

# Лабораторная работа № 4

Операционные системы

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## Информация

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## Вводная часть

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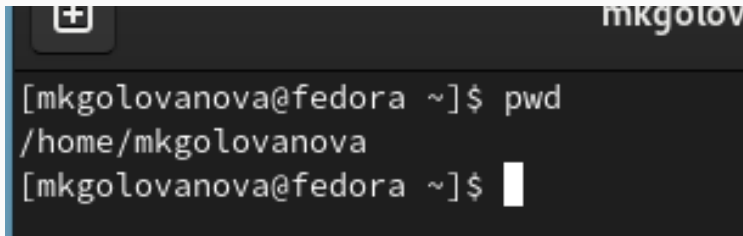
- Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

В операционной системе GNU Linux взаимодействие пользователя с системой обычно осуществляется с помощью командной строки посредством построчного ввода команд. Основными командами являются: Команда `cd`. Команда `cd` используется для перемещения по файловой системе операционной системы типа Linux. Команда `pwd`. Для определения абсолютного пути к текущему каталогу используется команда `pwd` (print working directory). Команда `ls`. Команда `ls` используется для просмотра содержимого каталога. Команда `mkdir`. Команда `mkdir` используется для создания каталогов. Команда `rm`. Команда `rm` используется для удаления файлов и/или каталогов. Команда `history`. Для вывода на экран списка ранее выполненных команд используется команда `history`. Выводимые на экран команды в списке нумеруются. К любой команде из выведенного на экран списка можно обратиться по её номеру в списке, воспользовавшись конструкцией `!`.

## Выполнение лабораторной работы

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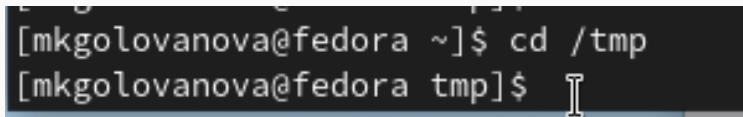
- Я определила полное имя моего домашнего каталога.(рис. 1).



```
[mkgołovanova@fedora ~]$ pwd
/home/mkgołovanova
[mkgołovanova@fedora ~]$
```

Рис. 1: Вывод полного имени моего домашнего каталога

- Я перешла в каталог /tmp. (рис. 2).



```
[mkgołovanova@fedora ~]$ cd /tmp
[mkgołovanova@fedora tmp]$
```



Я вывела на экран содержимое каталога /tmp, используя для этого команду ls с различными опциями (рис. 3, рис. 4, рис. 5, рис. 6, рис. 7). Разница в выводимой на экран информации объясняется тем, что различные опции позволяют увидеть дополнительные данные, которые не отображаются без дополнительных указаний к команде ls.

```
[mkgolovanova@fedora tmp]$ ls
systemd-private-dc6a45aelf164aeeac9a951159e43b83-chronyd.service-fG8tas
systemd-private-dc6a45aelf164aeeac9a951159e43b83-colord.service-ySnvRL
systemd-private-dc6a45aelf164aeeac9a951159e43b83-dbus-broker.service-2822HG
systemd-private-dc6a45aelf164aeeac9a951159e43b83-geoclue.service-ikmRsy
systemd-private-dc6a45aelf164aeeac9a951159e43b83-low-memory-monitor.service-cdY0A1
systemd-private-dc6a45aelf164aeeac9a951159e43b83-ModemManager.service-Y577y3
systemd-private-dc6a45aelf164aeeac9a951159e43b83-power-profiles-daemon.service-AdpnH7
systemd-private-dc6a45aelf164aeeac9a951159e43b83-rtkit-daemon.service-t6j0kU
systemd-private-dc6a45aelf164aeeac9a951159e43b83-switcheroo-control.service-KGGyhC
systemd-private-dc6a45aelf164aeeac9a951159e43b83-systemd-logind.service-nQcq2B
systemd-private-dc6a45aelf164aeeac9a951159e43b83-systemd-oomd.service-EMQLYG
systemd-private-dc6a45aelf164aeeac9a951159e43b83-systemd-resolved.service-f9ywmC
systemd-private-dc6a45aelf164aeeac9a951159e43b83-upower.service-0pWzuh
Temp-741604de-f2a6-4fd1-884d-a1d007f4ef7f
```

Рис. 3: Вывод на экран содержимого каталога /tmp с помощью команды ls

## Выполнение лабораторной работы

```
[mkgolovanova@fedora tmp]$ ls -a
.
..
.font-unix
.ICE-unix
.iprt-localipc-DRMIpcServer
systemd-private-dc6a45aef164aeeac9a951159e43b83-chronyd.service-fG8tas
systemd-private-dc6a45aef164aeeac9a951159e43b83-colord.service-ySnvrL
systemd-private-dc6a45aef164aeeac9a951159e43b83-dbus-broker.service-2822HG
systemd-private-dc6a45aef164aeeac9a951159e43b83-geoclue.service-ikmRsy
systemd-private-dc6a45aef164aeeac9a951159e43b83-low-memory-monitor.service-cdY0A1
systemd-private-dc6a45aef164aeeac9a951159e43b83-ModemManager.service-YS77y3
systemd-private-dc6a45aef164aeeac9a951159e43b83-power-profiles-daemon.service-AdpnH7
systemd-private-dc6a45aef164aeeac9a951159e43b83-rtkit-daemon.service-t6j0kU
systemd-private-dc6a45aef164aeeac9a951159e43b83-switcheroo-control.service-KG6yhC
systemd-private-dc6a45aef164aeeac9a951159e43b83-systemd-logind.service-nQcq2B
systemd-private-dc6a45aef164aeeac9a951159e43b83-systemd-oomd.service-EMQLYG
systemd-private-dc6a45aef164aeeac9a951159e43b83-systemd-resolved.service-f9ywmC
systemd-private-dc6a45aef164aeeac9a951159e43b83-upower.service-0pWzuh
Temp-741604de-f2a6-4fd1-884d-a1d007f4ef7f
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
```

Рис. 4: Вывод на экран содержимого каталога /tmp с помощью команды ls с опцией -a

```
[mkgolovanova@fedora tmp]$ ls -F
systemd-private-dc6a45ae1f164aeeac9a951159e43b83-chrond.service-fG8tas/
systemd-private-dc6a45ae1f164aeeac9a951159e43b83-colord.service-ySnvRL/
systemd-private-dc6a45ae1f164aeeac9a951159e43b83-dbus-broker.service-2822HG/
systemd-private-dc6a45ae1f164aeeac9a951159e43b83-geoclue.service-ikmRsy/
systemd-private-dc6a45ae1f164aeeac9a951159e43b83-low-memory-monitor.service-cdY0A1/
systemd-private-dc6a45ae1f164aeeac9a951159e43b83-ModemManager.service-Y577y3/
systemd-private-dc6a45ae1f164aeeac9a951159e43b83-power-profiles-daemon.service-AdpnH7/
systemd-private-dc6a45ae1f164aeeac9a951159e43b83-rtkit-daemon.service-t6j0kU/
systemd-private-dc6a45ae1f164aeeac9a951159e43b83-switcheroo-control.service-KGGyhC/
systemd-private-dc6a45ae1f164aeeac9a951159e43b83-systemd-logind.service-nQcq2B/
systemd-private-dc6a45ae1f164aeeac9a951159e43b83-systemd-oomd.service-EMQLYG/
systemd-private-dc6a45ae1f164aeeac9a951159e43b83-systemd-resolved.service-f9ywmC/
systemd-private-dc6a45ae1f164aeeac9a951159e43b83-upower.service-0pWzuh/
Temp-741604de-f2a6-4fd1-884d-a1d007f4ef7f/
[mkgolovanova@fedora tmp]$
```

Рис. 5: Вывод на экран содержимого каталога /tmp с помощью команды ls с опцией -F

# Выполнение лабораторной работы

```
[mkgolovanova@fedora tmp]$ ls -l
итора 0
drwx-----, 3 root      root      60 map  1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-chronyd.service-f68tas
drwx-----, 3 root      root      60 map  1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-colord.service-y5nvrI
drwx-----, 3 root      root      60 map  1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-dbus-broker.service-2822HG
drwx-----, 3 root      root      60 map  1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-geoclue.service-ikmRsy
drwx-----, 3 root      root      60 map  1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-low-memory-monitor.service-cdY0A1
drwx-----, 3 root      root      60 map  1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-ModemManager.service-Y577y3
drwx-----, 3 root      root      60 map  1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-power-profiles-daemon.service-AdpnHT
drwx-----, 3 root      root      60 map  1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-rtkit-daemon.service-t6j0kU
drwx-----, 3 root      root      60 map  1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-switcheroo-control.service-K6Gyhc
drwx-----, 3 root      root      60 map  1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-systemd-logind.service-nQcq2B
drwx-----, 3 root      root      60 map  1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-systemd-oomd.service-ENQLYG
drwx-----, 3 root      root      60 map  1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-systemd-resolved.service-f8ymmC
drwx-----, 3 root      root      60 map  1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-upower.service-0pWzuh
drwx-----, 2 mkgolovanova mkgolovanova 40 map  1 13:36 Temp-741604de-f2a6-4fd1-884d-a1d067f4e77f
```

Рис. 6: Вывод на экран содержимого каталога /tmp с помощью команды ls с опцией -l

## Выполнение лабораторной работы

```
[mkgolovanova@fedora tmp]$ ls -lF
итого 16
drwxrwxrwt. 20 root      root      500 map 1 13:43 ./
dr-xr-xr-x. 1 root      root      158 Feb 26 00:19 ../
drwxrwxrwt. 2 root      root      40 map 1 13:34 .font-unix/
drwxrwxrwt. 2 root      root      80 map 1 13:35 .ICE-unix/
srw-rw-rw-. 1 root      root      0 map 1 13:34 .iprt-localipc-DRMipcServer=
drwx----- 3 root      root      60 map 1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-chronyd.service-f68tao/
drwx----- 3 root      root      60 map 1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-colord.service-y5nvt/
drwx----- 3 root      root      60 map 1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-dbus-broker.service-2822H6/
drwx----- 3 root      root      60 map 1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-geoclue.service-1kmRsy/
drwx----- 3 root      root      60 map 1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-low-memory-monitor.service-cdY0A1/
drwx----- 3 root      root      60 map 1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-ModemManager.service-Y577y3/
drwx----- 3 root      root      60 map 1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-power-profiles-daemon.service-Adpnh7/
drwx----- 3 root      root      60 map 1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-rtkit-daemon.service-t6j0kU/
drwx----- 3 root      root      60 map 1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-switcheroo-control.service-KGG6yhC/
drwx----- 3 root      root      60 map 1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-systemd-logind.service-nQcQ2B/
drwx----- 3 root      root      60 map 1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-systemd-oomd.service-EHQLYG/
drwx----- 3 root      root      60 map 1 13:34 systemd-private-dc6a45aef164aeeac9a951159e43b83-systemd-resolved.service-f9ymC/
drwx----- 2 mkgolovanova mkgolovanova 40 map 1 13:36 Temp-741684de-f2a6-4fd1-884d-ald80774ef7f/
-r--r--r--. 1 mkgolovanova mkgolovanova 11 map 1 13:35 .X0-lock
-r--r--r--. 1 gdm          gdm          11 map 1 13:34 .X1024-lock
-r--r--r--. 1 gdm          gdm          11 map 1 13:34 .X1025-lock
drwxrwxrwt. 2 root      root      120 map 1 13:35 .X11-unix/
-r--r--r--. 1 mkgolovanova mkgolovanova 11 map 1 13:35 .X1-lock
drwxrwxrwt. 2 root      root      40 map 1 13:34 .XIM-unix/
```

Рис. 7: Вывод на экран содержимого каталога /tmp с помощью команды ls с опцией -lF

- Я перешла в каталог `/var/spool` и вывела на экран его содержимое, проверяя, есть ли там подкаталог с именем `cron` (рис. 8). В каталоге `/var/spool` нет подкаталога с именем `cron`.

```
[mkgolovanova@fedora ~]$ cd /var/spool
[mkgolovanova@fedora spool]$ ls
abrt  abrt-upload  cups  lpd  mail  plymouth
[mkgolovanova@fedora spool]$
```

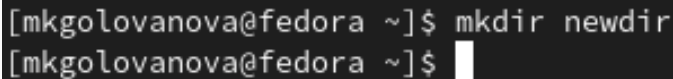
Рис. 8: Проверка содержимого каталог `/var/spool` на наличие подкаталога с именем `cron`

## Выполнение лабораторной работы

- Я перешла в домашний каталог, вывела на экран его содержимое и определила, кто является владельцем файлов и подкаталогов (mkgolovanova).(рис. 9).

```
[mkgolovanova@fedora spool]$ cd
[mkgolovanova@fedora ~]$ ls
bin                                pandoc-crossref-Linux.tar.xz      Музыка
pandoc-2.18                       work                              Общедоступные
pandoc-2.18-linux-amd64.tar.gz    Видео                             'Рабочий стол'
pandoc-2.19                       Документы                         Шаблоны
pandoc-crossref                   Загрузки
pandoc-crossref.1                 Изображения
[mkgolovanova@fedora ~]$ ls -l
итого 30468
drwxr-xr-x. 1 mkgolovanova mkgolovanova      8 фев 25 21:03 bin
drwxr-xr-x. 1 mkgolovanova mkgolovanova     16 апр  4 2022 pandoc-2.18
-rw-r--r--. 1 mkgolovanova mkgolovanova 16713899 апр  4 2022 pandoc-2.18-linux-amd64.tar.gz
drwxr-xr-x. 1 mkgolovanova mkgolovanova      16 авг  4 2022 pandoc-2.19
-rwxr-xr-x. 1 mkgolovanova mkgolovanova   7453900 мая 21 2022 pandoc-crossref
-rw-r--r--. 1 mkgolovanova mkgolovanova    40584 мая 21 2022 pandoc-crossref.1
-rw-r--r--. 1 mkgolovanova mkgolovanova   6984764 мая 21 2022 pandoc-crossref-Linux.tar.xz
drwxr-xr-x. 1 mkgolovanova mkgolovanova      76 фев 25 22:11 work
drwxr-xr-x. 1 mkgolovanova mkgolovanova       0 сен 17 20:24 Видео
drwxr-xr-x. 1 mkgolovanova mkgolovanova       0 сен 17 20:24 Документы
drwxr-xr-x. 1 mkgolovanova mkgolovanova     680 мар  1 13:43 Загрузки
drwxr-xr-x. 1 mkgolovanova mkgolovanova      50 окт  1 18:03 Изображения
drwxr-xr-x. 1 mkgolovanova mkgolovanova       0 сен 17 20:24 Музыка
drwxr-xr-x. 1 mkgolovanova mkgolovanova       0 сен 17 20:24 Общедоступные
drwxr-xr-x. 1 mkgolovanova mkgolovanova       0 сен 17 20:24 'Рабочий стол'
drwxr-xr-x. 1 mkgolovanova mkgolovanova       0 сен 17 20:24 Шаблоны
[mkgolovanova@fedora ~]$
```

- Я создала в домашнем каталоге новый каталог с именем newdir (рис. 10).

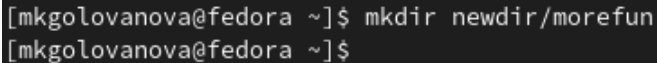
A terminal window with a dark background and light gray text. The prompt is [mkgolovanova@fedora ~]\$. The command mkdir newdir has been entered. The prompt is repeated on the next line with a white cursor block at the end.

```
[mkgolovanova@fedora ~]$ mkdir newdir  
[mkgolovanova@fedora ~]$
```

Рис. 10: Создание каталога newdir



- В каталоге ~/newdir создайте новый каталог с именем morefun (рис. 11).

A terminal window with a dark background and light-colored text. The prompt is [mkgolovanova@fedora ~]\$. The command mkdir newdir/morefun is entered on the first line. The prompt [mkgolovanova@fedora ~]\$ appears again on the second line.

```
[mkgolovanova@fedora ~]$ mkdir newdir/morefun  
[mkgolovanova@fedora ~]$
```

Рис. 11: Создание каталога morefun в каталоге ~/newdir

## Выполнение лабораторной работы

Я создала в домашнем каталоге одной командой три новых каталога с именами letters, memos, misk, а затем удалила эти каталоги одной командой (рис. 12, рис. 13).

```
[mkgolovanova@fedora ~]$ mkdir letters memos misk
[mkgolovanova@fedora ~]$ ls
bin      pandoc-2.18      pandoc-crossref-Linux.tar.xz  Изображения
letters  pandoc-2.18-linux-amd64.tar.gz work                          Музыка
memos    pandoc-2.19      Видео                         Общедоступные
misk     pandoc-crossref  Документы                    'Рабочий стол'
newdir   pandoc-crossref.1 Загрузки                     Шаблоны
[mkgolovanova@fedora ~]$
```

Рис. 12: Создание каталогов с именами letters, memos, miske

```
[mkgolovanova@fedora ~]$ rm -r letters memos misk
[mkgolovanova@fedora ~]$ ls
bin      pandoc-crossref.1  Изображения
newdir   pandoc-crossref-Linux.tar.xz Музыка
pandoc-2.18 work              Общедоступные
pandoc-2.18-linux-amd64.tar.gz Видео            'Рабочий стол'
pandoc-2.19 Документы        Шаблоны
pandoc-crossref Загрузки
[mkgolovanova@fedora ~]$
```

Рис. 13: Удаление каталогов letters, memos, misk

Я попробовала удалить ранее созданный каталог ~/newdir командой rm. Каталог не был удалён, так как для удаления каталогов необходимо использовать опцию рекурсивного удаления -r (рис. 14).

```
[mkgolovanova@fedora ~]$ rm newdir
rm: невозможно удалить 'newdir': Это каталог
[mkgolovanova@fedora ~]$ ls
bin                pandoc-crossref.1  Изображения
newdir             pandoc-crossref-Linux.tar.xz  Музыка
pandoc-2.18        work              Общедоступные
pandoc-2.18-linux-amd64.tar.gz  Видео            'Рабочий стол'
pandoc-2.19        Документы        Шаблоны
pandoc-crossref    Загрузки
```

```
[mkgolovanova@fedora ~]$
```

Рис. 14: Попытка удаления каталога ~/newdir командой rm

Я удалила каталог ~/newdir/morefun из домашнего каталога, и проверила, был ли он удалён (рис. 15).

```
[mkgolovanova@fedora ~]$ rm -r newdir/morefun
[mkgolovanova@fedora ~]$ ls
bin                pandoc-crossref.1      Изображения
newdir             pandoc-crossref-Linux.tar.xz  Музыка
pandoc-2.18        work                  Общедоступные
pandoc-2.18-linux-amd64.tar.gz  Видео                'Рабочий стол'
pandoc-2.19        Документы             Шаблоны
pandoc-crossref    Загрузки
```

```
[mkgolovanova@fedora ~]$ cd newdir
[mkgolovanova@fedora newdir]$ ls
[mkgolovanova@fedora newdir]$
```

Рис. 15: Удаление каталога ~/newdir/morefun из домашнего каталога и проверка действия

# Выполнение лабораторной работы

С помощью команды `man` я определила набор опций команды `ls`, позволяющий отсортировать по времени последнего изменения выводимый список содержимого каталога с развёрнутым описанием файлов (рис. 16, рис. 17, рис. 18, рис. 19, рис. 20). Это опции `-t`, `-lt`, `-ltr`

```
LS(1)                                User Commands                                LS(1)

NAME
  ls - list directory contents

SYNOPSIS
  ls [OPTION]... [FILE]...

DESCRIPTION
  List information about the FILES (the current directory by default). Sort en-
  tries alphabetically if none of -cfuvvsUX nor --sort is specified.

  Mandatory arguments to long options are mandatory for short options too.

  -a, --all
      do not ignore entries starting with .

  -A, --almost-all
      do not list implied . and ..

  --author
      with -l, print the author of each file

  -b, --escape
      print C-style escapes for nongraphic characters

  --block-size=SIZE
      with -l, scale sizes by SIZE when printing them; e.g., '--block-size=M';
      see SIZE format below

  -B, --ignore-backups
      do not list implied entries ending with ~

  -c
      with -lt: sort by, and show, ctime (time of last modification of file
      status information); with -l: show ctime and sort by name; otherwise:
      sort by ctime, newest first

  -C
      list entries by columns

  --color[=WHEN]
      colorize the output; WHEN can be 'always' (default if omitted), 'auto',
      or 'never'; more info below

  -d, --directory
      list directories themselves, not their contents

Manual page ls(1) 1line 1/242 178 (press h for help or q to quit)
```

# Выполнение лабораторной работы

```
-D, --dired
    generate output designed for Emacs' dired mode

-f    list all entries in directory order

-F, --classify[=WHEN]
    append indicator (one of */=>@|) to entries; WHEN can be 'always' (default if omitted), 'auto', or 'never'

--file-type
    likewise, except do not append '*'

--format=WORD
    across -x, commas -m, horizontal -x, long -l, single-column -l, verbose
    -l, vertical -C

--full-time
    like -l --time-style=full-iso

-g    like -l, but do not list owner

--group-directories-first
    group directories before files;

    can be augmented with a --sort option, but any use of --sort=none (-U)
    disables grouping

-G, --no-group
    in a long listing, don't print group names

-h, --human-readable
    with -l and -s, print sizes like 1K 234M 2G etc.

--si  likewise, but use powers of 1000 not 1024

-H, --dereference-command-line
    follow symbolic links listed on the command line

--dereference-command-line-symlink-to-dir
    follow each command line symbolic link

    that points to a directory

--hide=PATTERN

Manual page ls(1) line 46/242 34% (press h for help or q to quit)
```

Рис. 17: Вывод опций команды ls с помощью команды man (2)

# Выполнение лабораторной работы

```
--hyperlink[=WHEN]
    hyperlink file names; WHEN can be 'always' (default if omitted), 'auto',
    or 'never'

--indicator-style=WORD
    append indicator with style WORD to entry names: none (default), slash
    (-p), file-type (--file-type), classify (-F)

-i, --inode
    print the index number of each file

-I, --ignore=PATTERN
    do not list implied entries matching shell PATTERN

-k, --kibibytes
    default to 1024-byte blocks for file system usage; used only with -s and
    per directory totals

-l
    use a long listing format

-L, --dereference
    when showing file information for a symbolic link, show information for
    the file the link references rather than for the link itself

-m
    fill width with a comma separated list of entries

-n, --numeric-uid-gid
    like -l, but list numeric user and group IDs

-N, --literal
    print entry names without quoting

-o
    like -l, but do not list group information

-p, --indicator-style=slash
    append / indicator to directories

-q, --hide-control-chars
    print ? instead of nongraphic characters

--show-control-chars
    show nongraphic characters as-is (the default, unless program is 'ls' and
    Manual page ls(1) line 91/242 53% (press h for help or q to quit)
```

Рис. 18: Вывод опций команды ls с помощью команды man (3)

# Выполнение лабораторной работы

```
-Q, --quote-name
    enclose entry names in double quotes

--quoting-style=WORD
    use quoting style WORD for entry names: literal, locale, shell, shell-al-
    ways, shell-escape, shell-escape-always, c, escape (overrides QUOT-
    ING_STYLE environment variable)

-r, --reverse
    reverse order while sorting

-R, --recursive
    list subdirectories recursively

-s, --size
    print the allocated size of each file, in blocks

-S
    sort by file size, largest first

--sort=WORD
    sort by WORD instead of name (-U), size (-S), time (-t), version
    (-v), extension (-X), width

--time=WORD
    change the default of using modification times; access time (-u): atime,
    access, use; change time (-c): ctime, status; birth time: birth, crea-
    tion;

    with -l, WORD determines which time to show; with --sort=time, sort by
    WORD (newest first)

--time-style=TIME_STYLE
    time/date format with -l; see TIME_STYLE below

-t
    sort by time, newest first; see --time

-T, --tabsize=COLS
    assume tab stops at each COLS instead of 8

-u
    with -lt: sort by, and show, access time; with -l: show access time and
    sort by name; otherwise: sort by access time, newest first

-U
    do not sort; list entries in directory order

Manual page ls(1) line 136/242 73% (press h for help or q to quit)
```

Рис. 19: Вывод опций команды ls с помощью команды man (4)



# Выполнение лабораторной работы

```
-v      natural sort of (version) numbers within text

-w, --width=COLS
      set output width to COLS. 0 means no limit

-x      list entries by lines instead of by columns

-X      sort alphabetically by entry extension

-Z, --context
      print any security context of each file

--zero  end each output line with NUL, not newline

-l      list one file per line

--help  display this help and exit

--version
      output version information and exit

The SIZE argument is an integer and optional unit (example: 10K is 10*1024).
Units are K,M,G,T,P,E,Z,Y (powers of 1024) or KB,MB,... (powers of 1000). Binary
prefixes can be used, too: KiB=M, MiB=M, and so on.

The TIME_STYLE argument can be full-iso, long-iso, iso, locale, or +FORMAT.
FORMAT is interpreted like in date(1). If FORMAT is FORMAT1<newline>FORMAT2,
then FORMAT1 applies to non-recent files and FORMAT2 to recent files.
TIME_STYLE prefixed with 'posix-' takes effect only outside the POSIX locale.
Also the TIME_STYLE environment variable sets the default style to use.

Using color to distinguish file types is disabled both by default and with
--color=never. With --color=auto, ls emits color codes only when standard out-
put is connected to a terminal. The LS_COLORS environment variable can change
the settings. Use the dircolors command to set it.

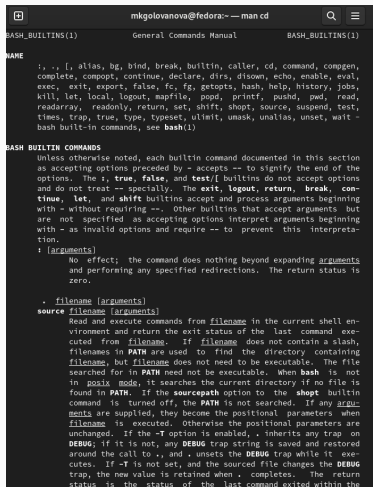
Exit status:
0      if OK,
1      if minor problems (e.g., cannot access subdirectory),
2      if serious trouble (e.g., cannot access command-line argument).
```

**AUTHOR**  
Manual page ls(1) line 181/242 92% (press h for help or q to quit)

Рис. 20: Вывод опций команды ls с помощью команды man (5)

# Выполнение лабораторной работы

Я использовала команду `man` для просмотра описания команд `cd`, `pwd`, `mkdir`, `rmdir`, `rm` (рис. 21, рис. 22, рис. 23, рис. 24, рис. 25, рис. 26, рис. 27).



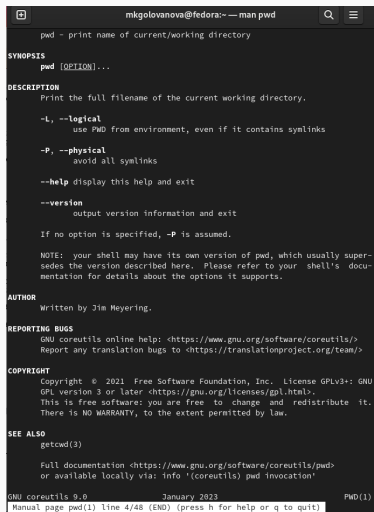
```
mkgolovanova@fedora:~ — man cd
BASH_BUILTINS(1)      General Commands Manual      BASH_BUILTINS(1)

NAME
: , . , [ , alias, bg, bind, break, builtin, caller, cd, command, compgen,
complete, compopt, continue, declare, dirs, disown, echo, enable, eval,
exec, exit, export, false, fc, fg, getopts, hash, help, history, jobs,
kill, let, local, logout, mapfile, popd, printf, pushd, pwd, read,
readarray, readonly, return, set, shift, shopt, source, suspend, test,
times, trap, true, type, typeset, ulimit, umask, unalias, unset, wait -
bash built-in commands, see bash(1)

BASH BUILTIN COMMANDS
Unless otherwise noted, each builtin command documented in this section
as accepting options preceded by - accepts -- to signify the end of the
options. The :, true, false, and test/[ builtins do not accept options
and do not treat -- specially. The exit, logout, return, break, con-
tinue, let, and shift builtins accept and process arguments beginning
with - without requiring --. Other builtins that accept arguments but
are not specified as accepting options interpret arguments beginning
with - as invalid options and require -- to prevent this interpreta-
tion.
: [arguments]
    No effect; the command does nothing beyond expanding arguments
    and performing any specified redirections. The return status is
    zero.

. filename [arguments]
source filename [arguments]
    Read and execute commands from filename in the current shell en-
    vironment and return the exit status of the last command exe-
    cuted from filename. If filename does not contain a slash,
    filenames in PATH are used to find the directory containing
    filename, but filename does not need to be executable. The file
    searched for in PATH need not be executable. When bash is not
    in posix mode, it searches the current directory if no file is
    found in PATH. If the sourcepath option to the shopt builtin
    command is turned off, the PATH is not searched. If any argu-
    ments are supplied, they become the positional parameters when
    filename is executed. Otherwise the positional parameters are
    unchanged. If the -T option is enabled, . inherits any trap on
    DEBUG; if it is not, any DEBUG trap string is saved and restored
    around the call to ., and . unsets the DEBUG trap while it exe-
    cutes. If -T is not set, and the sourced file changes the DEBUG
    trap, the new value is retained when . completes. The return
    status is the status of the last command exited within the
```

# Выполнение лабораторной работы



```
mkgolovanova@fedora:~ — man pwd

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 super-
sedes the version described here. Please refer to your shell's docu-
mentation 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/>

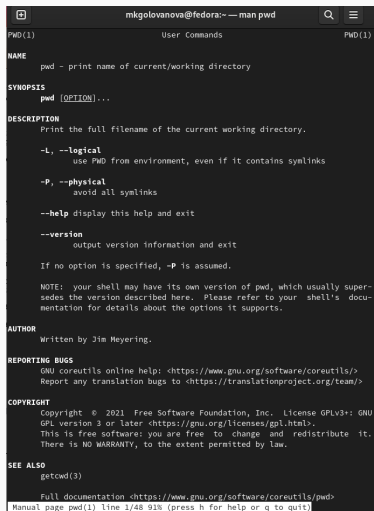
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GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
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SEE ALSO
getcwd(3)

Full documentation <https://www.gnu.org/software/coreutils/pwd>
or available locally via: info '(coreutils) pwd invocation'

GNU coreutils 9.0 January 2023 PWD(1)
Manual page pwd(1) line 4/48 (END) (press h for help or q to quit)
```

Рис. 22: Вывод опций команды pwd с помощью команды man (1)



```
mkgolovanova@fedora:~ -- 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 super-
  sedes the version described here. Please refer to your shell's docu-
  mentation 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/>

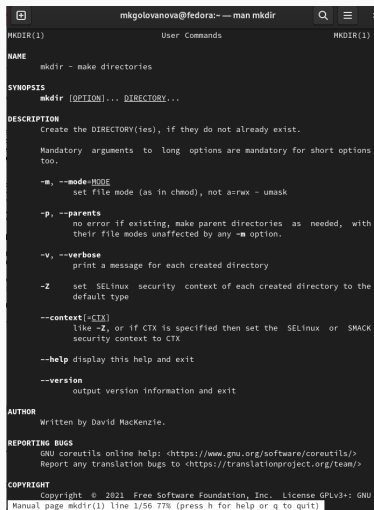
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  GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
  This is free software: you are free to change and redistribute it.
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SEE ALSO
  getcwd(3)

  Full documentation <https://www.gnu.org/software/coreutils/pwd>
Manual page pwd(1) line 1/48 91% (press h for help or q to quit)
```

Рис. 23: Вывод опций команды pwd с помощью команды man (2)

# Выполнение лабораторной работы



```
mkgolovanova@fedora:~ -- 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

  --help
      display this help and exit

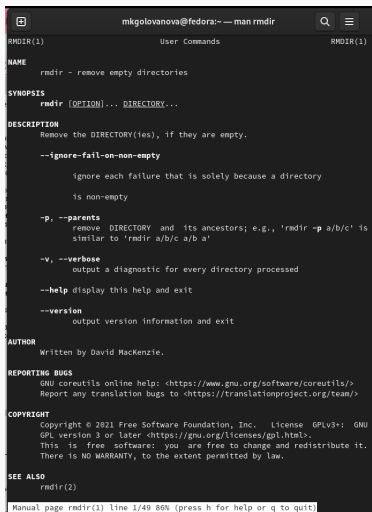
  --version
      output version information and exit

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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  Manual page mkdir(1) line 1/56 77% (press h for help or q to quit)
```

Рис. 24: Вывод опций команды mkdir с помощью команды man



```
mkgolovanova@fedora:~ -- 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

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/>

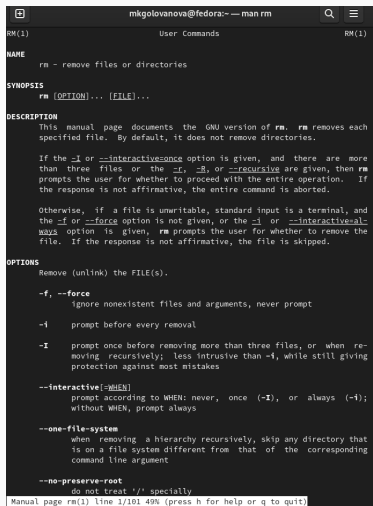
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  GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
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SEE ALSO
  rmdir(2)

Manual page rmdir(1) line 1/49 86% (press h for help or q to quit)
```

Рис. 25: Вывод опций команды `rmdir` с помощью команды `man`

# Выполнение лабораторной работы



```
mkgolovanova@fedora:~ -- 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 -f, -g, 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
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 re-
    moving recursively; less intrusive than -i, while still giving
    protection against most mistakes

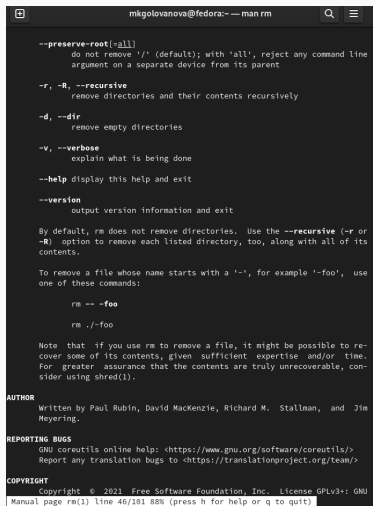
--interactive[=WHEN]
    prompt according to WHEN: never, once (-I), or always (-i);
    without WHEN, prompt always

--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

Manual page rm(1) line 1/101 49% (press h for help or q to quit)
```

Рис. 26: Вывод опций команды `rm` с помощью команды `man` (1)



```
mkgolovanova@fedora:~ -- man rm

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

-r, -R, --recursive
    remove directories and their contents recursively

-d, --dir
    remove empty directories

-v, --verbose
    explain what is being done

--help
    display this help and exit

--version
    output version information and exit

By default, rm does not remove directories.  Use the --recursive (-r or
-R) option to remove each listed directory, too, along with all of its
contents.

To remove a file whose name starts with a '-', for example '-foo', use
one of these commands:

    rm -- -foo

    rm ./-foo

Note that if you use rm to remove a file, it might be possible to re-
cover some of its contents, given sufficient expertise and/or time.
For greater assurance that the contents are truly unrecoverable, con-
sider using shred(1).

AUTHOR
    Written by Paul Rubin, David MacKenzie, Richard M. Stallman, and Jim
    Meyering.

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

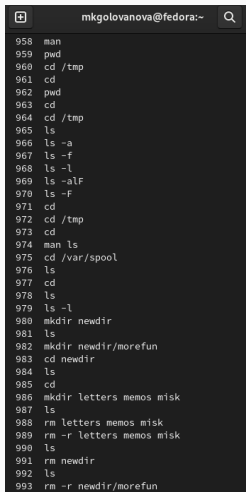
COPYRIGHT
    Copyright © 2021 Free Software Foundation, Inc.  License GPLv3+: GNU
    Manual page rm(1) line 46/101 88% (press h for help or q to quit)
```

Рис. 27: Вывод опций команды rm с помощью команды man (2)



## Выполнение лабораторной работы

Используя информацию, полученную при помощи команды history (рис. 28), я выполнила модификацию и исполнение нескольких команд из буфера команд.(рис. 29, рис. 30, рис. 31).

A terminal window with a dark background and light gray text. The title bar at the top shows a plus icon, the username 'mkgolovanova@fedora:~', and a search icon. The terminal displays a list of 36 commands, each preceded by a line number from 958 to 993. The commands include 'man', 'pwd', 'cd /tmp', 'ls', 'ls -a', 'ls -f', 'ls -l', 'ls -alF', 'mkdir newdir', 'rm letters memos misk', and 'rm -r newdir/morefun'.

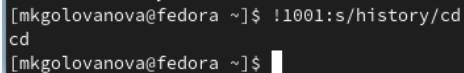
```
958 man
959 pwd
960 cd /tmp
961 cd
962 pwd
963 cd
964 cd /tmp
965 ls
966 ls -a
967 ls -f
968 ls -l
969 ls -alF
970 ls -f
971 cd
972 cd /tmp
973 cd
974 man ls
975 cd /var/spool
976 ls
977 cd
978 ls
979 ls -l
980 mkdir newdir
981 ls
982 mkdir newdir/morefun
983 cd newdir
984 ls
985 cd
986 mkdir letters memos misk
987 ls
988 rm letters memos misk
989 rm -r letters memos misk
990 ls
991 rm newdir
992 ls
993 rm -r newdir/morefun
```

```
[mkgolovanova@fedora ~]$ !993:s/morefun/  
rm -r newdir/  
[mkgolovanova@fedora ~]$
```

Рис. 29: Модификация и исполнение команды 993 из буфера команд

```
[mkgolovanova@fedora ~]$ !977:s/cd/ls  
ls  
bin                               Видео  
pandoc-2.18                       Документы  
pandoc-2.18-linux-amd64.tar.gz   Загрузки  
pandoc-2.19                       Изображения  
pandoc-crossref                   Музыка  
pandoc-crossref.1                 Общедоступные  
pandoc-crossref-Linux.tar.xz     'Рабочий стол'  
work                              Шаблоны  
[mkgolovanova@fedora ~]$
```

Рис. 30: Модификация и исполнение команды 977 из буфера команд

A terminal window with a dark background. The prompt is [mkgolovanova@fedora ~]\$. The first line shows the command !1001:s/history/cd. The second line shows the command cd. The third line shows the prompt [mkgolovanova@fedora ~]\$ with a white cursor block.

```
[mkgolovanova@fedora ~]$ !1001:s/history/cd  
cd  
[mkgolovanova@fedora ~]$
```

Рис. 31: Модификация и исполнение команды 1001 из буфера команд

## Выводы

---

- Я приобрела практические навыки работы с операционной системой на уровне командной строки (организация файловой системы, навигация по файловой системе, создание и удаление файлов и директорий).