

# Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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# Цели и задачи работы

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## Цель лабораторной работы

Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

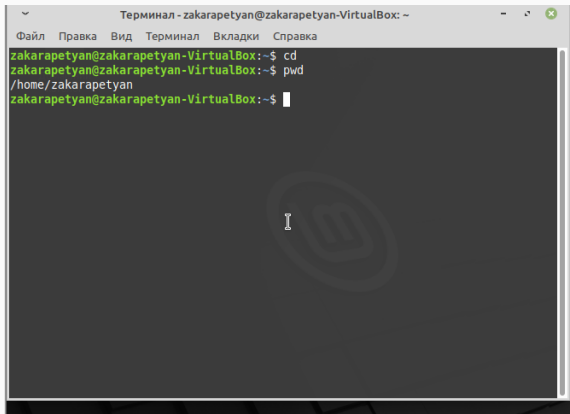
# Задачи лабораторной работы

- 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**

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# Имя и путь к домашнему каталогу

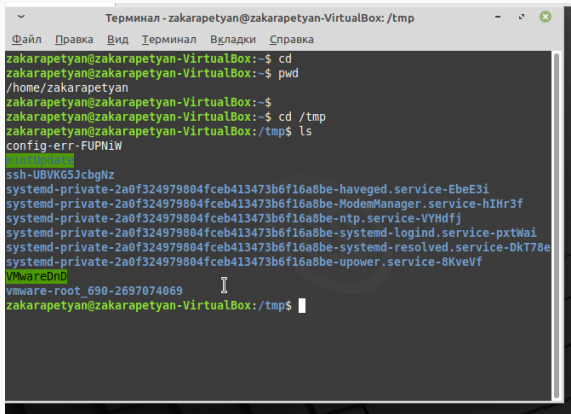
A terminal window titled "Терминал - zakarapetyan@zakarapetyan-VirtualBox: ~" with a menu bar containing "Файл", "Правка", "Вид", "Терминал", "Вкладки", and "Справка". The terminal shows the following commands and output:

```
zakarapetyan@zakarapetyan-VirtualBox:~$ cd  
zakarapetyan@zakarapetyan-VirtualBox:~$ pwd  
/home/zakarapetyan  
zakarapetyan@zakarapetyan-VirtualBox:~$
```

A faint watermark logo is visible in the background of the terminal window.

**Figure 1:** Путь к домашнему каталогу

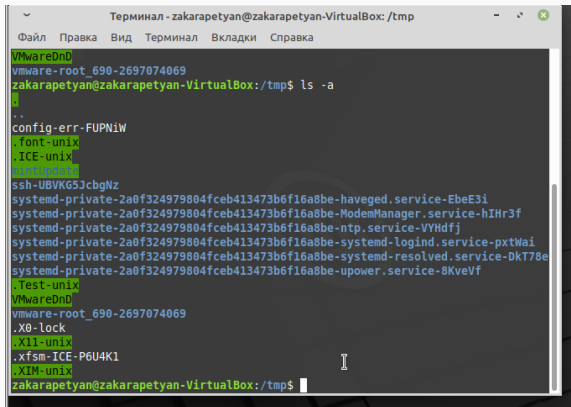
# Опции команды ls



```
Терминал - zakarapetyan@zakarapetyan-VirtualBox: /tmp
Файл  Правка  Вид  Терминал  Вкладки  Справка
zakarapetyan@zakarapetyan-VirtualBox:~$ cd
zakarapetyan@zakarapetyan-VirtualBox:~$ pwd
/home/zakarapetyan
zakarapetyan@zakarapetyan-VirtualBox:~$
zakarapetyan@zakarapetyan-VirtualBox:~$ cd /tmp
zakarapetyan@zakarapetyan-VirtualBox:/tmp$ ls
config-err-FUPNiW
n1tYUd5t6
ssh-UBVKG5JcbgNz
systemd-private-2a0f324979804fceb413473b6f16a8be-haveged.service-EbeE3i
systemd-private-2a0f324979804fceb413473b6f16a8be-ModemManager.service-hIHR3f
systemd-private-2a0f324979804fceb413473b6f16a8be-ntp.service-VYHdfj
systemd-private-2a0f324979804fceb413473b6f16a8be-systemd-logind.service-pxtWai
systemd-private-2a0f324979804fceb413473b6f16a8be-systemd-resolved.service-DkT78e
systemd-private-2a0f324979804fceb413473b6f16a8be-upower.service-8KveVf
VMwareDnD
Vmware-root_690-2697074069
zakarapetyan@zakarapetyan-VirtualBox:/tmp$
```

Figure 2: Команда ls

# Опции команды ls



The image shows a terminal window titled "Терминал - zakarapetyan@zakarapetyan-VirtualBox: /tmp". The window has a menu bar with "Файл", "Правка", "Вид", "Терминал", "Вкладки", and "Справка". The terminal content shows the command "ls -a" being executed, which lists all files and directories, including hidden ones. The output is as follows:

```
VMwareDnD
vmware-root_690-2697074069
zakarapetyan@zakarapetyan-VirtualBox:/tmp$ ls -a
.
..
config-err-FUPNiW
.font-unix
.ICE-unix
.multipath
ssh-UBVKG5JcbgNz
systemd-private-2a0f324979804fceb413473b6f16a8be-haveged.service-EbeE3i
systemd-private-2a0f324979804fceb413473b6f16a8be-ModemManager.service-hIHr3f
systemd-private-2a0f324979804fceb413473b6f16a8be-ntp.service-VYHdfj
systemd-private-2a0f324979804fceb413473b6f16a8be-systemd-logind.service-pxtWai
systemd-private-2a0f324979804fceb413473b6f16a8be-systemd-resolved.service-DKT78e
systemd-private-2a0f324979804fceb413473b6f16a8be-upower.service-8KveVf
.Test-unix
VMwareDnD
vmware-root_690-2697074069
.X0-lock
.X11-unix
.xfsm-ICE-P6U4K1
.XIM-unix
zakarapetyan@zakarapetyan-VirtualBox:/tmp$
```

Figure 3: Команда ls -a



## Опции команды ls

```

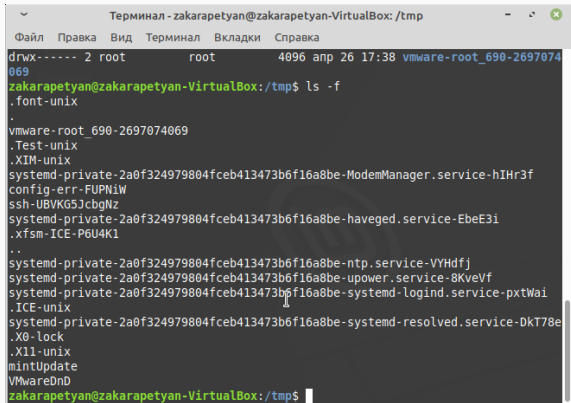
Терминал - zakarapetyan@zakarapetyan-VirtualBox: /tmp
Файл  Правка  Вид  Терминал  Вкладки  Справка

.X11-unix
.xfsm-ICE-P6U4K1
.XIM-unix
zakarapetyan@zakarapetyan-VirtualBox:/tmp$ ls -l
итого 40
-rw-r----- 1 zakarapetyan zakarapetyan    0 anp 26 17:39 config-err-FUPNiW
drwxrwxrwx  2 zakarapetyan zakarapetyan 4096 anp 26 17:39 libudmupdate
drwx----- 2 zakarapetyan zakarapetyan 4096 anp 26 17:39 ssh-UBVK65JcbgNz
drwx----- 3 root         root         4096 anp 26 17:38 systemd-private-2a0f324
979804fceb413473b6f16a8be-haveged.service-EbeE3i
drwx----- 3 root         root         4096 anp 26 17:38 systemd-private-2a0f324
979804fceb413473b6f16a8be-ModemManager.service-hIHr3f
drwx----- 3 root         root         4096 anp 26 17:38 systemd-private-2a0f324
979804fceb413473b6f16a8be-ntp.service-VYHdfj
drwx----- 3 root         root         4096 anp 26 17:38 systemd-private-2a0f324
979804fceb413473b6f16a8be-systemd-logind.service-pxtWai
drwx----- 3 root         root         4096 anp 26 17:38 systemd-private-2a0f324
979804fceb413473b6f16a8be-systemd-resolved.service-DkT78e
drwx----- 3 root         root         4096 anp 26 17:38 systemd-private-2a0f324
979804fceb413473b6f16a8be-upower.service-8KveVf
drwxrwxrwt  2 root         root         4096 anp 26 17:38 VMwareDnD
drwx----- 2 root         root         4096 anp 26 17:38 vmware-root_690-2697074
069
zakarapetyan@zakarapetyan-VirtualBox:/tmp$

```

### Figure 4: Команда ls -l

# Опции команды ls

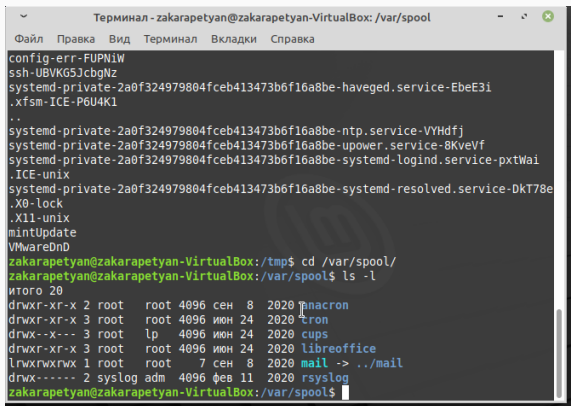


The image shows a terminal window titled "Терминал - zakarapetyan@zakarapetyan-VirtualBox: /tmp". The window has a menu bar with "Файл", "Правка", "Вид", "Терминал", "Вкладки", and "Справка". The terminal output shows the command "ls -f" being executed, resulting in a list of files and directories. The output is as follows:

```
drwx----- 2 root      root      4096 апр 26 17:38 vmware-root_690-2697074069
zakarapetyan@zakarapetyan-VirtualBox:/tmp$ ls -f
.font-unix
.
vmware-root_690-2697074069
.Test-unix
.XIM-unix
systemd-private-2a0f324979804fceb413473b6f16a8be-ModemManager.service-hIHr3f
config-err-FUPNiW
ssh-UBVKG5JcbgNz
systemd-private-2a0f324979804fceb413473b6f16a8be-haveged.service-EbeE3i
.xfsm-ICE-P6U4K1
..
systemd-private-2a0f324979804fceb413473b6f16a8be-ntp.service-VYHdfj
systemd-private-2a0f324979804fceb413473b6f16a8be-upower.service-8KveVf
systemd-private-2a0f324979804fceb413473b6f16a8be-systemd-logind.service-pxtWai
.ICE-unix
systemd-private-2a0f324979804fceb413473b6f16a8be-systemd-resolved.service-DkT78e
.X0-lock
.X11-unix
mintUpdate
VMwareDnD
zakarapetyan@zakarapetyan-VirtualBox:/tmp$
```

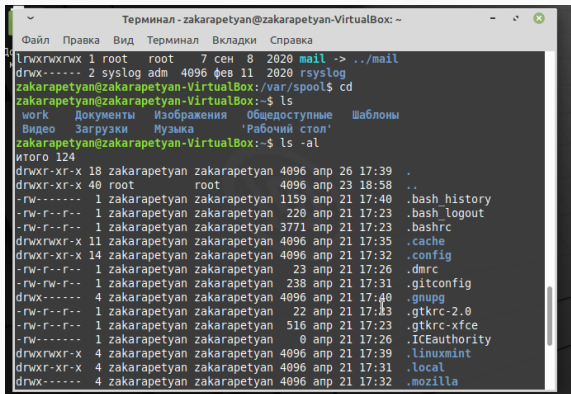
Figure 5: Команда ls -f

# Каталог cron



```
Терминал - zakarapetyan@zakarapetyan-VirtualBox: /var/spool
Файл Правка Вид Терминал Вкладки Справка
config-err-FUPNiW
ssh-UBVKG5JcbgNz
systemd-private-2a0f324979804fceb413473b6f16a8be-haveged.service-EbeE3i
.xfsm-ICE-P6U4K1
..
systemd-private-2a0f324979804fceb413473b6f16a8be-ntp.service-VYHdfj
systemd-private-2a0f324979804fceb413473b6f16a8be-upower.service-8KveVf
systemd-private-2a0f324979804fceb413473b6f16a8be-systemd-logind.service-pxtWai
.ICE-unix
systemd-private-2a0f324979804fceb413473b6f16a8be-systemd-resolved.service-DkT78e
.X0-lock
.X11-unix
mintUpdate
VMwareDnD
zakarapetyan@zakarapetyan-VirtualBox:/tmp$ cd /var/spool/
zakarapetyan@zakarapetyan-VirtualBox:/var/spool$ ls -l
итого 20
drwxr-xr-x 2 root root 4096 сен  8  2020 anacron
drwxr-xr-x 3 root root 4096 июн 24  2020 cron
drwx--x--- 3 root lp  4096 июн 24  2020 cups
drwxr-xr-x 3 root root 4096 июн 24  2020 libreoffice
lrwxrwxrwx 1 root root    7 сен  8  2020 mail -> ../mail
drwx----- 2 syslog adm 4096 фев 11  2020 rsyslog
zakarapetyan@zakarapetyan-VirtualBox:/var/spool$
```

Figure 6: Каталог cron

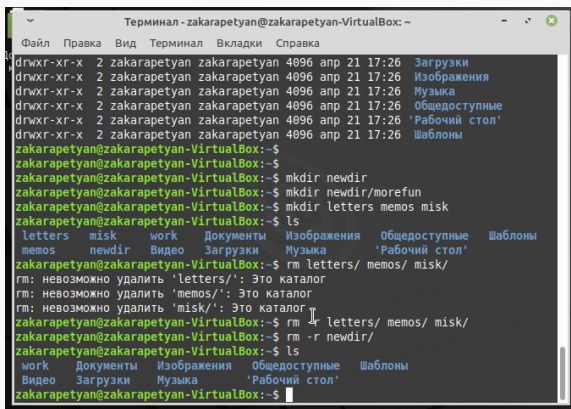


The screenshot shows a terminal window titled "Терминал - zakarapetyan@zakarapetyan-VirtualBox: ~". The window has a menu bar with "Файл", "Правка", "Вид", "Терминал", "Вкладки", and "Справка". The terminal output shows the user navigating to the home directory and listing files with 'ls' and 'ls -al'. The 'ls' command shows a directory listing with permissions, owner, group, size, date, and filename. The 'ls -al' command shows a detailed listing with permissions, owner, group, size, date, and filename, including hidden files like .bash\_history, .bash\_logout, .bashrc, .cache, .config, .dmrc, .gitconfig, .gnupg, .gtkrc-2.0, .gtkrc-xfce, .ICEauthority, .linuxmint, .local, and .mozilla.

```
Терминал - zakarapetyan@zakarapetyan-VirtualBox: ~
Файл Правка Вид Терминал Вкладки Справка
lgwxlgwx 1 root root 7 сен 8 2020 mail -> ../mail
drwx----- 2 syslog adm 4096 фев 11 2020 rsyslog
zakarapetyan@zakarapetyan-VirtualBox:/var/spool$ cd
zakarapetyan@zakarapetyan-VirtualBox:~$ ls
work Документы Изображения Общедоступные Шаблоны
Видео Загрузки Музыка 'Рабочий стол'
zakarapetyan@zakarapetyan-VirtualBox:~$ ls -al
итого 124
drwxr-xr-x 18 zakarapetyan zakarapetyan 4096 апр 26 17:39 .
drwxr-xr-x 40 root root 4096 апр 23 18:58 ..
-rw----- 1 zakarapetyan zakarapetyan 1159 апр 21 17:40 .bash_history
-rw-r--r-- 1 zakarapetyan zakarapetyan 220 апр 21 17:23 .bash_logout
-rw-r--r-- 1 zakarapetyan zakarapetyan 3771 апр 21 17:23 .bashrc
drwxrwxr-x 11 zakarapetyan zakarapetyan 4096 апр 21 17:35 .cache
drwxr-xr-x 14 zakarapetyan zakarapetyan 4096 апр 21 17:32 .config
-rw-r--r-- 1 zakarapetyan zakarapetyan 23 апр 21 17:26 .dmrc
-rw-rw-r-- 1 zakarapetyan zakarapetyan 238 апр 21 17:31 .gitconfig
drwx----- 4 zakarapetyan zakarapetyan 4096 апр 21 17:40 .gnupg
-rw-r--r-- 1 zakarapetyan zakarapetyan 22 апр 21 17:43 .gtkrc-2.0
-rw-r--r-- 1 zakarapetyan zakarapetyan 516 апр 21 17:23 .gtkrc-xfce
-rw----- 1 zakarapetyan zakarapetyan 0 апр 21 17:26 .ICEauthority
drwxrwxr-x 4 zakarapetyan zakarapetyan 4096 апр 21 17:39 .linuxmint
drwxr-xr-x 4 zakarapetyan zakarapetyan 4096 апр 21 17:31 .local
drwx----- 4 zakarapetyan zakarapetyan 4096 апр 21 17:32 .mozilla
```

Figure 7: Файлы в домашнем каталоге

# Работа с каталогами



The screenshot shows a terminal window titled "Терминал - zakarapetyan@zakarapetyan-VirtualBox: ~". The window has a menu bar with "Файл", "Правка", "Вид", "Терминал", "Вкладки", and "Справка". The terminal output shows a series of commands and their results:

```
drwxr-xr-x 2 zakarapetyan zakarapetyan 4096 апр 21 17:26 Загрузки
drwxr-xr-x 2 zakarapetyan zakarapetyan 4096 апр 21 17:26 Изображения
drwxr-xr-x 2 zakarapetyan zakarapetyan 4096 апр 21 17:26 Музыка
drwxr-xr-x 2 zakarapetyan zakarapetyan 4096 апр 21 17:26 Общедоступные
drwxr-xr-x 2 zakarapetyan zakarapetyan 4096 апр 21 17:26 'Рабочий стол'
drwxr-xr-x 2 zakarapetyan zakarapetyan 4096 апр 21 17:26 Шаблоны

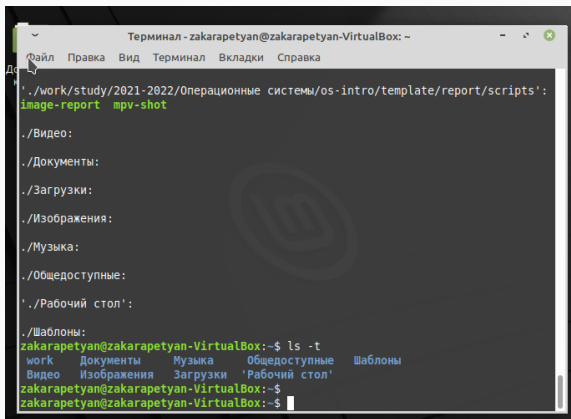
zakarapetyan@zakarapetyan-VirtualBox:~$
zakarapetyan@zakarapetyan-VirtualBox:~$
zakarapetyan@zakarapetyan-VirtualBox:~$ mkdir newdir
zakarapetyan@zakarapetyan-VirtualBox:~$ mkdir newdir/morefun
zakarapetyan@zakarapetyan-VirtualBox:~$ mkdir letters memos misk
zakarapetyan@zakarapetyan-VirtualBox:~$ ls
letters  misk  work  Документы  Изображения  Общедоступные  Шаблоны
memos   newdir  Видео  Загрузки  Музыка  'Рабочий стол'

zakarapetyan@zakarapetyan-VirtualBox:~$ rm letters/ memos/ misk/
rm: невозможно удалить 'letters/': Это каталог
rm: невозможно удалить 'memos/': Это каталог
rm: невозможно удалить 'misk/': Это каталог
zakarapetyan@zakarapetyan-VirtualBox:~$ rm -r letters/ memos/ misk/
zakarapetyan@zakarapetyan-VirtualBox:~$ rm -r newdir/
zakarapetyan@zakarapetyan-VirtualBox:~$ ls
work  Документы  Изображения  Общедоступные  Шаблоны
Видео  Загрузки  Музыка  'Рабочий стол'

zakarapetyan@zakarapetyan-VirtualBox:~$
```

Figure 8: Действия с каталогами

# Опции команды ls



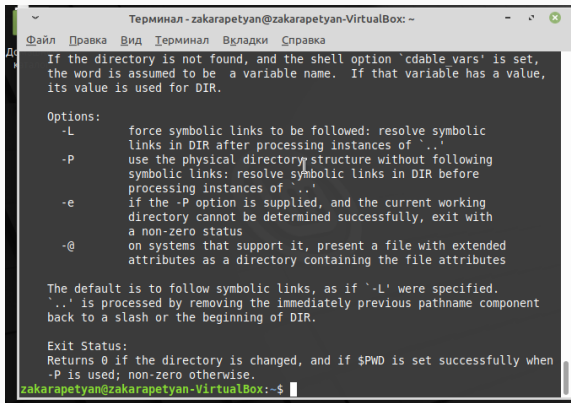
The screenshot shows a terminal window titled "Терминал - zakarapetyan@zakarapetyan-VirtualBox: ~". The window has a menu bar with "Файл", "Правка", "Вид", "Терминал", "Вкладки", and "Справка". The terminal content shows a directory listing for the path `./work/study/2021-2022/Операционные системы/os-intro/template/report/scripts/`. The output of the `ls -t` command is as follows:

```
zakarapetyan@zakarapetyan-VirtualBox:~$ ls -t
work  Документы  Музыка  Общедоступные  Шаблоны
Видео  Изображения  Загрузки  'Рабочий стол'
```

The prompt `zakarapetyan@zakarapetyan-VirtualBox:~$` is shown at the bottom of the terminal window.

Figure 9: Команда `ls -R` и `ls -t`

# Справка по командам



```
Терминал - zakarapetyan@zakarapetyan-VirtualBox: ~
Файл Правка Вид Терминал Вкладки Справка

If the directory is not found, and the shell option 'cdable_vars' is set,
the word is assumed to be a variable name. If that variable has a value,
its value is used for DIR.

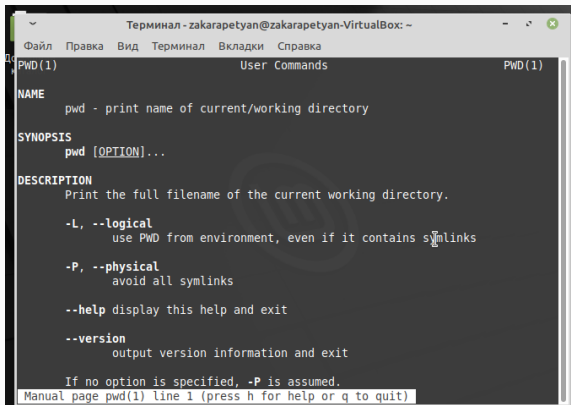
Options:
-L      force symbolic links to be followed: resolve symbolic
        links in DIR after processing instances of '..'
-P      use the physical directory structure without following
        symbolic links: resolve symbolic links in DIR before
        processing instances of '..'
-e      if the -P option is supplied, and the current working
        directory cannot be determined successfully, exit with
        a non-zero status
-@      on systems that support it, present a file with extended
        attributes as a directory containing the file attributes

The default is to follow symbolic links, as if '-L' were specified.
'..' is processed by removing the immediately previous pathname component
back to a slash or the beginning of DIR.

Exit Status:
Returns 0 if the directory is changed, and if $PWD is set successfully when
-P is used; non-zero otherwise.
zakarapetyan@zakarapetyan-VirtualBox:~$
```

Figure 10: Справка по команде cd

# Справка по командам



The screenshot shows a terminal window titled "Терминал - zakarapetyan@zakarapetyan-VirtualBox: ~". The window has a menu bar with "Файл", "Правка", "Вид", "Терминал", "Вкладки", and "Справка". The terminal content displays the help text for the 'pwd' command, which is organized into sections: NAME, SYNOPSIS, DESCRIPTION, and a list of options. The options include -L (logical), -P (physical), --help, and --version. A footer line indicates the manual page and provides instructions on how to get help or quit.

```
Терминал - zakarapetyan@zakarapetyan-VirtualBox: ~
Файл  Правка  Вид  Терминал  Вкладки  Справка
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

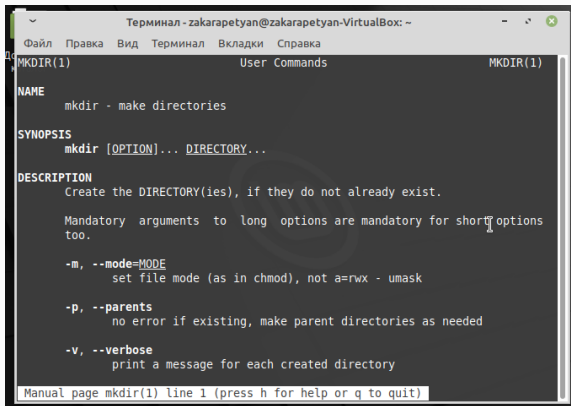
    --version
        output version information and exit

    If no option is specified, -P is assumed.
Manual page pwd(1) line 1 (press h for help or q to quit)
```

Figure 11: Справка по команде pwd



# Справка по командам



The screenshot shows a terminal window titled "Терминал - zakarapetyan@zakarapetyan-VirtualBox: ~". The window has a menu bar with "Файл", "Правка", "Вид", "Терминал", "Вкладки", and "Справка". The terminal content displays the manual page for the 'mkdir' command, titled "MKDIR(1) User Commands MKDIR(1)". The manual page includes sections for NAME, SYNOPSIS, DESCRIPTION, and a list of options. The NAME section states "mkdir - make directories". The SYNOPSIS section shows "mkdir [OPTION]... DIRECTORY...". The DESCRIPTION section explains that the command creates directories if they do not already exist and that mandatory arguments to long options are mandatory for short options too. The options listed are: -m, --mode=MODE (set file mode), -p, --parents (no error if existing, make parent directories), and -v, --verbose (print a message for each created directory). At the bottom, it says "Manual page mkdir(1) line 1 (press h for help or q to quit)".

```
Терминал - zakarapetyan@zakarapetyan-VirtualBox: ~
Файл Правка Вид Терминал Вкладки Справка
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

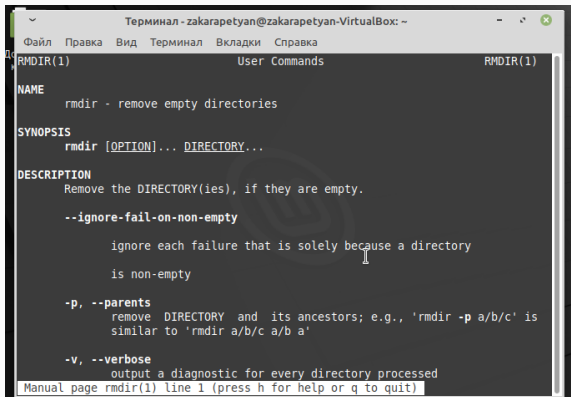
    -p, --parents
        no error if existing, make parent directories as needed

    -v, --verbose
        print a message for each created directory

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

Figure 12: Справка по команде mkdir

# Справка по командам



```
Терминал - zakarapetyan@zakarapetyan-VirtualBox: ~
Файл Правка Вид Терминал Вкладки Справка
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 that is solely because a directory
        is non-empty

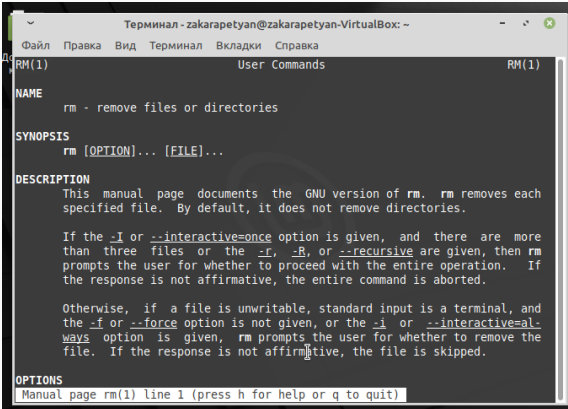
    -p, --parents
        remove DIRECTORY and its ancestors; e.g., 'rmdir -p a/b/c' is
        similar to 'rmdir a/b/c a/b a'

    -v, --verbose
        output a diagnostic for every directory processed

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

Figure 13: Справка по команде rmdir

# Справка по командам



The screenshot shows a terminal window titled "Терминал - zakarapetyan@zakarapetyan-VirtualBox: ~". The window has a menu bar with "Файл", "Правка", "Вид", "Терминал", "Вкладки", and "Справка". The terminal content displays the manual page for the `rm` command, titled "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.

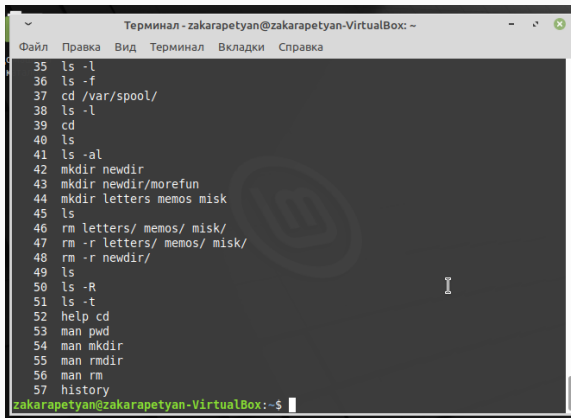
Otherwise, if a file is unwritable, standard input is a terminal, and the `-f` or `--force` option is not given, or the `-i` or `--interactive=always` option is given, `rm` prompts the user for whether to remove the file. If the response is not affirmative, the file is skipped.

**OPTIONS**

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

Figure 14: Справка по команде `rm`

# История командной строки



```
Терминал - zakarapetyan@zakarapetyan-VirtualBox: ~
Файл  Правка  Вид  Терминал  Вкладки  Справка
35 ls -l
36 ls -f
37 cd /var/spool/
38 ls -l
39 cd
40 ls
41 ls -al
42 mkdir newdir
43 mkdir newdir/morefun
44 mkdir letters memos misk
45 ls
46 rm letters/ memos/ misk/
47 rm -r letters/ memos/ misk/
48 rm -r newdir/
49 ls
50 ls -R
51 ls -t
52 help cd
53 man pwd
54 man mkdir
55 man rmdir
56 man rm
57 history
zakarapetyan@zakarapetyan-VirtualBox:~$
```

Figure 15: Команда history

## **Выводы по проделанной работе**

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