

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

дисциплина: Операционные системы

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Вводная часть

Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

- Определить имя и путь домашнего каталога
- Изучить команду `ls`.
- Выполнить действия с каталогами.
- Получить дополнительные сведения при помощи справки по командам.
- Изучить команду `history`.

Процесс выполнения лабораторной работы



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

A terminal window with a dark background. The title bar at the top shows a window icon on the left and the text 'kpletyago@kpletyago:~' on the right. The terminal content shows a series of commands and their output: 'cd' is entered, followed by 'pwd', which outputs '/home/kpletyago'. A new prompt line is visible at the bottom.

Рис. 1: Путь к домашнему каталогу


```
kpletyago@kpletyago:~$  
kpletyago@kpletyago:~$ cd /tmp  
kpletyago@kpletyago:/tmp$ ls  
dbus-j8jcbacM  
dbus-MDvKaP9A  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-chronyd.service-VePVMg  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-colord.service-wRNQmP  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-dbus-broker.service-lZhFqQ  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-fwupd.service-Hhxq9n  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-low-memory-monitor.service-T2YcSE  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-ModemManager.service-56skpx  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-polkit.service-uCmBIF  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-power-profiles-daemon.service-aiU2wA  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-rtkit-daemon.service-Mob68n  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-switcheroo-control.service-dtfYnq  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-systemd-logind.service-PrXrqC  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-systemd-oomd.service-OeDDCa  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-systemd-resolved.service-ZUibKh  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-upower.service-dcSyHS  
vmware-root_873-4013854327  
kpletyago@kpletyago:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
kpletyago@kpletyago:~$ cd /tmp
kpletyago@kpletyago:/tmp$ ls -la
.
..
dbus-j8jcbacM
dbus-MDvKaP9A
.font-unix
.ICE-unix
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-chronyd.service-VePVMg
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-color.service-wRNQmP
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-dbus-broker.service-lZhFqQ
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-fwupd.service-Hhxq9n
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-low-memory-monitor.service-T2YcSE
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-ModemManager.service-56skpx
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-polkit.service-uCmBIF
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-power-profiles-daemon.service-aiU2wA
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-rtkit-daemon.service-Mob68n
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-switcheroo-control.service-dtfYnq
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-systemd-logind.service-PrXrqC
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-systemd-oemd.service-0eDDCa
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-systemd-resolved.service-ZUibKh
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-upower.service-dcSyHS
vmware-root_873-4013854327
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
kpletyago@kpletyago:/tmp$
```

Рис. 3: Команда ls -la

Опции команды ls

```
kpletyago@kpletyago: /tmp$ ls -l
итого 0
srw-rw-rw-. 1 root root 0 map 7 10:41 dbus-j8jcbacM
srw-rw-rw-. 1 root root 0 map 7 10:41 dbus-MDvKaP9A
drwx----- 3 root root 60 map 7 10:41 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-chronyd.service-Ve
PVNg
drwx----- 3 root root 60 map 7 10:41 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-colord.service-wRN
QmP
drwx----- 3 root root 60 map 7 10:41 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-dbus-broker.servic
e-lZhFqQ
drwx----- 3 root root 60 map 7 10:43 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-fwupd.service-Hhxq
9n
drwx----- 3 root root 60 map 7 10:41 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-low-memory-monitor
.service-T2Yc5E
drwx----- 3 root root 60 map 7 10:41 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-ModemManager.servi
ce-56skpx
drwx----- 3 root root 60 map 7 10:41 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-polkit.service-uCm
8IF
drwx----- 3 root root 60 map 7 10:41 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-power-profiles-dae
mon.service-aiU2wA
drwx----- 3 root root 60 map 7 10:41 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-rtkit-daemon.servi
ce-Hob68n
drwx----- 3 root root 60 map 7 10:41 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-switcheroo-control
.service-dtfYnq
drwx----- 3 root root 60 map 7 10:41 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-systemd-logind.ser
vice-PrXrQc
drwx----- 3 root root 60 map 7 10:41 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-systemd-oomb.servi
ce-0eDDCa
drwx----- 3 root root 60 map 7 10:41 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-systemd-resolved.s
ervice-ZUibKh
drwx----- 3 root root 60 map 7 10:41 systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-upower.service-dcS
yHS
drwx----- 2 root root 40 map 7 10:41 vmware-root_873-4013854327
kpletyago@kpletyago: /tmp$
```

Рис. 4: Команда ls -l

```
kpletvago@kpletvago:/tmp$  
kpletvago@kpletvago:/tmp$ ls -f  
.  
..  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-fwupd.service-Hhxq9n  
.X1-lock  
.X0-lock  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-colord.service-wRNQmP  
.X1025-lock  
.X1024-lock  
dbus-j8jcbacM  
dbus-MDvKaP9A  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-ModemManager.service-56skpx  
vmware-root_873-4013854327  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-upower.service-dcSyHS  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-systemd-logind.service-PrXrqC  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-switcheroo-control.service-dtFYnq  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-rtkit-daemon.service-Mob68n  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-power-profiles-daemon.service-a1U2wA  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-polkit.service-uCmBIF  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-low-memory-monitor.service-T2YcSE  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-chrond.service-VePVMg  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-dbus-broker.service-lZhFqQ  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-systemd-resolved.service-ZUibKh  
systemd-private-ac2d8ad6dcb347ec92dd48f6198d2999-systemd-oond.service-OeDDCa  
.font-unix  
.XIM-unix  
.ICE-unix  
.X11-unix  
kpletvago@kpletvago:/tmp$
```

Рис. 5: Команда ls -f

```
kpletyago@kpletyago:/tmp$  
kpletyago@kpletyago:/tmp$ cd /var/spool/  
kpletyago@kpletyago:/var/spool$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 1366 мар  7 10:09 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 1178 мар  6 14:27 mail  
drwxr-xr-x. 1 root root    0 июл 21 2023 plymouth  
kpletyago@kpletyago:/var/spool$
```

Рис. 6: Каталог /var/spool

```
kpletyago@kpletyago:/var/spool$  
kpletyago@kpletyago:/var/spool$ cd  
kpletyago@kpletyago:~$ ls  
git-extended  Видео          Загрузки      Музыка        'Рабочий стол'  
work          Документы      Изображения   Общедоступные  Шаблоны  
kpletyago@kpletyago:~$ ls -al  
итого 20  
drwx-----. 1 kpletyago kpletyago 498 мар 1 15:00 .  
drwxr-xr-x. 1 root root 1172 мар 6 14:27 ..  
-rw-----. 1 kpletyago kpletyago 2818 мар 1 15:13 .bash_history  
-rw-r--r--. 1 kpletyago kpletyago 18 июл 19 2023 .bash_logout  
-rw-r--r--. 1 kpletyago kpletyago 144 июл 19 2023 .bash_profile  
-rw-r--r--. 1 kpletyago kpletyago 679 мар 1 14:59 .bashrc  
drwx-----. 1 kpletyago kpletyago 428 мар 1 15:02 .cache  
drwx-----. 1 kpletyago kpletyago 424 мар 1 15:02 .config  
-rw-r--r--. 1 kpletyago kpletyago 234 мар 1 14:59 .gitconfig  
drwxr-xr-x. 1 kpletyago kpletyago 74 мар 1 15:06 git-extended  
drwx-----. 1 kpletyago kpletyago 288 фев 26 11:21 .gnupg  
drwx-----. 1 kpletyago kpletyago 20 фев 10 11:02 .local  
drwxr-xr-x. 1 kpletyago kpletyago 48 фев 10 11:03 .mozilla  
drwx-----. 1 kpletyago kpletyago 132 фев 10 11:20 .ssh  
drwxr-xr-x. 1 kpletyago kpletyago 10 фев 10 11:20 work
```

Рис. 7: Файлы в домашнем каталоге

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

Рис. 8: Действия с каталогами

```
'./work/study/2023-2024/Операционные системы/os-intro/template/report/scripts':
```

```
image-report mpv-shot
```

```
./Видео:
```

```
./Документы:
```

```
./Загрузки:
```

```
./Изображения:
```

```
./Музыка:
```

```
./Общедоступные:
```

```
'./Рабочий стол':
```

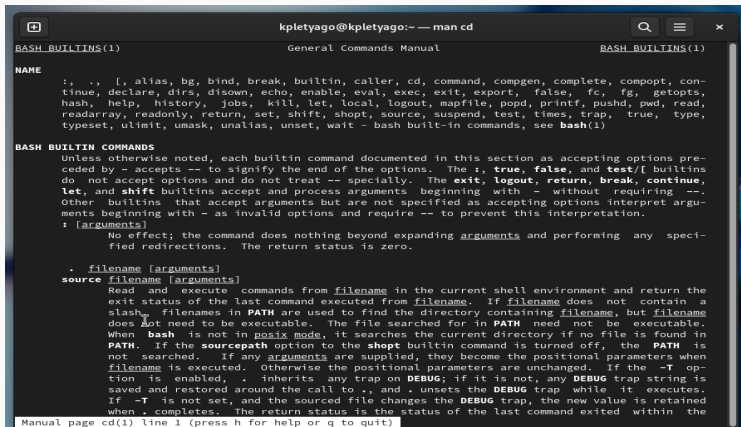
```
./Шаблоны:
```

```
kpletyago@kpletyago:~$ ls -t
```

git-extended	Видео	Загрузки	Музыка	'Рабочий стол'
work	Документы	Изображения	Общедоступные	Шаблоны

```
kpletyago@kpletyago:~$
```

Рис. 9: Команда ls -R и ls -t



```
kpletyago@kpletyago:~ — 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, fc, 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, unalias, unset, wait - bash built-in commands, see bash(1)

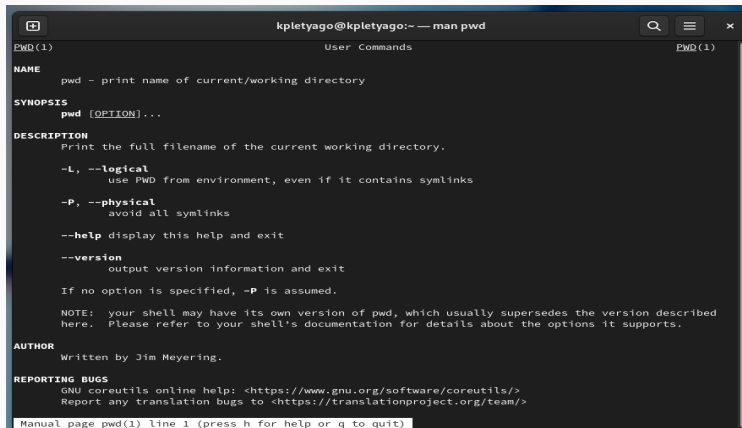
BASH BUILTIN COMMANDS
Unless otherwise noted, each builtin command documented in this section as accepting options preceded by - accepts -- to signify the end of the options. The :, true, false, and test/[ builtins do not accept options and do not treat -- specially. The exit, logout, return, break, 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 containing 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 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

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

Рис. 10: Справка по команде cd



```
kpletyago@kpletyago:~ — 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.

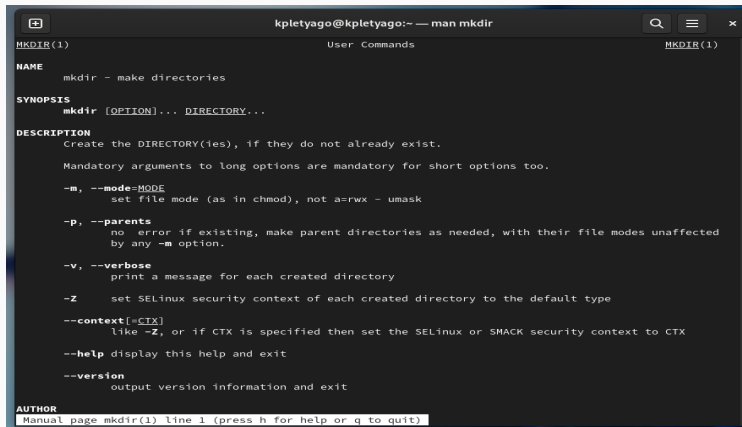
    NOTE: your shell may have its own version of pwd, which usually supersedes the version described
    here. Please refer to your shell's documentation for details about the options it supports.

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/>

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

Рис. 11: Справка по команде pwd



```
kpletyago@kpletyago:~ — 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

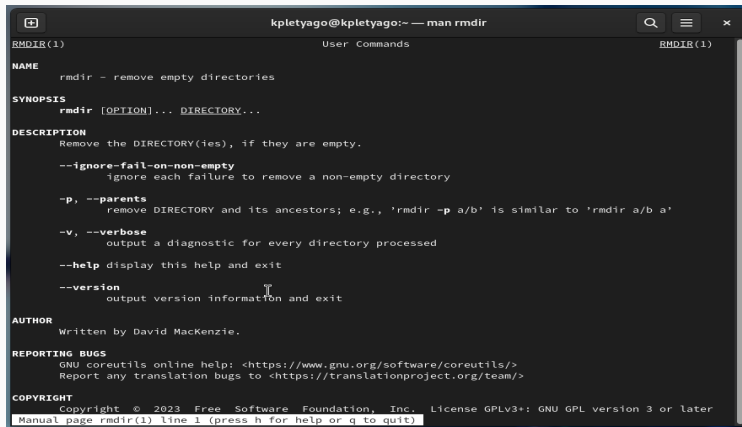
    --context[=CTX]
        like -Z, or if CTX is specified then set the SELinux or SMACK security context to CTX

    --help
        display this help and exit

    --version
        output version information and exit

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

Рис. 12: Справка по команде mkdir



```
kpletyago@kpletyago:~ — 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

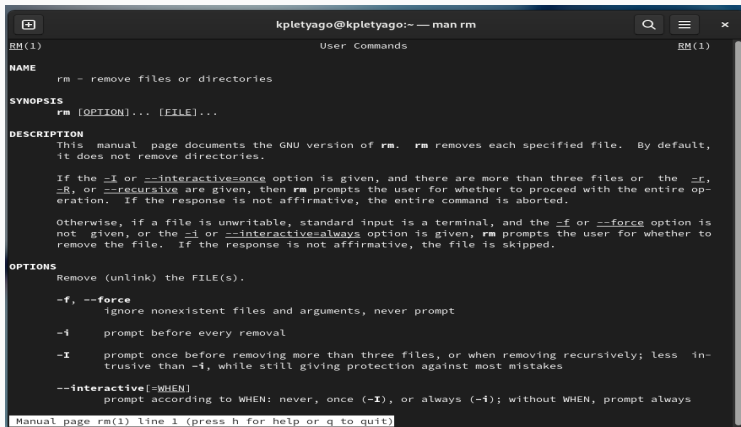
  --version
    output version information and exit

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



```
kpletyago@kpletyago:~ — 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 op-
  eration.  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 in-
    trusive 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

```
109 git push
110 cd
111 pwd
112 cd /tmp
113 ls
114 ls -a
115 ls -l
116 ls -f
117 cd /var/spool/
118 ls -l
119 cd
120 ls
121 ls -al
122 mkdir newdir
123 mkdir newdir/morefun
124 mkdir 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 man rm
135 history
kpletyago@kpletyago:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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