  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-power-profiles-daemon.service-lpdG  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-rtkit-daemon.service-CTq4i4  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-switcheroo-control.service-0ckqPl  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-systemd-logind.service-hTf2eq  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-upower.service-hnk5k0  
vmware-root_929-3980167385  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-ModemManager.service-NyNORu  
dbus-Ki4xwC7I  
dbus-L4Co6dt7  
.X1024-lock  
.X1025-lock  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-colord.service-zHMDvB  
.X0-lock  
.X1-lock  
systemd-private-94ded037aeeb41ec91cf1baf9d15e5d-fwupd.service-VUIFM1  
dashamavoyan@dashamavoyan: /tmp$
```

Рис. 5: Команда ls -f

```
dashamavoyan@dashamavoyan:/tmp$  
dashamavoyan@dashamavoyan:/tmp$ cd /var/spool/  
dashamavoyan@dashamavoyan:/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  
dashamavoyan@dashamavoyan:/var/spool$
```

Рис. 6: Каталог /var/spool

```
dashnavoyandashnavoyan:/var/spool$ cd
dashnavoyandashnavoyan:~$ ls
git-extended work Видео Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны
dashnavoyandashnavoyan:~$ ls -al
итого 20
drwx----- 1 dashnavoyan dashnavoyan 498 мар 3 15:27 .
drwxr-xr-x 1 root root 1216 мар 8 17:40 ..
-rw----- 1 dashnavoyan dashnavoyan 1391 мар 3 15:40 .bash_history
-rw-r--r-- 1 dashnavoyan dashnavoyan 18 июл 19 2023 .bash_logout
-rw-r--r-- 1 dashnavoyan dashnavoyan 144 июл 19 2023 .bash_profile
-rw-r--r-- 1 dashnavoyan dashnavoyan 682 мар 3 15:22 .bashrc
drwx----- 1 dashnavoyan dashnavoyan 452 мар 9 17:13 .cache
drwx----- 1 dashnavoyan dashnavoyan 482 мар 3 15:24 .config
-rw-r--r-- 1 dashnavoyan dashnavoyan 236 мар 3 15:21 .gitconfig
drwxr-xr-x 1 dashnavoyan dashnavoyan 74 мар 3 15:30 git-extended
drwx----- 1 dashnavoyan dashnavoyan 280 фев 25 15:13 .gnupg
drwx----- 1 dashnavoyan dashnavoyan 20 фев 25 11:05 .local
drwxr-xr-x 1 dashnavoyan dashnavoyan 48 фев 25 11:05 .mozilla
drwx----- 1 dashnavoyan dashnavoyan 132 фев 25 11:13 .ssh
drwxr-xr-x 1 dashnavoyan dashnavoyan 10 фев 25 11:11 work
drwxr-xr-x 1 dashnavoyan dashnavoyan 0 фев 25 11:05 Видео
drwxr-xr-x 1 dashnavoyan dashnavoyan 0 фев 25 11:05 Документы
drwxr-xr-x 1 dashnavoyan dashnavoyan 0 фев 25 11:05 Загрузки
drwxr-xr-x 1 dashnavoyan dashnavoyan 0 фев 25 11:05 Изображения
drwxr-xr-x 1 dashnavoyan dashnavoyan 0 фев 25 11:05 Музыка
drwxr-xr-x 1 dashnavoyan dashnavoyan 0 фев 25 11:05 Общедоступные
drwxr-xr-x 1 dashnavoyan dashnavoyan 0 фев 25 11:05 'Рабочий стол'
drwxr-xr-x 1 dashnavoyan dashnavoyan 0 фев 25 11:05 Шаблоны
dashnavoyandashnavoyan:~$
```

Рис. 7: Файлы в домашнем каталоге

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

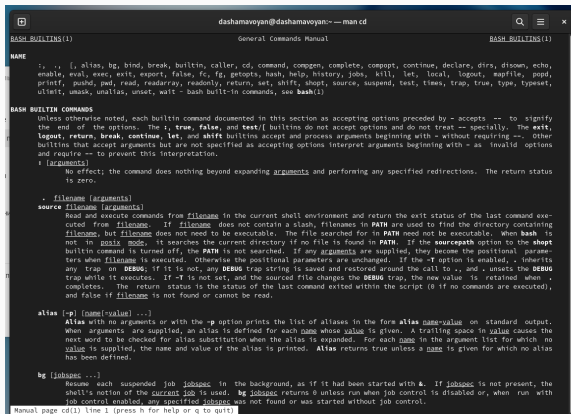
Рис. 8: Действия с каталогами

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:  
dashanavoyan@dashanavoyan:~$ ls -lt  
git-extended work Видео документы Загрузки Изображения Музыка Общедоступные Шаблоны 'Рабочий стол'  
dashanavoyan@dashanavoyan:~$
```

Рис. 9: Команда ls -R и ls -t

Справка по командам



```
dashamavoyan@dashamavoyan:~ -- 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, fc, fg, getopts, hash, help, history, jobs, kill, let, local, logout, mapfile, popd,
printf, pushd, pwd, 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 ;, true, false, and test 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 ex-
ecuted from filename. If filename does not contain a slash, filenames in PATH are used to find the directory containing
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 positional param-
eters when filename is executed. Otherwise the positional parameters are unchanged. If the -T option is enabled, - 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 commands are executed),
and false if filename is not found or cannot be read.

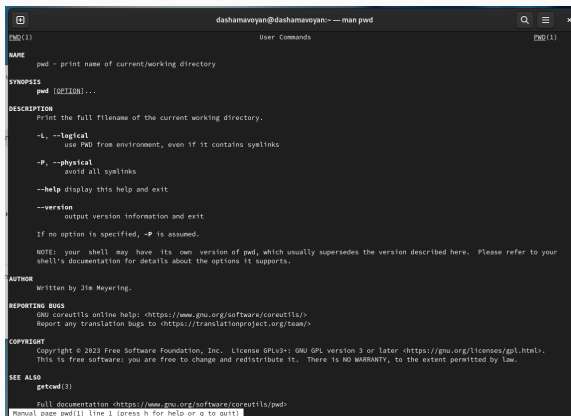
alias [-p] [name=value] ...]
Alias with no arguments or with the -p option prints the list of aliases in the form alias name=value on standard output.
When arguments are supplied, an alias is defined for each name whose value is given. A trailing space in value causes the
next word to be checked for 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



```
dashamavoyan@dashamavoyan:~ -- 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.

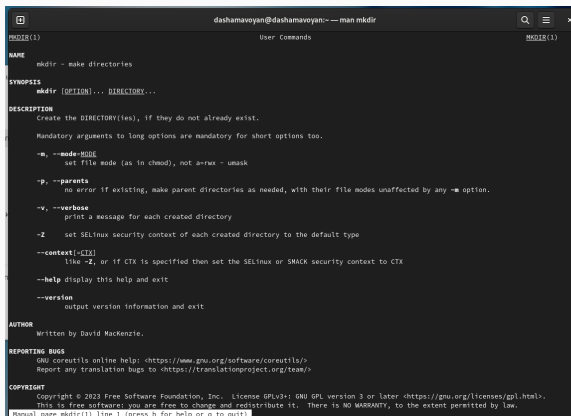
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  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
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SEE ALSO
  getcwd(3)

  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



```
dashamavoyan@dashamavoyan:~ -- man 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.

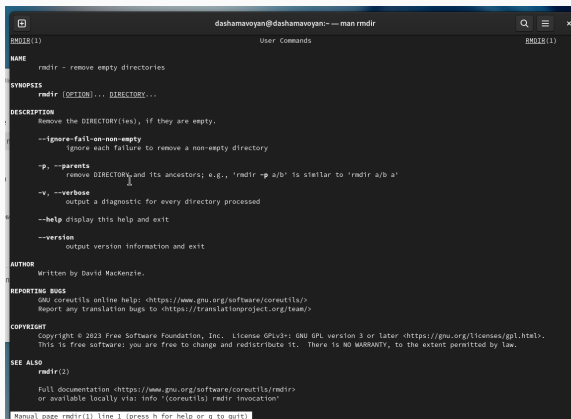
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  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
  Report any translation bugs to <https://translationproject.org/team/>

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

Рис. 12: Справка по команде mkdir

Справка по командам



```
dashamavoyan@dashamavoyan:~ — 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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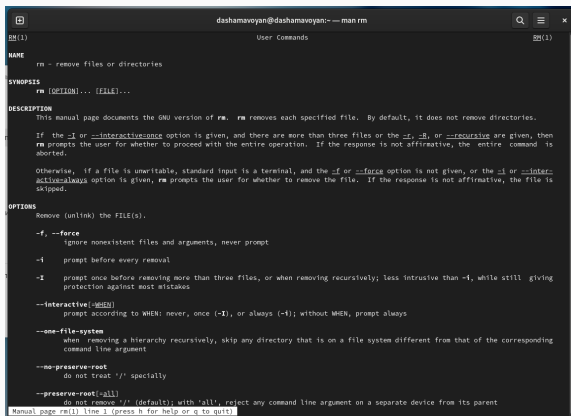
SEE ALSO
  rmdir(2)

  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



```
dashamavoyan@dashamavoyan:~$ 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 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 unwriteable, 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

```
56 cd
57 ls
58 ls -al
59 mkdir newdir
60 mkdir newdir/morefun
61 mkdir letters memos misk
62 ls
63 rm letters/ memos/ misk/
64 rm -r letters/ memos/ misk/
65 rm -r newdir/
66 ls -R
67 ls -t
68 man cd
69 man pwd
70 man mkdir
71 man rmdir
72 man rm
73 history
dashamavoyan@dashamavoyan:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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