

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

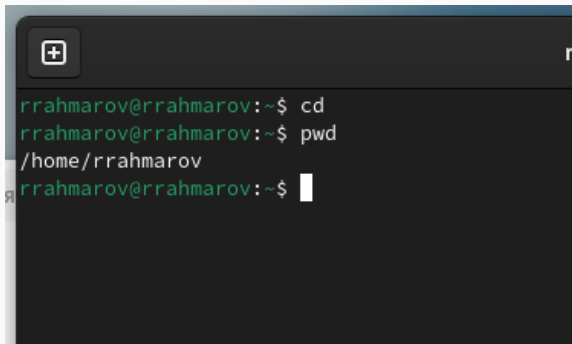
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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 title bar. The title bar contains a window control icon (a square with a plus sign) on the left and a partially visible character 'r' on the right. The terminal text shows a user named 'rrahmarov' at a host named 'rrahmarov' in the home directory '~'. The user enters 'cd' and then 'pwd', which outputs '/home/rrahmarov'. The prompt is followed by a white cursor.

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

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
rrahmarov@rrahmarov:~$  
rrahmarov@rrahmarov:~$ cd /tmp  
rrahmarov@rrahmarov:/tmp$ ls  
dbus-jRi3Qak9  
dbus-q3aLga84  
systemd-private-8df2fc000b254af78c16eb54138a3618-chrond.service-vhq2ZB  
systemd-private-8df2fc000b254af78c16eb54138a3618-colord.service-yVroJT  
systemd-private-8df2fc000b254af78c16eb54138a3618-dbus-broker.service-WCBydv  
systemd-private-8df2fc000b254af78c16eb54138a3618-fwupd.service-qgKH04  
systemd-private-8df2fc000b254af78c16eb54138a3618-low-memory-monitor.service-B3LW1A  
systemd-private-8df2fc000b254af78c16eb54138a3618-ModemManager.service-Bmc8o1  
systemd-private-8df2fc000b254af78c16eb54138a3618-polkit.service-whBmQi  
systemd-private-8df2fc000b254af78c16eb54138a3618-power-profiles-daemon.service-I1inBI  
systemd-private-8df2fc000b254af78c16eb54138a3618-rtkit-daemon.service-jZvRF  
systemd-private-8df2fc000b254af78c16eb54138a3618-switcheroo-control.service-wKV4m9  
systemd-private-8df2fc000b254af78c16eb54138a3618-systemd-logind.service-2P8Z9b  
systemd-private-8df2fc000b254af78c16eb54138a3618-systemd-oomd.service-cN1353  
systemd-private-8df2fc000b254af78c16eb54138a3618-systemd-resolved.service-6K4ra1  
systemd-private-8df2fc000b254af78c16eb54138a3618-upower.service-kly8nW  
vmware-root_867-3988621819  
rrahmarov@rrahmarov:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
rrahmarov@rrahmarov:/tmp$ ls -la
.
..
dbus-jRi3Qak9
dbus-q3aLga84
.font-unix
.ICE-unix
systemd-private-8df2fc000b254af78c16eb54138a3618-chronyd.service-vhQ2ZB
systemd-private-8df2fc000b254af78c16eb54138a3618-colord.service-yVrojT
systemd-private-8df2fc000b254af78c16eb54138a3618-dbus-broker.service-WCBydv
systemd-private-8df2fc000b254af78c16eb54138a3618-fwupd.service-qgKH04
systemd-private-8df2fc000b254af78c16eb54138a3618-low-memory-monitor.service-B3LWiA
systemd-private-8df2fc000b254af78c16eb54138a3618-ModemManager.service-Bmc0o1
systemd-private-8df2fc000b254af78c16eb54138a3618-polkit.service-whBmQi
systemd-private-8df2fc000b254af78c16eb54138a3618-power-profiles-daemon.service-I1inbI
systemd-private-8df2fc000b254af78c16eb54138a3618-rtkit-daemon.service-jZvVRf
systemd-private-8df2fc000b254af78c16eb54138a3618-switcheroo-control.service-wKV4m9
systemd-private-8df2fc000b254af78c16eb54138a3618-systemd-logind.service-2P8Z9b
systemd-private-8df2fc000b254af78c16eb54138a3618-systemd-oomd.service-cwL353
systemd-private-8df2fc000b254af78c16eb54138a3618-systemd-resolved.service-6K4rm1
systemd-private-8df2fc000b254af78c16eb54138a3618-upower.service-k1y8nW
vmware-root_867-3988621819
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
rrahmarov@rrahmarov:/tmp$
```

Рис. 3: Команда ls -la

Опции команды ls

```
rrahmarov@rrahmarov:~$ ls -l
итого 0
srwx-rw-rw-. 1 root root 0 map 8 19:05 dbus-jRi3Qak9
srwx-rw-rw-. 1 root root 0 map 8 19:05 dbus-q3alga84
drwx----- 3 root root 60 map 8 19:05 systemd-private-bdf2fc000b254a78c16eb54138a3618-chromyd.service-vhq2ZB
drwx----- 3 root root 60 map 8 19:05 systemd-private-bdf2fc000b254a78c16eb54138a3618-colord.service-yVroJT
drwx----- 3 root root 60 map 8 19:05 systemd-private-bdf2fc000b254a78c16eb54138a3618-dbus-broker.service-WC8ydv
drwx----- 3 root root 60 map 8 19:06 systemd-private-bdf2fc000b254a78c16eb54138a3618-fuupd.service-qgX004
drwx----- 3 root root 60 map 8 19:05 systemd-private-bdf2fc000b254a78c16eb54138a3618-low-memory-monitor.service-B3LW1A
drwx----- 3 root root 60 map 8 19:05 systemd-private-bdf2fc000b254a78c16eb54138a3618-ModemManager.service-BucBo1
drwx----- 3 root root 60 map 8 19:05 systemd-private-bdf2fc000b254a78c16eb54138a3618-pa1k1t.service-uH0ng1
drwx----- 3 root root 60 map 8 19:05 systemd-private-bdf2fc000b254a78c16eb54138a3618-power-profiles-daemon.service-I1mb1
drwx----- 3 root root 60 map 8 19:05 systemd-private-bdf2fc000b254a78c16eb54138a3618-rtkit-daemon.service-J2v8P
drwx----- 3 root root 60 map 8 19:05 systemd-private-bdf2fc000b254a78c16eb54138a3618-switcheroo-control.service-uKv4u0
drwx----- 3 root root 60 map 8 19:05 systemd-private-bdf2fc000b254a78c16eb54138a3618-systemd-logind.service-2P0Z9b
drwx----- 3 root root 60 map 8 19:05 systemd-private-bdf2fc000b254a78c16eb54138a3618-systemd-oomd.service-chL353
drwx----- 3 root root 60 map 8 19:05 systemd-private-bdf2fc000b254a78c16eb54138a3618-systemd-resolved.service-SK4rm1
drwx----- 2 root root 40 map 8 19:05 systemd-private-bdf2fc000b254a78c16eb54138a3618-upower.service-kly8W
drwx----- 2 root root 40 map 8 19:05 vmware-root_067-3388621019
```

Рис. 4: Команда ls -l

Опции команды ls

```
rrahmarov@rrahmarov: /tmp$ ls -f
..
systemd-private-8df2fc000b254af78c16eb54138a3618-fwupd.service-qgKH04
.X1-lock
.X0-lock
systemd-private-8df2fc000b254af78c16eb54138a3618-colord.service-yVrojT
.X1025-lock
.X1024-lock
dbus-jRi3Qak9
dbus-q3aLga84
systemd-private-8df2fc000b254af78c16eb54138a3618-ModemManager.service-Bmc0oI
vmware-root_867-3988621819
systemd-private-8df2fc000b254af78c16eb54138a3618-upower.service-kIy8nW
systemd-private-8df2fc000b254af78c16eb54138a3618-systemd-logind.service-2P8Z9b
systemd-private-8df2fc000b254af78c16eb54138a3618-switcheroo-control.service-wKV4m9
systemd-private-8df2fc000b254af78c16eb54138a3618-rtkit-daemon.service-jZvRF
systemd-private-8df2fc000b254af78c16eb54138a3618-power-profiles-daemon.service-IlinbI
systemd-private-8df2fc000b254af78c16eb54138a3618-polkit.service-whBmQi
systemd-private-8df2fc000b254af78c16eb54138a3618-low-memory-monitor.service-B3LWiA
systemd-private-8df2fc000b254af78c16eb54138a3618-chronyd.service-vhq2ZB
systemd-private-8df2fc000b254af78c16eb54138a3618-dbus-broker.service-WCBydv
systemd-private-8df2fc000b254af78c16eb54138a3618-systemd-resolved.service-6K4rmI
systemd-private-8df2fc000b254af78c16eb54138a3618-systemd-oomd.service-cNl353
.font-unix
.XIM-unix
.ICE-unix
.X11-unix
rrahmarov@rrahmarov: /tmp$
```

Рис. 5: Команда ls -f

```
rrahmarov@rrahmarov: /tmp$  
rrahmarov@rrahmarov: /tmp$ cd /var/spool/  
rrahmarov@rrahmarov: /var/spool$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 1438 мар  8 19:03 abrt  
drwx----- 1 abrt abrt   0 июл 19 2023 abrt-upload  
drwx--x--- 1 root lp      6 ноя  1 04:09 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  
rrahmarov@rrahmarov: /var/spool$
```

Рис. 6: Каталог /var/spool

```
rrahmarov@rrahmarov: /var/spool$ cd
rrahmarov@rrahmarov: $ ls
git-extended work Видео Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны
rrahmarov@rrahmarov: $ ls -al
итого 20
drwx----- 1 rrahmarov rrahmarov 498 мар 2 21:03 .
drwxr-xr-x 1 root root 1216 мар 8 17:48 ..
-rw----- 1 rrahmarov rrahmarov 1445 мар 2 21:14 .bash_history
-rw-r--r-- 1 rrahmarov rrahmarov 18 июл 19 2023 .bash_logout
-rw-r--r-- 1 rrahmarov rrahmarov 144 июл 19 2023 .bash_profile
-rw-r--r-- 1 rrahmarov rrahmarov 679 мар 2 21:03 .bashrc
drwx----- 1 rrahmarov rrahmarov 418 мар 2 21:06 .cache
drwx----- 1 rrahmarov rrahmarov 424 мар 2 21:06 .config
-rw-r--r-- 1 rrahmarov rrahmarov 234 фев 27 12:08 .gitconfig
drwxr-xr-x 1 rrahmarov rrahmarov 74 мар 2 21:09 git-extended
drwx----- 1 rrahmarov rrahmarov 136 фев 20 18:01 .gnupg
drwx----- 1 rrahmarov rrahmarov 20 фев 20 09:54 .local
drwxr-xr-x 1 rrahmarov rrahmarov 48 фев 20 18:02 .mozilla
drwx----- 1 rrahmarov rrahmarov 132 фев 20 18:05 .ssh
drwxr-xr-x 1 rrahmarov rrahmarov 10 фев 20 18:05 work
drwxr-xr-x 1 rrahmarov rrahmarov 0 фев 20 09:54 Видео
drwxr-xr-x 1 rrahmarov rrahmarov 0 фев 20 09:54 Документы
drwxr-xr-x 1 rrahmarov rrahmarov 0 фев 20 09:54 Загрузки
drwxr-xr-x 1 rrahmarov rrahmarov 0 фев 20 09:54 Изображения
drwxr-xr-x 1 rrahmarov rrahmarov 0 фев 20 09:54 Музыка
drwxr-xr-x 1 rrahmarov rrahmarov 0 фев 20 09:54 Общедоступные
drwxr-xr-x 1 rrahmarov rrahmarov 0 фев 20 09:54 'Рабочий стол'
drwxr-xr-x 1 rrahmarov rrahmarov 0 фев 20 09:54 Шаблоны
rrahmarov@rrahmarov: $
```

Рис. 7: Файлы в домашнем каталоге

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

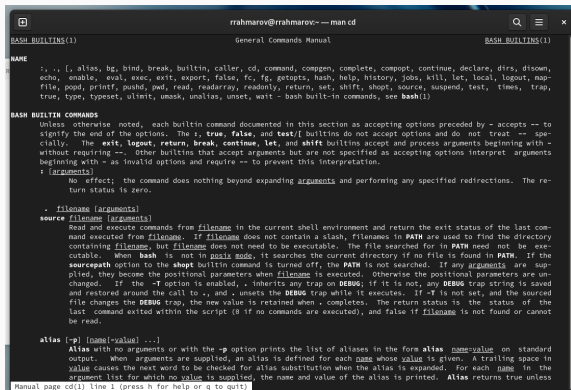
Рис. 8: Действия с каталогами

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

Рис. 9: Команда ls -R и ls -t

Справка по командам



```
rrahmarov@rrahmarov:~$ 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, job, kill, let, local, logout, map-
file, popd, printf, pushd, pwd, read, readarray, readonly, return, set, shift, shopt, source, suspend, test, times, trap,
true, type, typeset, ulimit, umask, unalias, unset, wait - bash built-in commands, see bash(1)

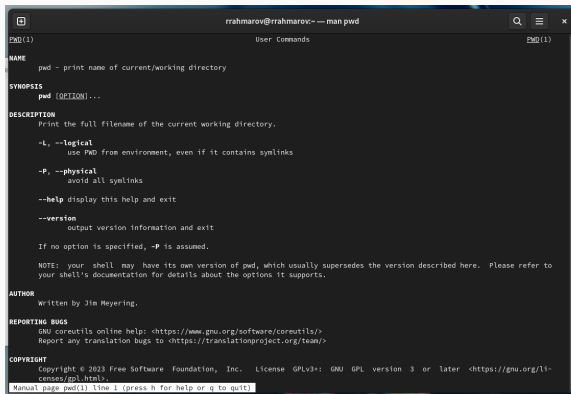
BASH BUILTIN COMMANDS
Unless otherwise noted, each builtin command documented in this section as accepting options preceded by - accepts -- to
signify the end of the options. The :, true, false, and test/[ builtins do not accept options and do not treat -- specially.
The exit, logout, return, break, 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 re-
    turn 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 com-
    mand executed 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 exe-
    cutable. When hash 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 sup-
    plied, they become the positional parameters when filename is executed. Otherwise the positional parameters are un-
    changed. 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
    Manual page cd(1) line 1 (press h for help or q to quit)
```

Рис. 10: Справка по команде cd



```
rrahmarov@rrahmarov:~ — 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.

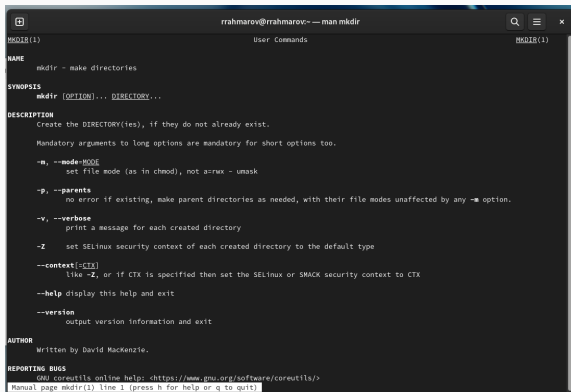
AUTHOR
  Written by Jim Meyering.

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

Справка по командам



```
rrahmarov@rrahmarov:~$ 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

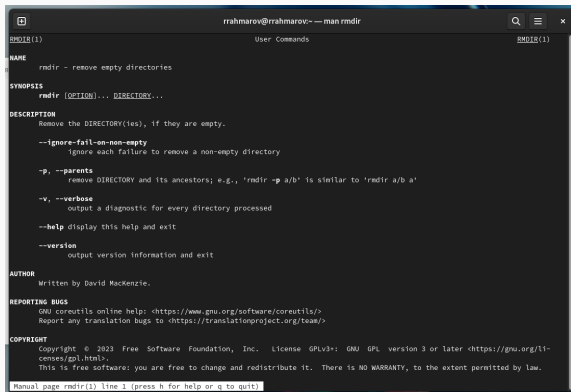
  --version
      output version information and exit

AUTHOR
  Written by David MacKenzie.

REPORTING BUGS
  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
  Manual page mkdir(1) line 1 (press h for help or q to quit)
```

Рис. 12: Справка по команде mkdir

Справка по командам



```
rrahmarov@rrahmarov:~ — 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.

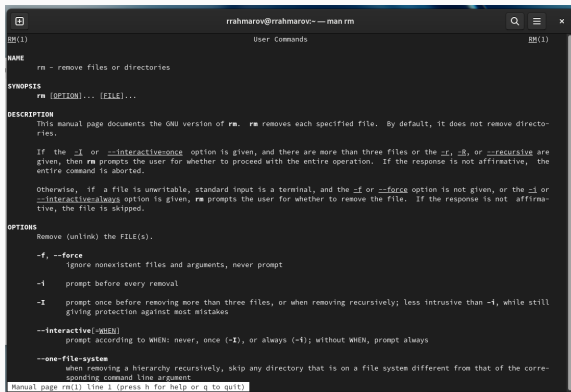
REPORTING BUGS
  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
  Report any translation bugs to <https://translationproject.org/team/>

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

Рис. 13: Справка по команде rmdir

Справка по командам



```
rrahmarov@rrahmarov:~ — man rm
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 -f, -B, 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

```
66 ls -al
67 mkdir newdir
68 mkdir newdir/morefun
69 mkdir letters memos misk
70 ls
71 rm letters/ memos/ misk/
72 rm -r letters/ memos/ misk/
73 rm -r newdir/
74 ls
75 ls -R
76 ls -t
77 ls -R
78 ls -t
79 man cd
80 man pwd
81 man mkdir
82 man rmdir
83 man rm
84 history
rrahmarov@rrahmarov:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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