

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

A terminal window with a dark background. The title bar shows a window icon and the text 'stursunboev@stursunboev:~'. The terminal content shows three lines of text: a prompt 'stursunboev@stursunboev:~\$' followed by 'cd', another prompt 'stursunboev@stursunboev:~\$' followed by 'pwd', and the output '/home/stursunboev'. A third prompt 'stursunboev@stursunboev:~\$' is followed by a cursor.

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

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
stursunboev@stursunboev:~$ cd /tmp
stursunboev@stursunboev:/tmp$ ls
dbus-2B07hT9x
dbus-NyHqIMnb
systemd-private-d26414ae11c3450aabf992585ca14f94-chrond.service-tZ0pnc
systemd-private-d26414ae11c3450aabf992585ca14f94-colord.service-Fnxjbx
systemd-private-d26414ae11c3450aabf992585ca14f94-dbus-broker.service-jVIThI
systemd-private-d26414ae11c3450aabf992585ca14f94-fwupd.service-MNTH02
systemd-private-d26414ae11c3450aabf992585ca14f94-low-memory-monitor.service-co0NZy
systemd-private-d26414ae11c3450aabf992585ca14f94-ModemManager.service-3anH0c
systemd-private-d26414ae11c3450aabf992585ca14f94-polkit.service-K7YHAW
systemd-private-d26414ae11c3450aabf992585ca14f94-power-profiles-daemon.service-eGBqBh
systemd-private-d26414ae11c3450aabf992585ca14f94-rtkit-daemon.service-yppwKJ
systemd-private-d26414ae11c3450aabf992585ca14f94-switcheroo-control.service-c95xDc
systemd-private-d26414ae11c3450aabf992585ca14f94-systemd-logind.service-LUrD1h
systemd-private-d26414ae11c3450aabf992585ca14f94-systemd-oomd.service-qqJFt4
systemd-private-d26414ae11c3450aabf992585ca14f94-systemd-resolved.service-ASfrVG
systemd-private-d26414ae11c3450aabf992585ca14f94-upower.service-NTltVg
vmware-root_939-4022308692
stursunboev@stursunboev:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
stursunboev@stursunboev:/tmp$ ls -la
..
dbus-2B07hT9x
dbus-NyHqIMnb
.font-unix
.ICE-unix
systemd-private-d26414ae11c3450aabf992585ca14f94-chrond.service-tZ0pnC
systemd-private-d26414ae11c3450aabf992585ca14f94-colord.service-Fnxjbx
systemd-private-d26414ae11c3450aabf992585ca14f94-dbus-broker.service-jYITHI
systemd-private-d26414ae11c3450aabf992585ca14f94-fwupd.service-MNTM02
systemd-private-d26414ae11c3450aabf992585ca14f94-low-memory-monitor.service-co0NZy
systemd-private-d26414ae11c3450aabf992585ca14f94-ModemManager.service-3anH0c
systemd-private-d26414ae11c3450aabf992585ca14f94-polkit.service-K7yHAW
systemd-private-d26414ae11c3450aabf992585ca14f94-power-profiles-daemon.service-eGBq8h
systemd-private-d26414ae11c3450aabf992585ca14f94-rtkit-daemon.service-ypwqKJ
systemd-private-d26414ae11c3450aabf992585ca14f94-switcheroo-control.service-c95xDc
systemd-private-d26414ae11c3450aabf992585ca14f94-systemd-logind.service-LUrD1h
systemd-private-d26414ae11c3450aabf992585ca14f94-systemd-oomd.service-qqJFt4
systemd-private-d26414ae11c3450aabf992585ca14f94-systemd-resolved.service-A8frVG
systemd-private-d26414ae11c3450aabf992585ca14f94-upower.service-NTltVg
vmware-root_939-4022308693
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
stursunboev@stursunboev:/tmp$
```

Рис. 3: Команда ls -a

Опции команды ls

```
stursunboev@stursunboev: /tmp$ ls -l
иторо 8
srw-rw-rw-. 1 root root 0 map 9 12:26 dbus-2B07hT9x
srw-rw-rw-. 1 root root 0 map 9 12:26 dbus-NyHq1Mnb
drwx----- 3 root root 60 map 9 12:26 systemd-private-d26414ae11c3458aabf992585ca14f94-chrond.service-tZ9pnc
drwx----- 3 root root 60 map 9 12:26 systemd-private-d26414ae11c3458aabf992585ca14f94-colord.service-Foxjbx
drwx----- 3 root root 60 map 9 12:26 systemd-private-d26414ae11c3458aabf992585ca14f94-dbus-broker.service-jVITH1
drwx----- 3 root root 60 map 9 12:30 systemd-private-d26414ae11c3458aabf992585ca14f94-fwupd.service-MNTN02
drwx----- 3 root root 60 map 9 12:26 systemd-private-d26414ae11c3458aabf992585ca14f94-low-memory-monitor.service-ca0hZy
drwx----- 3 root root 60 map 9 12:26 systemd-private-d26414ae11c3458aabf992585ca14f94-ModemManager.service-3anH0c
drwx----- 3 root root 60 map 9 12:26 systemd-private-d26414ae11c3458aabf992585ca14f94-polkkit.service-KtyNAM
drwx----- 3 root root 60 map 9 12:26 systemd-private-d26414ae11c3458aabf992585ca14f94-power-profiles-daemon.service-eBq8h
drwx----- 3 root root 60 map 9 12:26 systemd-private-d26414ae11c3458aabf992585ca14f94-rtkit-daemon.service-ypmQJ
drwx----- 3 root root 60 map 9 12:26 systemd-private-d26414ae11c3458aabf992585ca14f94-switcheroo-control.service-c85xDe
drwx----- 3 root root 60 map 9 12:26 systemd-private-d26414ae11c3458aabf992585ca14f94-systemd-logind.service-lUr01h
drwx----- 3 root root 60 map 9 12:26 systemd-private-d26414ae11c3458aabf992585ca14f94-systemd-oomd.service-qQ3ft4
drwx----- 3 root root 60 map 9 12:26 systemd-private-d26414ae11c3458aabf992585ca14f94-systemd-resolved.service-A8frV6
drwx----- 3 root root 60 map 9 12:26 systemd-private-d26414ae11c3458aabf992585ca14f94-upower.service-NTLCVg
drwx----- 2 root root 40 map 9 12:26 vmware-root_939-4022308693
stursunboev@stursunboev: /tmp$
```

Рис. 4: Команда ls -l

Опции команды ls

```
stursunboev@stursunboev: /tmp$ ls -f
.
..
.X11-unix
.XICE-unix
.XIM-unix
.font-unix
systemd-private-d26414ae11c3450aabf992585ca14f94-systemd-oomd.service-qqJft4
systemd-private-d26414ae11c3450aabf992585ca14f94-systemd-resolved.service-A8frVG
systemd-private-d26414ae11c3450aabf992585ca14f94-dbus-broker.service-jYIthI
systemd-private-d26414ae11c3450aabf992585ca14f94-chronyd.service-tZ0pnC
systemd-private-d26414ae11c3450aabf992585ca14f94-low-memory-monitor.service-co0NZy
systemd-private-d26414ae11c3450aabf992585ca14f94-polkit.service-K7yHAW
systemd-private-d26414ae11c3450aabf992585ca14f94-power-profiles-daemon.service-egBqBh
systemd-private-d26414ae11c3450aabf992585ca14f94-rtkit-daemon.service-ypwqKJ
systemd-private-d26414ae11c3450aabf992585ca14f94-switcheroo-control.service-c95xDc
systemd-private-d26414ae11c3450aabf992585ca14f94-systemd-logind.service-LUrd1h
systemd-private-d26414ae11c3450aabf992585ca14f94-upower.service-NTltVg
vmware-root_939-4022308693
systemd-private-d26414ae11c3450aabf992585ca14f94-ModemManager.service-3anH0c
dbus-NyHqIMnb
dbus-2B07hT9x
.X1024-lock
.X1025-lock
systemd-private-d26414ae11c3450aabf992585ca14f94-colord.service-Fnxjbx
.X0-lock
.X1-lock
systemd-private-d26414ae11c3450aabf992585ca14f94-fwupd.service-MNTM02
stursunboev@stursunboev: /tmp$
```

Рис. 5: Команда ls -f

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

Рис. 6: Каталог /var/spool

Домашний каталог

```
stursunboev@stursunboev:~/mp$ cd
stursunboev@stursunboev:~$ ls
git-extended  work  фото  Документы  Загрузки  Изображения  Музыка  Общедоступные  'Рабочий стол'  Шаблоны
stursunboev@stursunboev:~$ ls -al
итого 28
drwx----- 1 stursunboev stursunboev 498 мар 3 11:35 .
drwxr-xr-x 1 root 1216 мар 8 17:40 ../
-rw-r----- 1 stursunboev stursunboev 198 мар 3 11:45 .bash_history
-rw-r----- 1 stursunboev stursunboev 18 июл 19 2023 .bash_logout
-rw-r----- 1 stursunboev stursunboev 144 июл 19 2023 .bash_profile
-rw-r----- 1 stursunboev stursunboev 681 мар 3 11:34 .bashrc
drwx----- 1 stursunboev stursunboev 452 мар 9 12:30 .cache
drwx----- 1 stursunboev stursunboev 424 мар 3 11:36 .config
-rw-r----- 1 stursunboev stursunboev 240 мар 3 11:31 .gitconfig
drwxr-xr-x 1 stursunboev stursunboev 74 мар 3 11:39 git-extended
drwx----- 1 stursunboev stursunboev 136 фев 22 17:41 .gnupg
drwx----- 1 stursunboev stursunboev 20 фев 22 16:25 .local
drwxr-xr-x 1 stursunboev stursunboev 48 фев 22 16:27 .mozilla
drwx----- 1 stursunboev stursunboev 132 фев 22 16:35 .ssh
drwxr-xr-x 1 stursunboev stursunboev 10 фев 22 16:34 .vscode
drwxr-xr-x 1 stursunboev stursunboev 0 фев 22 16:25 фото
drwxr-xr-x 1 stursunboev stursunboev 0 фев 22 16:25 Документы
drwxr-xr-x 1 stursunboev stursunboev 0 фев 22 16:25 Загрузки
drwxr-xr-x 1 stursunboev stursunboev 0 фев 22 16:25 Изображения
drwxr-xr-x 1 stursunboev stursunboev 0 фев 22 16:25 Музыка
drwxr-xr-x 1 stursunboev stursunboev 0 фев 22 16:25 Общедоступные
drwxr-xr-x 1 stursunboev stursunboev 0 фев 22 16:25 'Рабочий стол'
drwxr-xr-x 1 stursunboev stursunboev 0 фев 22 16:25 Шаблоны
stursunboev@stursunboev:~$
```

Рис. 7: Файлы в домашнем каталоге

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

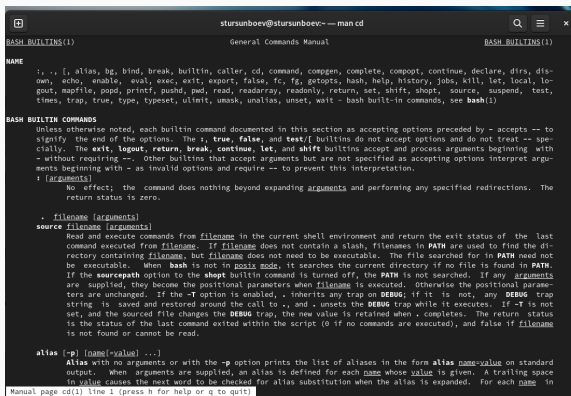
Рис. 8: Действия с каталогами

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

Рис. 9: Команда ls -R и ls -t

Справка по командам



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

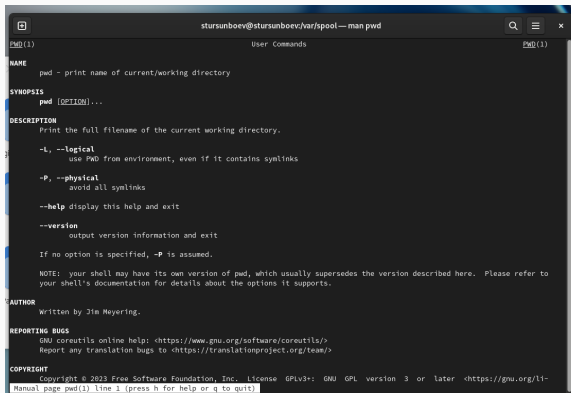
BASH BUILTIN COMMANDS
Unless otherwise noted, each builtin command documented in this section as accepting options preceded by - accepts -- to
signify the end of the options. The ! true false, and test/[ builtins do not accept options and do not treat -- specially.
The exit, logout, return, break, continue, let, and shift builtins accept and process arguments beginning with
- without 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 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 be checked for alias substitution when the alias is expanded. For each name in
    Manual page cd(1) line 1 (press h for help or q to quit)
```

Рис. 10: Справка по команде cd



```
stursunboev@stursunboev:/var/spool$ 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.

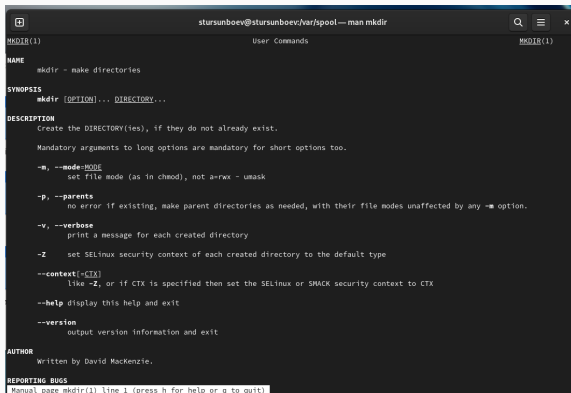
  NOTE: your shell may have its own version of pwd, which usually supersedes the version described here. Please refer to
  your shell's documentation for details about the options it supports.

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/>

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

Рис. 11: Справка по команде pwd



```
stursunboev@stursunboev:/var/spool$ 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

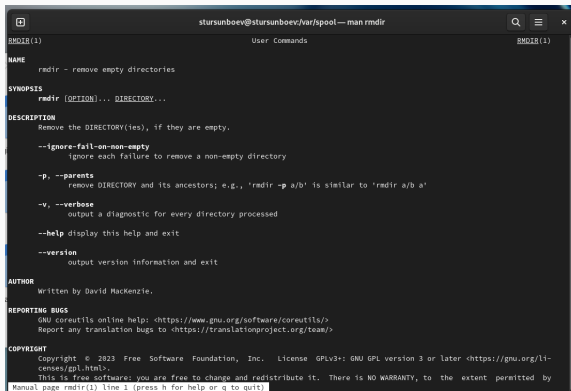
  --version
      output version information and exit

AUTHOR
  Written by David MacKenzie.

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

Рис. 12: Справка по команде mkdir

Справка по командам



```
stursunboev@stursunboev:/var/spool — 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



```
stursunboev@stursunboev:/var/spool — 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 di-
  rectories.

  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 af-
  firmative, 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

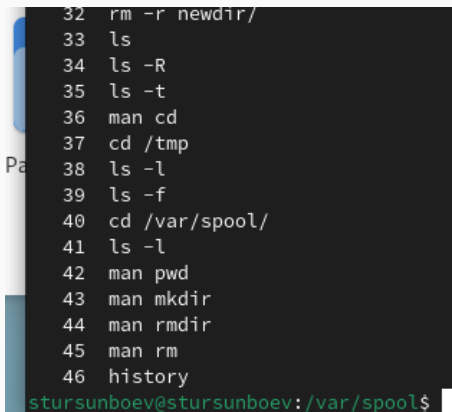
  --interactive[=WHEN]
    prompt according to WHEN: never, once (-I), or always (-i); without WHEN, prompt always

  --one-file-system
    when removing a hierarchy recursively, skip any directory that is on a file system different from that of the

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

Рис. 14: Справка по команде rm

История командной строки

A screenshot of a Linux terminal window with a dark background. The terminal shows a list of 13 commands, each preceded by a line number from 32 to 46. The commands are: rm -r newdir/, ls, ls -R, ls -t, man cd, cd /tmp, ls -l, ls -f, cd /var/spool/, ls -l, man pwd, man mkdir, man rmdir, man rm, and history. The prompt at the bottom is stursunboev@stursunboev:/var/spool\$ with a white cursor. To the left of the terminal, a portion of a file manager window is visible, showing a sidebar with a blue icon and a file named 'Pa'.

```
32 rm -r newdir/
33 ls
34 ls -R
35 ls -t
36 man cd
37 cd /tmp
38 ls -l
39 ls -f
40 cd /var/spool/
41 ls -l
42 man pwd
43 man mkdir
44 man rmdir
45 man rm
46 history
stursunboev@stursunboev:/var/spool$
```

Рис. 15: Команда history

Выводы по проделанной работе

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