

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

Леденев Егор Олегович¹

12 августа, 2023, Москва, Россия

¹Российский Университет Дружбы Народов

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

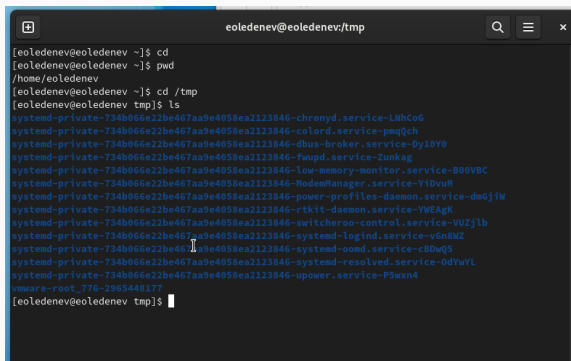
Имя и путь к домашнему каталогу

A terminal window titled 'eolenedev@eolenedev:~' with search, menu, and close buttons. The terminal shows the following commands and output:

```
[eolenedev@eolenedev ~]$ cd  
[eolenedev@eolenedev ~]$ pwd  
/home/eolenedev  
[eolenedev@eolenedev ~]$
```

Рис. 1: Путь к домашнему каталогу

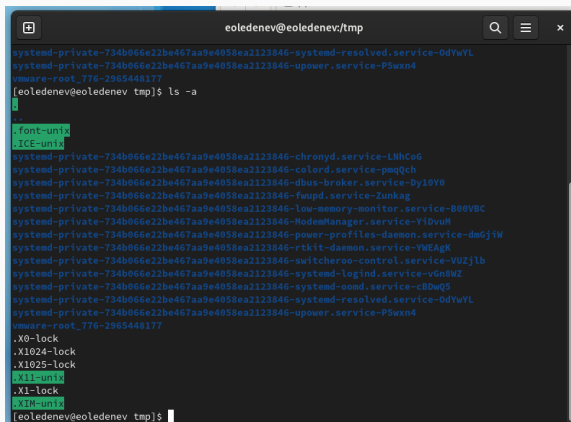
Опции команды ls



```
eoledenev@eoledenev:tmp
[eoledenev@eoledenev ~]$ cd
[eoledenev@eoledenev ~]$ pwd
/home/eoledenev
[eoledenev@eoledenev ~]$ cd /tmp
[eoledenev@eoledenev tmp]$ ls
systemd-private-734b066e22be467aa9e4058ea2123846-chronyd.service-LNhCoG
systemd-private-734b066e22be467aa9e4058ea2123846-colord.service-pmqQch
systemd-private-734b066e22be467aa9e4058ea2123846-dbus-broker.service-Dy10V8
systemd-private-734b066e22be467aa9e4058ea2123846-fwupd.service-Zunkag
systemd-private-734b066e22be467aa9e4058ea2123846-low-memory-monitor.service-B08VBC
systemd-private-734b066e22be467aa9e4058ea2123846-ModemManager.service-YiDvuM
systemd-private-734b066e22be467aa9e4058ea2123846-power-profiles-daemon.service-dmGjiW
systemd-private-734b066e22be467aa9e4058ea2123846-rtkit-daemon.service-YWEagK
systemd-private-734b066e22be467aa9e4058ea2123846-switcheroo-control.service-VWzjlb
systemd-private-734b066e22be467aa9e4058ea2123846-systemd-logind.service-vGn8WZ
systemd-private-734b066e22be467aa9e4058ea2123846-systemd-oomd.service-cB0wQ5
systemd-private-734b066e22be467aa9e4058ea2123846-systemd-resolved.service-0dYwYL
systemd-private-734b066e22be467aa9e4058ea2123846-upower.service-P5wxn4
vmware-root_776-2965448177
[eoledenev@eoledenev tmp]$
```

Рис. 2: Команда ls

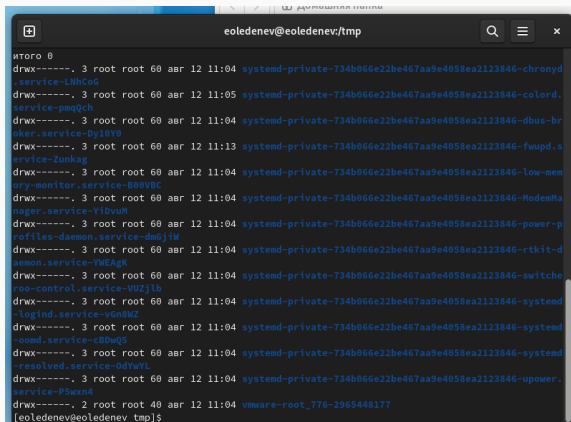
Опции команды ls



```
eolenedev@eolenedev:tmp
systemd-private-734b066e22be467aa9e4058ea2123846-systemd-resolved.service-0dYwVL
systemd-private-734b066e22be467aa9e4058ea2123846-upower.service-P5wxn4
vmware-root_776-2965448177
[eolenedev@eolenedev tmp]$ ls -la
.
.
.font-unix
.ICE-unix
systemd-private-734b066e22be467aa9e4058ea2123846-chrond.service-LNhCoG
systemd-private-734b066e22be467aa9e4058ea2123846-colord.service-pmqQch
systemd-private-734b066e22be467aa9e4058ea2123846-dbus-broker.service-Dy10Y0
systemd-private-734b066e22be467aa9e4058ea2123846-fwupd.service-Zunkag
systemd-private-734b066e22be467aa9e4058ea2123846-low-memory-monitor.service-B00VBC
systemd-private-734b066e22be467aa9e4058ea2123846-ModemManager.service-YiDvuH
systemd-private-734b066e22be467aa9e4058ea2123846-power-profiles-daemon.service-dmGjiW
systemd-private-734b066e22be467aa9e4058ea2123846-rtkit-daemon.service-YMEAgK
systemd-private-734b066e22be467aa9e4058ea2123846-switcheroo-control.service-VUZjlb
systemd-private-734b066e22be467aa9e4058ea2123846-systemd-logind.service-VGn8WZ
systemd-private-734b066e22be467aa9e4058ea2123846-systemd-oomd.service-c8DwQS
systemd-private-734b066e22be467aa9e4058ea2123846-systemd-resolved.service-0dYwVL
systemd-private-734b066e22be467aa9e4058ea2123846-upower.service-P5wxn4
vmware-root_776-2965448177
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
[eolenedev@eolenedev tmp]$
```

Рис. 3: Команда ls -a

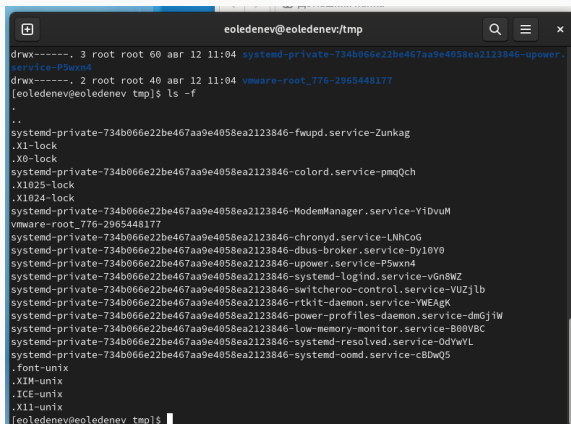
Опции команды ls



```
eolenedev@eolenedev/tmp
итого 0
drwx-----, 3 root root 60 abr 12 11:04 systemd-private-734b066e22be467aa9e4058ea2123846-chronyd
.service-LMhCo6
drwx-----, 3 root root 60 abr 12 11:05 systemd-private-734b066e22be467aa9e4058ea2123846-color.d.
service-pmqQch
drwx-----, 3 root root 60 abr 12 11:04 systemd-private-734b066e22be467aa9e4058ea2123846-dbus-br
oker.service-Dy10Y0
drwx-----, 3 root root 60 abr 12 11:13 systemd-private-734b066e22be467aa9e4058ea2123846-fwupd.s
ervice-Zunkag
drwx-----, 3 root root 60 abr 12 11:04 systemd-private-734b066e22be467aa9e4058ea2123846-low-mem
ory-monitor.service-880VBC
drwx-----, 3 root root 60 abr 12 11:04 systemd-private-734b066e22be467aa9e4058ea2123846-ModemMa
nager.service-YiDvuM
drwx-----, 3 root root 60 abr 12 11:04 systemd-private-734b066e22be467aa9e4058ea2123846-power-p
rofiles-daemon.service-dmGjiW
drwx-----, 3 root root 60 abr 12 11:04 systemd-private-734b066e22be467aa9e4058ea2123846-rtkit-d
aemon.service-YWEAgK
drwx-----, 3 root root 60 abr 12 11:04 systemd-private-734b066e22be467aa9e4058ea2123846-switche
roo-control.service-VUZjlb
drwx-----, 3 root root 60 abr 12 11:04 systemd-private-734b066e22be467aa9e4058ea2123846-systemd
-logind.service-vGn8WZ
drwx-----, 3 root root 60 abr 12 11:04 systemd-private-734b066e22be467aa9e4058ea2123846-systemd
-pomod.service-cBDwQ5
drwx-----, 3 root root 60 abr 12 11:04 systemd-private-734b066e22be467aa9e4058ea2123846-systemd
-resolved.service-0dYwYL
drwx-----, 3 root root 60 abr 12 11:04 systemd-private-734b066e22be467aa9e4058ea2123846-upower.
service-P5wxn4
drwx-----, 2 root root 40 abr 12 11:04 vmware-root_776-2965448177
[eolenedev@eolenedev tmp]$
```

Рис. 4: Команда ls -l

Опции команды ls

A terminal window titled 'eoledenev@eoledenev/tmp' with search, menu, and close icons in the title bar. The terminal shows the output of the 'ls -f' command, listing files and directories with their permissions, owner, group, size, and modification time. The output includes files like 'systemd-private-734b066e22be467aa9e4058ea2123846-upower.service-P5wxn4', 'vmware-root_776-2965448177', and various lock files like '.X1-lock', '.X0-lock', '.X1025-lock', and '.X1024-lock'. It also lists system services like 'fwupd.service-Zunkag', 'colord.service-pmqQch', 'ModemManager.service-YiDvuM', 'chronyd.service-LNHCoG', 'dbus-broker.service-Dy10V0', 'upower.service-P5wxn4', 'systemd-logind.service-VGn8WZ', 'switcheroo-control.service-VUZjlb', 'rtkit-daemon.service-YWEAgK', 'power-profiles-daemon.service-dmGjiw', 'low-memory-monitor.service-B00VBC', 'systemd-resolved.service-0dYwYL', and 'systemd-oomd.service-cBDwQ5'. At the bottom, it shows font and X11-related files like '.font-unix', '.XIM-unix', '.ICE-unix', and '.X11-unix'. The prompt '[eoledenev@eoledenev tmp]\$' is visible at the end of the output.

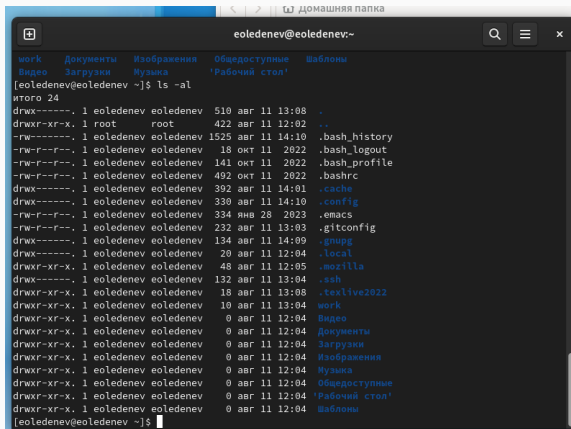
```
eoledenev@eoledenev/tmp
drwx-----, 3 root root 60 abr 12 11:04 systemd-private-734b066e22be467aa9e4058ea2123846-upower.
service-P5wxn4
drwx-----, 2 root root 40 abr 12 11:04 vmware-root_776-2965448177
[eoledenev@eoledenev tmp]$ ls -f
.
..
systemd-private-734b066e22be467aa9e4058ea2123846-fwupd.service-Zunkag
.X1-lock
.X0-lock
systemd-private-734b066e22be467aa9e4058ea2123846-colord.service-pmqQch
.X1025-lock
.X1024-lock
systemd-private-734b066e22be467aa9e4058ea2123846-ModemManager.service-YiDvuM
vmware-root_776-2965448177
systemd-private-734b066e22be467aa9e4058ea2123846-chronyd.service-LNHCoG
systemd-private-734b066e22be467aa9e4058ea2123846-dbus-broker.service-Dy10V0
systemd-private-734b066e22be467aa9e4058ea2123846-upower.service-P5wxn4
systemd-private-734b066e22be467aa9e4058ea2123846-systemd-logind.service-VGn8WZ
systemd-private-734b066e22be467aa9e4058ea2123846-switcheroo-control.service-VUZjlb
systemd-private-734b066e22be467aa9e4058ea2123846-rtkit-daemon.service-YWEAgK
systemd-private-734b066e22be467aa9e4058ea2123846-power-profiles-daemon.service-dmGjiw
systemd-private-734b066e22be467aa9e4058ea2123846-low-memory-monitor.service-B00VBC
systemd-private-734b066e22be467aa9e4058ea2123846-systemd-resolved.service-0dYwYL
systemd-private-734b066e22be467aa9e4058ea2123846-systemd-oomd.service-cBDwQ5
.font-unix
.XIM-unix
.ICE-unix
.X11-unix
[eoledenev@eoledenev tmp]$
```

Рис. 5: Команда ls -f

```
[eolenedev@eolenedev tmp]$  
[eolenedev@eolenedev tmp]$ cd /var/spool  
[eolenedev@eolenedev spool]$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 578 июн 22 11:07 abrt  
drwx-----. 1 abrt abrt  0 мар 11 2022 abrt-upload  
drwx--x---. 1 root lp    6 окт  3 2022 cups  
drwxr-xr-x. 1 root root  0 авг  9 2022 lpd  
drwxrwxr-x. 1 root mail 428 авг 11 12:02 mail  
drwxr-xr-x. 1 root root  0 мар  7 2022 plymouth  
[eolenedev@eolenedev spool]$
```

Рис. 6: Каталог /var/spool

Домашний каталог



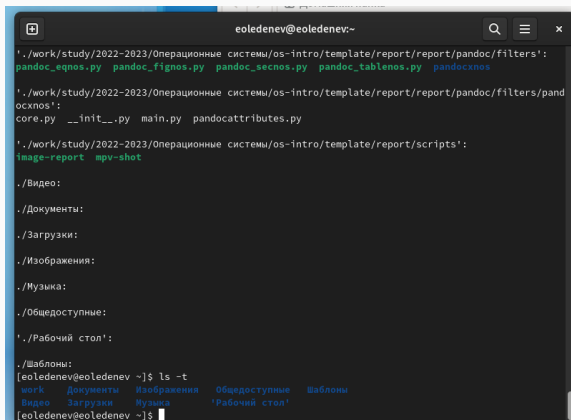
```
eolenedev@eolenedev:~  
[eolenedev@eolenedev ~]$ ls -al  
итого 24  
drwx-----, 1 eolenedev eolenedev 510 авг 11 13:08 .  
drwxr-xr-x, 1 root root 422 авг 11 12:02 ..  
-rw-----, 1 eolenedev eolenedev 1525 авг 11 14:10 .bash_history  
-rw-r--r--, 1 eolenedev eolenedev 18 окт 11 2022 .bash_logout  
-rw-r--r--, 1 eolenedev eolenedev 141 окт 11 2022 .bash_profile  
-rw-r--r--, 1 eolenedev eolenedev 492 окт 11 2022 .bashrc  
drwx-----, 1 eolenedev eolenedev 392 авг 11 14:01 .cache  
drwx-----, 1 eolenedev eolenedev 330 авг 11 14:10 .config  
-rw-r--r--, 1 eolenedev eolenedev 334 янв 28 2023 .emacs  
-rw-r--r--, 1 eolenedev eolenedev 232 авг 11 13:03 .gitconfig  
drwx-----, 1 eolenedev eolenedev 134 авг 11 14:09 .gnupg  
drwx-----, 1 eolenedev eolenedev 20 авг 11 12:04 .local  
drwxr-xr-x, 1 eolenedev eolenedev 48 авг 11 12:05 .mozilla  
drwx-----, 1 eolenedev eolenedev 132 авг 11 13:04 .ssh  
drwxr-xr-x, 1 eolenedev eolenedev 18 авг 11 13:08 .texlive2022  
drwxr-xr-x, 1 eolenedev eolenedev 10 авг 11 13:04 work  
drwxr-xr-x, 1 eolenedev eolenedev 0 авг 11 12:04 Видео  
drwxr-xr-x, 1 eolenedev eolenedev 0 авг 11 12:04 Документы  
drwxr-xr-x, 1 eolenedev eolenedev 0 авг 11 12:04 Загрузки  
drwxr-xr-x, 1 eolenedev eolenedev 0 авг 11 12:04 Изображения  
drwxr-xr-x, 1 eolenedev eolenedev 0 авг 11 12:04 Музыка  
drwxr-xr-x, 1 eolenedev eolenedev 0 авг 11 12:04 Общедоступные  
drwxr-xr-x, 1 eolenedev eolenedev 0 авг 11 12:04 'Рабочий стол'  
drwxr-xr-x, 1 eolenedev eolenedev 0 авг 11 12:04 Шаблоны  
[eolenedev@eolenedev ~]$
```

Рис. 7: Файлы в домашнем каталоге

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

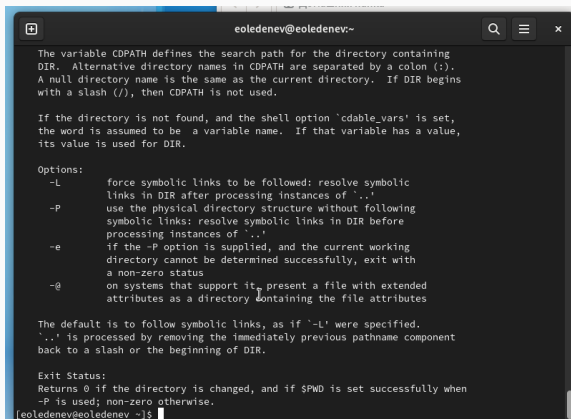
Рис. 8: Действия с каталогами

Опции команды ls



```
eoledenev@eoledenev:~  
'./work/study/2022-2023/Операционные системы/os-intro/template/report/report/pandoc/filters':  
pandoc_eqnos.py pandoc_fignos.py pandoc_secnos.py pandoc_tablenos.py pandocxnos  
  
'./work/study/2022-2023/Операционные системы/os-intro/template/report/report/pandoc/filters/pandocxnos':  
core.py __init__.py main.py pandocattributes.py  
  
'./work/study/2022-2023/Операционные системы/os-intro/template/report/scripts':  
image-report mpv-shot  
  
./Видео:  
  
./Документы:  
  
./Загрузки:  
  
./Изображения:  
  
./Музыка:  
  
./Общедоступные:  
  
./Рабочий стол:  
  
./Шаблоны:  
[eoledenev@eoledenev ~]$ ls -lt  
work  Документы  Изображения  Общедоступные  Шаблоны  
Видео  Загрузки  Музыка  'Рабочий стол'  
[eoledenev@eoledenev ~]$
```

Рис. 9: Команда ls -R и ls -t



```
eoledenev@eoledenev:~$ man cd

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

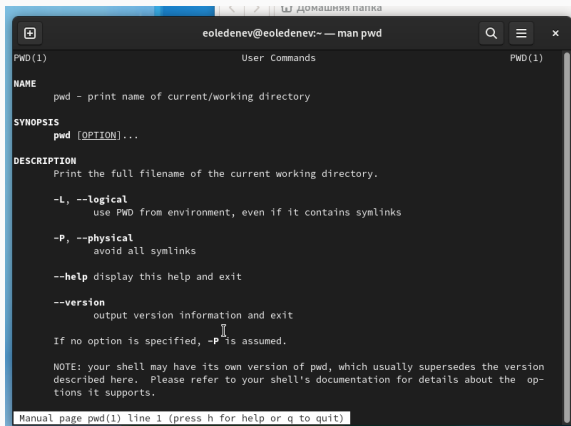
The default is to follow symbolic links, as if '-L' were specified.
'..' is processed by removing the immediately previous pathname component
back to a slash or the beginning of DIR.

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

[eoledenev@eoledenev ~]$
```

Рис. 10: Справка по команде cd

Справка по командам



The screenshot shows a terminal window titled "eoledenev@eoledenev:~ — 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

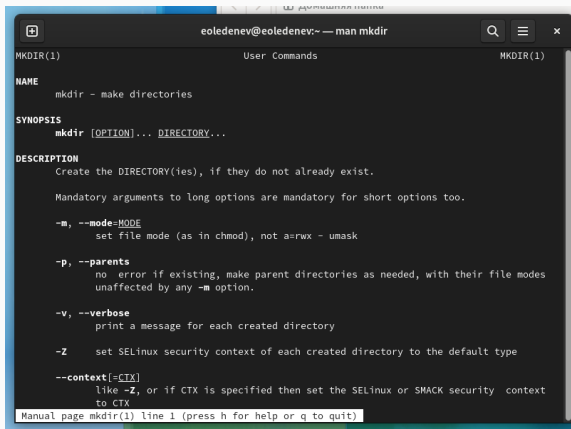
    If no option is specified, -P is assumed.

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.
```

At the bottom of the terminal, a status bar reads: "Manual page pwd(1) line 1 (press h for help or q to quit)".

Рис. 11: Справка по команде pwd

Справка по командам



```
eoledenev@eoledenev:~ — 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

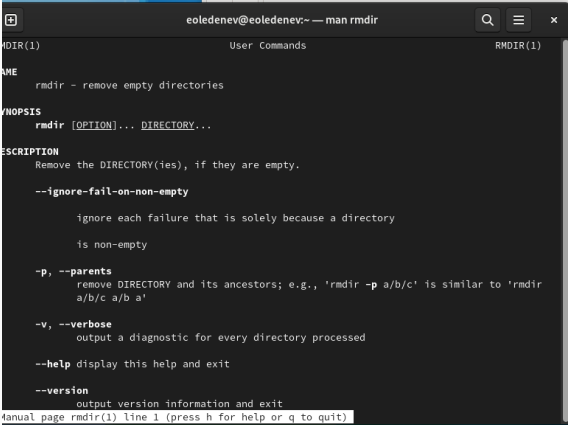
    -Z
        set SELinux security context of each created directory to the default type

    --context[=CTX]
        like -Z, or if CTX is specified then set the SELinux or SMACK security context
        to CTX

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

Рис. 12: Справка по команде mkdir

Справка по командам



```
eoledenev@eoledenev:~ — 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

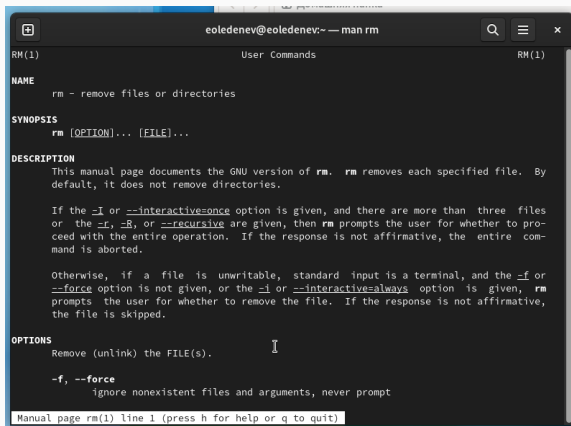
    --help display this help and exit

    --version
        output version information and exit

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

Рис. 13: Справка по команде rmdir

Справка по командам



```
eoledenev@eoledenev:~$ 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

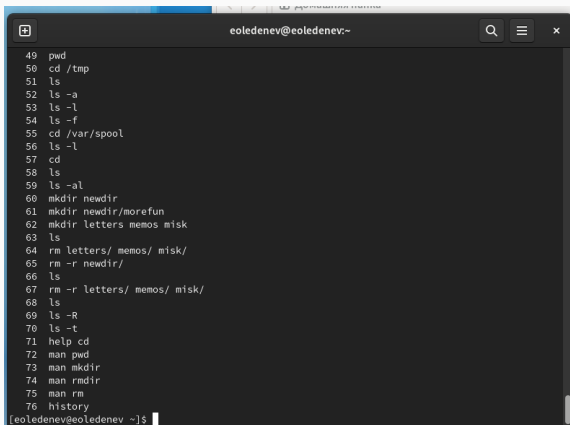
Remove (unlink) the FILE(s).

-f, --force
ignore nonexistent files and arguments, never prompt

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 'eoledenev@eoledenev:~' with search, menu, and close buttons in the title bar. The terminal displays a list of 26 numbered commands from 49 to 76. The commands include file navigation (cd), directory listing (ls), directory creation (mkdir), directory removal (rm), and help commands (help, man). The prompt at the bottom is '[eoledenev@eoledenev ~]\$' with a cursor.

```
49 pwd
50 cd /tmp
51 ls
52 ls -a
53 ls -l
54 ls -f
55 cd /var/spool
56 ls -l
57 cd
58 ls
59 ls -al
60 mkdir newdir
61 mkdir newdir/morefun
62 mkdir letters memos misk
63 ls
64 rm letters/ memos/ misk/
65 rm -r newdir/
66 ls
67 rm -r letters/ memos/ misk/
68 ls
69 ls -R
70 ls -t
71 help cd
72 man pwd
73 man mkdir
74 man rmdir
75 man rm
76 history
[eoledenev@eoledenev ~]$
```

Рис. 15: Команда history

Выводы по проделанной работе

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