

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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22 июня, 2024, Москва, Россия

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Цели и задачи работы

Цель лабораторной работы

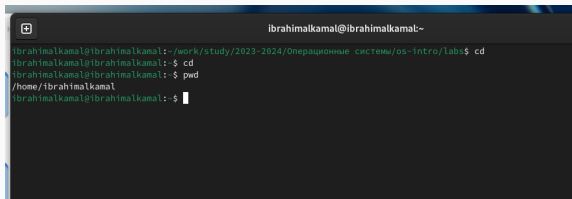
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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

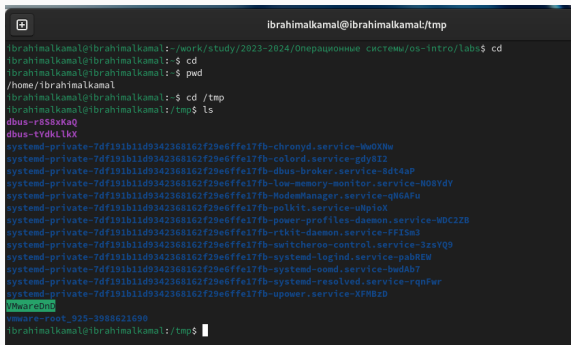
Имя и путь к домашнему каталогу



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

Рис. 1: Путь к домашнему каталогу

Опции команды ls



```
ibrahimalkamal@ibrahimalkamal:/tmp
ibrahimalkamal@ibrahimalkamal:~/work/study/2023-2024/Операционные системы/os-intro/labs$ cd
ibrahimalkamal@ibrahimalkamal:~$ pwd
/home/ibrahimalkamal
ibrahimalkamal@ibrahimalkamal:~$ cd /tmp
ibrahimalkamal@ibrahimalkamal:/tmp$ ls
dbus-r858xKaQ
dbus-tYdKtLkX
systemd-private-7df191b11d9342368162f29e6ffe17fb-chronyd.service-WuOXNu
systemd-private-7df191b11d9342368162f29e6ffe17fb-colord.service-gdy8I2
systemd-private-7df191b11d9342368162f29e6ffe17fb-dbus-broker.service-8dt4aP
systemd-private-7df191b11d9342368162f29e6ffe17fb-low-memory-monitor.service-N08YdY
systemd-private-7df191b11d9342368162f29e6ffe17fb-ModemManager.service-qN6AFu
systemd-private-7df191b11d9342368162f29e6ffe17fb-polkit.service-uNpioX
systemd-private-7df191b11d9342368162f29e6ffe17fb-power-profiles-daemon.service-WDC2ZB
systemd-private-7df191b11d9342368162f29e6ffe17fb-rtkit-daemon.service-FFISm3
systemd-private-7df191b11d9342368162f29e6ffe17fb-switcheroo-control.service-3zsYQ9
systemd-private-7df191b11d9342368162f29e6ffe17fb-systemd-logind.service-pabREW
systemd-private-7df191b11d9342368162f29e6ffe17fb-systemd-oomd.service-bwdAb7
systemd-private-7df191b11d9342368162f29e6ffe17fb-systemd-resolved.service-rqnFwr
systemd-private-7df191b11d9342368162f29e6ffe17fb-upower.service-XFHBzD
VMwareDnD
vmware-root_925-3988621690
ibrahimalkamal@ibrahimalkamal:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
ibrahimalkamal@ibrahimalkamal: /tmp$  
ibrahimalkamal@ibrahimalkamal: /tmp$ ls -a  
.  
..  
dbus-r8S8xKaQ  
dbus-tYdkLlkX  
font-unix  
ICE-unix  
systemd-private-7df191b11d9342368162f29e6ffe17fb-chronyd.service-WwOXHw  
systemd-private-7df191b11d9342368162f29e6ffe17fb-colord.service-gdy8I2  
systemd-private-7df191b11d9342368162f29e6ffe17fb-dbus-broker.service-8dt4aP  
systemd-private-7df191b11d9342368162f29e6ffe17fb-low-memory-monitor.service-N08YdV  
systemd-private-7df191b11d9342368162f29e6ffe17fb-ModemManager.service-qN6AFu  
systemd-private-7df191b11d9342368162f29e6ffe17fb-polkit.service-uNpioX  
systemd-private-7df191b11d9342368162f29e6ffe17fb-power-profiles-daemon.service-WDC2ZB  
systemd-private-7df191b11d9342368162f29e6ffe17fb-rtkit-daemon.service-FFISm3  
systemd-private-7df191b11d9342368162f29e6ffe17fb-switcheroo-control.service-3zsYQ9  
systemd-private-7df191b11d9342368162f29e6ffe17fb-systemd-logind.service-pabREW  
systemd-private-7df191b11d9342368162f29e6ffe17fb-systemd-oomd.service-bwdAb7  
systemd-private-7df191b11d9342368162f29e6ffe17fb-systemd-resolved.service-rqnFwr  
systemd-private-7df191b11d9342368162f29e6ffe17fb-upower.service-XFMBzD  
VMwareDnD  
vmware-root_925-3988621690  
.X0-lock  
.X1024-lock  
.X1025-lock  
.X11-unix  
.X1-lock  
.XIM-unix  
ibrahimalkamal@ibrahimalkamal: /tmp$
```

Рис. 3: Команда ls -a

Опции команды ls

```
ibrahimkamil@ibrahimkamil:~/tmp$  
ibrahimkamil@ibrahimkamil:~/tmp$ ls -l  
total 0  
drwxr-xr-x. 1 root root 0 Nov 22 13:37 dbus-r858uKq  
drwxr-xr-x. 1 root root 0 Nov 22 13:37 dbus-TYdKLiKX  
drwx-----. 3 root root 60 Nov 22 13:37 systemd-private-7d7f191b11d9342368162f29a6ffe17fb-chronyd.service-Wu0Xhw  
drwx-----. 3 root root 60 Nov 22 13:37 systemd-private-7d7f191b11d9342368162f29a6ffe17fb-calord.service-gdy8I2  
drwx-----. 3 root root 60 Nov 22 13:37 systemd-private-7d7f191b11d9342368162f29a6ffe17fb-dbus-broker.service-Id4qP  
drwx-----. 3 root root 60 Nov 22 13:37 systemd-private-7d7f191b11d9342368162f29a6ffe17fb-low-memory-monitor.service-N08ydy  
drwx-----. 3 root root 60 Nov 22 13:37 systemd-private-7d7f191b11d9342368162f29a6ffe17fb-ModemManager.service-qHGAfu  
drwx-----. 3 root root 60 Nov 22 13:37 systemd-private-7d7f191b11d9342368162f29a6ffe17fb-polkitt.service-uhp1x  
drwx-----. 3 root root 60 Nov 22 13:37 systemd-private-7d7f191b11d9342368162f29a6ffe17fb-power-profiles-daemon.service-M0C2ZB  
drwx-----. 3 root root 60 Nov 22 13:37 systemd-private-7d7f191b11d9342368162f29a6ffe17fb-r81x-daemon.service-PT1m3  
drwx-----. 3 root root 60 Nov 22 13:37 systemd-private-7d7f191b11d9342368162f29a6ffe17fb-switcheroo-control.service-3uYVqg  
drwx-----. 3 root root 60 Nov 22 13:37 systemd-private-7d7f191b11d9342368162f29a6ffe17fb-systemd-logind.service-paRER  
drwx-----. 3 root root 60 Nov 22 13:37 systemd-private-7d7f191b11d9342368162f29a6ffe17fb-systemd-oomd.service-budAb7  
drwx-----. 3 root root 60 Nov 22 13:37 systemd-private-7d7f191b11d9342368162f29a6ffe17fb-systemd-razelind.service-qn4wr  
drwx-----. 3 root root 60 Nov 22 13:37 systemd-private-7d7f191b11d9342368162f29a6ffe17fb-upower.service-3PN8zP  
drwxrwxrwt. 2 ibrahimkamil ibrahimkamil 260 Nov 22 14:31 vmware-root  
drwx-----. 2 root root 40 Nov 22 13:37 vmware-root_525-3588621650  
ibrahimkamil@ibrahimkamil:~/tmp$
```

Рис. 4: Команда ls -l

Опции команды ls

```
ibrahimkamal@ibrahimkamal:/tmp$  
ibrahimkamal@ibrahimkamal:/tmp$ ls -f  
.  
..  
ib0 .X11-unix  
  .ICE-unix  
  .XIM-unix  
  .font-unix  
systemd-private-7df191b1d9342368162f29e6ffe17fb-systemd-oomd.service-bwdAb7  
systemd-private-7df191b1d9342368162f29e6ffe17fb-systemd-resolved.service-rqnFwr  
systemd-private-7df191b1d9342368162f29e6ffe17fb-dbus-broker.service-8dt4aP  
ib0 systemd-private-7df191b1d9342368162f29e6ffe17fb-chronyd.service-WwOXNw  
systemd-private-7df191b1d9342368162f29e6ffe17fb-low-memory-monitor.service-N08YdY  
systemd-private-7df191b1d9342368162f29e6ffe17fb-polkit.service-uNpioX  
systemd-private-7df191b1d9342368162f29e6ffe17fb-power-profiles-daemon.service-WDC2ZB  
systemd-private-7df191b1d9342368162f29e6ffe17fb-rtkit-daemon.service-FFISm3  
systemd-private-7df191b1d9342368162f29e6ffe17fb-switcheroo-control.service-3zsYQ9  
systemd-private-7df191b1d9342368162f29e6ffe17fb-systemd-logind.service-pabREW  
systemd-private-7df191b1d9342368162f29e6ffe17fb-upower.service-XFMBzD  
vmware-root_925-3988621690  
systemd-private-7df191b1d9342368162f29e6ffe17fb-ModemManager.service-qN6AFu  
dbus-r8S8xKaQ  
dbus-tYdkLlkX  
  .X1024-lock  
  .X1025-lock  
systemd-private-7df191b1d9342368162f29e6ffe17fb-colord.service-gdy8I2  
  .X0-lock  
  .X1-lock  
VMwareDnD  
ibrahimkamal@ibrahimkamal:/tmp$
```

Рис. 5: Команда ls -f

```
ibrahimalkamal@ibrahimalkamal: /tmp$  
ibrahimalkamal@ibrahimalkamal: /tmp$  
ibrahimalkamal@ibrahimalkamal: /tmp$ cd /var/spool/  
ibrahimalkamal@ibrahimalkamal: /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 03:00 cups  
drwxr-xr-x. 1 root root 0 июл 21 2023 lpd  
drwxrwxr-x. 1 root mail 1364 июн 22 13:36 mail  
drwxr-xr-x. 1 root root 0 июл 21 2023 plymouth  
ibrahimalkamal@ibrahimalkamal: /var/spool$
```

Рис. 6: Каталог /var/spool

Домашний каталог

```
ibrahimkamil@ibrahimkamil: /var/spool$  
ibrahimkamil@ibrahimkamil: /var/spool$ cd  
ibrahimkamil@ibrahimkamil: $ ls  
git-extended work видео документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны  
ibrahimkamil@ibrahimkamil: $ ls -al  
итого 24  
drwx----- 1 ibrahimkamil ibrahimkamil 510 июн 22 14:16 .  
drwxr-xr-x 1 root root 1358 июн 22 13:36 ..  
-rw----- 1 ibrahimkamil ibrahimkamil 2558 июн 22 14:35 .bash_history  
-rw-r--r-- 1 ibrahimkamil ibrahimkamil 18 янв 22 03:00 .bash_logout  
-rw-r--r-- 1 ibrahimkamil ibrahimkamil 144 янв 22 03:00 .bash_profile  
-rw-r--r-- 1 ibrahimkamil ibrahimkamil 684 июн 22 14:13 .bashrc  
drwx----- 1 ibrahimkamil ibrahimkamil 452 июн 22 14:17 .cache  
drwx----- 1 ibrahimkamil ibrahimkamil 376 июн 22 14:17 .config  
-rw-r--r-- 1 ibrahimkamil ibrahimkamil 334 мар 25 03:00 .emacs  
-rw-r--r-- 1 ibrahimkamil ibrahimkamil 237 июн 22 13:47 .gitconfig  
drwxr-xr-x 1 ibrahimkamil ibrahimkamil 74 июн 22 14:21 git-extended  
drwx----- 1 ibrahimkamil ibrahimkamil 136 июн 22 13:46 .gnupg  
drwx----- 1 ibrahimkamil ibrahimkamil 20 июн 22 13:38 .local  
drwxr-xr-x 1 ibrahimkamil ibrahimkamil 48 июн 22 13:38 .mozilla  
drwx----- 1 ibrahimkamil ibrahimkamil 132 июн 22 13:50 .ssh  
drwxr-xr-x 1 ibrahimkamil ibrahimkamil 10 июн 22 13:50 work  
drwxr-xr-x 1 ibrahimkamil ibrahimkamil 0 июн 22 13:38 видео  
drwxr-xr-x 1 ibrahimkamil ibrahimkamil 0 июн 22 13:38 документы  
drwxr-xr-x 1 ibrahimkamil ibrahimkamil 0 июн 22 13:38 Загрузки  
drwxr-xr-x 1 ibrahimkamil ibrahimkamil 0 июн 22 13:38 Изображения  
drwxr-xr-x 1 ibrahimkamil ibrahimkamil 0 июн 22 13:38 Музыка  
drwxr-xr-x 1 ibrahimkamil ibrahimkamil 0 июн 22 13:38 Общедоступные  
drwxr-xr-x 1 ibrahimkamil ibrahimkamil 0 июн 22 13:38 'Рабочий стол'  
drwxr-xr-x 1 ibrahimkamil ibrahimkamil 0 июн 22 13:38 Шаблоны  
ibrahimkamil@ibrahimkamil: $
```

Рис. 7: Файлы в домашнем каталоге

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

Рис. 8: Действия с каталогами

Опции команды ls

```
gost-r-7-8-5-2808-numeric.csl
lab0
!./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
lab0
./Видео:
./Документы:
./Загрузки:
./Изображения:
./Музыка:
./Общедоступные:
./Рабочий стол':
./Шаблоны:
ibrahimalkamal@ibrahimalkamal:~$ ls -t
git-extended work Видео Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны
ibrahimalkamal@ibrahimalkamal:~$
```

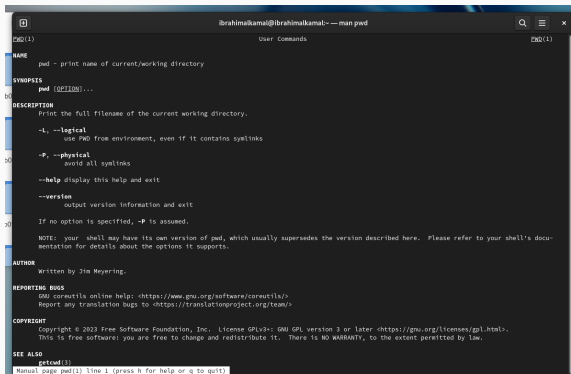
Рис. 9: Команда ls -R и ls -t

Справка по командам

```
ibrahimalkamal@ibrahimalkamal:~$  
ibrahimalkamal@ibrahimalkamal:~$  
ibrahimalkamal@ibrahimalkamal:~$ help cd  
cd: cd [-L][-P [-e]] [-@]] [karanor]  
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 $PWD is set successfully when  
-P is used; non-zero otherwise.  
ibrahimalkamal@ibrahimalkamal:~$
```

Рис. 10: Справка по команде cd

Справка по командам



```
ibrahimalkamal@ibrahimalkamal:~$ 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.

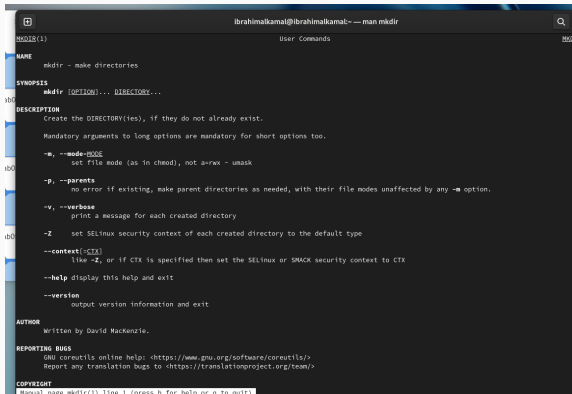
REPORTING BUGS
  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
  Report any translation bugs to <https://translationproject.org/team/>

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SEE ALSO
  getcwd(3)
  Manual page pwd(1) line 1 (press h for help or q to quit)
```

Рис. 11: Справка по команде pwd

Справка по командам



```
ibrahimkamal@ibrahimkamal:~ -- man mkdir
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

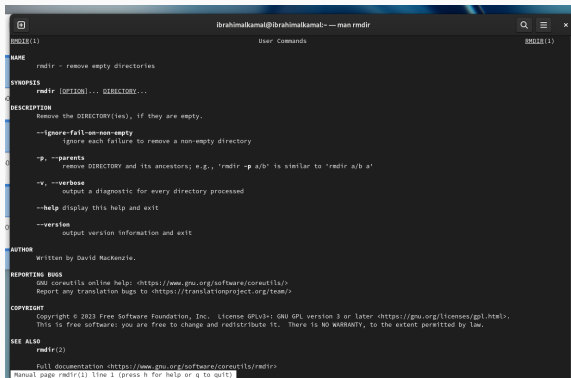
  --version
      output version information and exit

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/>

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

Рис. 12: Справка по команде mkdir



```
ibrahimalkamal@ibrahimalkamal:~ — 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.

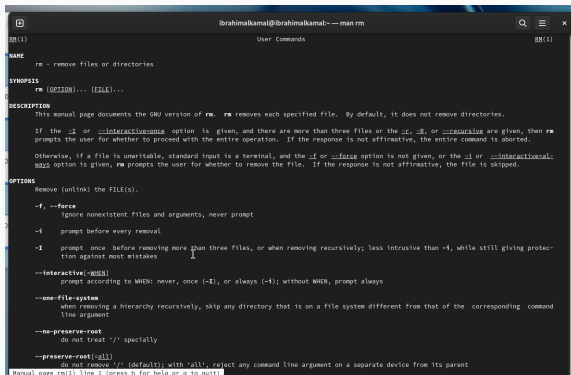
REPORTING BUGS
  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
  Report any translation bugs to <https://translationproject.org/team/>

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SEE ALSO
  rmdir(2)

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

Рис. 13: Справка по команде rmdir



```
ibrahimkamal@ibrahimkamal:~$ man rm
rm(1)                                User Commands
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 unwriteable, standard input is a terminal, and the -i 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

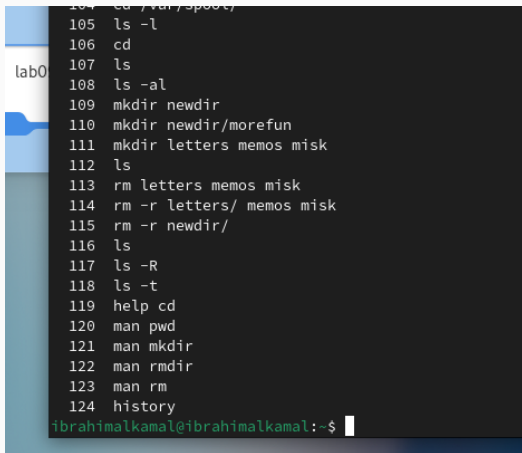
--no-preserve-root
    do not treat '/' specially

--preserve-root[=all]
    do not remove '/' (default); with 'all', reject any command line argument on a separate device from its parent

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. On the left side, there is a vertical sidebar with a light blue background and a white tab labeled 'lab0'. The terminal displays a list of 14 commands, each preceded by a line number from 104 to 124. The commands are: cd /var/spool/, ls -l, cd, ls, ls -al, mkdir newdir, mkdir newdir/morefun, mkdir letters memos misk, ls, rm letters memos misk, rm -r letters/ memos misk, rm -r newdir/, ls, ls -R, ls -t, help cd, man pwd, man mkdir, man rmdir, man rm, and history. The prompt 'ibrahimalkamal@ibrahimalkamal:~\$' is visible at the bottom, followed by a white cursor.

```
104 cd /var/spool/
105 ls -l
106 cd
107 ls
108 ls -al
109 mkdir newdir
110 mkdir newdir/morefun
111 mkdir letters memos misk
112 ls
113 rm letters memos misk
114 rm -r letters/ memos misk
115 rm -r newdir/
116 ls
117 ls -R
118 ls -t
119 help cd
120 man pwd
121 man mkdir
122 man rmdir
123 man rm
124 history
ibrahimalkamal@ibrahimalkamal:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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