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Отчет по лабораторным работам  
Дисциплина: «Операционные системы»

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Уфа – 2023

## Лабораторная работа №3

### Задания:

#### — Запустите командное окно

```
MAN(1)                                Manual pager utils                                MAN(1)

NAME
  man - an interface to the system reference manuals

SYNOPSIS
  man [man options] [[section] page ...] ...
  man -k [apropos options] regexp ...
  man -K [man options] [section] term ...
  man -f [whatis options] page ...
  man -l [man options] file ...
  man -w|-W [man options] page ...

DESCRIPTION
  man is the system's manual pager. Each page argument given to man is normally the name of a program, utility or function. The manual page associated with each of these arguments is then found and displayed. A section, if provided, will direct man to look only in that section of the manual. The default action is to search in all of the available sections following a pre-defined order (see DEFAULTS), and to show only the first page found, even if page exists in several sections.

  The table below shows the section numbers of the manual followed by the types of pages they contain.

  1 Executable programs or shell commands
  2 System calls (functions provided by the kernel)
  3 Library calls (functions within program libraries)
  4 Special files (usually found in /dev)
  5 File formats and conventions, e.g. /etc/passwd
  6 Games
  7 Miscellaneous (including macro packages and conventions), e.g. man(7), groff(7)
  8 System administration commands (usually only for root)
  9 Kernel routines [Non standard]

  A manual page consists of several sections.

  Conventional section names include NAME, SYNOPSIS, CONFIGURATION, DESCRIPTION, OPTIONS, EXIT STATUS, RETURN VALUE, ERRORS, ENVIRONMENT, FILES, VERSIONS, CONFORMING TO, NOTES, BUGS, EXAMPLE, AUTHORS, and SEE ALSO.

  The following conventions apply to the SYNOPSIS section and can be used as a guide in other sections.

  bold text           type exactly as shown.
  italic text        replace with appropriate argument.
  [-abc]              any or all arguments within [ ] are optional.
  -a|-b               options delimited by | cannot be used together.
  argument ...        argument is repeatable.
  [expression] ...    entire expression within [ ] is repeatable.

  Exact rendering may vary depending on the output device. For instance, man will usually not be able to render italics when running in a terminal, and will typically use underlined or coloured text instead.

  The command or function illustration is a pattern that should match all possible invocations. In some cases it is advisable to illustrate several exclusive invocations as is shown in the SYNOPSIS section of this manual page.

EXAMPLES
  man ls
  Display the manual page for the item (program) ls.

  man man.Z
  Display the manual page for macro package man from section Z. (This is an alternative spelling of "man Z man".)

  man 'man(Z)'
  Display the manual page for macro package man from section Z. (This is another alternative spelling of "man Z man". It may be more convenient when copying and pasting cross-references to manual pages. Note that the parentheses must normally be quoted to protect them from the shell.)

  man -a intro
  Display, in succession, all of the available intro manual pages contained within the manual. It is possible to quit between successive displays or skip any of them.

  man -t bash | lpr -Pps
  Format the manual page for bash into the default troff or groff format and pipe it to the printer named ps. The default output for groff is usually PostScript. man --help should advise as to which processor is bound to the -t option.

  man -l -Tdv ./foo.1x.gz > ./foo.1x.dvi
  Manual page man(1) line 1 (press h for help or q to quit).
```

# man - интерфейс к справочным руководствам системы

## — Пролитайте несколько строк

```
EXAMPLES
man ls
    Display the manual page for the item (program) ls.

man man(2)
    Display the manual page for macro package man from section 2. (This is an alternative spelling of "man 2
    man".)

man 'man(2)'
    Display the manual page for macro package man from section 2. (This is another alternative spelling of
    "man 2 man". It may be more convenient when copying and pasting cross-references to manual pages. Note
    that the parentheses must normally be quoted to protect them from the shell.)

man -a intro
    Display, in succession, all of the available intro manual pages contained within the manual. It is possi-
    ble to quit between successive displays or skip any of them.

man -t bash | lpr -Pps
    Format the manual page for bash into the default troff or groff format and pipe it to the printer named
    ps. The default output for groff is usually PostScript. man --help should advise as to which processor
    is bound to the -t option.

man -l -Tdvi ./foo.1x.gz > ./foo.1x.dvi
    This command will decompress and format the nroff source manual page ./foo.1x.gz into a device independent
    (dvi) file. The redirection is necessary as the -T flag causes output to be directed to stdout with no
    pager. The output could be viewed with a program such as xdvi or further processed into PostScript using
    a program such as dvips.

man -k printf
    Search the short descriptions and manual page names for the keyword printf as regular expression. Print
    out any matches. Equivalent to apropos printf.

man -f smail
    Lookup the manual pages referenced by smail and print out the short descriptions of any found. Equivalent
    to whatis smail.

OVERVIEW
Many options are available to man in order to give as much flexibility as possible to the user. Changes can
be made to the search path, section order, output processor, and other behaviours and operations detailed be-
low.

If set, various environment variables are interrogated to determine the operation of man. It is possible to
set the "catch-all" variable $MANOPT to any string in command line format, with the exception that any spaces
used as part of an option's argument must be escaped (preceded by a backslash). man will parse $MANOPT prior
to parsing its own command line. Those options requiring an argument will be overridden by the same options
found on the command line. To reset all of the options set in $MANOPT, -D can be specified as the initial
command line option. This will allow man to "forget" about the options specified in $MANOPT, although they
must still have been valid.

Manual pages are normally stored in nroff(1) format under a directory such as /usr/share/man. In some instal-
lations, there may also be preformatted cat pages to improve performance. See manpath(5) for details of where
these files are stored.

This package supports manual pages in multiple languages, controlled by your locale. If your system did not
set this up for you automatically, then you may need to set $LC_MESSAGES, $LANG, or another system-dependent
environment variable to indicate your preferred locale, usually specified in the POSIX format:

<language>[_<territory>[.<character-set>[,<version>]]]

If the desired page is available in your locale, it will be displayed in lieu of the standard (usually Ameri-
can English) page.

If you find that the translations supplied with this package are not available in your native language and you
would like to supply them, please contact the maintainer who will be coordinating such activity.

Individual manual pages are normally written and maintained by the maintainers of the program, function, or
other topic that they document, and are not included with this package. If you find that a manual page is
missing or inadequate, please report that to the maintainers of the package in question.

For information regarding other features and extensions available with this manual pager, please read the doc-
uments supplied with the package.

DEFAULTS
The order of sections to search may be overridden by the environment variable $MANSECT or by the SECTION di-
rective in /etc/manpath.config. By default it is as follows:
Manual page man(1) line 53 (press h for help or q to quit)
```

## SUMMARY OF LESS COMMANDS

Commands marked with \* may be preceded by a number, N.  
 Notes in parentheses indicate the behavior if N is given.  
 A key preceded by a caret indicates the Ctrl key; thus ^K is ctrl-K.

h H Display this help.  
 q :q Q :Q ZZ Exit.

### MOVING

e ^E j ^N CR \* Forward one line (or N lines).  
 y ^Y k ^K ^P \* Backward one line (or N lines).  
 f ^F ^V SPACE \* Forward one window (or N lines).  
 b ^B ESC-v \* Backward one window (or N lines).  
 z \* Forward one window (and set window to N).  
 w \* Backward one window (and set window to N).  
 ESC-SPACE \* Forward one window, but don't stop at end-of-file.  
 d ^D \* Forward one half-window (and set half-window to N).  
 u ^U \* Backward one half-window (and set half-window to N).  
 ESC-) RightArrow \* Right one half screen width (or N positions).  
 ESC-( LeftArrow \* Left one half screen width (or N positions).  
 ESC-} ^RightArrow Right to last column displayed.  
 ESC-{ ^LeftArrow Left to first column.  
 F Forward forever; like "tail -f".  
 ESC-F Like F but stop when search pattern is found.  
 r ^R ^L Repaint screen.  
 R Repaint screen, discarding buffered input.

Default "window" is the screen height.  
 Default "half-window" is half of the screen height.

### SEARCHING

/pattern \* Search forward for (N-th) matching line.  
 ?pattern \* Search backward for (N-th) matching line.  
 n \* Repeat previous search (for N-th occurrence).  
 N \* Repeat previous search in reverse direction.  
 ESC-n \* Repeat previous search, spanning files.  
 ESC-N \* Repeat previous search, reverse dir. & spanning files.  
 ESC-u Undo (toggle) search highlighting.  
 &pattern \* Display only matching lines

A search pattern may begin with one or more of:  
 ^N or ! Search for NON-matching lines.  
 ^E or \* Search multiple files (pass thru END OF FILE).  
 ^F or @ Start search at FIRST file (for /) or last file (for ?).  
 ^K Highlight matches, but don't move (KEEP position).  
 ^R Don't use REGULAR EXPRESSIONS.

### JUMPING

g < ESC-< \* Go to first line in file (or line N).  
 G > ESC-> \* Go to last line in file (or line N).  
 p % \* Go to beginning of file (or N percent into file).  
 t \* Go to the (N-th) next tag.  
 T \* Go to the (N-th) previous tag.  
 { ( [ \* Find close bracket } ) ].  
 } ) ] \* Find open bracket { ( [.  
 ESC-^F <c1> <c2> \* Find close bracket <c2>.  
 ESC-^B <c1> <c2> \* Find open bracket <c1>

Each "find close bracket" command goes forward to the close bracket matching the (N-th) open bracket in the top line.  
 Each "find open bracket" command goes backward to the open bracket matching the (N-th) close bracket in the bottom line.

m<letter> Mark the current top line with <letter>.  
 M<letter> Mark the current bottom line with <letter>.  
 '<letter> Go to a previously marked position.  
 ', Go to the previous position.  
 ^X^X Same as ',.  
 ESC-M<letter> Clear a mark.

A mark is any upper-case or lower-case letter.  
 Certain marks are predefined:  
 ^ means beginning of the file  
 \$ means end of the file

H: HELP -- Press RETURN for more, or a when done

```
lexot@DESKTOP-TBI95IT:/home$
```

Q:

## Выведите на экран справку по команде `ls`: `man ls`

```
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 entries alphabetically if none of
    -cftuvSUX 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

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

    -f
        do not sort, enable -aU, disable -ls --color

    -F, --classify
        append indicator (one of */=>@|) to entries

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

    --format=WORD
        across -x, commas -m, horizontal -x, long -l, single-column -1, 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

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

ls — список содержимого каталога

## — Выведите на экран справку по команде ps

```
PS(1)                                User Commands                                PS(1)

NAME
    ps - report a snapshot of the current processes.

SYNOPSIS
    ps [options]

DESCRIPTION
    ps displays information about a selection of the active processes. If you want a repetitive update of the selection and the displayed information, use top(1) instead.

    This version of ps accepts several kinds of options:

    1  UNIX options, which may be grouped and must be preceded by a dash.
    2  BSD options, which may be grouped and must not be used with a dash.
    3  GNU long options, which are preceded by two dashes.

    Options of different types may be freely mixed, but conflicts can appear. There are some synonymous options, which are functionally identical, due to the many standards and ps implementations that this ps is compatible with.

    Note that "ps -aux" is distinct from "ps aux". The POSIX and UNIX standards require that "ps -aux" print all processes owned by a user named "x", as well as printing all processes that would be selected by the -a option. If the user named "x" does not exist, this ps may interpret the command as "ps aux" instead and print a warning. This behavior is intended to aid in transitioning old scripts and habits. It is fragile, subject to change, and thus should not be relied upon.

    By default, ps selects all processes with the same effective user ID (euid=EUID) as the current user and associated with the same terminal as the invoker. It displays the process ID (pid=PID), the terminal associated with the process (tname=TTY), the cumulated CPU time in [DD-]hh:mm:ss format (time=TIME), and the executable name (ucmd=CMD). Output is unsorted by default.

    The use of BSD-style options will add process state (stat=STAT) to the default display and show the command args (args=COMMAND) instead of the executable name. You can override this with the PS_FORMAT environment variable. The use of BSD-style options will also change the process selection to include processes on other terminals (TTys) that are owned by you; alternately, this may be described as setting the selection to be the set of all processes filtered to exclude processes owned by other users or not on a terminal. These effects are not considered when options are described as being "identical" below, so -M will be considered identical to Z and so on.

    Except as described below, process selection options are additive. The default selection is discarded, and then the selected processes are added to the set of processes to be displayed. A process will thus be shown if it meets any of the given selection criteria.

EXAMPLES
    To see every process on the system using standard syntax:
        ps -e
        ps -ef
        ps -ef
        ps -ely

    To see every process on the system using BSD syntax:
        ps ax
        ps axu

    To print a process tree:
        ps -ejH
        ps axjf

    To get info about threads:
        ps -elf
        ps axms

    To get security info:
        ps -eo euser,ruser,suser,fuser,f,comm,label
        ps axZ
        ps -eM

    To see every process running as root (real & effective ID) in user format:
        ps -U root -u root u

    To see every process with a user-defined format:
        ps -eo pid,tid,class,rtprio,ni,pri,psr,pcpu,stat,wchan:14,comm
        ps axo stat,euid,ruid,TTY,tpgid,sses,pgpr,ppid,pid,pcpu,comm
        ps -Ao pid,tt,user,fname,tmout,f,wchan

    Print only the process IDs of syslogd:
        ps -C syslogd -o pid=

    Print only the name of PID 42:
        ps -q 42 -o comm=

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

ps — отчет о моментальном снимке текущих процессов.

-e Выберите все процессы. Идентичен -A

— Вызовите команду ps без параметров

```
lexot@DESKTOP-TBI95IT:/home$ ps
  PID TTY          TIME CMD
  269 pts/0    00:00:00 bash
  276 pts/0    00:00:00 ps
lexot@DESKTOP-TBI95IT:/home$
```

— Получите информацию обо всех процессах

```
lexot@DESKTOP-TBI95IT:/home$ ps -e
  PID TTY          TIME CMD
    1 ?           00:00:00 init
  244 ?           00:00:00 init
  245 ?           00:00:00 init
  246 pts/0    00:00:00 bash
  268 pts/0    00:00:00 su
  269 pts/0    00:00:00 bash
  294 pts/0    00:00:00 ps
lexot@DESKTOP-TBI95IT:/home$ _
```

— Введите команду:

`ps -e | grep term`

— Выясните название программы, обслуживающей терминал и запустите ее

```
lexot@DESKTOP-TBI95IT:/home$ ps -e | grep term
lexot@DESKTOP-TBI95IT:/home$ _
```

— Нажмите комбинацию клавиш [Ctrl+C]

— Введите ту же самую команду, поставив после названия команды символ амперсанда &

```
lexot@DESKTOP-TBI95IT:/home$ ps -e | grep term
lexot@DESKTOP-TBI95IT:/home$ ^C
lexot@DESKTOP-TBI95IT:/home$ grep term&
[1] 301
lexot@DESKTOP-TBI95IT:/home$ _
```

— Просмотрите статью Амперсанд на Википедии





```

GREP(1)                                User Commands                                GREP(1)

NAME
    grep, egrep, fgrep, rgrep - print lines that match patterns

SYNOPSIS
    grep [OPTION...] PATTERNS [FILE...]
    grep [OPTION...] -e PATTERNS ... [FILE...]
    grep [OPTION...] -f PATTERN FILE ... [FILE...]

DESCRIPTION
    grep searches for PATTERNS in each FILE. PATTERNS is one or more patterns separated by newline characters,
    and grep prints each line that matches a pattern. Typically PATTERNS should be quoted when grep is used in a
    shell command.

    A FILE of "." stands for standard input. If no FILE is given, recursive searches examine the working
    directory, and nonrecursive searches read standard input.

    In addition, the variant programs egrep, fgrep and rgrep are the same as grep -E, grep -F, and grep -r,
    respectively. These variants are deprecated, but are provided for backward compatibility.

OPTIONS
    Generic Program Information
    --help Output a usage message and exit.

    -V, --version
        Output the version number of grep and exit.

    Pattern Syntax
    -E, --extended-regexp
        Interpret PATTERNS as extended regular expressions (EREs, see below).

    -F, --fixed-strings
        Interpret PATTERNS as fixed strings, not regular expressions.

    -G, --basic-regexp
        Interpret PATTERNS as basic regular expressions (BREs, see below). This is the default.

    -P, --perl-regexp
        Interpret PATTERNS as Perl-compatible regular expressions (PCREs). This option is experimental when
        combined with the -z (--null-data) option, and grep -P may warn of unimplemented features.

    Matching Control
    -e PATTERNS, --regexp=PATTERNS
        Use PATTERNS as the patterns. If this option is used multiple times or is combined with the -f
        (--file) option, search for all patterns given. This option can be used to protect a pattern beginning
        with "-".

    -f FILE, --file=FILE
        Obtain patterns from FILE, one per line. If this option is used multiple times or is combined with the
        -e (--regexp) option, search for all patterns given. The empty file contains zero patterns, and
        therefore matches nothing.

    -i, --ignore-case
        Ignore case distinctions in patterns and input data, so that characters that differ only in case match
        each other.

    --no-ignore-case
        Do not ignore case distinctions in patterns and input data. This is the default. This option is
        useful for passing to shell scripts that already use -i, to cancel its effects because the two options
        override each other.

    -v, --invert-match
        Invert the sense of matching, to select non-matching lines.

    -w, --word-regexp
        Select only those lines containing matches that form whole words. The test is that the matching
        substring must either be at the beginning of the line, or preceded by a non-word constituent character.
        Similarly, it must be either at the end of the line or followed by a non-word constituent character.
        Word-constituent characters are letters, digits, and the underscore. This option has no effect if -x
        is also specified.

    -x, --line-regexp
        Select only those lines containing matches that exactly match the whole line.

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

```

— Выведите на экран справку по команде **tty**

```

TTY(1)                                User Commands                                TTY(1)

NAME
    tty - print the file name of the terminal connected to standard input

SYNOPSIS
    tty [OPTION]...

DESCRIPTION
    Print the file name of the terminal connected to standard input.

    -s, --silent, --quiet
        print nothing, only return an exit status

    --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 tty translation bugs to <https://translationproject.org/team/>

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    <https://gnu.org/licenses/gpl.html>.
    This is free software: you are free to change and redistribute it. There is NO WARRANTY, to the extent per-
    mitted by law.

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

GNU coreutils 8.30                                September 2019                                TTY(1)
Manual page tty(1) line 1/37 (END) (press h for help or q to quit)

```

`tty` — выводит имя файла терминала, подключенного к стандартному вводу

```

lexot@DESKTOP-TBI95IT:/home$ gnome term&
[2] 339
lexot@DESKTOP-TBI95IT:/home$
Command 'gnome' not found, did you mean:

  command 'gnote' from deb gnote (3.36.0-1)
  command 'genome' from deb libgenome-perl (0.06-5)

Try: apt install <deb name>

```

— В новом командном окне запустите еще одно командное окно

```
lexot@DESKTOP-TBI95IT:/home$  
Command 'gnome' not found, did you mean:  
  
  command 'gnote' from deb gnote (3.36.0-1)  
  command 'genome' from deb libgenome-perl (0.06-5)  
.  
Try: apt install <deb name>  
  
gnome term&  
[3] 347  
[2]  Exit 127                  gnome term  
lexot@DESKTOP-TBI95IT:/home$  
Command 'gnome' not found, did you mean:  
  
  command 'gnote' from deb gnote (3.36.0-1)  
  command 'genome' from deb libgenome-perl (0.06-5)  
.  
Try: apt install <deb name>
```

— В каждом из четырех окон введите команды

```
lexot@DESKTOP-TBI95IT:/home$ ps -l
F S   UID   PID  PPID  C PRI  NI ADDR SZ WCHAN  TTY          TIME CMD
4 S  1001   269   268   0  80   0 -  2630 do_wai pts/0    00:00:00 bash
0 T  1001   301   269   0  80   0 -  2041 do_sig pts/0    00:00:00 grep
0 R  1001   464   269   0  80   0 -  2630 -      pts/0    00:00:00 ps
lexot@DESKTOP-TBI95IT:/home$
```

```
lexot@DESKTOP-TBI95IT:/home$ ps -l
F S   UID   PID  PPID  C PRI  NI ADDR SZ WCHAN  TTY          TIME CMD
4 S  1001   387   386   0  80   0 -  2501 do_wai pts/1    00:00:00 bash
0 R  1001   467   387   0  80   0 -  2630 -      pts/1    00:00:00 ps
lexot@DESKTOP-TBI95IT:/home$
```

```
lexot@DESKTOP-TBI95IT:/home$ ps -l
F S   UID   PID  PPID  C PRI  NI ADDR SZ WCHAN  TTY          TIME CMD
4 S  1001   421   420   0  80   0 -  2501 do_wai pts/2    00:00:00 bash
0 R  1001   466   421   0  80   0 -  2630 -      pts/2    00:00:00 ps
lexot@DESKTOP-TBI95IT:/home$
```

```
lexot@DESKTOP-TBI95IT:/home$ ps -l
F S      UID      PID      PPID      C  PRI      NI  ADDR  SZ  WCHAN      TTY          TIME CMD
4 S    1001      421      420      0   80      0   -   2501  do_wai    pts/2        00:00:00 bash
0 R    1001      466      421      0   80      0   -   2630  -        pts/2        00:00:00 ps
lexot@DESKTOP-TBI95IT:/home$
```

```
lexot@DESKTOP-TBI95IT:/home$ ps -l
F S      UID      PID      PPID      C  PRI      NI  ADDR  SZ  WCHAN      TTY          TIME CMD
4 S    1001      455      454      0   80      0   -   2501  do_wai    pts/3        00:00:00 bash
0 R    1001      465      455      0   80      0   -   2630  -        pts/3        00:00:00 ps
lexot@DESKTOP-TBI95IT:/home$
```

— Сделайте зарисовку схемы дерева, используя PID, PPID, TTY, CMD для процессов `bash` и `term`, относящихся к рассматриваемым окнам

	PPID	PID	TTY	CMD
268		1736	pts/0   \_	bash
269		5599	pts/0   \_	ps
270		5444	pts/1   \_	bash
271		5760	pts/1   \_	ps
272		5471	pts/2   \_	bash
273		5948	pts/2   \_	ps
274		5526	pts/3   \_	bash
275		6009	pts/3   \_	ps

## — Выведите дерево процессов на экран

```
lexot@DESKTOP-TBI95IT:/home$ ps -ajfx
PPID  PID  PGID  SID  TTY      TPGID  STAT   UID    TIME  COMMAND
0      1      0      0  ?        -1  Sl      0      0:00  /init
1      244    244    244  ?        -1  Ss      0      0:00  /init
244    245    244    244  ?        -1  S       0      0:00  \_ /init
245    246    246    246 pts/0    463  Ss     1000    0:00  \_ -bash
246    268    268    246 pts/0    463  S       0      0:00  \_ su lexot
268    269    269    246 pts/0    463  S       1001    0:00  \_ bash
269    301    301    246 pts/0    463  T       1001    0:00  \_ grep --color=auto term
269    463    463    246 pts/0    463  R+      1001    0:00  \_ ps -ajfx
1      362    362    362  ?        -1  Ss      0      0:00  /init
362    363    362    362  ?        -1  S       0      0:00  \_ /init
363    364    364    364 pts/1    387  Ss     1000    0:00  \_ -bash
364    386    386    364 pts/1    387  S       0      0:00  \_ su lexot
386    387    387    364 pts/1    387  S+      1001    0:00  \_ bash
1      396    396    396  ?        -1  Ss      0      0:00  /init
396    397    396    396  ?        -1  S       0      0:00  \_ /init
397    398    398    398 pts/2    421  Ss     1000    0:00  \_ -bash
398    420    420    398 pts/2    421  S       0      0:00  \_ su lexot
420    421    421    398 pts/2    421  S+      1001    0:00  \_ bash
1      430    430    430  ?        -1  Ss      0      0:00  /init
430    431    430    430  ?        -1  S       0      0:00  \_ /init
431    432    432    432 pts/3    455  Ss     1000    0:00  \_ -bash
432    454    454    432 pts/3    455  S       0      0:00  \_ su lexot
454    455    455    432 pts/3    455  S+      1001    0:00  \_ bash
lexot@DESKTOP-TBI95IT:/home$
```

## — Остановите выполнение второго окна терминала

```
lexot@DESKTOP-TBI95IT:/home$ kill -9 362
bash: kill: (362) - Operation not permitted
lexot@DESKTOP-TBI95IT:/home$ kill -9 387
lexot@DESKTOP-TBI95IT:/home$

lexot@DESKTOP-TBI95IT:/home$ ps -l
F S  UID  PID  PPID  C PRI  NI ADDR SZ WCHAN  TTY      TIME CMD
4 S  1001  387   386  0  80   0 - 2501 do_wai pts/1    00:00:00 bash
0 R  1001  467   387  0  80   0 - 2630 -      pts/1    00:00:00 ps
lexot@DESKTOP-TBI95IT:/home$ Killed
```

## — Выведите на экран дерево процессов ps -le — forest





— Ознакомьтесь с изменением в структуре дерева

```
lexot@DESKTOP-TBI95IT:/home$ pstree
init--init--init--bash--su--bash--grep
                                     |
                                     pstree
init--init--init--bash
|
2*[init--init--bash--su--bash]
|
{init}

lexot@DESKTOP-TBI95IT:/home$ kill -9 421
lexot@DESKTOP-TBI95IT:/home$ pstree
init--init--init--bash--su--bash--grep
                                     |
                                     pstree
init--init--init--bash
|
2*[init--init--bash]
|
init--init--bash--su--bash
|
{init}

lexot@DESKTOP-TBI95IT:/home$ _
```

— Выведите на экран список файлов текущего каталога

```
lexot@DESKTOP-TBI95IT:/$ ls
bin  dev  home  lib  lib64  lost+found  mnt  proc  run  snap  sys  usr
boot  etc  init  lib32  libx32  media  opt  root  sbin  srv  tmp  var
lexot@DESKTOP-TBI95IT:/$ _
```

— Направьте список файлов текущего каталога в файл ddd

— Добавьте список файлов текущего каталога с полной информацией к файлу ddd

```
lexot@DESKTOP-TBI95IT:~$ ls
lexot@DESKTOP-TBI95IT:~$ ls > ddd
lexot@DESKTOP-TBI95IT:~$ ls
ddd
lexot@DESKTOP-TBI95IT:~$ ls -l > ddd
lexot@DESKTOP-TBI95IT:~$ ls -l >> ddd
lexot@DESKTOP-TBI95IT:~$ ls
ddd
lexot@DESKTOP-TBI95IT:~$ ls ddd
ddd
lexot@DESKTOP-TBI95IT:~$
```

— Введите команду `ps -e | more`

```
lexot@DESKTOP-TBI95IT:~$ ps -e | more
  PID TTY          TIME CMD
    1 ?            00:00:00 init
   244 ?            00:00:00 init
   245 ?            00:00:00 init
   246 pts/0        00:00:00 bash
   268 pts/0        00:00:00 su
   269 pts/0        00:00:00 bash
   533 pts/0        00:00:00 ps
   534 pts/0        00:00:00 more
lexot@DESKTOP-TBI95IT:~$
```

## — Выведите на экран справку по команде cat

```
CAT(1)                                     User Commands                                CAT(1)

NAME
  cat - concatenate files and print on the standard output

SYNOPSIS
  cat [OPTION]... [FILE]...

DESCRIPTION
  Concatenate FILE(s) to standard output.

  With no FILE, or when FILE is -, read standard input.

  -A, --show-all
      equivalent to -vET

  -b, --number-nonblank
      number nonempty output lines, overrides -n

  -e
      equivalent to -vE

  -E, --show-ends
      display $ at end of each line

  -n, --number
      number all output lines

  -s, --squeeze-blank
      suppress repeated empty output lines

  -t
      equivalent to -vT

  -T, --show-tabs
      display TAB characters as ^I

  -u
      (ignored)

  -v, --show-nonprinting
      use ^ and M- notation, except for LFD and TAB

  --help
      display this help and exit

  --version
      output version information and exit

EXAMPLES
  cat f - g
      Output f's contents, then standard input, then g's contents.

  cat
      Copy standard input to standard output.

AUTHOR
  Written by Torbjorn Granlund and Richard M. Stallman.

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

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

cat – объединение файлов и печать на стандартном выводе

## — Выведите на экран файл ddd

```
lexot@DESKTOP-TBI95IT:~$ cat ddd
total 0
-rw-rw-r-- 1 lexot lexot 0 Mar 26 20:41 ddd
total 4
-rw-rw-r-- 1 lexot lexot 52 Mar 26 20:41 ddd
lexot@DESKTOP-TBI95IT:~$
```

## — Создайте файл z.x

## — Выведите файл z.x на экран

```
lexot@DESKTOP-TBI95IT:~$ cat z.x
lexot@DESKTOP-TBI95IT:~$ ls
ddd  z.x
lexot@DESKTOP-TBI95IT:~$
```

## — Выведите на экран справку по команде 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

  -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 mkdir translation bugs to <https://translationproject.org/team/>

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  <https://gnu.org/licenses/gpl.html>.
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  mitted by law.

SEE ALSO
  mkdir(2)

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

GNU coreutils 8.30                               September 2019                               MKDIR(1)
Manual page mkdir(1) line 1/52 (END) (press h for help or q to quit)
```

mkdir – создавать каталоги

## — Создайте каталог d1

```
lexot@DESKTOP-TBI95IT:~$ ls
ddd  z.x
lexot@DESKTOP-TBI95IT:~$ mkdir d1
lexot@DESKTOP-TBI95IT:~$ ls
d1  ddd  z.x
lexot@DESKTOP-TBI95IT:~$
```

## — Выведите на экран справку по команде ls

```
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 entries alphabetically if none of
  -ctuvSUX 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

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

  -f
      do not sort, enable -aU, disable -ls --color

  -F, --classify
      append indicator (one of */=>@|) to entries

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

  --format=WORD
      across -x, commas -m, horizontal -x, long -l, single-column -1, verbose -l, vertical -C

  --full-time
      like -l --time-style=full-iso
Manual page ls(1) line 1 (press h for help or q to quit)
```

ls — список содержимого каталога

ls -a, -l, -F

```
lexot@DESKTOP-TBI95IT:~$ ls -a
.  ..  .bash_history  .bash_logout  .bashrc  .profile  d1  ddd  z.x
lexot@DESKTOP-TBI95IT:~$
```

```
lexot@DESKTOP-TBI95IT:~$ ls -l
total 8
drwxrwxr-x 2 lexot lexot 4096 Mar 26 20:59 d1
-rw-rw-r-- 1 lexot lexot  105 Mar 26 20:41 ddd
-rw-rw-r-- 1 lexot lexot    0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$
```

```
lexot@DESKTOP-TBI95IT:~$ ls -F
d1/  ddd  z.x
lexot@DESKTOP-TBI95IT:~$
```

## ls -la

```
lexot@DESKTOP-TBI95IT:~$ ls -la
total 32
drwxr-xr-x 3 lexot lexot 4096 Mar 26 20:59 .
drwxr-xr-x 4 root  root  4096 Mar 26 18:49 ..
-rw----- 1 lexot lexot  106 Mar 26 20:08 .bash_history
-rw-r--r-- 1 lexot lexot  220 Mar 26 18:49 .bash_logout
-rw-r--r-- 1 lexot lexot 3771 Mar 26 18:49 .bashrc
-rw-r--r-- 1 lexot lexot  807 Mar 26 18:49 .profile
drwxrwxr-x 2 lexot lexot 4096 Mar 26 20:59 d1
-rw-rw-r-- 1 lexot lexot  105 Mar 26 20:41 ddd
-rw-rw-r-- 1 lexot lexot    0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$
```

## ls -laF

```
lexot@DESKTOP-TBI95IT:~$ ls -laF
total 32
drwxr-xr-x 3 lexot lexot 4096 Mar 26 20:59 ./
drwxr-xr-x 4 root  root  4096 Mar 26 18:49 ../
-rw----- 1 lexot lexot  106 Mar 26 20:08 .bash_history
-rw-r--r-- 1 lexot lexot  220 Mar 26 18:49 .bash_logout
-rw-r--r-- 1 lexot lexot 3771 Mar 26 18:49 .bashrc
-rw-r--r-- 1 lexot lexot   807 Mar 26 18:49 .profile
drwxrwxr-x 2 lexot lexot 4096 Mar 26 20:59 d1/
-rw-rw-r-- 1 lexot lexot  105 Mar 26 20:41 ddd
-rw-rw-r-- 1 lexot lexot    0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$
```

## ls -laF z.x

```
lexot@DESKTOP-TBI95IT:~$ ls -laF z.x
-rw-rw-r-- 1 lexot lexot 0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$
```

## ls /

```
lexot@DESKTOP-TBI95IT:~$ ls /
bin  dev  home  lib  lib64  lost+found  mnt  proc  run  snap  sys  usr
boot  etc  init  lib32  libx32  media  opt  root  sbin  srv  tmp  var
lexot@DESKTOP-TBI95IT:~$
```

## — Выведите на экран справку по команде cd

```
lexot@DESKTOP-TBI95IT:~$ man cd
No manual entry for cd
lexot@DESKTOP-TBI95IT:~$
```

## — Перейдите на один уровень вверх по файловому дереву

```
lexot@DESKTOP-TBI95IT:~$ cd ..
lexot@DESKTOP-TBI95IT:/home$
```

## — Выведите на экран справку по команде 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 pwd translation bugs to <https://translationproject.org/team/>
COPYRIGHT
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    <https://gnu.org/licenses/gpl.html>.
    This is free software: you are free to change and redistribute it. There is NO WARRANTY, to the extent per-
    mitted by law.
SEE ALSO
    getcwd(3)

    Full documentation at: <https://www.gnu.org/software/coreutils/pwd>
    or available locally via: info '(coreutils) pwd invocation'
GNU coreutils 8.30                      September 2019                      PWD(1)
Manual page pwd(1) line 1/47 (FND) (press h for help or q to quit)

```

## pwd – вывести имя текущего/рабочего каталога

### — Введите команду pwd

```

lexot@DESKTOP-TBI95IT:~$ pwd
/home/lexot
lexot@DESKTOP-TBI95IT:~$ _

```

### — Перейдите в корневой каталог



- Введите команду `pwd`
- Перейдите в домашний каталог
- Введите команду `pwd`

```
lexot@DESKTOP-TBI95IT:~$ pwd
/home/lexot
lexot@DESKTOP-TBI95IT:~$ cd /
lexot@DESKTOP-TBI95IT:/$ pwd
/
lexot@DESKTOP-TBI95IT:/$ cd ~
lexot@DESKTOP-TBI95IT:~$ pwd
/home/lexot
lexot@DESKTOP-TBI95IT:~$
```

- Введите команду `ls`
- Перейдите в каталог `d1`
- Создайте каталог `d2`

```
lexot@DESKTOP-TBI95IT:~$ ls
d1  ddd  z.x
lexot@DESKTOP-TBI95IT:~$ cd d1
lexot@DESKTOP-TBI95IT:~/d1$ mkdir d2
lexot@DESKTOP-TBI95IT:~/d1$ _
```

- Выведите на экран справку по команде `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 rmdir translation bugs to <https://translationproject.org/team/>
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    <https://gnu.org/licenses/gpl.html>.
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    mitted by law.
SEE ALSO
    rmdir(2)

    Full documentation at: <https://www.gnu.org/software/coreutils/rmdir>
    or available locally via: info '(coreutils) rmdir invocation'
GNU coreutils 8.30                                September 2019                                RMDIR(1)
Manual page rmdir(1) line 1/48 (END) (press h for help or q to quit)

```

## rmdir – удалить пустые каталоги

— Удалите каталог d2

— Введите команду ls

```

lexot@DESKTOP-TBI95IT:~/d1$ man rmdir
lexot@DESKTOP-TBI95IT:~/d1$ ls
d2
lexot@DESKTOP-TBI95IT:~/d1$ rmdir d2
lexot@DESKTOP-TBI95IT:~/d1$ ls
lexot@DESKTOP-TBI95IT:~/d1$

```

— Создайте файл r.w

— Введите команду `ls -laF`

```
lexot@DESKTOP-TBI95IT:~/d1$ cat>r.w
^C
lexot@DESKTOP-TBI95IT:~/d1$ ls
r.w
lexot@DESKTOP-TBI95IT:~/d1$ ls -laF
total 8
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:08 ./
drwxr-xr-x 3 lexot lexot 4096 Mar 26 20:59 ../
-rw-rw-r-- 1 lexot lexot   0 Mar 26 21:08 r.w
lexot@DESKTOP-TBI95IT:~/d1$
```

— Выведите на экран справку по команде `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 --re-
    cursive 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

    -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

    -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

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

```

## rm – удаление файлов или каталогов

— Перейдите в домашний каталог

— Введите команду **rmdir d1**

```
lexot@DESKTOP-TBI95IT:~/d1$ cd
lexot@DESKTOP-TBI95IT:~$ rmdir d1
rmdir: failed to remove 'd1': Directory not empty
lexot@DESKTOP-TBI95IT:~$
```

rmdir: не удалось удалить 'd1': Каталог не пуст

— Перейдите в каталог **d1**

— Введите команду **rm r.w**

```
lexot@DESKTOP-TBI95IT:~/d1$ cd
lexot@DESKTOP-TBI95IT:~$ rmdir d1
rmdir: failed to remove 'd1': Directory not empty
lexot@DESKTOP-TBI95IT:~$ cd d1
lexot@DESKTOP-TBI95IT:~/d1$ rm r.w
lexot@DESKTOP-TBI95IT:~/d1$
```

Сообщения ОС не было

— Введите команду **ls**

```
lexot@DESKTOP-TBI95IT:~/d1$ ls
lexot@DESKTOP-TBI95IT:~/d1$ _
```

— Убедитесь, что файл **r.w** не был удален

Файл **r.w** **был** удалён.

— Перейдите на один уровень вверх по файловому дереву

— Введите команду `pwd`

```
lexot@DESKTOP-TBI95IT:~/d1$ cd ..  
lexot@DESKTOP-TBI95IT:~$ pwd  
/home/lexot  
lexot@DESKTOP-TBI95IT:~$
```

— Введите команду `ls`

— Введите команду `rmdir d1`

— Убедитесь, что каталог `d1` удален

```
lexot@DESKTOP-TBI95IT:~$ ls  
d1 ddd z.x  
lexot@DESKTOP-TBI95IT:~$ rmdir d1  
lexot@DESKTOP-TBI95IT:~$ ls  
ddd z.x  
lexot@DESKTOP-TBI95IT:~$
```

— Создайте каталог `G1`

- Перейдите в каталог G1
- Создайте файл s1
- Скопируйте файл s1 в файл s2
- Введите команду ls
- Скопируйте файл s1 в каталог /home
- Запишите сообщение ОС и переведите его

```
lexot@DESKTOP-TBI95IT:~$ mkdir G1
lexot@DESKTOP-TBI95IT:~$ cd G1
lexot@DESKTOP-TBI95IT:~/G1$ cat>s1
123344
^Z
[2]+  Stopped                  cat > s1
lexot@DESKTOP-TBI95IT:~/G1$ cp s1 s2
lexot@DESKTOP-TBI95IT:~/G1$ ls
s1  s2
lexot@DESKTOP-TBI95IT:~/G1$ cp s1 /home
cp: cannot create regular file '/home/s1': Permission denied
lexot@DESKTOP-TBI95IT:~/G1$ _
```

cp: невозможно создать обычный файл '/home/s1': Отказано в доступе

- Скопируйте файл s1 в каталог /home/knoppix

```
lexot@DESKTOP-TBI95IT:~/G1$ cp s1 /home/knoppix
cp: cannot create regular file '/home/knoppix': Permission denied
lexot@DESKTOP-TBI95IT:~/G1$ _
```

- Перейдите в домашний каталог

## — Введите команду ls

```
lexot@DESKTOP-TBI95IT:~/G1$ cd ~
lexot@DESKTOP-TBI95IT:~$ ls
G1 ddd z.x
lexot@DESKTOP-TBI95IT:~$
```

## — Выведите файл s1 на экран

```
lexot@DESKTOP-TBI95IT:~$ cat G1/s1
123344
lexot@DESKTOP-TBI95IT:~$
```

## — Выведите на экран справку по команде chmod

```
CHMOD(1) User Commands CHMOD(1)

NAME
    chmod - change file mode bits

SYNOPSIS
    chmod [OPTION]... MODE[,MODE]... FILE...
    chmod [OPTION]... OCTAL-MODE FILE...
    chmod [OPTION]... --reference=RFILE FILE...

DESCRIPTION
    This manual page documents the GNU version of chmod.  chmod changes the file mode bits of each given file according to mode, which can be either a symbolic representation of changes to make, or an octal number representing the bit pattern for the new mode bits.

    The format of a symbolic mode is [ugoa...][[+|=][perms...]...], where perms is either zero or more letters from the set rwXst, or a single letter from the set ugo.  Multiple symbolic modes can be given, separated by commas.

    A combination of the letters ugoa controls which users' access to the file will be changed: the user who owns it (u), other users in the file's group (g), other users not in the file's group (o), or all users (a).  If none of these are given, the effect is as if (a) were given, but bits that are set in the umask are not affected.

    The operator + causes the selected file mode bits to be added to the existing file mode bits of each file; - causes them to be removed; and = causes them to be added and causes unmentioned bits to be removed except that a directory's unmentioned set user and group ID bits are not affected.

    The letters rwXst select file mode bits for the affected users: read (r), write (w), execute (or search for directories) (X), execute/search only if the file is a directory or already has execute permission for some user (x), set user or group ID on execution (s), restricted deletion flag or sticky bit (t).  Instead of one or more of these letters, you can specify exactly one of the letters ugo: the permissions granted to the user who owns the file (u), the permissions granted to other users who are members of the file's group (g), and the permissions granted to users that are in neither of the two preceding categories (o).

    A numeric mode is from one to four octal digits (0-7), derived by adding up the bits with values 4, 2, and 1.  Omitted digits are assumed to be leading zeros.  The first digit selects the set user ID (4) and set group ID (2) and restricted deletion or sticky (1) attributes.  The second digit selects permissions for the user who owns the file: read (4), write (2), and execute (1); the third selects permissions for other users in the file's group, with the same values; and the fourth for other users not in the file's group, with the same values.

    chmod never changes the permissions of symbolic links; the chmod system call cannot change their permissions.  This is not a problem since the permissions of symbolic links are never used.  However, for each symbolic link listed on the command line, chmod changes the permissions of the pointed-to file.  In contrast, chmod ignores symbolic links encountered during recursive directory traversals.

SETUID AND SETGID BITS
    chmod clears the set-group-ID bit of a regular file if the file's group ID does not match the user's effective group ID or one of the user's supplementary group IDs, unless the user has appropriate privileges.  Additional restrictions may cause the set-user-ID and set-group-ID bits of MODE or RFILE to be ignored.  This behavior depends on the policy and functionality of the underlying chmod system call.  When in doubt, check the underlying system behavior.

    For directories chmod preserves set-user-ID and set-group-ID bits unless you explicitly specify otherwise.  You can set or clear the bits with symbolic modes like u+s and g-s.  To clear these bits for directories with a numeric mode requires an additional leading zero, or leading = like 00755, or =755.

RESTRICTED DELETION FLAG OR STICKY BIT
    Manual page chmod(1) line 1 (press h for help or q to quit)
```

## chmod – изменение битов режима файла



— Создайте текстовый файл dw

— Выведите атрибуты файла на экран командой ls -l

```
lexot@DESKTOP-TBI95IT:~$ cat>dw
artabas
^Z
[3]+  Stopped                  cat > dw
lexot@DESKTOP-TBI95IT:~$ ls -l
total 12
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
-rw-rw-r-- 1 lexot lexot  105 Mar 26 20:41 ddd
-rw-rw-r-- 1 lexot lexot   8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot   0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$
```

— Рассчитайте, какие атрибуты будут установлены командами:

**chmod 351 dw**

**chmod 427 dw**

**chmod 607 dw**

**chmod 777 dw**

**chmod 000 dw**

```
lexot@DESKTOP-TBI95IT:~$ chmod 427 dw
lexot@DESKTOP-TBI95IT:~$ ls -l
total 12
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-r---w-rwx 1 lexot lexot 8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot 0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$ chmod 607 dw
lexot@DESKTOP-TBI95IT:~$ ls -l
total 12
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-rw----rwx 1 lexot lexot 8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot 0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$ chmod 777 dw
lexot@DESKTOP-TBI95IT:~$ ls -l
total 12
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-rwxrwxrwx 1 lexot lexot 8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot 0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$ chmod 000 dw
lexot@DESKTOP-TBI95IT:~$ ls -l
total 12
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
----- 1 lexot lexot 8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot 0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$
```

**— Используя буквенное задание атрибутов, установите следующие разрешения:**

**Чтение владельцу:**

```
lexot@DESKTOP-TBI95IT:~$ ls -l dw
----- 1 lexot lexot 8 Mar 26 21:23 dw
lexot@DESKTOP-TBI95IT:~$ chmod u+r dw
lexot@DESKTOP-TBI95IT:~$ ls -l dw
-r----- 1 lexot lexot 8 Mar 26 21:23 dw
lexot@DESKTOP-TBI95IT:~$
```

**Запись группе:**

```
lexot@DESKTOP-TBI95IT:~$ chmod g+w dw
lexot@DESKTOP-TBI95IT:~$ ls -l dw
-r---w---- 1 lexot lexot 8 Mar 26 21:23 dw
lexot@DESKTOP-TBI95IT:~$
```

**Выполнение остальным:**

```
lexot@DESKTOP-TBI95IT:~$ chmod o+x dw
lexot@DESKTOP-TBI95IT:~$ ls -l dw
-r---w---x 1 lexot lexot 8 Mar 26 21:23 dw
lexot@DESKTOP-TBI95IT:~$
```

**Чтение всем:**

```
lexot@DESKTOP-TBI95IT:~$ chmod a+r dw
lexot@DESKTOP-TBI95IT:~$ ls -l dw
-r--rw-r-x 1 lexot lexot 8 Mar 26 21:23 dw
lexot@DESKTOP-TBI95IT:~$
```

**— Создайте каталог Z7**

- Проверьте атрибуты каталога командой `ls -l`
- Установите следующие атрибуты каталога `Z7` — `x` — —
- Проверьте атрибуты каталога командой `ls -l`
- Перейдите в каталог `Z7`
- Введите команду `ls -l`

```
lexot@DESKTOP-TBI95IT:~$ mkdir Z7
lexot@DESKTOP-TBI95IT:~$ ls -l
total 16
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:27 Z7
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-r--rw-r-x 1 lexot lexot 8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot 0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$ chmod 770 Z7
lexot@DESKTOP-TBI95IT:~$ ls -l
total 16
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
drwxrwx--- 2 lexot lexot 4096 Mar 26 21:27 Z7
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-r--rw-r-x 1 lexot lexot 8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot 0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$ cd Z7
lexot@DESKTOP-TBI95IT:~/Z7$ ls -l
total 0
lexot@DESKTOP-TBI95IT:~/Z7$
```

- Запишите сообщение ОС и переведите его

Всего 0

- Перейдите в домашний каталог

— Установите следующие атрибуты каталога **Z7** **r-x** — — —

— Проверьте атрибуты каталога командой

**ls -l**

— Перейдите в каталог **Z7**

— Введите команду **ls -l**

— Создайте файл **Fg**

```
lexot@DESKTOP-TBI95IT:~/Z7$ cd ~
lexot@DESKTOP-TBI95IT:~$ chmod 500 Z7
lexot@DESKTOP-TBI95IT:~$ ls -l
total 16
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
dr-x----- 2 lexot lexot 4096 Mar 26 21:27 Z7
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-r--rw-r-x 1 lexot lexot 8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot 0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$ cd Z7
lexot@DESKTOP-TBI95IT:~/Z7$ ls -l
total 0
lexot@DESKTOP-TBI95IT:~/Z7$ cat>Fg
bash: Fg: Permission denied
lexot@DESKTOP-TBI95IT:~/Z7$
```

— Запишите сообщение ОС и переведите его

bash: Fg: В разрешении отказано

— Создайте файл **x1** и введите одну строку текста

— Выведите на экран файл x1

— Создайте указатель x2 на файл x1 командой ln:

**ln -s x1 x2**

— Создайте указатель x3 на файл x1 командой cp:

**cp -s x1 x3**

— Введите команды ls, ls -l, ls -F

```
lexot@DESKTOP-TBI95IT:~$ cat>x1
tftctcrct
^Z
[4]+  Stopped                  cat > x1
lexot@DESKTOP-TBI95IT:~$ cat x1
tftctcrct
lexot@DESKTOP-TBI95IT:~$ ln -s x1 x2
lexot@DESKTOP-TBI95IT:~$ cp -s x1 x3
lexot@DESKTOP-TBI95IT:~$ ls
G1 Z7 ddd dw x1 x2 x3 z.x
lexot@DESKTOP-TBI95IT:~$ ls -l
total 20
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
dr-x----- 2 lexot lexot 4096 Mar 26 21:27 Z7
-rw-rw-r-- 1 lexot lexot  105 Mar 26 20:41 ddd
-r--rw-r-x 1 lexot lexot    8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot   10 Mar 26 21:31 x1
lrwxrwxrwx 1 lexot lexot    2 Mar 26 21:31 x2 -> x1
lrwxrwxrwx 1 lexot lexot    2 Mar 26 21:31 x3 -> x1
-rw-rw-r-- 1 lexot lexot    0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$ ls -F
G1/ Z7/ ddd dw* x1 x2@ x3@ z.x
lexot@DESKTOP-TBI95IT:~$
```

— Прочитайте статью про символ @ на Википедии

— Выведите на экран файлы x1, x2 и x3

```
lexot@DESKTOP-TBI95IT:~$ cat x1
tftctcrct
lexot@DESKTOP-TBI95IT:~$ cat x2
tftctcrct
lexot@DESKTOP-TBI95IT:~$ cat x3
tftctcrct
lexot@DESKTOP-TBI95IT:~$ echo "vitalik" >> x1
lexot@DESKTOP-TBI95IT:~$ cat x1
tftctcrct
vitalik
lexot@DESKTOP-TBI95IT:~$ cat x2
tftctcrct
vitalik
lexot@DESKTOP-TBI95IT:~$ cat x3
tftctcrct
vitalik
lexot@DESKTOP-TBI95IT:~$ echo "lesha" >> x2
lexot@DESKTOP-TBI95IT:~$ cat x1
tftctcrct
vitalik
lesha
lexot@DESKTOP-TBI95IT:~$ cat x2
tftctcrct
vitalik
lesha
lexot@DESKTOP-TBI95IT:~$ cat x3
tftctcrct
vitalik
lesha
lexot@DESKTOP-TBI95IT:~$ echo "sokol" >> x2
lexot@DESKTOP-TBI95IT:~$ cat x1
tftctcrct
vitalik
lesha
sokol
lexot@DESKTOP-TBI95IT:~$ cat x2
tftctcrct
vitalik
lesha
sokol
lexot@DESKTOP-TBI95IT:~$ cat x3
tftctcrct
vitalik
lesha
sokol
lexot@DESKTOP-TBI95IT:~$ _
```

— Удалите файл x1

— Введите команду ls -l

— Выведите на экран файл x3



```
lexot@DESKTOP-TBI95IT:~$ rm x1
lexot@DESKTOP-TBI95IT:~$ ls -l
total 16
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
dr-x----- 2 lexot lexot 4096 Mar 26 21:27 Z7
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-r--rw-r-x 1 lexot lexot 8 Mar 26 21:23 dw
lrwxrwxrwx 1 lexot lexot 2 Mar 26 21:31 x2 -> x1
lrwxrwxrwx 1 lexot lexot 2 Mar 26 21:31 x3 -> x1
-rw-rw-r-- 1 lexot lexot 0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$ cat x3
cat: x3: No such file or directory
lexot@DESKTOP-TBI95IT:~$ _
```

— Запишите сообщение ОС и переведите его  
cat: x3: Такого файла или каталога нет

— Удалите файлы x2 и x3

```
lexot@DESKTOP-TBI95IT:~$ rm x2
lexot@DESKTOP-TBI95IT:~$ rm x3
lexot@DESKTOP-TBI95IT:~$ _
```

— Создайте пакетный файл w1 командой cat и введите текст:

**echo Privet!**

— Запустите пакетный файл w1 на выполнение командой  
**sh w1**

— Запустите пакетный файл w1 на выполнение командой  
**./w1**

```
lexot@DESKTOP-TBI95IT:~$ cat>w1
echo Privet!
^Z
[5]+  Stopped                  cat > w1
lexot@DESKTOP-TBI95IT:~$ sh w1
Privet!
lexot@DESKTOP-TBI95IT:~$ ./w1
bash: ./w1: Permission denied
lexot@DESKTOP-TBI95IT:~$
```

— Запишите сообщение ОС и переведите его

bash: ./w1: В разрешении отказано

— Выполните команды `ls -l`, `ls -F`

```
lexot@DESKTOP-TBI95IT:~$ ls -l
total 20
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
dr-x----- 2 lexot lexot 4096 Mar 26 21:27 Z7
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-r--rw-r-x 1 lexot lexot 8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot 13 Mar 26 22:04 w1
-rw-rw-r-- 1 lexot lexot 0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$ ls -F
G1/ Z7/ ddd dw* w1 z.x
lexot@DESKTOP-TBI95IT:~$
```

— Установите разрешение на запуск для файла `w1`

— Выполните команды `ls -l`

```
lexot@DESKTOP-TBI95IT:~$ chmod +x w1
lexot@DESKTOP-TBI95IT:~$ ls -l
total 20
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
dr-x----- 2 lexot lexot 4096 Mar 26 21:27 Z7
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-r--rw-r-x 1 lexot lexot 8 Mar 26 21:23 dw
-rwxrwxr-x 1 lexot lexot 13 Mar 26 22:04 w1
-rw-rw-r-- 1 lexot lexot 0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$
```

## **ls -F**

```
lexot@DESKTOP-TBI95IT:~$ ls -F
G1/  Z7/  ddd  dw*  w1*  z.x
lexot@DESKTOP-TBI95IT:~$
```

— Обратите внимание на изменение атрибутов и обозначений

— Запустите пакетный файл w1 на выполнение командой **./w1**

— Удалите файл w1

```
lexot@DESKTOP-TBI95IT:~$ ./w1
bash: ./w1: Text file busy
lexot@DESKTOP-TBI95IT:~$ rm w1
lexot@DESKTOP-TBI95IT:~$
```

— Создайте текстовые файлы s1 и s2

— Определите размеры файлов командой **ls -l**

— Упакуйте файл s1 командой **gzip s1**

— Определите имя и размеры архива командой **ls -l**

— Упакуйте файл s2 командой **gzip s2**

— Определите имя и размеры архива командой **ls -l**

— Выведите информацию об архиве командой **gzip -l s2**

— Распакуйте архивы командами **gzip -d s1** и **gzip -d s2**

— Ознакомьтесь с результатами распаковки командой **ls -l**

```

lexot@DESKTOP-TBI95IT:~$ cat>s1
s1
^Z
[6]+  Stopped                  cat > s1
lexot@DESKTOP-TBI95IT:~$ cat>s2
s2
^Z
[7]+  Stopped                  cat > s2
lexot@DESKTOP-TBI95IT:~$ ls -l
total 24
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
dr-x----- 2 lexot lexot 4096 Mar 26 21:27 Z7
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-r--rw-r-x 1 lexot lexot  8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot  3 Mar 26 22:07 s1
-rw-rw-r-- 1 lexot lexot  3 Mar 26 22:07 s2
-rw-rw-r-- 1 lexot lexot  0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$ gzip s1
lexot@DESKTOP-TBI95IT:~$ ls -l
total 24
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
dr-x----- 2 lexot lexot 4096 Mar 26 21:27 Z7
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-r--rw-r-x 1 lexot lexot  8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot 26 Mar 26 22:07 s1.gz
-rw-rw-r-- 1 lexot lexot  3 Mar 26 22:07 s2
-rw-rw-r-- 1 lexot lexot  0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$ gzip s2
lexot@DESKTOP-TBI95IT:~$ ls -l
total 24
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
dr-x----- 2 lexot lexot 4096 Mar 26 21:27 Z7
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-r--rw-r-x 1 lexot lexot  8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot 26 Mar 26 22:07 s1.gz
-rw-rw-r-- 1 lexot lexot 26 Mar 26 22:07 s2.gz
-rw-rw-r-- 1 lexot lexot  0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$ gzip -l s2
      compressed      uncompressed  ratio uncompressed_name
          26              3  -66.7% s2
lexot@DESKTOP-TBI95IT:~$ gzip -d s1
lexot@DESKTOP-TBI95IT:~$ gzip -d s2
lexot@DESKTOP-TBI95IT:~$ ls -l
total 24
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
dr-x----- 2 lexot lexot 4096 Mar 26 21:27 Z7
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-r--rw-r-x 1 lexot lexot  8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot  3 Mar 26 22:07 s1
-rw-rw-r-- 1 lexot lexot  3 Mar 26 22:07 s2
-rw-rw-r-- 1 lexot lexot  0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$ █

```

— Создайте архив командой `gzip -c s1> a1`

— Определите имя и размеры архива командой `ls -l`

```
lexot@DESKTOP-TBI95IT:~$ gzip -c s1>a1
lexot@DESKTOP-TBI95IT:~$ ls -l
total 28
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
dr-x----- 2 lexot lexot 4096 Mar 26 21:27 Z7
-rw-rw-r-- 1 lexot lexot  26 Mar 26 22:10 a1
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-r--rw-r-x 1 lexot lexot   8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot   3 Mar 26 22:07 s1
-rw-rw-r-- 1 lexot lexot   3 Mar 26 22:07 s2
-rw-rw-r-- 1 lexot lexot   0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$
```

— Добавьте второй файл к архиву командой

`gzip -c s2>> a1`

— Определите размеры архива командой

`ls -l`

```
lexot@DESKTOP-TBI95IT:~$ gzip -c s2>>a1
lexot@DESKTOP-TBI95IT:~$ ls -l
total 28
drwxrwxr-x 2 lexot lexot 4096 Mar 26 21:19 G1
dr-x----- 2 lexot lexot 4096 Mar 26 21:27 Z7
-rw-rw-r-- 1 lexot lexot  52 Mar 26 22:11 a1
-rw-rw-r-- 1 lexot lexot 105 Mar 26 20:41 ddd
-r--rw-r-x 1 lexot lexot   8 Mar 26 21:23 dw
-rw-rw-r-- 1 lexot lexot   3 Mar 26 22:07 s1
-rw-rw-r-- 1 lexot lexot   3 Mar 26 22:07 s2
-rw-rw-r-- 1 lexot lexot   0 Mar 26 20:46 z.x
lexot@DESKTOP-TBI95IT:~$
```

— Выведите информацию об архиве командой

`gzip a1 -l`

```
lexot@DESKTOP-TBI95IT:~$ gzip a1 -l
      compressed      uncompressed   ratio uncompressed_name
           67             52   11.5% a1
lexot@DESKTOP-TBI95IT:~$ _
```

— Введите команды

## \$PATH, \$HOME

```
lexot@DESKTOP-TBI95IT:~$ $PATH
bash: /usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games: No such file or directory
lexot@DESKTOP-TBI95IT:~$ $HOME
bash: /home/lexot: Is a directory
lexot@DESKTOP-TBI95IT:~$
```

— Перейдите в домашний каталог

— Создайте каталог R3

— Перейдите в каталог R3

— Создайте пакетный файл zs и введите строку  
**echo Hello World!**

— Сделайте файл zs исполняемым

— Запустите файл zs на выполнение командой

**./zs**

— Перейдите в домашний каталог

— Запустите файл zs на выполнение командой

**zs**

```

lexot@DESKTOP-TBI95IT:~$ cd /home/lexot
lexot@DESKTOP-TBI95IT:~$ mkdir R3
lexot@DESKTOP-TBI95IT:~$ cd R3
lexot@DESKTOP-TBI95IT:~/R3$ cat>zs
echo Hello World!^Z
[8]+  Stopped                  cat > zs
lexot@DESKTOP-TBI95IT:~/R3$ chmod +x zs
lexot@DESKTOP-TBI95IT:~/R3$ ./zs
bash: ./zs: Text file busy
lexot@DESKTOP-TBI95IT:~/R3$ zs
zs: command not found
lexot@DESKTOP-TBI95IT:~/R3$ bash zs
lexot@DESKTOP-TBI95IT:~/R3$ cat > zs
echo Hello World!
^Z
[9]+  Stopped                  cat > zs
lexot@DESKTOP-TBI95IT:~/R3$ zs
zs: command not found
lexot@DESKTOP-TBI95IT:~/R3$ ./zs
bash: ./zs: Text file busy
lexot@DESKTOP-TBI95IT:~/R3$ bash ./zs
Hello World!
lexot@DESKTOP-TBI95IT:~/R3$ cd ..
lexot@DESKTOP-TBI95IT:~$ zs
zs: command not found
lexot@DESKTOP-TBI95IT:~$

```

— Запишите сообщение ОС и переведите его

**zs: команда не найдена**

— Добавьте каталог R3 в путь для поиска

— Запустите файл zs на выполнение командой zs

```

zs: command not found
lexot@DESKTOP-TBI95IT:~$ PATH="$PATH:$HOME/R3"
lexot@DESKTOP-TBI95IT:~$ zs
bash: /home/lexot/R3/zs: Text file busy
lexot@DESKTOP-TBI95IT:~$ bash ./zs
bash: ./zs: No such file or directory
lexot@DESKTOP-TBI95IT:~$ bash zs
Hello World!
lexot@DESKTOP-TBI95IT:~$

```

— Запустите файл `zs` на выполнение командой

`./R3/zs`

```
lexot@DESKTOP-TBI95IT:~$ ./R3/zs
bash: ./R3/zs: Text file busy
lexot@DESKTOP-TBI95IT:~$ bash ./R3/zs
Hello World!
lexot@DESKTOP-TBI95IT:~$ zs
bash: /home/lexot/R3/zs: Text file busy
lexot@DESKTOP-TBI95IT:~$ zc
zc: command not found
lexot@DESKTOP-TBI95IT:~$
```

— Удалите все созданные файлы и каталоги

```
exot@DESKTOP-TBI95IT:~$ cd R3
exot@DESKTOP-TBI95IT:~/R3$ ls
s
exot@DESKTOP-TBI95IT:~/R3$ rm zs
exot@DESKTOP-TBI95IT:~/R3$ ls
exot@DESKTOP-TBI95IT:~/R3$ cd
exot@DESKTOP-TBI95IT:~$ rmdir R3
exot@DESKTOP-TBI95IT:~$ ls
i1 Z7 a1.gz ddd dw s1 s2 z.x
exot@DESKTOP-TBI95IT:~$
```