

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

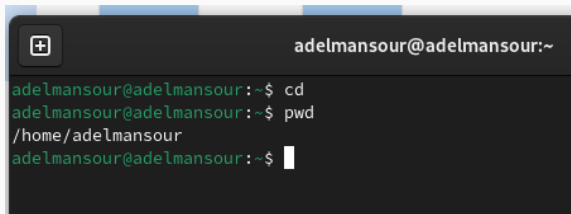
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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



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

A terminal window with a dark background and light blue title bar. The title bar contains a window control icon on the left and the text 'adelmansour@adelmansour:~' on the right. The terminal shows a sequence of commands: 'cd' followed by 'pwd', which outputs '/home/adelmansour'. The prompt 'adelmansour@adelmansour:~\$' is shown at the end of each line.

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
adelmansour@adelmansour:~$ cd /tmp
adelmansour@adelmansour:/tmp$ ls
dbus-JMpe7hem
dbus-PKE2i9uj
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-chrond.service-1Iu9pc
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-colord.service-xK29Tp
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-dbus-broker.service-zYa0t0
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-fwupd.service-N592xx
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-low-memory-monitor.service-0TvTro
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-ModemManager.service-N2Dnrk
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-polkit.service-PE8SpG
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-power-profiles-daemon.service-5JKMNH
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-rtkit-daemon.service-TTCdtg
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-switcheroo-control.service-fpyx75
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-systemd-logind.service-09vWcu
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-systemd-oomd.service-7t043H
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-systemd-resolved.service-jb7pkD
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-upower.service-X1DFUG
Temp-42394e4d-f214-4ab2-8392-c3980228c67f
VMwareDnD
vmware-root_869-3988752892
adelmansour@adelmansour:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
adelmansour@adelmansour: /tmp$ ls -la
..
dbus-3MpE7hem
dbus-PKE2i9uj
.font-unix
.ICE-unix
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-chrond.service-1Iu9pc
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-colord.service-xK29Tp
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-dbus-broker.service-zYa0t0
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-fwupd.service-N592xx
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-low-memory-monitor.service-0TvTro
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-ModemManager.service-N20nrk
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-polkit.service-PE8SpG
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-power-profiles-daemon.service-53KMNH
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-rtkit-daemon.service-TTCdtg
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-switcheroo-control.service-fpyx75
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-systemd-logind.service-09vMCu
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-systemd-oomd.service-7t043H
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-systemd-resolved.service-jb7pkD
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-upower.service-Xi0Fu6
Temp-42394e4d-f214-4ab2-8392-c3980228c67f
VMwareDnD
vmware-root_869-3988752892
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
adelmansour@adelmansour: /tmp$
```

Рис. 3: Команда ls -a

Опции команды ls

```
adelmansour@adelmansour:~$  
adelmansour@adelmansour:~$ ls -l  
итого 0  
srwxrwxrwx. 1 root root 0 map 8 16:55 dbus-3HpEThem  
srwxrwxrwx. 1 root root 0 map 8 16:55 dbus-PHE219uJ  
drwx----- 3 root root 60 map 8 16:55 system-private-8cdf9a0b50324d1b277407c4815b4d0-chromyd.service-12ubpc  
drwx----- 3 root root 60 map 8 16:55 system-private-8cdf9a0b50324d1b277407c4815b4d0-cloned.service-8K28Tp  
drwx----- 3 root root 60 map 8 16:55 system-private-8cdf9a0b50324d1b277407c4815b4d0-dbus-broker.service-2Vw8T0  
drwx----- 3 root root 60 map 8 16:57 system-private-8cdf9a0b50324d1b277407c4815b4d0-fuppd.service-80928x  
drwx----- 3 root root 60 map 8 16:55 system-private-8cdf9a0b50324d1b277407c4815b4d0-low-memory-monitor.service-8TVira  
drwx----- 3 root root 60 map 8 16:55 system-private-8cdf9a0b50324d1b277407c4815b4d0-ModemManager.service-820b8k  
drwx----- 3 root root 60 map 8 16:55 system-private-8cdf9a0b50324d1b277407c4815b4d0-polkitt.service-P88pG  
drwx----- 3 root root 60 map 8 16:55 system-private-8cdf9a0b50324d1b277407c4815b4d0-power-profiles-daemon.service-526WMM  
drwx----- 3 root root 60 map 8 16:55 system-private-8cdf9a0b50324d1b277407c4815b4d0-rtkit-daemon.service-7YdAg  
drwx----- 3 root root 60 map 8 16:55 system-private-8cdf9a0b50324d1b277407c4815b4d0-switcheroo-control.service-fpyx75  
drwx----- 3 root root 60 map 8 16:55 system-private-8cdf9a0b50324d1b277407c4815b4d0-systemd-logind.service-09vWC  
drwx----- 3 root root 60 map 8 16:55 system-private-8cdf9a0b50324d1b277407c4815b4d0-systemd-sdmd.service-7t043H  
drwx----- 3 root root 60 map 8 16:25 system-private-8cdf9a0b50324d1b277407c4815b4d0-systemd-resolved.service-j8tpd  
drwx----- 3 root root 60 map 8 16:55 system-private-8cdf9a0b50324d1b277407c4815b4d0-upower.service-K1DF06  
drwx----- 2 adelmansour adelmansour 40 map 8 16:57 temp-42384d4-f214-4ab3-8392-c3980228c67f  
drwxrwxrwt. 2 adelmansour adelmansour 100 map 8 17:10 NastraGm  
drwx----- 2 root root 40 map 8 16:55 NastraGm-root_009-2300752892  
adelmansour@adelmansour:~$
```

Рис. 4: Команда ls -l

Опции команды ls

```
adelmansour@adelmansour: /tmp$ ls -f
.
..
VMwareDnD
Temp-42394e4d-f214-4ab2-8392-c3980228c67f
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-fwupd.service-N592xx
.X1-lock
.X0-lock
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-colord.service-xK29Tp
.X1025-lock
.X1024-lock
dbus-PKE2i9uj
dbus-JMpE7hem
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-ModemManager.service-N2Dnrk
vmware-root_869-3988752892
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-upower.service-XiDfU6
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-systemd-logind.service-O9vWCu
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-switcheroo-control.service-fpyx75
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-rtkit-daemon.service-TTCdtg
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-power-profiles-daemon.service-5JKMNH
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-polkit.service-PE8SpG
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-low-memory-monitor.service-0TvTro
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-chrond.service-1Iu9pc
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-dbus-broker.service-zYa0t0
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-systemd-resolved.service-jb7pkD
systemd-private-9cdf9a9b583241d1b2f7487c4815b4d0-systemd-oomd.service-7t043H
.font-unix
.XIM-unix
.ICE-unix
.X11-unix
adelmansour@adelmansour: /tmp$
```

Рис. 5: Команда ls -f

Каталог /var/spool

```
adelmansour@adelmansour:/tmp$  
adelmansour@adelmansour:/tmp$ cd /var/spool/  
adelmansour@adelmansour:/var/spool$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 1582 мар  8 12:35 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 1200 мар  8 16:54 mail  
drwxr-xr-x. 1 root root   0 июл 21 2023 plymouth  
adelmansour@adelmansour:/var/spool$
```

Рис. 6: Каталог /var/spool

```
adelmansour@adelmansour: /var/spool$ cd
adelmansour@adelmansour:~$ ls
git-extended work Ваканс Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны
adelmansour@adelmansour:~$ ls -al
total 20
drwx----- 1 adelmansour adelmansour 486 мар 8 17:03 .
drwxr-xr-x 1 root root 1194 мар 8 16:54 ..
-rw----- 1 adelmansour adelmansour 10 мар 8 17:11 .bash_history
-rw-r--r-- 1 adelmansour adelmansour 18 июл 19 2023 .bash_logout
-rw-r--r-- 1 adelmansour adelmansour 144 июл 19 2023 .bash_profile
-rw-r--r-- 1 adelmansour adelmansour 681 мар 8 17:02 .bashrc
drwx----- 1 adelmansour adelmansour 418 мар 8 17:10 .cache
drwx----- 1 adelmansour adelmansour 376 мар 8 17:04 .config
-rw-r--r-- 1 adelmansour adelmansour 171 мар 8 17:02 .gitconfig
drwxr-xr-x 1 adelmansour adelmansour 74 мар 8 17:06 git-extended
drwx----- 1 adelmansour adelmansour 20 мар 8 16:56 local
drwxr-xr-x 1 adelmansour adelmansour 48 мар 8 16:57 maila
drwx----- 1 adelmansour adelmansour 132 мар 8 17:00 .ssh
drwxr-xr-x 1 adelmansour adelmansour 10 мар 8 17:00 work
drwxr-xr-x 1 adelmansour adelmansour 0 мар 8 16:56 Ваканс
drwxr-xr-x 1 adelmansour adelmansour 0 мар 8 16:56 Документы
drwxr-xr-x 1 adelmansour adelmansour 0 мар 8 16:56 Загрузки
drwxr-xr-x 1 adelmansour adelmansour 0 мар 8 16:56 Изображения
drwxr-xr-x 1 adelmansour adelmansour 0 мар 8 16:56 Музыка
drwxr-xr-x 1 adelmansour adelmansour 0 мар 8 16:56 Общедоступные
drwxr-xr-x 1 adelmansour adelmansour 0 мар 8 16:56 'Рабочий стол'
drwxr-xr-x 1 adelmansour adelmansour 0 мар 8 16:56 Шаблоны
adelmansour@adelmansour:~$
```

Рис. 7: Файлы в домашнем каталоге

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

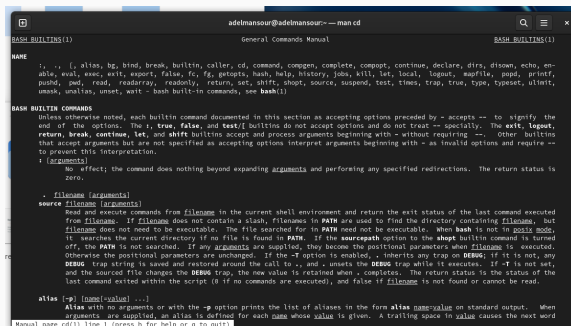
Рис. 8: Действия с каталогами

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:  
ade1mancour@ade1mancour:~$ ls -t  
git-extended work Basic Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны  
ade1mancour@ade1mancour:~$
```

Рис. 9: Команда ls -R и ls -t

Справка по командам



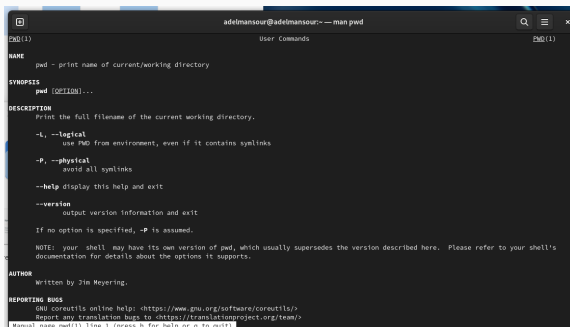
```
adelmansour@adelmansour:~ — man cd
BASH BUILTINS(1)                                General Commands Manual                                BASH BUILTINS(1)

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

Рис. 10: Справка по команде cd

Справка по командам



```
adelmansour@adelmansour:~ -- 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

Справка по командам



```
adelmansour@adelmansour:~ -- 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

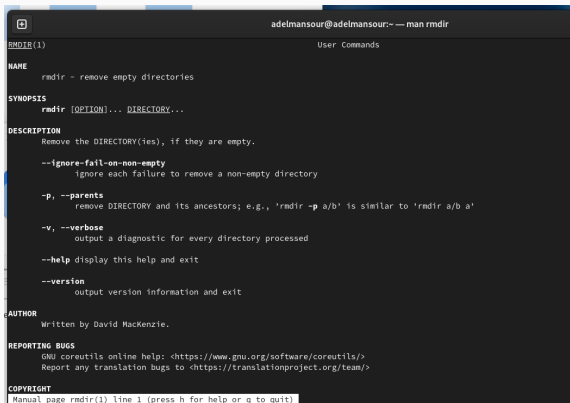
  --context[=CTX]
      like -Z, or if CTX is specified then set the SELinux or SMACK security context to CTX

  --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



```
adelmansour@adelmansour:~ — man rmdir
RMDIR(1)                                User Commands

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

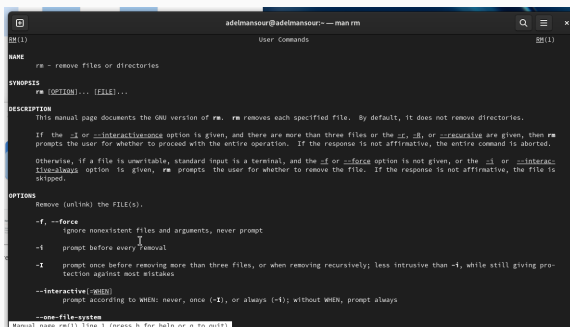
AUTHOR
    Written by David MacKenzie.

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

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

Рис. 13: Справка по команде rmdir

Справка по командам



```
adelmansour@adelmansour:~$ 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 -i 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

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

Рис. 14: Справка по команде rm

История командной строки

```
14 cd
15 ls
16 ls -al
17 mkdir newdir
18 mkdir newdir/morefun
19 mkdir letters memos misk
20 ls
21 rm letters/ memos/ misk/
22 rm -r letters/ memos/ misk/
23 rm -r newdir/
24 ls
25 ls -R
26 ls -t
27 man cd
28 man pwd
29 man mkdir
30 man rmdir
31 man rm
32 history
adelmansour@adelmansour:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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