

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

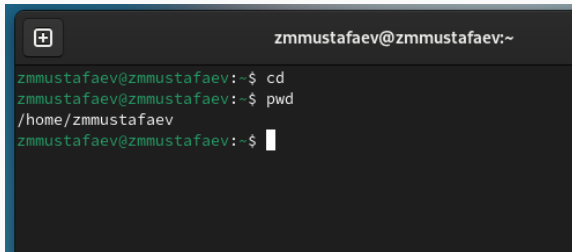
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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



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

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
zmmustafaev@zmmustafaev:~$ cd /tmp
zmmustafaev@zmmustafaev:/tmp$ ls
dbus-FNEkAD0n
dbus-SUpCUGvL
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-chrond.service-qPUUe1
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-colord.service-374WyX
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-dbus-broker.service-51Vye0
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-fwupd.service-sD9QI8
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-low-memory-monitor.service-8v0rmc
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-ModemManager.service-9rCEat
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-polkit.service-I2tHiF
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-power-profiles-daemon.service-Z7tXam
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-rtkit-daemon.service-dPBC75
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-switcheroo-control.service-80WRVe
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-systemd-hostnamed.service-UYh6jb
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-systemd-logind.service-zK5f7K
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-systemd-oomd.service-TPIAti
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-systemd-resolved.service-6U6L2n
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-upower.service-RGu8zi
vmware-root_919-4013854454
zmmustafaev@zmmustafaev:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
zmmustafaev@zmmustafaev:/tmp$ ls -la
..
dbus-FNEkAD0n
dbus-SUPcUgVL
.font-unix
.ICE-unix
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-chronyd.service-qPUUe1
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-colord.service-374WYX
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-dbus-broker.service-51Vye0
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-fwupd.service-s09QI8
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-low-memory-monitor.service-8v0rmc
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-ModemManager.service-9rCEat
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-polkit.service-I2tHfF
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-power-profiles-daemon.service-Z7tXam
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-rtkit-daemon.service-dPBC7S
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-switcheroo-control.service-00WRVv
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-systemd-logind.service-zK5f7K
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-systemd-oomd.service-TPIAti
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-systemd-resolved.service-6U6L2n
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-upower.service-RGu8zi
vmware-root_919-4013854454
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
zmmustafaev@zmmustafaev:/tmp$
```

Рис. 3: Команда ls -a

Опции команды ls

```
zmmustafaev@zmmustafaev: /tmp$ ls -l
итого 0
-rw-rw-r--. 1 root root 0 map 12 10:59 dbus-FHEkADon
-rw-rw-r--. 1 root root 0 map 12 10:59 dbus-SUpCUpVL
drwx----- 3 root root 60 map 12 10:59 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-chrpyd.service-qPUuEl
drwx----- 3 root root 60 map 12 10:59 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-colored.service-374MyX
drwx----- 3 root root 60 map 12 10:59 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-dbus-broker.service-51Vye0
drwx----- 3 root root 60 map 12 11:02 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-fuupd.service-sD9QIR
drwx----- 3 root root 60 map 12 10:59 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-low-memory-monitor.service-8v8rac
drwx----- 3 root root 60 map 12 10:59 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-hodemanager.service-9rcEat
drwx----- 3 root root 60 map 12 10:59 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-polkit.service-12UHf
drwx----- 3 root root 60 map 12 10:59 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-power-profiles-daemon.service-2ltxam
drwx----- 3 root root 60 map 12 10:59 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-rikkit-daemon.service-dP8C75
drwx----- 3 root root 60 map 12 10:59 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-switcheroo-control.service-90MRVc
drwx----- 3 root root 60 map 12 10:59 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-systemd-logind.service-zK577K
drwx----- 3 root root 60 map 12 10:59 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-systemd-oomd.service-TP1At1
drwx----- 3 root root 60 map 12 10:59 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-systemd-resolved.service-6UGL2n
drwx----- 3 root root 60 map 12 10:59 systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-upower.service-R6uZri
drwx----- 2 root root 40 map 12 10:59 vmware-root_919-4013554454
zmmustafaev@zmmustafaev: /tmp$
```

Рис. 4: Команда ls -l

Опции команды ls

```
zmmustafaev@zmmustafaev: /tmp$  
zmmustafaev@zmmustafaev: /tmp$ ls -f  
.  
..  
.X11-unix  
.ICE-unix  
.XIM-unix  
.font-unix  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-systemd-oomd.service-TPIAti  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-systemd-resolved.service-6U6L2n  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-dbus-broker.service-51Vye0  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-chrond.service-qPUUe1  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-low-memory-monitor.service-8v0rmc  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-polkit.service-I2tMiF  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-power-profiles-daemon.service-Z7tXam  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-rtkit-daemon.service-dPBC7S  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-switcheroo-control.service-00WRVe  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-systemd-logind.service-zK5f7K  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-upower.service-RGu8zi  
vmware-root_919-4013854454  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-ModemManager.service-9rcEat  
dbus-SUpCUgVL  
dbus-FNEkAD0n  
.X1024-lock  
.X1025-lock  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-colord.service-J74WyX  
.X0-lock  
.X1-lock  
systemd-private-1c21f75f44b24e858bd379cd6eacfb6f-fwupd.service-sD9QI8  
zmmustafaev@zmmustafaev: /tmp$
```

Рис. 5: Команда ls -f

```
zmmustafaev@zmmustafaev:~/tmp$  
zmmustafaev@zmmustafaev:/tmp$ cd /var/spool/  
zmmustafaev@zmmustafaev:/var/spool$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 1510 мар 11 12:08 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  
zmmustafaev@zmmustafaev:/var/spool$
```

Рис. 6: Каталог /var/spool

Домашний каталог

```
zmmustafaev@zmmustafaev:~/var/spool$ cd
zmmustafaev@zmmustafaev:~$ ls
git-extended  Видео  Загрузки  Музыка  'Рабочий стол'
work         Документы  Изображения  Общедоступные  Шаблоны
zmmustafaev@zmmustafaev:~$ ls -al
итого 20
drwx----- 1 zmmustafaev zmmustafaev 498 мар 6 10:55 .
drwxr-xr-x 1 root root 1216 мар 8 17:40 ..
-rw----- 1 zmmustafaev zmmustafaev 1165 мар 6 10:59 .bash_history
-rw-r--r-- 1 zmmustafaev zmmustafaev 18 июл 19 2023 .bash_logout
-rw-r--r-- 1 zmmustafaev zmmustafaev 144 июл 19 2023 .bash_profile
-rw-r--r-- 1 zmmustafaev zmmustafaev 681 мар 6 10:43 .bashrc
drwx----- 1 zmmustafaev zmmustafaev 452 мар 12 11:02 .cache
drwx----- 1 zmmustafaev zmmustafaev 402 мар 6 10:44 .config
-rw-r--r-- 1 zmmustafaev zmmustafaev 235 мар 6 10:55 .gitconfig
drwxr-xr-x 1 zmmustafaev zmmustafaev 74 мар 6 10:46 git-extended
drwx----- 1 zmmustafaev zmmustafaev 136 мар 1 10:36 .gnupg
drwx----- 1 zmmustafaev zmmustafaev 20 мар 1 10:29 .local
drwxr-xr-x 1 zmmustafaev zmmustafaev 48 мар 1 10:29 .mozilla
drwx----- 1 zmmustafaev zmmustafaev 132 мар 1 10:38 .ssh
drwxr-xr-x 1 zmmustafaev zmmustafaev 10 мар 1 10:38 work
drwxr-xr-x 1 zmmustafaev zmmustafaev 0 мар 1 10:29 Видео
drwxr-xr-x 1 zmmustafaev zmmustafaev 0 мар 1 10:29 Документы
drwxr-xr-x 1 zmmustafaev zmmustafaev 0 мар 1 10:29 Загрузки
drwxr-xr-x 1 zmmustafaev zmmustafaev 0 мар 1 10:29 Изображения
drwxr-xr-x 1 zmmustafaev zmmustafaev 0 мар 1 10:29 Музыка
drwxr-xr-x 1 zmmustafaev zmmustafaev 0 мар 1 10:29 Общедоступные
drwxr-xr-x 1 zmmustafaev zmmustafaev 0 мар 1 10:29 'Рабочий стол'
drwxr-xr-x 1 zmmustafaev zmmustafaev 0 мар 1 10:29 Шаблоны
zmmustafaev@zmmustafaev:~$
```

Рис. 7: Файлы в домашнем каталоге

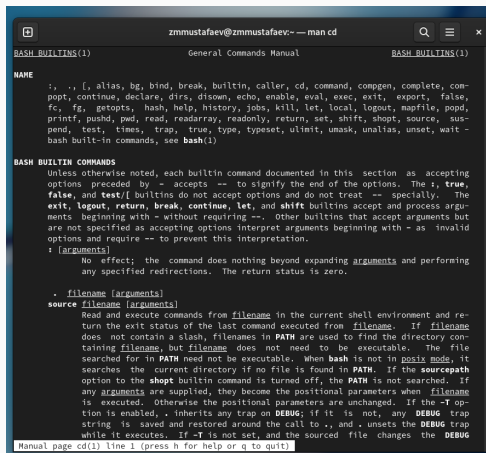
```
zmmustafaev@zmmustafaev:~$  
zmmustafaev@zmmustafaev:~$ mkdir newdir  
zmmustafaev@zmmustafaev:~$ mkdir newdir/morefun  
zmmustafaev@zmmustafaev:~$ mkdir letters memos misk  
zmmustafaev@zmmustafaev:~$ ls  
git-extended  memos  newdir  Видео  Загрузки  Музыка  'Рабочий стол'  
letters       misk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

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

Рис. 9: Команда ls -R и ls -t



```
zmmustafaev@zmmustafaev:~ — man cd
BASH_BUILTINS(1)      General Commands Manual      BASH_BUILTINS(1)

NAME
; ., [, alias, bg, bind, break, builtin, caller, cd, command, compgen, complete, com-
popt, 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, sus-
pend, test, times, trap, true, type, typeset, ulimit, umask, unalias, unset, wait -
bash built-in commands, see bash(1)

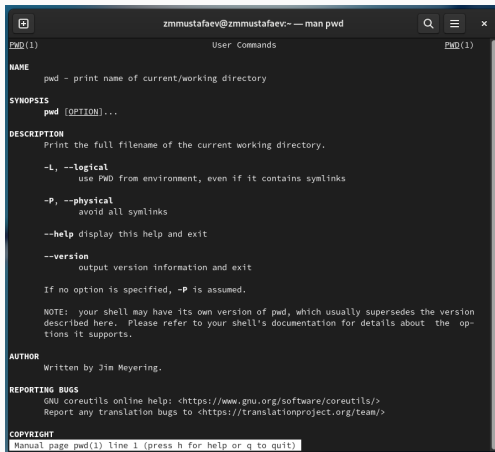
BASH BUILTIN COMMANDS
Unless otherwise noted, each builtin command documented in this section as accepting
options preceded by - accepts -- to signify the end of the options. The :, true,
false, and test/[ builtins do not accept options and do not treat -- specially. The
exit, logout, return, break, continue, let, and shift builtins accept and process argu-
ments 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 re-
    turn 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
    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 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
    Manual page cd(1) line 1 (press h for help or q to quit)
```

Рис. 10: Справка по команде cd

Справка по командам



```
zmmustafaev@zmmustafaev:~ -- 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.

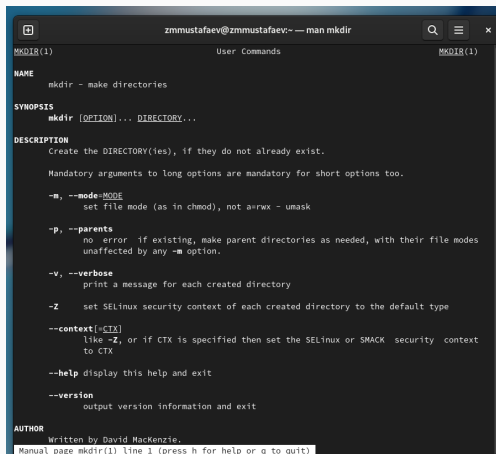
NOTE: your shell may have its own version of pwd, which usually supersedes the version
described here. Please refer to your shell's documentation for details about the options
it supports.

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

Рис. 11: Справка по команде pwd



```
zmmustafaev@zmmustafaev:~ -- 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

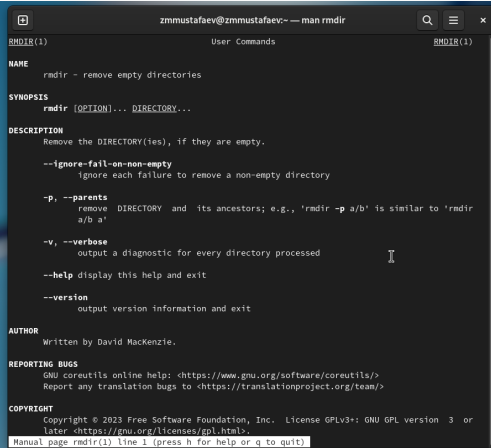
  --help display this help and exit

  --version
        output version information and exit

AUTHOR
  Written by David MacKenzie.

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

Рис. 12: Справка по команде mkdir



```
zmmustafaev@zmmustafaev:~ -- 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

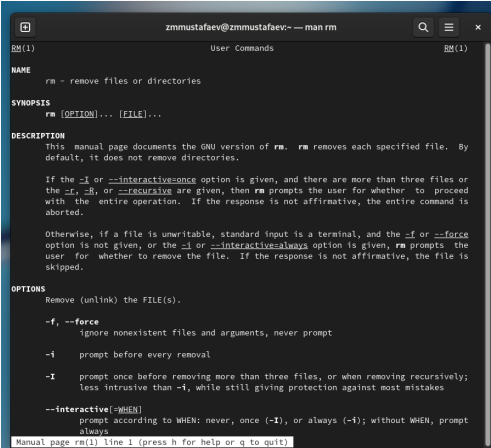
  --version
      output version information and exit

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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  later <https://gnu.org/licenses/gpl.html>.
  Manual page rmdir(1) line 1 (press h for help or q to quit)
```

Рис. 13: Справка по команде rmdir



```
zmmustafaev@zmmustafaev:~ -- 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

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

Рис. 14: Справка по команде rm

История командной строки

```
45 ls
46 ls -al
47 mkdir newdir
48 mkdir newdir/morefun
49 mkdir letters memos misk
50 ls
51 rm letters/ memos/ misk/
52 rm -r letters/ memos/ misk/
53 rm -r newdir/
54 ls
55 ls -R
56 ls -t
57 man cd
58 man wd
59 man pwd
60 man mkdir
61 man rmdir
62 man rm
63 history
zmmustafaev@zmmustafaev:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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