

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

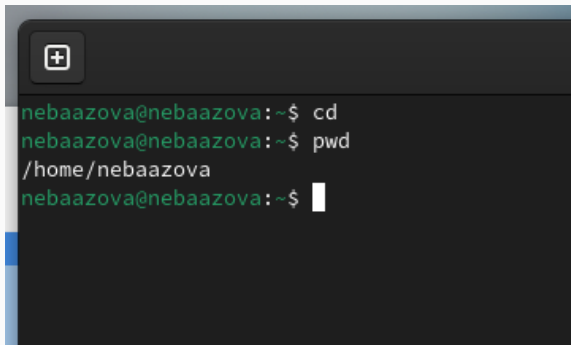
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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

A terminal window with a dark background and a light blue title bar. The terminal shows the user 'nebaazova' at the prompt '~\$' executing the 'cd' command, followed by the 'pwd' command which outputs '/home/nebaazova'. The prompt is followed by a white cursor.

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

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
nebaazova@nebaazova:/tmp$ cd
nebaazova@nebaazova:/$ pwd
/home/nebaazova
nebaazova@nebaazova:/$ cd /tmp
nebaazova@nebaazova:/tmp$ ls
dbus-cukhTJaL
dbus-L3yOCjww
systemd-private-00dc1d8080b4433fba67803e5eb25607-chrond.service-ZSRN70
systemd-private-00dc1d8080b4433fba67803e5eb25607-color.service-z9wM0d
systemd-private-00dc1d8080b4433fba67803e5eb25607-dbus-broker.service-r3o5Wl
systemd-private-00dc1d8080b4433fba67803e5eb25607-fwupd.service-heWM45
systemd-private-00dc1d8080b4433fba67803e5eb25607-low-memory-monitor.service-M7QskY
systemd-private-00dc1d8080b4433fba67803e5eb25607-ModemManager.service-ASNXXR
systemd-private-00dc1d8080b4433fba67803e5eb25607-polkit.service-DDFseQ
systemd-private-00dc1d8080b4433fba67803e5eb25607-power-profiles-daemon.service-IV3dPT
systemd-private-00dc1d8080b4433fba67803e5eb25607-rtkit-daemon.service-rcR38H
systemd-private-00dc1d8080b4433fba67803e5eb25607-switcheroo-control.service-cWSU1j
systemd-private-00dc1d8080b4433fba67803e5eb25607-systemd-logind.service-AZ4xJR
systemd-private-00dc1d8080b4433fba67803e5eb25607-systemd-oomd.service-Ct995t
systemd-private-00dc1d8080b4433fba67803e5eb25607-systemd-resolved.service-tZ3Ajw
systemd-private-00dc1d8080b4433fba67803e5eb25607-upower.service-43FtKe
vmware-root_906-2688554163
nebaazova@nebaazova:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
nebaazova@nebaazova:~/tmp$ ls -la
total 12
drwxr-xr-x 2 nebaazova nebaazova 4096 Aug 11 11:01 .
drwxr-xr-x 1 nebaazova nebaazova 4096 Aug 11 11:01 ..
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 dbus-cukhTJaL
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 dbus-LJyOCjww
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 .font-unix
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 .ICE-unix
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-chrond.service-ZSRN70
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-colord.service-z9wNod
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-dbus-broker.service-r3o5Wl
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-fwupd.service-heMM45
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-low-memory-monitor.service-M7QskY
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-ModemManager.service-ASNXXR
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-polkit.service-DDFseQ
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-power-profiles-daemon.service-IY3dPT
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-rtkit-daemon.service-rcRJ8H
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-switcheroo-control.service-cwSU1j
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-systemd-logind.service-AZ4xJR
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-systemd-oond.service-Ct995t
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-systemd-resolved.service-tZ3Afw
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 systemd-private-00dc1d8080b4433fba67803e5eb25607-upower.service-43FtKe
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 vmware-root_906-2688554163
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 .X0-lock
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 .X1024-lock
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 .X1025-lock
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 .X11-unix
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 .X1-lock
-rw-r--r-- 1 nebaazova nebaazova  100 Aug 11 11:01 .X1M-unix
nebaazova@nebaazova:~/tmp$
```

Рис. 3: Команда ls -la

Опции команды ls

```
nebaazova@nebaazova:~/tmp$ ls -l
-rw-rw-rw-. 1 root root 0 map 9 11:50 dbus-cukhTJaL
-rw-rw-rw-. 1 root root 0 map 9 11:50 dbus-L2y0CjwJ
drwx----- 3 root root 60 map 9 11:50 systemd-private-80dc1d8080b4433fba67803e5eb25607-chromyd.service-Z5RM78
drwx----- 3 root root 60 map 9 11:50 systemd-private-80dc1d8080b4433fba67803e5eb25607-color.service-z9WbOd
drwx----- 3 root root 60 map 9 11:50 systemd-private-80dc1d8080b4433fba67803e5eb25607-dbus-broker.service-r3o5Wl
drwx----- 3 root root 60 map 9 11:51 systemd-private-80dc1d8080b4433fba67803e5eb25607-fwupd.service-heWM4S
drwx----- 3 root root 60 map 9 11:50 systemd-private-80dc1d8080b4433fba67803e5eb25607-low-memory-monitor.service-W7QsKy
drwx----- 3 root root 60 map 9 11:50 systemd-private-80dc1d8080b4433fba67803e5eb25607-ModemManager.service-AShXXR
drwx----- 3 root root 60 map 9 11:50 systemd-private-80dc1d8080b4433fba67803e5eb25607-polkit.service-DBFaeQ
drwx----- 3 root root 60 map 9 11:50 systemd-private-80dc1d8080b4433fba67803e5eb25607-power-profiles-daemon.service-IV3dP
drwx----- 3 root root 60 map 9 11:50 systemd-private-80dc1d8080b4433fba67803e5eb25607-rtkit-daemon.service-rcR2M
drwx----- 3 root root 60 map 9 11:50 systemd-private-80dc1d8080b4433fba67803e5eb25607-switcheroo-control.service-cWSUlj
drwx----- 3 root root 60 map 9 11:50 systemd-private-80dc1d8080b4433fba67803e5eb25607-systemd-logind.service-A24xJR
drwx----- 3 root root 60 map 9 11:50 systemd-private-80dc1d8080b4433fba67803e5eb25607-systemd-oomd.service-Ct99St
drwx----- 3 root root 60 map 9 11:50 systemd-private-80dc1d8080b4433fba67803e5eb25607-systemd-resolved.service-tZ3AJw
drwx----- 2 root root 40 map 9 11:50 systemd-private-80dc1d8080b4433fba67803e5eb25607-upower.service-43FTKe
drwx----- 2 root root 40 map 9 11:50 vmware-root_906-2688554183
nebaazova@nebaazova:~/tmp$
```

Рис. 4: Команда ls -l

Опции команды ls

```
nebaazova@nebaazova: /tmp$  
nebaazova@nebaazova: /tmp$ ls -f  
.  
..  
.X11-unix  
.ICE-unix  
.XIM-unix  
.font-unix  
systemd-private-00dc1d8080b4433fba67803e5eb25607-systemd-oomd.service-Ct995t  
systemd-private-00dc1d8080b4433fba67803e5eb25607-systemd-resolved.service-tz3Ajw  
systemd-private-00dc1d8080b4433fba67803e5eb25607-dbus-broker.service-r3o5Wl  
systemd-private-00dc1d8080b4433fba67803e5eb25607-chronyd.service-ZSRN70  
systemd-private-00dc1d8080b4433fba67803e5eb25607-low-memory-monitor.service-M7QskY  
systemd-private-00dc1d8080b4433fba67803e5eb25607-polkit.service-DDFseQ  
systemd-private-00dc1d8080b4433fba67803e5eb25607-power-profiles-daemon.service-IV3dPT  
systemd-private-00dc1d8080b4433fba67803e5eb25607-rtkit-daemon.service-rcRJ8H  
systemd-private-00dc1d8080b4433fba67803e5eb25607-switcheroo-control.service-cw5U1j  
systemd-private-00dc1d8080b4433fba67803e5eb25607-systemd-logind.service-AZ4xjR  
systemd-private-00dc1d8080b4433fba67803e5eb25607-upower.service-43FtKe  
vmware-root_906-2688554163  
systemd-private-00dc1d8080b4433fba67803e5eb25607-ModemManager.service-ASNXXR  
dbus-LJyOCjww  
dbus-cukhTJaL  
.X1024-lock  
.X1025-lock  
systemd-private-00dc1d8080b4433fba67803e5eb25607-colord.service-z9wNod  
.X0-lock  
.X1-lock  
systemd-private-00dc1d8080b4433fba67803e5eb25607-fwupd.service-heWM45  
nebaazova@nebaazova: /tmp$
```

Рис. 5: Команда ls -f

Каталог /var/spool

```
nebaazova@nebaazova:/tmp$  
nebaazova@nebaazova:/tmp$ cd /var/spool/  
nebaazova@nebaazova:/var/spool$ ls -al  
итого 0  
drwxr-xr-x. 1 root root  68 ноя  1 04:09 .  
drwxr-xr-x. 1 root root 200 ноя  1 04:15 ..  
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  
nebaazova@nebaazova:/var/spool$
```

Рис. 6: Каталог /var/spool

```
nebaazova@nebaazova: /var/spool$ cd
nebaazova@nebaazova: $ ls
git-extended work Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны
nebaazova@nebaazova: $ ls -al
итого 20
drwx-----, 1 nebaazova nebaazova 478 мар 2 22:58 .
drwxr-xr-x, 1 root root 1216 мар 8 17:40 ..
-rw-----, 1 nebaazova nebaazova 1788 мар 2 22:58 .bash_history
-rw-r--r--, 1 nebaazova nebaazova 18 июл 19 2023 .bash_logout
-rw-r--r--, 1 nebaazova nebaazova 144 июл 19 2023 .bash_profile
-rw-r--r--, 1 nebaazova nebaazova 679 мар 2 22:46 .bashrc
drwx-----, 1 nebaazova nebaazova 452 мар 9 11:46 .cache
drwx-----, 1 nebaazova nebaazova 424 мар 2 22:48 .config
-rw-r--r--, 1 nebaazova nebaazova 233 мар 2 22:58 .gitconfig
drwxr-xr-x, 1 nebaazova nebaazova 74 мар 2 22:52 git-extended
drwx-----, 1 nebaazova nebaazova 136 фев 22 09:26 .gnupg
drwx-----, 1 nebaazova nebaazova 20 фев 21 21:18 .local
drwxr-xr-x, 1 nebaazova nebaazova 48 фев 22 09:15 .mozilla
drwx-----, 1 nebaazova nebaazova 132 фев 22 09:33 .ssh
drwxr-xr-x, 1 nebaazova nebaazova 10 фев 22 09:30 work
drwxr-xr-x, 1 nebaazova nebaazova 20 фев 22 09:37 Документы
drwxr-xr-x, 1 nebaazova nebaazova 0 фев 21 21:18 Загрузки
drwxr-xr-x, 1 nebaazova nebaazova 0 фев 21 21:18 Изображения
drwxr-xr-x, 1 nebaazova nebaazova 0 фев 21 21:18 Музыка
drwxr-xr-x, 1 nebaazova nebaazova 0 фев 21 21:18 Общедоступные
drwxr-xr-x, 1 nebaazova nebaazova 0 фев 21 21:18 'Рабочий стол'
drwxr-xr-x, 1 nebaazova nebaazova 0 фев 21 21:18 Шаблоны
nebaazova@nebaazova: $
```

Рис. 7: Файлы в домашнем каталоге

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

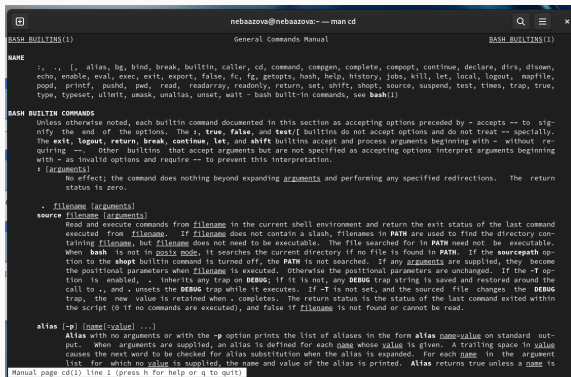
Рис. 8: Действия с каталогами

Опции команды ls

```
./work/study/2023-2024/Операционные системы/os-intro/template/report/scripts':  
image-report mpv-shot  
./Документы:  
Видео  
./Документы/Видео:  
./Загрузки:  
./Изображения:  
./Музыка:  
./Общедоступные:  
./Рабочий стол':  
./Шаблоны:  
nebaazova@nebaazova: $ ls -t  
git-extended Документы work Изображения Музыка общедоступные Загрузки 'Рабочий стол' Шаблоны  
nebaazova@nebaazova: $
```

Рис. 9: Команда ls -R и ls -t

Справка по командам



```
nebaazova@nebaazova:~$ 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,
popd, printf, pushd, pwd, read, readarray, readonly, 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 sig-
nify 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 re-
quiring --. 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.

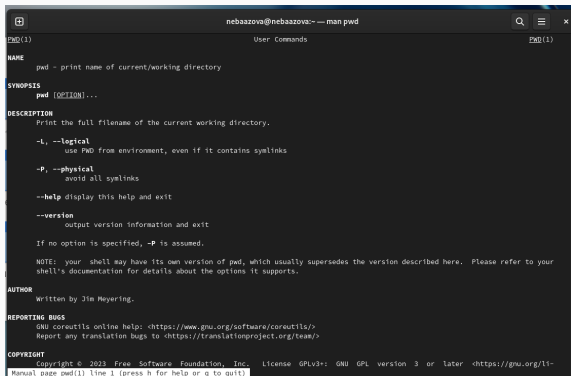
: [arguments]
    No effect; the command does nothing beyond expanding arguments and performing any specified redirections. The return
    status is zero.

- 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 con-
    taining 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 op-
    tion 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 op-
    tion 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 out-
    put. 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
    Manual page cd(1) line 1 (press h for help or q to quit)
```

Рис. 10: Справка по команде cd

Справка по командам



```
nebaazova@nebaazova:~ — 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.

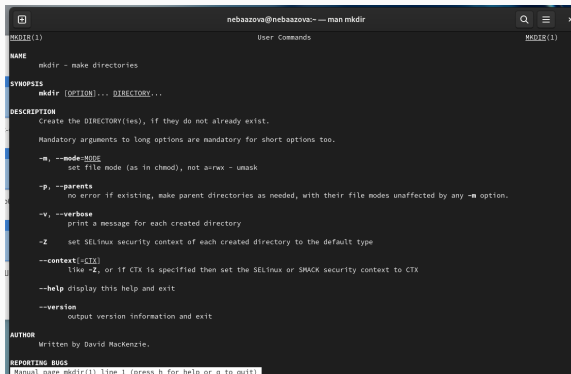
  NOTE: your shell may have its own version of pwd, which usually supersedes the version described here. Please refer to your
  shell's documentation for details about the options it supports.

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



```
nebaazova@nebaazova:~$ 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

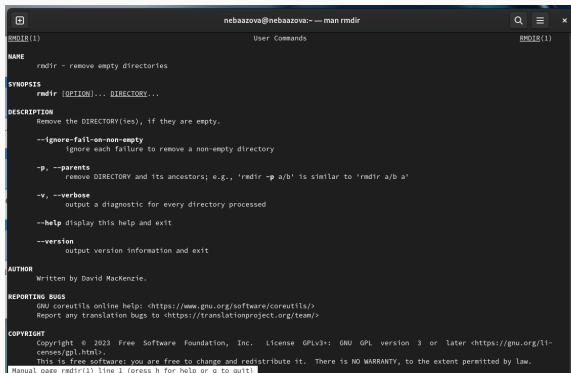
  --help
      display this help and exit

  --version
      output version information and exit

AUTHOR
  Written by David Mackenzie.

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

Рис. 12: Справка по команде mkdir



```
nebaazova@nebaazova:~$ 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

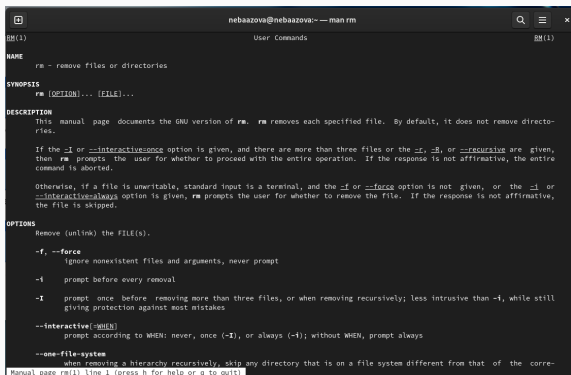
  --version
      output version information and exit

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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  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



```
nebaazova@nebaazova:~$ 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 current directory

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

Рис. 14: Справка по команде rm

История командной строки

```
93 cd
94 ls
95 ls -al
96 mkdir newdir
97 mkdir newdir/morefun
98 mkdir letters memos misk
99 ls
100 rm letters/ memos/ misk/
101 rm -r letters/ memos/ misk/
102 rm -r newdir/
103 ls
104 ls -R
105 ls -t
106 man cd
107 man pwd
108 man mkdir
109 man rmdir
110 man rm
111 history
nebaazova@nebaazova:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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