

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

Алина Молокова¹

10 марта, 2024, Москва, Россия

¹Российский Университет Дружбы Народов

Цели и задачи работы

Цель лабораторной работы

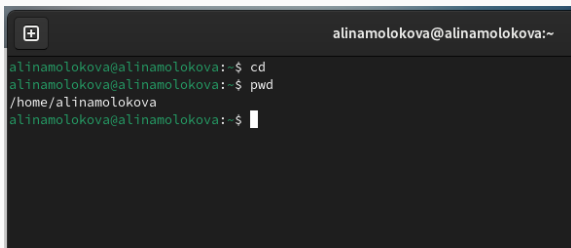
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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



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

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
alinalokova@alinalokova:~$ cd /tmp
alinalokova@alinalokova:/tmp$ ls
dbus-Gctnaoyp
dbus-NGKXJEWE
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-chrond.service-VL40x1
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-colord.service-aleQX0
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-dbus-broker.service-fc5I7e
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-fwupd.service-CHs2ze
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-low-memory-monitor.service-pEQ6A3
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-ModemManager.service-xYlrEs
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-polkit.service-LWP5zW
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-power-profiles-daemon.service-yg1ZDL
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-rtkit-daemon.service-2F6qSu
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-switcheroo-control.service-AhwrUw
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-systemd-logind.service-FXvDG9
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-systemd-oomd.service-PSDBXN
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-systemd-resolved.service-WflouU
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-upower.service-4y5vY2
vmware-root_919-4013854454
alinalokova@alinalokova:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
alinalokova@alinalokova:/tmp$ ls -la
.
..
dbus-Gctnaoyy
dbus-NGKXJEwE
.font-unix
.ICE-unix
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-chrond.service-Vl40x1
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-colord.service-aieQX0
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-dbus-broker.service-fc5I7e
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-fwupd.service-CHs2ze
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-low-memory-monitor.service-pEQ6A3
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-ModemManager.service-xYlrEs
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-polkit.service-LWP5zW
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-power-profiles-daemon.service-yg1ZDL
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-rtkit-daemon.service-2F6qSu
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-switcheroo-control.service-AhwrUw
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-systemd-logind.service-FXvDG9
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-systemd-oomd.service-PSD8XN
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-systemd-resolved.service-WflouU
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-upower.service-4y5vYZ
vmware-root_919-4013854454
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
alinalokova@alinalokova:/tmp$
```

Рис. 3: Команда ls -la

Опции команды ls

```
altnamokovaga@linamokovaz:~$ps
altnamokovaga@linamokovaz:~$ps$ ls -l
итого 0
srw-rw-rw-. 1 root root 0 map 10 12:28 dbus-Gctnaoyp
srw-rw-rw-. 1 root root 0 map 10 12:28 dbus-HGKX3bWt
drwx----- 3 root root 60 map 10 12:28 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-chromyd.service-V140x1
drwx----- 3 root root 60 map 10 12:28 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-colored.service-aiQX0
drwx----- 3 root root 60 map 10 12:28 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-dbus-broker.service-fc5I7e
drwx----- 3 root root 60 map 10 12:30 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-fwupd.service-Chs2ze
drwx----- 3 root root 60 map 10 12:28 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-low-memory-monitor.service-pEQ6A3
drwx----- 3 root root 60 map 10 12:28 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-NodeManager.service-xVLEs
drwx----- 3 root root 60 map 10 12:28 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-polkit.service-WP5zW
drwx----- 3 root root 60 map 10 12:28 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-power-profiles-daemon.service-yg1Z0L
drwx----- 3 root root 60 map 10 12:28 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-rfkill-daemon.service-27qJW
drwx----- 3 root root 60 map 10 12:28 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-switcheroo-control.service-4hrbw
drwx----- 3 root root 60 map 10 12:28 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-systemd-logind.service-FxvG63
drwx----- 3 root root 60 map 10 12:28 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-systemd-nond.service-PSDBXN
drwx----- 3 root root 60 map 10 12:28 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-systemd-resolved.service-WfLowd
drwx----- 3 root root 60 map 10 12:28 systemd-private-0122f1b49fd14b1c88b3ca943a4b018-upower.service-4y5vYZ
drwx----- 2 root root 40 map 10 12:28 vmware-root_919-4013854454
altnamokovaga@linamokovaz:~$ps$
```

Рис. 4: Команда ls -l

Опции команды ls

```
alinamolokova@alinamolokova: /tmp$ ls -f
..
.X11-unix
.ICE-unix
.XIM-unix
.font-unix
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-systemd-oomd.service-PSDBXN
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-systemd-resolved.service-WfLouU
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-dbus-broker.service-fc5I7e
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-chronyd.service-Vl40x1
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-low-memory-monitor.service-pEQ6A3
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-polkit.service-LWP5zW
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-power-profiles-daemon.service-yg1ZDL
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-rtkit-daemon.service-2F6qSu
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-switcheroo-control.service-AhwrUw
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-systemd-logind.service-FXvDG9
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-upower.service-4y5vYZ
vmware-root_919-4013854454
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-ModemManager.service-xYlrEs
dbus-GctnaoyP
dbus-NGKXJEW
.X1024-lock
.X1025-lock
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-colord.service-aleQX0
.X0-lock
.X1-lock
systemd-private-0122f1b49fd14b1c88b3c4a943a4b018-fwupd.service-CHS2ze
alinamolokova@alinamolokova: /tmp$
```

Рис. 5: Команда ls -f

```
alinamolokova@alinamolokova:~/tmp$  
alinamolokova@alinamolokova:~/tmp$ cd /var/spool/  
alinamolokova@alinamolokova:/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  
alinamolokova@alinamolokova:/var/spool$
```

Рис. 6: Каталог /var/spool

```
alinamolokova@alinamolokova:~/var/spool$  
alinamolokova@alinamolokova:/var/spool$ cd  
alinamolokova@alinamolokova:~$ ls  
git-extended  work  Видео  Документы  Загрузки  Изображения  Музыка  Общедоступные  'Ра  
alinamolokova@alinamolokova:~$ ls -al  
итого 20  
drwx-----, 1 alinamolokova alinamolokova 498 мар 4 11:52 .  
drwxr-xr-x, 1 root root 1216 мар 8 17:40 ..  
-rw-----, 1 alinamolokova alinamolokova 2742 мар 4 11:52 .bash_history  
-rw-r--r--, 1 alinamolokova alinamolokova 18 июл 19 2023 .bash_logout  
-rw-r--r--, 1 alinamolokova alinamolokova 144 июл 19 2023 .bash_profile  
-rw-r--r--, 1 alinamolokova alinamolokova 683 мар 4 11:41 .bashrc  
drwx-----, 1 alinamolokova alinamolokova 462 мар 10 12:30 .cache  
drwx-----, 1 alinamolokova alinamolokova 402 мар 4 11:42 .config  
-rw-r--r--, 1 alinamolokova alinamolokova 237 мар 4 11:52 .gitconfig  
drwxr-xr-x, 1 alinamolokova alinamolokova 74 мар 4 11:45 git-extended  
drwx-----, 1 alinamolokova alinamolokova 136 фев 26 12:13 .gnupg  
drwx-----, 1 alinamolokova alinamolokova 20 фев 26 12:07 .local  
drwxr-xr-x, 1 alinamolokova alinamolokova 48 фев 26 12:07 .mozilla  
drwx-----, 1 alinamolokova alinamolokova 132 фев 26 12:16 .ssh  
drwxr-xr-x, 1 alinamolokova alinamolokova 10 фев 26 12:15 work  
drwxr-xr-x, 1 alinamolokova alinamolokova 0 фев 26 12:07 Видео  
drwxr-xr-x, 1 alinamolokova alinamolokova 0 фев 26 12:07 Документы  
drwxr-xr-x, 1 alinamolokova alinamolokova 0 фев 26 12:07 Загрузки
```

Рис. 7: Файлы в домашнем каталоге

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

Рис. 8: Действия с каталогами

Опции команды ls

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

Рис. 9: Команда ls -R и ls -t

Справка по командам

```
alinamolokova@alinamolokova:~$ man cd
BASH_BUILTINS(1)          General Commands Manual          BASH_BUILTINS(1)

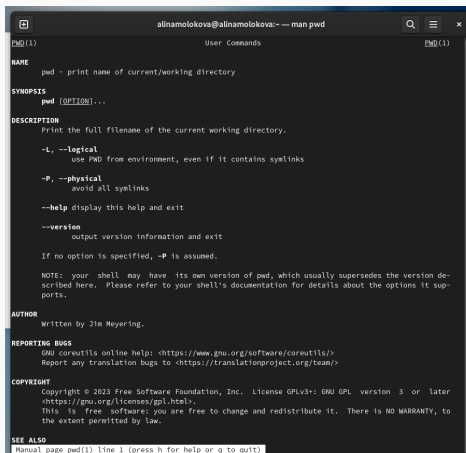
NAME
: , , [, alias, bg, bind, break, builtin, caller, cd, command, compgen, complete, compopt, con-
tinue, declare, dirs, disown, echo, enable, eval, exec, exit, false, fg, fg, getopts,
hash, help, history, jobs, kill, let, local, logout, mapfile, popd, printf, pushd, pwd, read,
readarray, readonly, return, set, shift, shopt, source, suspend, test, times, trap, true, type,
typeset, ulimit, 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 requir-
ing --. Other builtins that accept arguments but are not specified as accepting options inter-
pret arguments beginning with - as invalid options and require -- to prevent this interpreta-
tion.
: [arguments]
    No effect; the command does nothing beyond expanding arguments and performing any speci-
    fied 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 containing filename, but file-
name does not need to be executable. The file searched for in PATH need not be exe-
    cutable. 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 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 exe-
    cuted 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
    Manual page cd(1) line 1 (press h for help or q to quit)
```

Рис. 10: Справка по команде cd



```
alinamolokova@alinamolokova:~ — man pwd
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 de-
  scribed here. Please refer to your shell's documentation for details about the options it sup-
  ports.

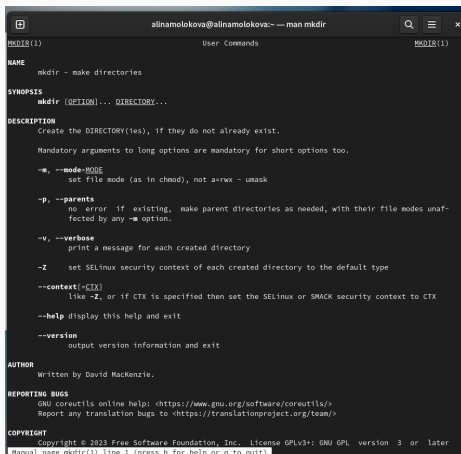
AUTHOR
  Written by Jim Meyerling.

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.

SEE ALSO
  Manual page pwd(1) line 1 (press h for help or q to quit)
```

Рис. 11: Справка по команде pwd



```
alinalokolova@alinalokolova:~ -- 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

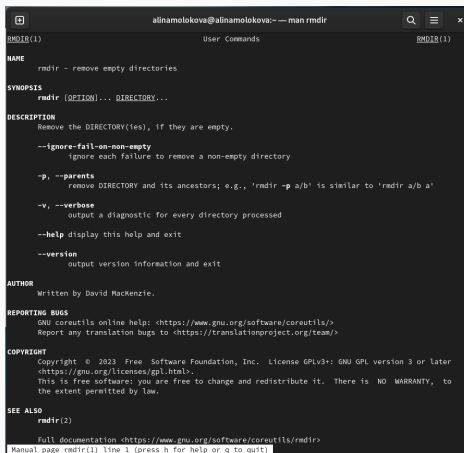
    --version
        output version information and exit

AUTHOR
    Written by David MacKenzie.

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

COPYRIGHT
    Copyright © 2023 Free Software Foundation, Inc.  License GPLv3+: GNU GPL version 3 or later
    Manual page mkdir(1) line 1 (press h for help or q to quit)
```

Рис. 12: Справка по команде mkdir



```
alinamolokova@alinamolokova:~ -- 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.

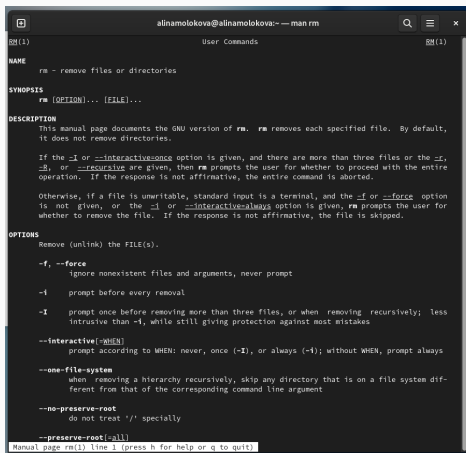
REPORTING BUGS
  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
  Report any translation bugs to <https://translationproject.org/team/>

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.

SEE ALSO
  rmdir(2)

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

Рис. 13: Справка по команде rmdir



```
alinamolokova@alinamolokova:~ -- man rm
User Commands

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 -I, -d, 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]
Manual page rm(1) line 1 (press h for help or q to quit)
```

Рис. 14: Справка по команде rm

История командной строки

```
113 ls -r
114 cd /var/spool/
115 ls -l
116 mkdir newdir
117 cd
118 ls
119 ls -al
120 mkdir newdir
121 mkdir newdir/morefun
122 mkdir letters memos misk
123 ls
124 rm letters/ memos/ misk/
125 rm -r letters/ memos/ misk/
126 rm -r newdir/
127 ls
128 ls -R
129 ls -t
130 man cd
131 man pwd
132 man mkdir
133 man rmdir
134 history
alinamolokova@alinamolokova:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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