

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

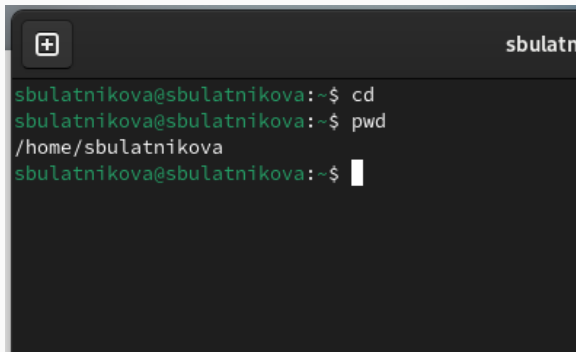
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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



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

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
sbulatnikova@sbulatnikova:~$ cd /tmp
sbulatnikova@sbulatnikova:/tmp$ ls
dbus-8Em34dCc
dbus-KmTeoCtD
systemd-private-fc747cf546974dcc91d7407609ab7385-chronyd.service-Agmegu
systemd-private-fc747cf546974dcc91d7407609ab7385-colord.service-Vf6vAX
systemd-private-fc747cf546974dcc91d7407609ab7385-dbus-broker.service-x4xnPU
systemd-private-fc747cf546974dcc91d7407609ab7385-fwupd.service-VGB9fS
systemd-private-fc747cf546974dcc91d7407609ab7385-low-memory-monitor.service-ft0qbF
systemd-private-fc747cf546974dcc91d7407609ab7385-ModemManager.service-DAOECN
systemd-private-fc747cf546974dcc91d7407609ab7385-polkit.service-0u4Hm0
systemd-private-fc747cf546974dcc91d7407609ab7385-power-profiles-daemon.service-oYwXPo
systemd-private-fc747cf546974dcc91d7407609ab7385-rtkit-daemon.service-0J3UDL
systemd-private-fc747cf546974dcc91d7407609ab7385-switcheroo-control.service-BTHDU1
systemd-private-fc747cf546974dcc91d7407609ab7385-systemd-logind.service-52lcX5
systemd-private-fc747cf546974dcc91d7407609ab7385-systemd-oomd.service-Y2ylus
systemd-private-fc747cf546974dcc91d7407609ab7385-systemd-resolved.service-Cuo5OI
systemd-private-fc747cf546974dcc91d7407609ab7385-upower.service-CxdQTV
vmware-root_911-4013199880
sbulatnikova@sbulatnikova:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
sbulatnikova@sbulatnikova: /tmp$ ls -a
.
..
dbus-8Em34dCc
dbus-KmTeoCtD
.font-unix
.ICE-unix
systemd-private-fc747cf546974dcc91d7407609ab7385-chronyd.service-Agmegu
systemd-private-fc747cf546974dcc91d7407609ab7385-colord.service-Vf6vAX
systemd-private-fc747cf546974dcc91d7407609ab7385-dbus-broker.service-x4xnPU
systemd-private-fc747cf546974dcc91d7407609ab7385-fwupd.service-VGB9fS
systemd-private-fc747cf546974dcc91d7407609ab7385-low-memory-monitor.service-ftQ0bF
systemd-private-fc747cf546974dcc91d7407609ab7385-ModemManager.service-DA0ECN
systemd-private-fc747cf546974dcc91d7407609ab7385-polkit.service-0u4HmO
systemd-private-fc747cf546974dcc91d7407609ab7385-power-profiles-daemon.service-oYwXPe
systemd-private-fc747cf546974dcc91d7407609ab7385-rtkit-daemon.service-0J3UDL
systemd-private-fc747cf546974dcc91d7407609ab7385-switcheroo-control.service-BTHDU1
systemd-private-fc747cf546974dcc91d7407609ab7385-systemd-logind.service-521cX5
systemd-private-fc747cf546974dcc91d7407609ab7385-systemd-oomd.service-Y2ylus
systemd-private-fc747cf546974dcc91d7407609ab7385-systemd-resolved.service-Cuo5OI
systemd-private-fc747cf546974dcc91d7407609ab7385-upower.service-CxdQTV
vmware-root_911-4013199880
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
sbulatnikova@sbulatnikova: /tmp$
```

Рис. 3: Команда ls -a

Опции команды ls

```
shulatinikov@shulatinikova:~/tmp$ ls -l
итого 0
srwxrwxr-x. 1 root root 8 map 9 12:06 dbus-8Ea3dCc
srwxrwxr-x. 1 root root 8 map 9 12:06 dbus-KaFaeCtD
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-chrond.service-Agneyu
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-colord.service-Vf6vAX
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-dbus-broker.service-x4xvPU
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-fwupd.service-VG89f5
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-low-memory-monitor.service-FT0QhF
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-ModemManager.service-BA0ECM
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-polkit.service-0u4mM0
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-power-profiles-daemon.service-otwPe
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-rtkit-daemon.service-Q3JUDL
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-switcheroo-control.service-B7NDW1
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-systemd-logind.service-52icX5
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-systemd-nmnd.service-Y2ylus
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-systemd-resolved.service-Cuo5OI
drwx----- 3 root root 68 map 9 12:06 systemd-private-fc747cf546974dcc91d7407609ab7385-upower.service-CxdQTV
drwx----- 2 root root 48 map 9 12:06 vmware-root_311-4013199080
shulatinikov@shulatinikova:~/tmp$
```

Рис. 4: Команда ls -l

Опции команды ls

```
sbulatnikova@sbulatnikova:/tmp$ ls -f
.
..
.X11-unix
.ICE-unix
.XIM-unix
.font-unix
systemd-private-fc747cf546974dcc91d7407609ab7385-systemd-oomd.service-Y2ylus
systemd-private-fc747cf546974dcc91d7407609ab7385-systemd-resolved.service-Cuo50I
systemd-private-fc747cf546974dcc91d7407609ab7385-dbus-broker.service-x4xnPU
systemd-private-fc747cf546974dcc91d7407609ab7385-chronyd.service-Agmegu
systemd-private-fc747cf546974dcc91d7407609ab7385-low-memory-monitor.service-ft0QbF
systemd-private-fc747cf546974dcc91d7407609ab7385-polkit.service-0u4Hm0
systemd-private-fc747cf546974dcc91d7407609ab7385-power-profiles-daemon.service-oYwXPe
systemd-private-fc747cf546974dcc91d7407609ab7385-rtkit-daemon.service-0J3UDL
systemd-private-fc747cf546974dcc91d7407609ab7385-switcheroo-control.service-BTHDU1
systemd-private-fc747cf546974dcc91d7407609ab7385-systemd-logind.service-521cX5
systemd-private-fc747cf546974dcc91d7407609ab7385-upower.service-CxdQTV
vmware-root_911-4013199080
systemd-private-fc747cf546974dcc91d7407609ab7385-ModemManager.service-DA0ECN
dbus-8Em34dCc
dbus-KmTеоCtD
.X1024-lock
.X1025-lock
systemd-private-fc747cf546974dcc91d7407609ab7385-colord.service-Vf6vAX
.X0-lock
.X1-lock
systemd-private-fc747cf546974dcc91d7407609ab7385-fwupd.service-VGB9fs
sbulatnikova@sbulatnikova:/tmp$
```

Рис. 5: Команда ls -f

```
sbulatnikova@sbulatnikova: /tmp$  
sbulatnikova@sbulatnikova: /tmp$ cd /var/spool/  
sbulatnikova@sbulatnikova: /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  
sbulatnikova@sbulatnikova: /var/spool$
```

Рис. 6: Каталог /var/spool

```
shulatnikova@shulatnikova: ~/spool$ cd
shulatnikova@shulatnikova: $ ls
git-extended work Видео Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны
shulatnikova@shulatnikova: $ ls -al
итого 20
drwx----- 1 shulatnikova shulatnikova 498 мар 3 11:08 .
drwxr-xr-x 1 root root 1216 мар 8 17:40 ..
-rw----- 1 shulatnikova shulatnikova 112 мар 3 11:27 .bash_history
-rw-r--r-- 1 shulatnikova shulatnikova 18 июл 19 2023 .bash_logout
-rw-r--r-- 1 shulatnikova shulatnikova 144 июл 19 2023 .bash_profile
-rw-r--r-- 1 shulatnikova shulatnikova 682 мар 3 11:08 .bashrc
drwx----- 1 shulatnikova shulatnikova 452 мар 9 12:06 .cache
drwx----- 1 shulatnikova shulatnikova 424 мар 3 11:09 .config
-rw-r--r-- 1 shulatnikova shulatnikova 236 мар 3 11:06 .gitconfig
drwxr-xr-x 1 shulatnikova shulatnikova 74 мар 3 11:12 git-extended
drwx----- 1 shulatnikova shulatnikova 136 фев 22 10:48 .gnupg
drwx----- 1 shulatnikova shulatnikova 20 фев 22 10:41 .local
drwxr-xr-x 1 shulatnikova shulatnikova 48 фев 22 10:41 .mozilla
drwx----- 1 shulatnikova shulatnikova 132 фев 22 10:51 .ssh
drwxr-xr-x 1 shulatnikova shulatnikova 10 фев 22 10:50 work
drwxr-xr-x 1 shulatnikova shulatnikova 0 фев 22 10:41 Видео
drwxr-xr-x 1 shulatnikova shulatnikova 0 фев 22 10:41 Документы
drwxr-xr-x 1 shulatnikova shulatnikova 0 фев 22 10:41 Загрузки
drwxr-xr-x 1 shulatnikova shulatnikova 0 фев 22 10:41 Изображения
drwxr-xr-x 1 shulatnikova shulatnikova 0 фев 22 10:41 Музыка
drwxr-xr-x 1 shulatnikova shulatnikova 0 фев 22 10:41 Общедоступные
drwxr-xr-x 1 shulatnikova shulatnikova 0 фев 22 10:41 'Рабочий стол'
drwxr-xr-x 1 shulatnikova shulatnikova 0 фев 22 10:41 Шаблоны
shulatnikova@shulatnikova: $
```

Рис. 7: Файлы в домашнем каталоге

```
shulatnikova@shulatnikova:~$  
shulatnikova@shulatnikova:~$ mkdir newdir  
shulatnikova@shulatnikova:~$ mkdir newdir/morefun  
shulatnikova@shulatnikova:~$ mkdir letters memos misk  
shulatnikova@shulatnikova:~$ rm letters/ memos/ misk/  
rm: невозможно удалить 'letters/': 3го каталог  
rm: невозможно удалить 'memos/': 3го каталог  
rm: невозможно удалить 'misk/': 3го каталог  
shulatnikova@shulatnikova:~$ rm -r letters/ memos/ misk/  
shulatnikova@shulatnikova:~$ rm -r newdir/  
shulatnikova@shulatnikova:~$ ls  
git-extended work Видео Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны  
shulatnikova@shulatnikova:~$
```

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:

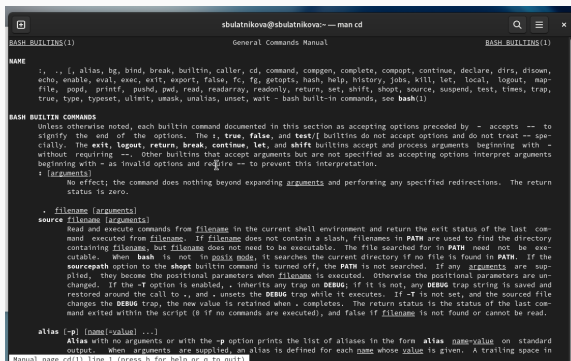
./Общедоступные:

"/Рабочий стол":

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

Рис. 9: Команда ls -R и ls -t

Справка по командам



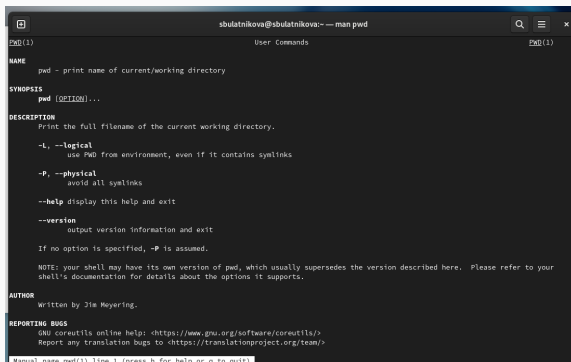
```
sbulatnikova@sbulatnikova:~ — man cd
BASH_BUILTINS(1)                                General Commands Manual                                BASH_BUILTINS(1)

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, map-
file, popd, printf, pushd, pwd, read, readarray, readonly, return, 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
signify the end of the options. The :, true, false, and test builtins do not accept options and do not treat -- spe-
cially. 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 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 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 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 -f 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 com-
mand 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. Also, arguments are supplied on alias is defined for each name whose value is given. A trailing space in
Manual page cd(1) line 1 (press h for help or q to quit)
```

Рис. 10: Справка по команде cd



```
sbulatnikova@sbulatnikova:~ -- 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.

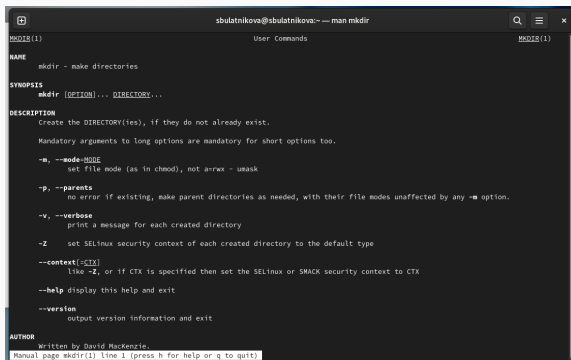
AUTHOR
  Written by Jim Meyerling.

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

Справка по командам



```
sbulatnikova@sbulatnikova:~$ 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 - uask

  -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

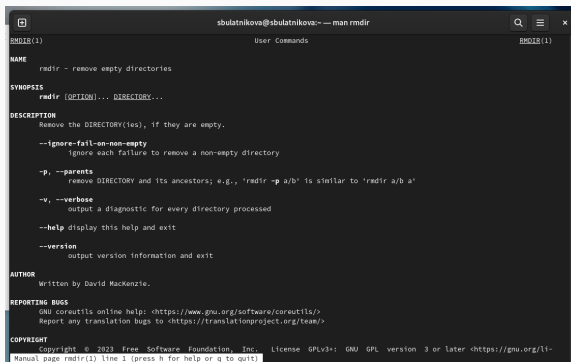
  --help
      display this help and exit

  --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



```
sbulatnikova@sbulatnikova:~$ 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

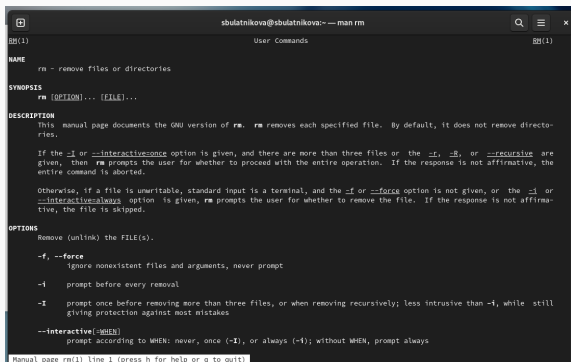
AUTHOR
  Written by David MacKenzie.

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

Рис. 13: Справка по команде rmdir

Справка по командам



```
sbulatnikova@sbulatnikova:~ -- 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

```
21 ls -al
22 mkdir newdir
23 mkdir newdir/morefun
24 mkdir letters memos misk
25 rm letters/ memos/ misk/
26 rm -r letters/ memos/ misk/
27 rm -r newdir/
28 ls
29 ls -R
30 ls -t
31 man cd
32 man mkdir
33 man rmdir
34 man rm
35 man pwd
36 history
sbulatnikova@sbulatnikova:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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