

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

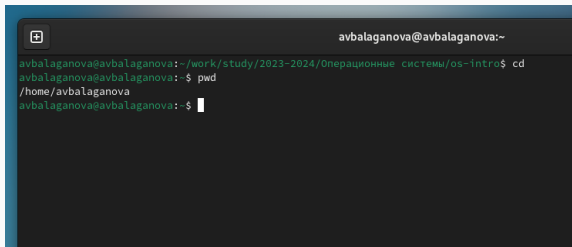
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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



```
avbalaganova@avbalaganova:~  
avbalaganova@avbalaganova:~/work/study/2023-2024/Операционные системы/os-intro$ cd  
avbalaganova@avbalaganova:~$ pwd  
/home/avbalaganova  
avbalaganova@avbalaganova:~$
```

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
avbalaganova@avbalaganova:~$ cd /tmp
avbalaganova@avbalaganova:/tmp$ ls
dbus-19eH4YUv
dbus-VFImRI93
hsperfdata_avbalaganova
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-chronyd.service-pyv20B
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-colord.service-yA723Q
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-dbus-broker.service-sMPHYv
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-low-memory-monitor.service-wYSc7x
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-ModemManager.service-6M9dik
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-polkit.service-qj30fj
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-power-profiles-daemon.service-wdWkXS
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-rtkit-daemon.service-3H72WL
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-switcheroo-control.service-tS4qCM
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-systemd-logind.service-6v859r
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-systemd-oomd.service-44jEC0
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-systemd-resolved.service-Wm4wYY
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-upower.service-fFN82q
VMwareDnD
vmware-root_922-2722632355
avbalaganova@avbalaganova:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
avbalaganova@avbalaganova:/tmp$ ls -a
.
..
dbus-19eH4YUv
dbus-VFImRI93
.font-unix
hyperfddata_avbalaganova
.ICE-unix
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-chrond.service-pyv20B
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-colord.service-yA723Q
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-dbus-broker.service-sNPHYv
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-low-memory-monitor.service-wYSc7x
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-ModemManager.service-6M9dik
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-polkit.service-qj30fj
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-power-profiles-daemon.service-wdwkXS
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-rtkit-daemon.service-3H72WL
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-switcheroo-control.service-ts4qCH
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-systemd-logind.service-6vB59r
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-systemd-oomd.service-44jEC0
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-systemd-resolved.service-Wm4wYY
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-upower.service-fFN82q
VMwareDnD
vmware-root_922-2722632355
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
avbalaganova@avbalaganova:/tmp$
```

Рис. 3: Команда ls -a

Опции команды ls

```
avbalaganova@avbalaganova:~$ ls -l
итого 0
srwxrwxrwx. 1 root      root      0 аар 28 10:11 dbus-19eH4fUv
srwxrwxrwx. 1 root      root      0 аар 28 10:11 dbus-VFImI93
drwxr-xr-x. 2 avbalaganova avbalaganova 40 аар 28 10:39 .user/fdata_avbalaganova
drwx----- 3 root      root      60 аар 28 10:11 systemd-private-9cadcebacfaed01bfb6dce43227de42-chrond.service-xyz208
drwx----- 3 root      root      60 аар 28 10:11 systemd-private-9cadcebacfaed01bfb6dce43227de42-color.service-yA73q
drwx----- 3 root      root      60 аар 28 10:11 systemd-private-9cadcebacfaed01bfb6dce43227de42-dbus-broker.service-uPRVv
drwx----- 3 root      root      60 аар 28 10:11 systemd-private-9cadcebacfaed01bfb6dce43227de42-low-memory-monitor.service-WY6C7k
drwx----- 3 root      root      60 аар 28 10:11 systemd-private-9cadcebacfaed01bfb6dce43227de42-modeshaper.service-omdHk
drwx----- 3 root      root      60 аар 28 10:11 systemd-private-9cadcebacfaed01bfb6dce43227de42-polkit.service-q10Uf
drwx----- 3 root      root      60 аар 28 10:11 systemd-private-9cadcebacfaed01bfb6dce43227de42-power-profiles-daemon.service-uhkX5
drwx----- 3 root      root      60 аар 28 10:11 systemd-private-9cadcebacfaed01bfb6dce43227de42-rfkill-daemon.service-30726L
drwx----- 3 root      root      60 аар 28 10:11 systemd-private-9cadcebacfaed01bfb6dce43227de42-switcheroo-control.service-154qC8
drwx----- 3 root      root      60 аар 28 10:11 systemd-private-9cadcebacfaed01bfb6dce43227de42-systemd-logind.service-nv859r
drwx----- 3 root      root      60 аар 28 10:11 systemd-private-9cadcebacfaed01bfb6dce43227de42-systemd-oomd.service-44jCo
drwx----- 3 root      root      60 аар 28 10:11 systemd-private-9cadcebacfaed01bfb6dce43227de42-systemd-resolved.service-M6uWY
drwxrwxrwt. 2 avbalaganova avbalaganova 208 аар 28 11:12 .gnuc9000
drwx----- 2 root      root      40 аар 28 10:11 vmware-root_832-272632335
avbalaganova@avbalaganova:~$
```

Рис. 4: Команда ls -l

Опции команды ls

```
avbalaganova@avbalaganova: /tmp$ ls -f
.
..
.X11-unix
.ICE-unix
.XIM-unix
.font-unix
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-systemd-oomd.service-44jEC0
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-systemd-resolved.service-Wm4wYY
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-dbus-broker.service-sMPHYv
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-chronyd.service-pyv208
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-low-memory-monitor.service-wYSc7x
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-polkit.service-qj30fj
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-power-profiles-daemon.service-wdWkXS
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-rtkit-daemon.service-3H72WL
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-switcheroo-control.service-tS4qCM
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-systemd-logind.service-6v859r
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-upower.service-FFN82q
vmware-root_922-2722632355
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-ModemManager.service-6M9dik
dbus-19eH4YUv
dbus-VFImRI93
.X1024-lock
.X1025-lock
systemd-private-9cadce9acfae4d91bf6dbcef3927de42-colord.service-yA723Q
.X0-lock
.X1-lock
VMwareDnD
hsperfdata_avbalaganova
avbalaganova@avbalaganova: /tmp$
```

Рис. 5: Команда ls -f

```
avbalaganova@avbalaganova:/tmp$  
avbalaganova@avbalaganova:/tmp$ cd /var/spool  
avbalaganova@avbalaganova:/var/spool$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 1510 июн 10 10:47 abrt  
drwx----- 1 abrt abrt 0 июл 19 2023 abrt-upload  
drwx--x--- 1 root lp 6 фев 16 2024 cups  
drwxr-xr-x. 1 root root 0 июл 21 2023 lpd  
drwxrwxr-x. 1 root mail 514 авг 28 10:10 mail  
drwxr-xr-x. 1 root root 0 июл 21 2023 plymouth  
avbalaganova@avbalaganova:/var/spool$
```

Рис. 6: Каталог /var/spool

```
avbalaganova@avbalaganova: /var/spool$ cd
avbalaganova@avbalaganova: $ ls
git-extended  work  Видео  Документы  Загрузки  Изображения  Музыка  Общедоступные  'Рабочий стол'  Шаблоны
avbalaganova@avbalaganova: $ ls -al
итого 24
drwx-----, 1 avbalaganova avbalaganova 510 аэр 28 11:01 .
drwxr-xr-x, 1 root root 508 аэр 28 10:10 ..
-rw-----, 1 avbalaganova avbalaganova 2655 аэр 28 11:17 .bash_history
-rw-r--r--, 1 avbalaganova avbalaganova 18 янв 22 2024 .bash_logout
-rw-r--r--, 1 avbalaganova avbalaganova 144 янв 22 2024 .bash_profile
-rw-r--r--, 1 avbalaganova avbalaganova 682 аэр 28 10:59 .bashrc
drwx-----, 1 avbalaganova avbalaganova 452 аэр 28 11:02 .cache
drwx-----, 1 avbalaganova avbalaganova 398 аэр 28 11:02 .config
-rw-r--r--, 1 avbalaganova avbalaganova 334 мар 25 03:00 .emacs
-rw-r--r--, 1 avbalaganova avbalaganova 235 аэр 28 10:24 .gitconfig
drwxr-xr-x, 1 avbalaganova avbalaganova 74 аэр 28 11:07 git-extended
drwx-----, 1 avbalaganova avbalaganova 136 аэр 28 10:23 .gnupg
drwx-----, 1 avbalaganova avbalaganova 20 аэр 28 10:11 .local
drwxr-xr-x, 1 avbalaganova avbalaganova 48 аэр 28 10:12 .mozilla
drwx-----, 1 avbalaganova avbalaganova 132 аэр 28 10:26 .ssh
drwxr-xr-x, 1 avbalaganova avbalaganova 10 аэр 28 10:26 work
drwxr-xr-x, 1 avbalaganova avbalaganova 0 аэр 28 10:11 Видео
drwxr-xr-x, 1 avbalaganova avbalaganova 0 аэр 28 10:11 Документы
drwxr-xr-x, 1 avbalaganova avbalaganova 0 аэр 28 10:11 Загрузки
drwxr-xr-x, 1 avbalaganova avbalaganova 0 аэр 28 10:11 Изображения
drwxr-xr-x, 1 avbalaganova avbalaganova 0 аэр 28 10:11 Музыка
drwxr-xr-x, 1 avbalaganova avbalaganova 0 аэр 28 10:11 Общедоступные
drwxr-xr-x, 1 avbalaganova avbalaganova 0 аэр 28 10:11 'Рабочий стол'
drwxr-xr-x, 1 avbalaganova avbalaganova 0 аэр 28 10:11 Шаблоны
avbalaganova@avbalaganova: $
```

Рис. 7: Файлы в домашнем каталоге

Работа с каталогами

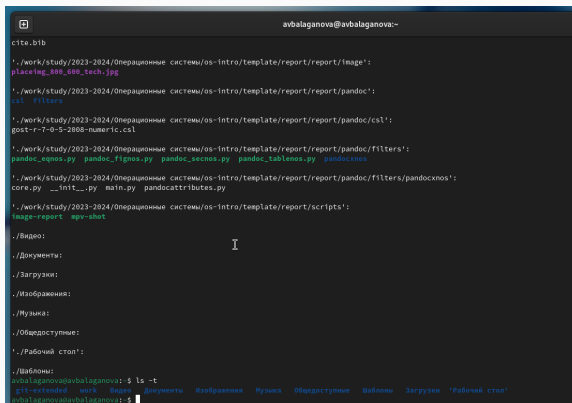
```

vch@laganovsashch@laganov:~$
vch@laganovsashch@laganov:~$ mkdir newdir
vch@laganovsashch@laganov:~$ mkdir newdir/morefun
vch@laganovsashch@laganov:~$ mkdir letters memos misk
vch@laganovsashch@laganov:~$ ls
git-extended  letters  memos  misk  newdir  work
vch@laganovsashch@laganov:~$ rm letters memos misk
rm: невозможно удалить 'letters': 2го каталога
rm: невозможно удалить 'memos': 3го каталога
rm: невозможно удалить 'misk': 3го каталога
vch@laganovsashch@laganov:~$ rm -r letters/ memos/ misk/
vch@laganovsashch@laganov:~$ rm -r newdir/
vch@laganovsashch@laganov:~$ ls
git-extended  work  Books  Documents  Зарплата  Изобретения  Музыка  Обязательства  'Рабочий стол'  Работы
vch@laganovsashch@laganov:~$

```

Рис. 8: Действия с каталогами

Опции команды ls



```
avbalaganova@avbalaganova:~  
cite.bib  
./work/study/2023-2024/Операционные системы/os-intro/template/report/report/image:  
placing_899_609_tech.jpg  
./work/study/2023-2024/Операционные системы/os-intro/template/report/report/pandoc:  
csl filters  
./work/study/2023-2024/Операционные системы/os-intro/template/report/report/pandoc/csl:  
gost-r-7-0-5-2008-numeric.csl  
./work/study/2023-2024/Операционные системы/os-intro/template/report/report/pandoc/filters:  
pandoc_eqnos.py pandoc_fignos.py pandoc_secnos.py pandoc_tablenos.py pandocxnos  
./work/study/2023-2024/Операционные системы/os-intro/template/report/report/pandoc/filters/pandocxnos:  
core.py __init__.py main.py pandocattributes.py  
./work/study/2023-2024/Операционные системы/os-intro/template/report/scripts:  
image-report mpv-shot  
./Видео:  
./Документы:  
./Загрузки:  
./Изображения:  
./Музыка:  
./Общедоступные:  
./Рабочий стол:  
./Шаблоны:  
avbalaganova@avbalaganova:~$ ls -t  
sit-extended work video документы Изображения Музыка Общедоступные Шаблоны Загрузки 'Рабочий стол'  
avbalaganova@avbalaganova:~$
```

Рис. 9: Команда ls -R и ls -t

```
avbalaganova@avbalaganova:~$ help cd
cd: cd [-L|[-P [-e]] [-@]] [watanor]
    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.

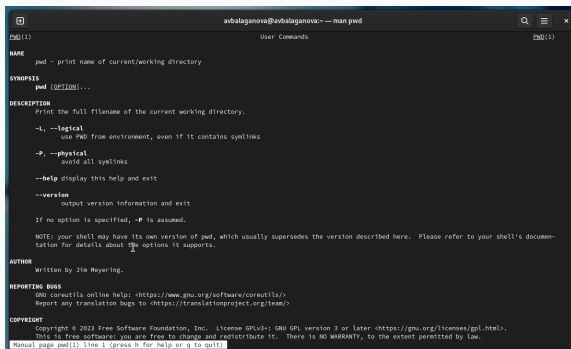
Options:
  -L      force symbolic links to be followed: resolve symbolic
          links in DIR after processing instances of '..'
  -P      use the physical directory structure without following
          symbolic links: resolve symbolic links in DIR before
          processing instances of '..'
  -e      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 $PWD is set successfully when
-P is used; non-zero otherwise.
avbalaganova@avbalaganova:~$
```

Рис. 10: Справка по команде cd

Справка по командам



```
avbalaganova@avbalaganova:~$ 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.

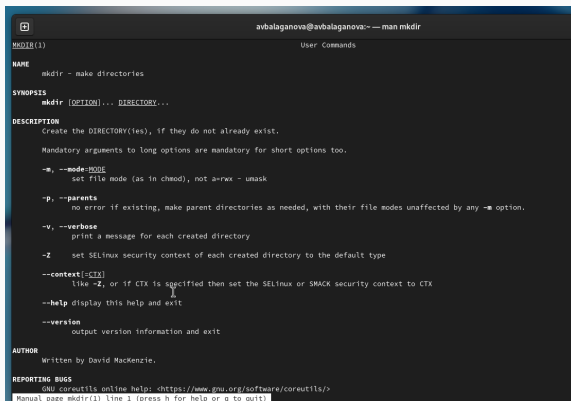
AUTHOR
  Written by Jim Meyerling.

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



```
avbalaganova@avbalaganova:~ — man mkdir
mkdir(1)                                User Commands

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

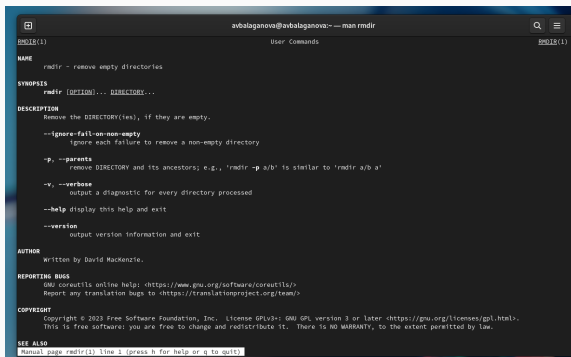
  --help
      display this help and exit

  --version
      output version information and exit

AUTHOR
  Written by David MacKenzie.

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

Рис. 12: Справка по команде mkdir



```
avbalaganova@avbalaganova:~ -- 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.

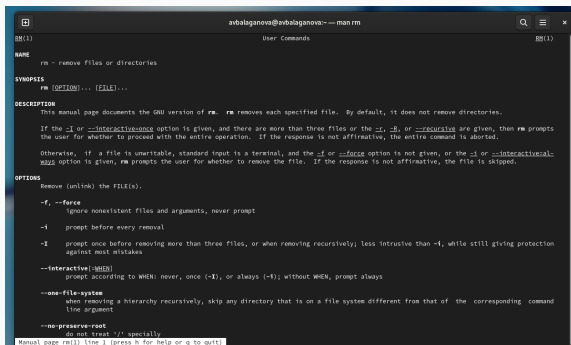
REPORTING BUGS
  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
  Report any translation bugs to <https://translationproject.org/team/>

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

Рис. 13: Справка по команде rmdir

Справка по командам



```
avbalaganova@avbalaganova:~ -- man rm
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 -f, -B, 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 unritable, 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 (-f); without WHEN, prompt always

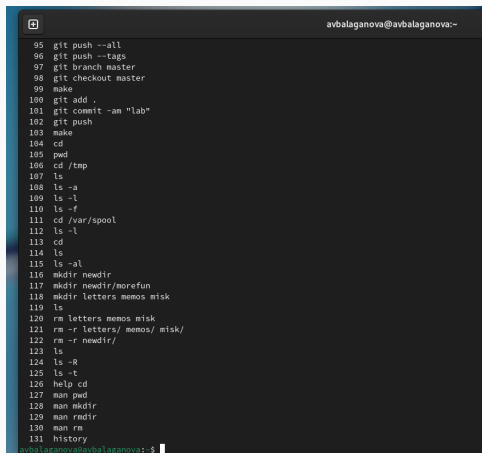
    --one-file-system
        when removing a hierarchy recursively, skip any directory that is on a file system different from that of the corresponding command line argument

    --no-preserve-root
        do not treat '/' specially

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 with a dark background and light blue text. The window title is 'avbalaganova@avbalaganova:-'. The terminal shows a list of 31 commands, each preceded by a line number from 95 to 131. The commands include git operations, file system navigation, file listing, directory creation, and file removal. The last command is 'history', which has triggered the display of the previous 30 commands in the list.

```
avbalaganova@avbalaganova:-
95 git push --all
96 git push --tags
97 git branch master
98 git checkout master
99 make
100 git add .
101 git commit -an "lab"
102 git push
103 make
104 cd
105 pwd
106 cd /tmp
107 ls
108 ls -a
109 ls -l
110 ls -f
111 cd /var/spool
112 ls -l
113 cd
114 ls
115 ls -al
116 mkdir newdir
117 mkdir newdir/morefun
118 mkdir letters memos misk
119 ls
120 rm letters memos misk
121 rm -r letters/ memos/ misk/
122 rm -r newdir/
123 ls
124 ls -R
125 ls -t
126 help cd
127 man pwd
128 man mkdir
129 man rmdir
130 man rm
131 history
avbalaganova@avbalaganova:- $
```

Рис. 15: Команда history

Выводы по проделанной работе

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