

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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11 марта, 2024, Москва, Россия

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Цели и задачи работы

Цель лабораторной работы

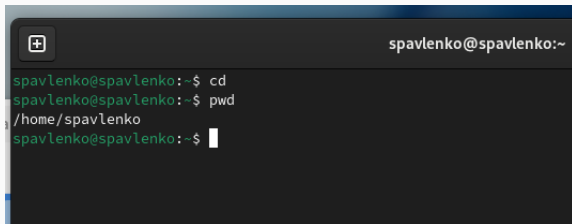
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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



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

A terminal window with a dark background. The title bar shows a plus icon and the text 'spavlenko@spavlenko:~'. The terminal content shows a user running 'cd' and 'pwd' commands, with the output being '/home/spavlenko'.

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
spavlenko@spavlenko:~$  
spavlenko@spavlenko:~$ cd /tmp  
spavlenko@spavlenko:/tmp$ ls  
dbus-0xX2EdRh  
dbus-rBaKW08m  
systemd-private-acb75f45adf447e09de05498aea3f1db-chrond.service-fZYExn  
systemd-private-acb75f45adf447e09de05498aea3f1db-colord.service-jQq7SV  
systemd-private-acb75f45adf447e09de05498aea3f1db-dbus-broker.service-oW1PIj  
systemd-private-acb75f45adf447e09de05498aea3f1db-fwupd.service-zSeG5v  
systemd-private-acb75f45adf447e09de05498aea3f1db-low-memory-monitor.service-DGymhc  
systemd-private-acb75f45adf447e09de05498aea3f1db-ModemManager.service-GhkAwn  
systemd-private-acb75f45adf447e09de05498aea3f1db-polkit.service-haJjw4  
systemd-private-acb75f45adf447e09de05498aea3f1db-power-profiles-daemon.service-ng2XKJ  
systemd-private-acb75f45adf447e09de05498aea3f1db-rtkit-daemon.service-2ZpRB7  
systemd-private-acb75f45adf447e09de05498aea3f1db-switcheroo-control.service-RoRVSI  
systemd-private-acb75f45adf447e09de05498aea3f1db-systemd-logind.service-Q9Pm0j  
systemd-private-acb75f45adf447e09de05498aea3f1db-systemd-oomd.service-mUvLs9  
systemd-private-acb75f45adf447e09de05498aea3f1db-systemd-resolved.service-Soz0Pv  
systemd-private-acb75f45adf447e09de05498aea3f1db-upower.service-QRQaxG  
vmware-root_906-2688554163  
spavlenko@spavlenko:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
spavlenko@spavlenko: /tmp$  
spavlenko@spavlenko: /tmp$ ls -la  
.  
..  
dbus-0xX2EdRh  
dbus-rBaKW08m  
.font-unix  
.ICE-unix  
systemd-private-acb75f45adf447e09de05498aea3f1db-chrond.service-fZYExn  
systemd-private-acb75f45adf447e09de05498aea3f1db-colord.service-jQq7SY  
systemd-private-acb75f45adf447e09de05498aea3f1db-dbus-broker.service-oWlPIj  
systemd-private-acb75f45adf447e09de05498aea3f1db-fwupd.service-zSeG5v  
systemd-private-acb75f45adf447e09de05498aea3f1db-low-memory-monitor.service-DGymhc  
systemd-private-acb75f45adf447e09de05498aea3f1db-ModemManager.service-GhkAwn  
systemd-private-acb75f45adf447e09de05498aea3f1db-polkit.service-haJjw4  
systemd-private-acb75f45adf447e09de05498aea3f1db-power-profiles-daemon.service-ng2XK3  
systemd-private-acb75f45adf447e09de05498aea3f1db-rtkit-daemon.service-2ZpRB7  
systemd-private-acb75f45adf447e09de05498aea3f1db-switcheroo-control.service-RoRVSI  
systemd-private-acb75f45adf447e09de05498aea3f1db-systemd-logind.service-Q9Pm0j  
systemd-private-acb75f45adf447e09de05498aea3f1db-systemd-oomd.service-mUvLs9  
systemd-private-acb75f45adf447e09de05498aea3f1db-systemd-resolved.service-SozOPv  
systemd-private-acb75f45adf447e09de05498aea3f1db-upower.service-QRQaxG  
vmware-root_906-2688554163  
.X0-lock  
.X1024-lock  
.X1025-lock  
.X11-unix  
.X1-lock  
.XIM-unix  
spavlenko@spavlenko: /tmp$
```

Рис. 3: Команда ls -la

Опции команды ls

```
spavlenko@spavlenko:~/tmp$  
spavlenko@spavlenko:~/tmp$ ls -l  
итого 0  
srwxrwxrwx. 1 root root 0 map 11 12:26 dbus-0xx2EdRH  
srwxrwxrwx. 1 root root 0 map 11 12:26 dbus-rBAKM8a  
drwx----- 3 root root 60 map 11 12:26 systemd-private-acb75f45adf447e09de05498aea3f1db-chronyd.service-fZYEn  
drwx----- 3 root root 60 map 11 12:26 systemd-private-acb75f45adf447e09de05498aea3f1db-colord.service-jQqT4V  
drwx----- 3 root root 60 map 11 12:26 systemd-private-acb75f45adf447e09de05498aea3f1db-dbus-broker.service-oMIPJ  
drwx----- 3 root root 60 map 11 12:34 systemd-private-acb75f45adf447e09de05498aea3f1db-fwupd.service-zSeG5v  
drwx----- 3 root root 60 map 11 12:26 systemd-private-acb75f45adf447e09de05498aea3f1db-low-memory-monitor.service-DGynhc  
drwx----- 3 root root 60 map 11 12:26 systemd-private-acb75f45adf447e09de05498aea3f1db-ModemManager.service-GhKAm  
drwx----- 3 root root 60 map 11 12:26 systemd-private-acb75f45adf447e09de05498aea3f1db-polkkit.service-ha7Jw4  
drwx----- 3 root root 60 map 11 12:26 systemd-private-acb75f45adf447e09de05498aea3f1db-power-profiles-daemon.service-ng2XKJ  
drwx----- 3 root root 60 map 11 12:26 systemd-private-acb75f45adf447e09de05498aea3f1db-rfkill-daemon.service-2zP8T  
drwx----- 3 root root 60 map 11 12:26 systemd-private-acb75f45adf447e09de05498aea3f1db-switcheroo-control.service-RoBV5I  
drwx----- 3 root root 60 map 11 12:26 systemd-private-acb75f45adf447e09de05498aea3f1db-systemd-logind.service-Q9Pw0j  
drwx----- 3 root root 60 map 11 12:26 systemd-private-acb75f45adf447e09de05498aea3f1db-systemd-oomd.service-mUvls9  
drwx----- 3 root root 60 map 11 12:26 systemd-private-acb75f45adf447e09de05498aea3f1db-systemd-resolved.service-SozOPv  
drwx----- 3 root root 60 map 11 12:26 systemd-private-acb75f45adf447e09de05498aea3f1db-upower.service-QRQaxG  
drwx----- 2 root root 40 map 11 12:26 vmware-root_986-2688554163  
spavlenko@spavlenko:~/tmp$
```

Рис. 4: Команда ls -l

Опции команды ls

```
spavlenko@spavlenko:/tmp$  
10 spavlenko@spavlenko:/tmp$ ls -f  
.  
..  
11 .X11-unix  
12 .ICE-unix  
13 .XIM-unix  
14 .font-unix  
systemd-private-acb75f45adf447e09de05498aea3f1db-systemd-oomd.service-mUvLs9  
20 systemd-private-acb75f45adf447e09de05498aea3f1db-systemd-resolved.service-Soz0Pv  
systemd-private-acb75f45adf447e09de05498aea3f1db-dbus-broker.service-oW1PIj  
systemd-private-acb75f45adf447e09de05498aea3f1db-chronyd.service-fZYExn  
systemd-private-acb75f45adf447e09de05498aea3f1db-low-memory-monitor.service-DGymhc  
systemd-private-acb75f45adf447e09de05498aea3f1db-polkit.service-ha3jw4  
systemd-private-acb75f45adf447e09de05498aea3f1db-power-profiles-daemon.service-ng2XKJ  
systemd-private-acb75f45adf447e09de05498aea3f1db-rtkit-daemon.service-2ZpRB7  
61 systemd-private-acb75f45adf447e09de05498aea3f1db-switcheroo-control.service-RoRvSI  
systemd-private-acb75f45adf447e09de05498aea3f1db-systemd-logind.service-Q9Pm0j  
systemd-private-acb75f45adf447e09de05498aea3f1db-upower.service-QRQaxG  
vmware-root_906-268854163  
systemd-private-acb75f45adf447e09de05498aea3f1db-ModemManager.service-GhkAwn  
dbus-rBaKW08m  
dbus-0xX2EdRh  
17 .X1024-lock  
18 .X1025-lock  
systemd-private-acb75f45adf447e09de05498aea3f1db-colord.service-jqQ7SY  
19 .X0-lock  
20 .X1-lock  
systemd-private-acb75f45adf447e09de05498aea3f1db-fwupd.service-zSeG5v  
spavlenko@spavlenko:/tmp$
```

Рис. 5: Команда ls -f

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

Рис. 6: Каталог /var/spool

```
spavlenko@spavlenko: /var/spool$  
spavlenko@spavlenko: /var/spool$ cd  
spavlenko@spavlenko:~$ ls  
git-extended  Видео      Загрузки    Музыка      'Рабочий стол'  
work          Документы  Изображения  Общедоступные  Шаблоны  
spavlenko@spavlenko:~$ ls -al  
итого 20  
drwx----- 1 spavlenko spavlenko 498 мар 5 16:29 .  
drwxr-xr-x 1 root root 1216 мар 8 17:40 ..  
-rw----- 1 spavlenko spavlenko 198 мар 5 16:29 .bash_history  
-rw-r--r-- 1 spavlenko spavlenko 18 июл 19 2023 .bash_logout  
-rw-r--r-- 1 spavlenko spavlenko 144 июл 19 2023 .bash_profile  
-rw-r--r-- 1 spavlenko spavlenko 679 мар 5 16:18 .bashrc  
drwx----- 1 spavlenko spavlenko 452 мар 11 12:34 .cache  
drwx----- 1 spavlenko spavlenko 402 мар 5 16:20 .config  
-rw-r--r-- 1 spavlenko spavlenko 242 мар 5 16:29 .gitconfig  
drwxr-xr-x 1 spavlenko spavlenko 74 мар 5 16:23 git-extended  
drwx----- 1 spavlenko spavlenko 136 фев 29 16:46 .gnupg  
drwx----- 1 spavlenko spavlenko 20 фев 29 16:42 .local  
drwxr-xr-x 1 spavlenko spavlenko 48 фев 29 16:42 .mozilla  
drwx----- 1 spavlenko spavlenko 132 фев 29 16:49 .ssh  
drwxr-xr-x 1 spavlenko spavlenko 10 фев 29 16:48 work  
drwxr-xr-x 1 spavlenko spavlenko 0 фев 29 16:42 Видео  
drwxr-xr-x 1 spavlenko spavlenko 0 фев 29 16:42 Документы  
drwxr-xr-x 1 spavlenko spavlenko 0 фев 29 16:42 Загрузки  
drwxr-xr-x 1 spavlenko spavlenko 0 фев 29 16:42 Изображения  
drwxr-xr-x 1 spavlenko spavlenko 0 фев 29 16:42 Музыка  
drwxr-xr-x 1 spavlenko spavlenko 0 фев 29 16:42 Общедоступные  
drwxr-xr-x 1 spavlenko spavlenko 0 фев 29 16:42 'Рабочий стол'  
drwxr-xr-x 1 spavlenko spavlenko 0 фев 29 16:42 Шаблоны  
spavlenko@spavlenko:~$
```

Рис. 7: Файлы в домашнем каталоге

Работа с каталогами

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

Рис. 8: Действия с каталогами

Опции команды ls

```
pa *. /work/study/2023-2024/Операционные системы/os-intro/template/report/scripts':
image-report mpv-shot

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

Рис. 9: Команда ls -R и ls -t

Справка по командам

```
spavlenko@spavlenko:~ — 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 set, 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.

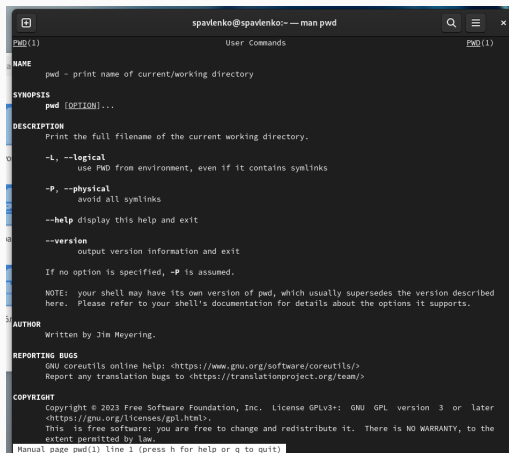
: [arguments]
    No effect; the command does nothing beyond expanding arguments and performing any specified redirections. The return status is zero.

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

Рис. 10: Справка по команде cd

Справка по командам



```
spavlenko@spavlenko:~$ 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.

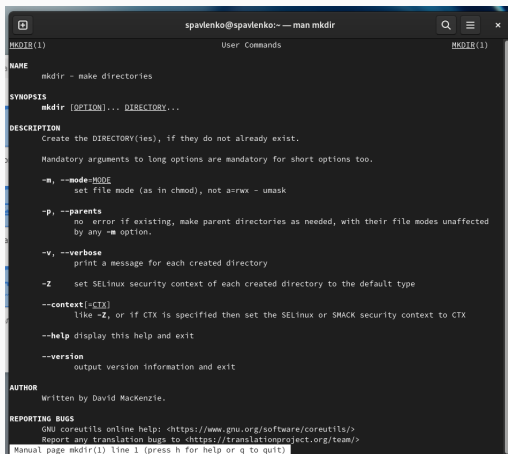
AUTHOR
  Written by Jim Meyering.

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  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
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Manual page pwd(1) line 1 (press h for help or q to quit)
```

Рис. 11: Справка по команде pwd



```
spavlenko@spavlenko:~$ 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

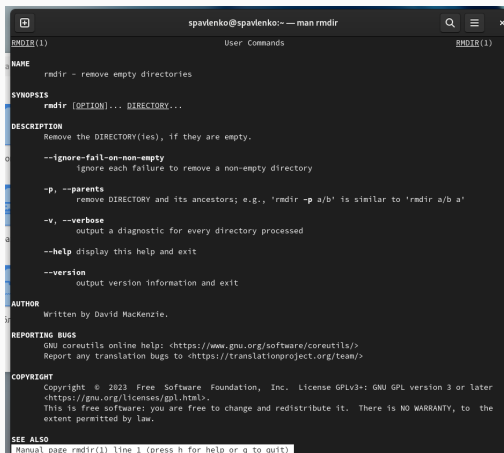
    --help
        display this help and exit

    --version
        output version information and exit

AUTHOR
    Written by David MacKenzie.

REPORTING BUGS
    GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
    Report any translation bugs to <https://translationproject.org/team/>
    Manual page mkdir(1) line 1 (press h for help or q to quit)
```

Рис. 12: Справка по команде mkdir



```
spavlenko@spavlenko:~ — 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

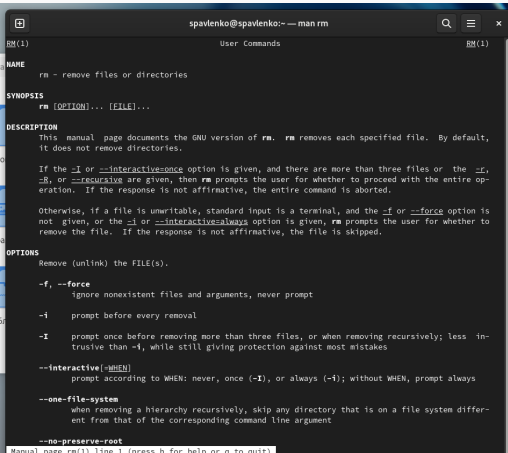
AUTHOR
  Written by David MacKenzie.

REPORTING BUGS
  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
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  extent permitted by law.

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

Рис. 13: Справка по команде rmdir



```
spavlenko@spavlenko:~$ 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

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

--no-preserve-root
    Manual page rm(1) line 1 (press h for help or q to quit)
```

Рис. 14: Справка по команде rm

История командной строки

```
26 ls -al
27 mkdir newdir
28 mkdir newdir/morefun
29 mkdir letters memos misk
30 ls
31 rm letters/ memos/ misk/
32 rm -r letters/ memos/ misk/
33 rm -r newdir/
34 ls
35 ls -R
36 ls -t
37 man mkdir
38 man rmdir
39 man cd
40 man pwd
41 man rm
42 history
spavlenko@spavlenko:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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