

# Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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# Цели и задачи работы

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# 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**

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# Имя и путь к домашнему каталогу



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

A terminal window with a dark background. The title bar shows a window icon and the text "iavoloubaev@iavoloubaev:~". The terminal content shows three lines of text: a green prompt followed by "cd", a green prompt followed by "pwd", and the output "/home/iavoloubaev". The final line shows a green prompt followed by a cursor.

**Рис. 1:** Путь к домашнему каталогу

# Опции команды ls

```
iaouloubaev@iaouloubaev:~$ cd /tmp
iaouloubaev@iaouloubaev:/tmp$ ls
dbus-g4H2ExLG
dbus-ItPwB3jg
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-chronyd.service-nj2YMP
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-colord.service-hg4SaC
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-dbus-broker.service-MkufPF
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-fwupd.service-yvmfGC
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-low-memory-monitor.service-UW1Y4U
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-ModemManager.service-ys4jsE
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-polkit.service-eP3cNe
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-power-profiles-daemon.service-OMJNSg
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-rtkit-daemon.service-Vx1xHB
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-switcheroo-control.service-QMjQDM
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-systemd-logind.service-FoPvZi
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-systemd-oomd.service-0Y0YBC
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-systemd-resolved.service-zugBMq
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-upower.service-i0RXp4
vmware-root_927-3980167416
iaouloubaev@iaouloubaev:/tmp$
```

Рис. 2: Команда ls

# Опции команды ls

```
iavouloubaev@iavouloubaev:/tmp$ ls -a
.
..
dbus-g4M2ExLG
dbus-ItPxwBJg
.font-unix
.ICE-unix
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-chrondy.service-nj2Ymp
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-colord.service-hg4sAc
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-dbus-broker.service-MkufF
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-fwupd.service-yvmfgC
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-low-memory-monitor.service-UW1Y4U
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-ModemManager.service-ys4jsE
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-polkit.service-ePJcNe
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-power-profiles-daemon.service-OMJH
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-rtkit-daemon.service-Vx1xHB
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-switcheroo-control.service-QHjQDM
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-systemd-logind.service-FoPvZi
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-systemd-oomd.service-0Y0YBC
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-systemd-resolved.service-zugBMq
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-upower.service-i0RXp4
vmware-root_927-3980167416
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
iavouloubaev@iavouloubaev:/tmp$
```

Рис. 3: Команда ls -a



# Опции команды ls

```
lavoloubaev@lavoloubaev:/tmp$ ls -l
итеро 9
srw-rw-rw-. 1 root root 0 map 10 11:50 dbus-p4H2Ex1G
srw-rw-rw-. 1 root root 0 map 10 11:50 dbus-ItFaw8Jg
drwx----- 3 root root 60 map 10 11:50 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-chrond.service-mj2Yw
drwx----- 3 root root 60 map 10 11:50 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-colord.service-hg45aC
drwx----- 3 root root 60 map 10 11:50 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-dbus-broker.service-MuwpF
drwx----- 3 root root 60 map 10 11:53 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-fwupd.service-ymfgC
drwx----- 3 root root 60 map 10 11:50 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-low-memory-monitor.service-UM1YAU
drwx----- 3 root root 60 map 10 11:50 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-ModemManager.service-ys4jsE
drwx----- 3 root root 60 map 10 11:50 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-polkit.service-aPz18e
drwx----- 3 root root 60 map 10 11:50 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-power-profiles-daemon.service-QM3Ng
drwx----- 3 root root 60 map 10 11:50 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-rtkit-daemon.service-Vk1xNB
drwx----- 3 root root 60 map 10 11:50 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-switcheroo-control.service-QHjQDM
drwx----- 3 root root 60 map 10 11:50 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-systemd-logind.service-FoPvZ1
drwx----- 3 root root 60 map 10 11:50 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-systemd-oomd.service-8Y0YBC
drwx----- 3 root root 60 map 10 11:50 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-systemd-resolved.service-zug8Nq
drwx----- 3 root root 60 map 10 11:50 systemd-private-b1d500694bdd4beb9453d5dae2c1d787-upower.service-10RXp4
drwx----- 2 root root 40 map 10 11:50 vmware-root_927-3980167416
lavoloubaev@lavoloubaev:/tmp$
```

Рис. 4: Команда ls -l

# Опции команды ls

```
iaivoloubaev@iaivoloubaev: /tmp$  
iaivoloubaev@iaivoloubaev: /tmp$ ls -f  
.  
..  
.X11-unix  
.ICE-unix  
.XIM-unix  
.font-unix  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-systemd-oomd.service-0Y0YBC  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-systemd-resolved.service-zugBMq  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-dbus-broker.service-MkufpF  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-chronyd.service-nj2Ymp  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-low-memory-monitor.service-UW1Y4U  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-polkit.service-eP3cNe  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-power-profiles-daemon.service-OMJNSg  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-rtkit-daemon.service-Vx1xHB  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-switcheroo-control.service-QMjQDM  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-systemd-logind.service-FoPvZi  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-upower.service-i0RXp4  
vmware-root_927-3980167416  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-ModemManager.service-ys4jsE  
dbus-g4H2ExLG  
dbus-ItPxwBJg  
.X1024-lock  
.X1025-lock  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-colord.service-hg4SaC  
.X0-lock  
.X1-lock  
systemd-private-b1d500694bdd4beb9453d5dae2c1d787-fwupd.service-yvmfG  
iaivoloubaev@iaivoloubaev: /tmp$
```

Рис. 5: Команда ls -f

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

Рис. 6: Каталог /var/spool

```
iaivoloubaev@iaivoloubaev: /var/spool$ cd
iaivoloubaev@iaivoloubaev: $ ls
git-extended work Видео Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны
iaivoloubaev@iaivoloubaev: $ ls -al
итого 20
drwx-----, 1 iaivoloubaev iaivoloubaev 498 мар 3 22:42 .
drwxr-xr-x, 1 root root 1216 мар 8 17:40 ..
-rw-r--r--, 1 iaivoloubaev iaivoloubaev 193 мар 3 22:42 .bash_history
-rw-r--r--, 1 iaivoloubaev iaivoloubaev 18 июл 19 2023 .bash_logout
-rw-r--r--, 1 iaivoloubaev iaivoloubaev 144 июл 19 2023 .bash_profile
-rw-r--r--, 1 iaivoloubaev iaivoloubaev 681 мар 3 22:31 .bashrc
drwx-----, 1 iaivoloubaev iaivoloubaev 452 мар 10 11:52 .cache
drwx-----, 1 iaivoloubaev iaivoloubaev 402 мар 3 22:33 .config
-rw-r--r--, 1 iaivoloubaev iaivoloubaev 238 мар 3 22:42 .gitconfig
drwxr-xr-x, 1 iaivoloubaev iaivoloubaev 74 мар 3 22:36 git-extended
drwx-----, 1 iaivoloubaev iaivoloubaev 136 фев 25 15:48 .gnupg
drwx-----, 1 iaivoloubaev iaivoloubaev 20 фев 25 15:42 .local
drwxr-xr-x, 1 iaivoloubaev iaivoloubaev 48 фев 25 15:44 .mozilla
drwx-----, 1 iaivoloubaev iaivoloubaev 132 фев 25 15:50 .ssh
drwxr-xr-x, 1 iaivoloubaev iaivoloubaev 10 фев 25 15:50 work
drwxr-xr-x, 1 iaivoloubaev iaivoloubaev 0 фев 25 15:42 Видео
drwxr-xr-x, 1 iaivoloubaev iaivoloubaev 0 фев 25 15:42 Документы
drwxr-xr-x, 1 iaivoloubaev iaivoloubaev 0 фев 25 15:42 Загрузки
drwxr-xr-x, 1 iaivoloubaev iaivoloubaev 0 фев 25 15:42 Изображения
drwxr-xr-x, 1 iaivoloubaev iaivoloubaev 0 фев 25 15:42 Музыка
drwxr-xr-x, 1 iaivoloubaev iaivoloubaev 0 фев 25 15:42 Общедоступные
drwxr-xr-x, 1 iaivoloubaev iaivoloubaev 0 фев 25 15:42 'Рабочий стол'
drwxr-xr-x, 1 iaivoloubaev iaivoloubaev 0 фев 25 15:42 Шаблоны
iaivoloubaev@iaivoloubaev: $
```

Рис. 7: Файлы в домашнем каталоге

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

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:

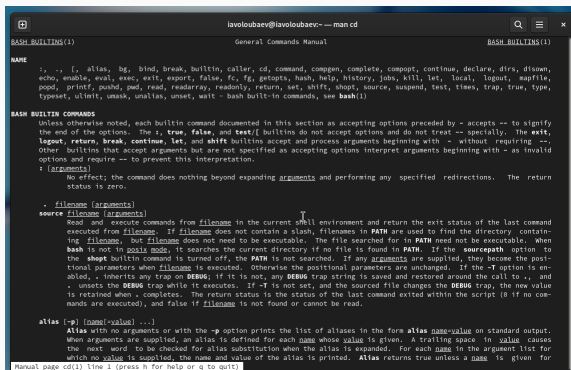
./Общедоступные:

./Рабочий стол':

./Шаблоны:
iavoloubaev@iavoloubaev: $
```

Рис. 9: Команда ls -R и ls -t

# Справка по командам

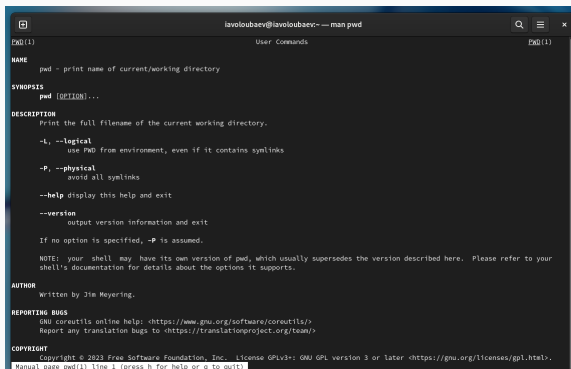


```
lavaloubae@lavaloubae:~$ man cd
BASH BUILTINS(1)                                     General Commands Manual
NAME
  :, :, [, alias, bg, bind, break, builtin, caller, cd, command, compgen, complete, compopt, continue, declare, dirs, disown,
  echo, enable, eval, exec, exit, export, false, fg, fg, getopts, hash, help, history, jobs, kill, let, local, logout, mapfile,
  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
    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 positional
    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
    Manual page cd(1) line 1 (press h for help or q to quit)
```

Рис. 10: Справка по команде cd

# Справка по командам



```
lavaloubaev@lavaloubaev:~$ 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.

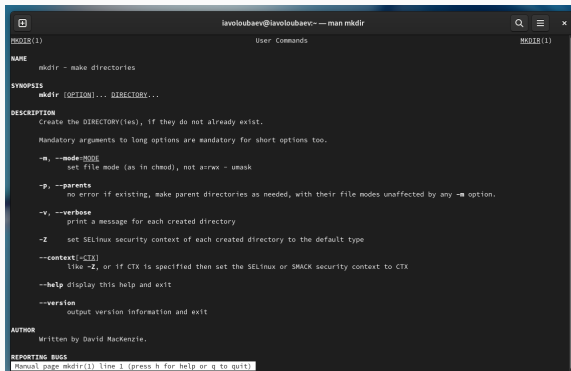
REPORTING BUGS
  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
  Report any translation bugs to <https://translationproject.org/team/>

COPYRIGHT
  Copyright © 2023 Free Software Foundation, Inc.  License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
  Manual page pwd(1) line 1 (press h for help or q to quit)
```

Рис. 11: Справка по команде pwd



# Справка по командам



```
lavloubaev@lavloubaev:~ — man mkdir
mkdir(1)                                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

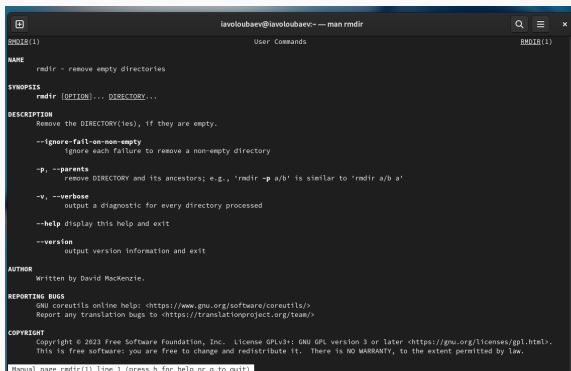
  --help
      display this help and exit

  --version
      output version information and exit

AUTHOR
  Written by David Mackenzie.

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

Рис. 12: Справка по команде mkdir



```
iavoloubaev@iavoloubaev:~$ 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.

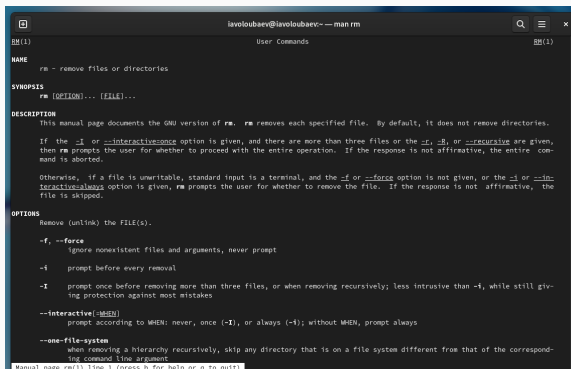
REPORTING BUGS
  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
  Report any translation bugs to <https://translationproject.org/team/>

COPYRIGHT
  Copyright © 2023 Free Software Foundation, Inc.  License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
  This is free software; you are free to change and redistribute it.  There is NO WARRANTY, to the extent permitted by law.

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

Рис. 13: Справка по команде rmdir

# Справка по командам



```
iavloubaev@iavloubaev:~$ 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

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

Рис. 14: Справка по команде rm

# История командной строки

```
25 ls -al
26 mkdir newdir
27 mkdir newdir/morefun
28 mkdir letters memos misk
29 ls
30 rm letters/ memos/ misk/
31 rm -r letters/ memos/ misk/
32 rm -r newdir/
33 ls
34 ls -R
35 ls -t
36 man cd
37 man pwd
38 man mkdir
39 man rmdir
40 man history
41 man rm
42 history
iavoloubaev@iavoloubaev:~$
```

Рис. 15: Команда history

## **Выводы по проделанной работе**

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