

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

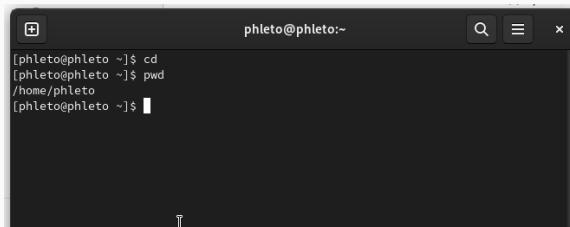
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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



```
phleto@phleto:~  
[phleto@phleto ~]$ cd  
[phleto@phleto ~]$ pwd  
/home/phleto  
[phleto@phleto ~]$
```

A terminal window with a dark background. The title bar shows 'phleto@phleto:~' and standard window controls. The terminal text shows a sequence of commands: 'cd' followed by 'pwd', which outputs '/home/phleto'. The prompt returns to '[phleto@phleto ~]\$'.

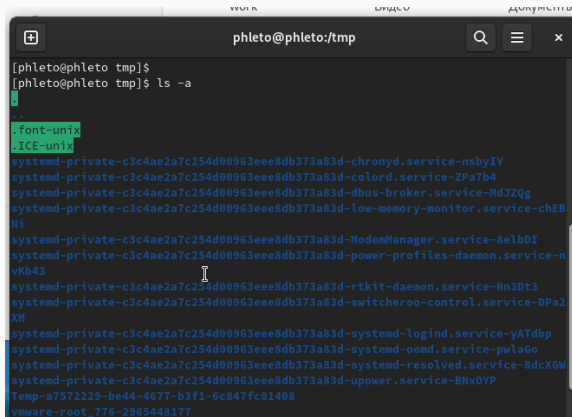
Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
/home/phleto
[phleto@phleto ~]$ cd /tmp
[phleto@phleto tmp]$ ls
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-chrond.service-nsbyIY
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-colord.service-ZPa7b4
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-dbus-broker.service-MdJZQg
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-low-memory-monitor.service-chEB
Ni
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-ModemManager.service-8elbDI
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-power-profiles-daemon.service-n
vKb43
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-rtkit-daemon.service-Nn3Dt3
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-switcheroo-control.service-DPa2
XM
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-systemd-logind.service-yATdbp
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-systemd-oomd.service-pwlaGo
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-systemd-resolved.service-8dcXGW
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-upower.service-BNxOYP
Temp-a7572229-be44-4677-b3f1-6c847fc01408
vmware-root_776-2965448177
```

Рис. 2: Команда ls

Опции команды ls

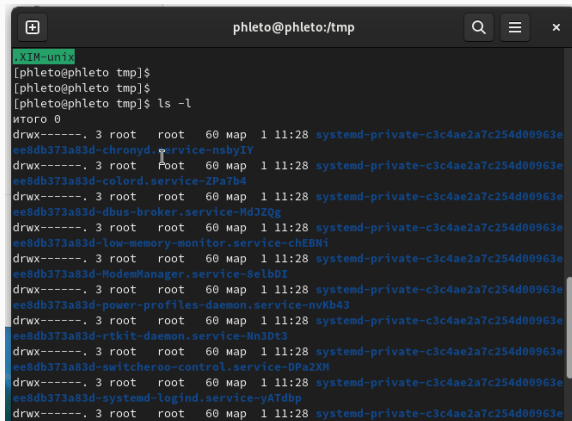


A terminal window titled 'phleto@phleto:/tmp' with search, menu, and close icons. The prompt is '[phleto@phleto tmp]\$'. The command '[phleto@phleto tmp]\$ ls -a' has been executed. The output lists hidden files and system services. The files '.font-unix' and '.ICE-unix' are highlighted in green. The services listed include chronyd, colord, dbus-broker, low-memory-monitor, ModemManager, power-profiles-daemon, rtkit-daemon, switcheroo-control, systemd-logind, systemd-oomd, systemd-resolved, and upower. The terminal also shows the path 'vmware-root_776-2965448177' at the bottom.

```
[phleto@phleto tmp]$  
[phleto@phleto tmp]$ ls -a  
.  
..  
.font-unix  
.ICE-unix  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-chronyd.service-nsbyIY  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-colord.service-ZPa7b4  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-dbus-broker.service-MdJZQg  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-low-memory-monitor.service-chEB  
Ni  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-ModemManager.service-8elbDI  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-power-profiles-daemon.service-n  
vKb43  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-rtkit-daemon.service-Nn3Dt3  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-switcheroo-control.service-DPa2  
XM  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-systemd-logind.service-yATdbp  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-systemd-oomd.service-pwlaGo  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-systemd-resolved.service-8dcXGW  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-upower.service-BNxoYP  
Temp-a7572229-be44-4677-b3f1-6c847fc01408  
vmware-root_776-2965448177
```

Рис. 3: Команда ls -a

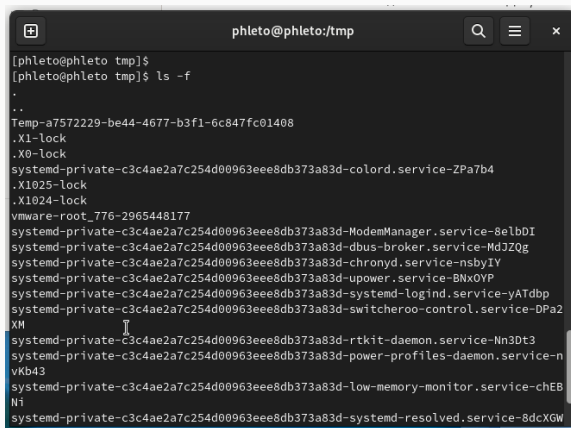
Опции команды ls



```
phleto@phleto:/tmp
.XIM-unix
[phleto@phleto tmp]$
[phleto@phleto tmp]$
[phleto@phleto tmp]$ ls -l
итого 0
drwx-----, 3 root root 60 map 1 11:28 systemd-private-c3c4ae2a7c254d00963e
ee8db373a83d-chronyd.service-nsbyIV
drwx-----, 3 root root 60 map 1 11:28 systemd-private-c3c4ae2a7c254d00963e
ee8db373a83d-colord.service-ZPa7b4
drwx-----, 3 root root 60 map 1 11:28 systemd-private-c3c4ae2a7c254d00963e
ee8db373a83d-dbus-broker.service-MdJZQg
drwx-----, 3 root root 60 map 1 11:28 systemd-private-c3c4ae2a7c254d00963e
ee8db373a83d-low-memory-monitor.service-chEBN1
drwx-----, 3 root root 60 map 1 11:28 systemd-private-c3c4ae2a7c254d00963e
ee8db373a83d-ModemManager.service-8elbDI
drwx-----, 3 root root 60 map 1 11:28 systemd-private-c3c4ae2a7c254d00963e
ee8db373a83d-power-profiles-daemon.service-nvKb43
drwx-----, 3 root root 60 map 1 11:28 systemd-private-c3c4ae2a7c254d00963e
ee8db373a83d-rtkit-daemon.service-Nn3Dt3
drwx-----, 3 root root 60 map 1 11:28 systemd-private-c3c4ae2a7c254d00963e
ee8db373a83d-switcheroo-control.service-DPa2XM
drwx-----, 3 root root 60 map 1 11:28 systemd-private-c3c4ae2a7c254d00963e
ee8db373a83d-systemd-logind.service-yATdbp
drwx-----, 3 root root 60 map 1 11:28 systemd-private-c3c4ae2a7c254d00963e
```

Рис. 4: Команда ls -l

Опции команды ls



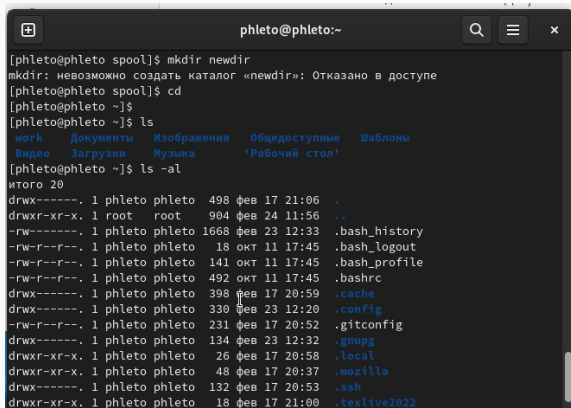
A terminal window titled 'phleto@phleto/tmp' with search, menu, and close icons in the title bar. The terminal shows the command 'ls -f' and its output, which lists various files and directories including symbolic links to systemd services and lock files. The output is as follows:

```
[phleto@phleto tmp]$  
[phleto@phleto tmp]$ ls -f  
.  
..  
Temp-a7572229-be44-4677-b3f1-6c847fc01408  
.X1-lock  
.X0-lock  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-colord.service-ZPa7b4  
.X1025-lock  
.X1024-lock  
vmware-root_776-2965448177  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-ModemManager.service-8elbDI  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-dbus-broker.service-MdJZQg  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-chronyd.service-nsbyIY  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-upower.service-BNxOYP  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-systemd-logind.service-yATdbp  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-switcheroo-control.service-DPa2  
XM  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-rtkit-daemon.service-Nn3Dt3  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-power-profiles-daemon.service-n  
vKb43  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-low-memory-monitor.service-chEB  
Ni  
systemd-private-c3c4ae2a7c254d00963eee8db373a83d-systemd-resolved.service-8dcXGW
```

Рис. 5: Команда ls -f

```
[phleto@phleto tmp]$  
[phleto@phleto tmp]$  
[phleto@phleto tmp]$ cd /var/spool/  
[phleto@phleto spool]$ ls  
abrt abrt-upload cups lpd mail plymouth  
[phleto@phleto spool]$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 578 фев 21 15:05 abrt  
drwx-----. 1 abrt abrt 0 мар 11 2022 abrt-upload  
drwx--x---. 1 root lp 6 окт 3 11:46 cups  
drwxr-xr-x. 1 root root 0 авг 9 2022 lpd  
drwxrwxr-x. 1 root mail 910 фев 24 11:56 mail  
drwxr-xr-x. 1 root root 0 мар 7 2022 plymouth  
[phleto@phleto spool]$
```

Рис. 6: Каталог /var/spool



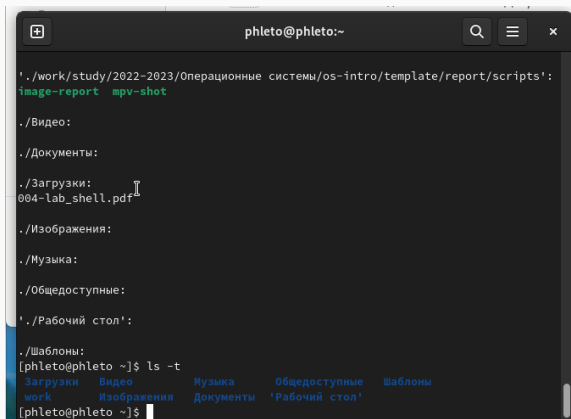
```
phleto@phleto:~  
[phleto@phleto spool]$ mkdir newdir  
mkdir: невозможно создать каталог «newdir»: Отказано в доступе  
[phleto@phleto spool]$ cd  
[phleto@phleto ~]$  
[phleto@phleto ~]$ ls  
work  Документы  Изображения  Общедоступные  Шаблоны  
Видео  Загрузки  Музыка  'Рабочий стол'  
[phleto@phleto ~]$ ls -al  
итого 20  
drwx-----. 1 phleto phleto 498 фев 17 21:06 .  
drwxr-xr-x. 1 root root 904 фев 24 11:56 ..  
-rw-----. 1 phleto phleto 1668 фев 23 12:33 .bash_history  
-rw-r--r--. 1 phleto phleto 18 окт 11 17:45 .bash_logout  
-rw-r--r--. 1 phleto phleto 141 окт 11 17:45 .bash_profile  
-rw-r--r--. 1 phleto phleto 492 окт 11 17:45 .bashrc  
drwx-----. 1 phleto phleto 398 фев 17 20:59 .cache  
drwx-----. 1 phleto phleto 330 фев 23 12:20 .config  
-rw-r--r--. 1 phleto phleto 231 фев 17 20:52 .gitconfig  
drwx-----. 1 phleto phleto 134 фев 23 12:32 .gnupg  
drwxr-xr-x. 1 phleto phleto 26 фев 17 20:58 .local  
drwxr-xr-x. 1 phleto phleto 48 фев 17 20:37 .mozilla  
drwx-----. 1 phleto phleto 132 фев 17 20:53 .ssh  
drwxr-xr-x. 1 phleto phleto 18 фев 17 21:00 .texlive2022
```

Рис. 7: Файлы в домашнем каталоге

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

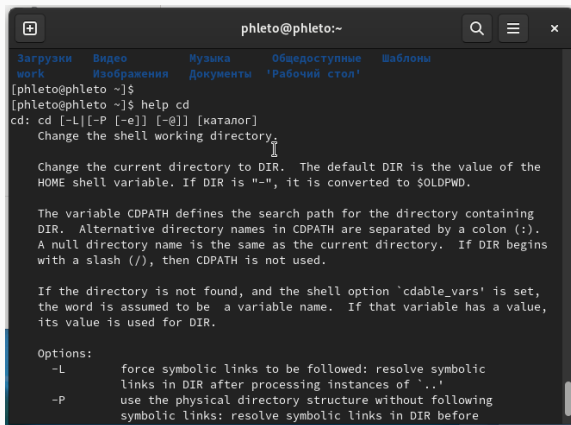
Рис. 8: Действия с каталогами

Опции команды ls



```
phleto@phleto:~  
'./work/study/2022-2023/Операционные системы/os-intro/template/report/scripts':  
image-report mpv-shot  
  
./Видео:  
  
./Документы:  
  
./Загрузки:  
004-lab_shell.pdf  
  
./Изображения:  
  
./Музыка:  
  
./Общедоступные:  
  
./Рабочий стол:  
  
./Шаблоны:  
[phleto@phleto ~]$ ls -t  
Загрузки Видео Музыка Общедоступные Шаблоны  
work Изображения Документы 'Рабочий стол'  
[phleto@phleto ~]$
```

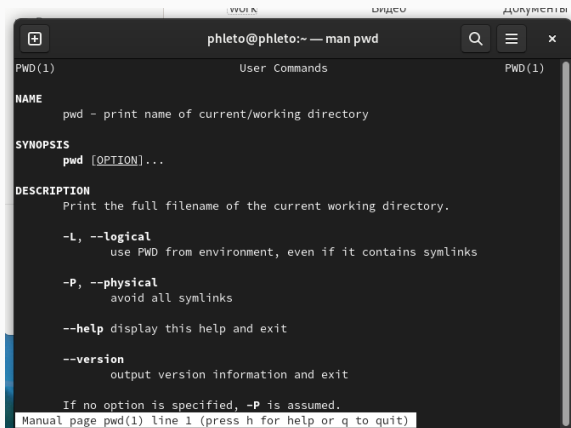
Рис. 9: Команда ls -R и ls -t



```
phleto@phleto:~  
Загрузки Видео Музыка Общедоступные Шаблоны  
work Изображения Документы 'Рабочий стол'  
[phleto@phleto ~]$  
[phleto@phleto ~]$ help cd  
cd: cd [-L|[-P [-e]] [-@]] [каталог]  
    Change the shell working directory.  
  
    Change the current directory to DIR. The default DIR is the value of the  
    HOME shell variable. If DIR is "-", it is converted to $OLDPWD.  
  
    The variable CDPATH defines the search path for the directory containing  
    DIR. Alternative directory names in CDPATH are separated by a colon (:).  
    A null directory name is the same as the current directory. If DIR begins  
    with a slash (/), then CDPATH is not used.  
  
    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
```

Рис. 10: Справка по команде cd

Справка по командам



The screenshot shows a terminal window titled "phleto@phleto:~ — man pwd". The window displays the manual page for the 'pwd' command. The content is as follows:

```
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

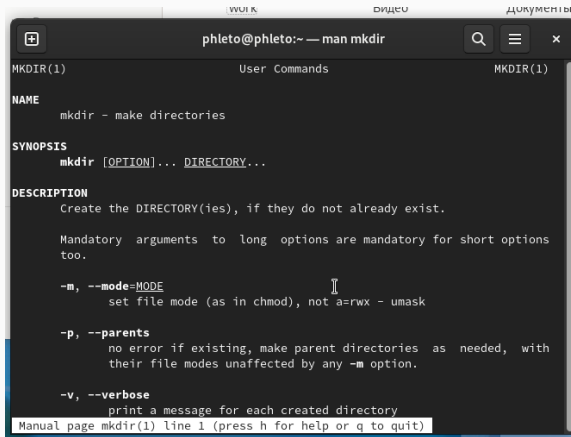
    --version
        output version information and exit

    If no option is specified, -P is assumed.

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

Рис. 11: Справка по команде pwd

Справка по командам



The screenshot shows a terminal window titled "phleto@phleto:~ — man mkdir". The window displays the manual page for the "mkdir" command. The content is as follows:

```
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

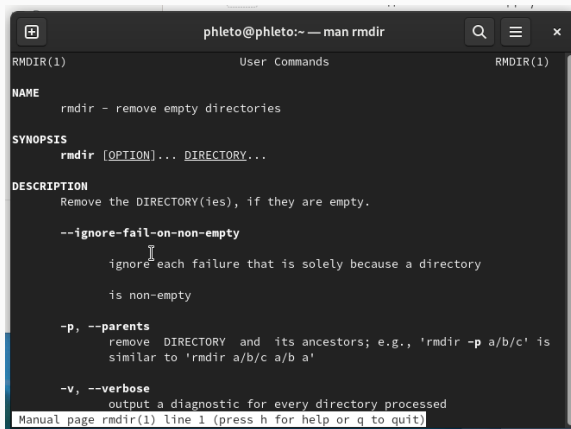
    -p, --parents
        no error if existing, make parent directories as needed, with
        their file modes unaffected by any -m option.

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

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

Рис. 12: Справка по команде mkdir

Справка по командам



```
phleto@phleto:~ — 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 that is solely because a directory
        is non-empty

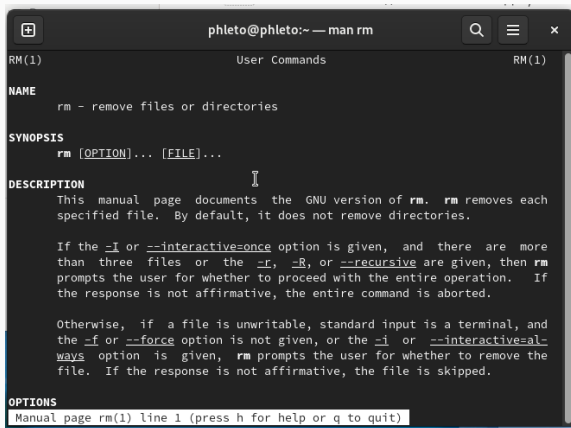
    -p, --parents
        remove DIRECTORY and its ancestors; e.g., 'rmdir -p a/b/c' is
        similar to 'rmdir a/b/c a/b a'

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

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

Рис. 13: Справка по команде rmdir

Справка по командам



```
phleto@phleto:~ — 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.

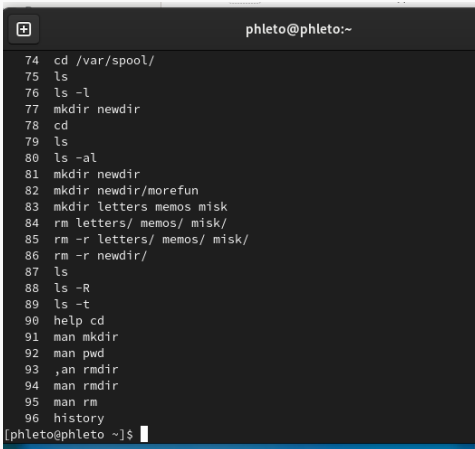
    If the -I or --interactive=once option is given, and there are more
    than three files or the -r, -R, or --recursive are given, then rm
    prompts the user for whether to proceed with the entire operation. If
    the response is not affirmative, the entire command is aborted.

    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=al-
    ways 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)
```

Рис. 14: Справка по команде rm

История командной строки

A terminal window titled 'phleto@phleto:~' with a '+' icon in the top-left corner. The window displays a list of 22 commands, each preceded by a line number from 74 to 96. The commands are: cd /var/spool/, ls, ls -l, mkdir newdir, cd, ls, ls -al, mkdir newdir, mkdir newdir/morefun, mkdir letters memos misk, rm letters/ memos/ misk/, rm -r letters/ memos/ misk/, rm -r newdir/, ls, ls -R, ls -t, help cd, man mkdir, man pwd, ,an rmdir, man rmdir, man rm, and history. The prompt '[phleto@phleto ~]\$' is visible at the bottom of the terminal.

```
74 cd /var/spool/
75 ls
76 ls -l
77 mkdir newdir
78 cd
79 ls
80 ls -al
81 mkdir newdir
82 mkdir newdir/morefun
83 mkdir letters memos misk
84 rm letters/ memos/ misk/
85 rm -r letters/ memos/ misk/
86 rm -r newdir/
87 ls
88 ls -R
89 ls -t
90 help cd
91 man mkdir
92 man pwd
93 ,an rmdir
94 man rmdir
95 man rm
96 history
[phleto@phleto ~]$
```

Рис. 15: Команда history

Выводы по проделанной работе

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