

Лабораторная работа №4.

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Цели и задачи работы

Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки

Процесс выполнения лабораторной работы

Определим полное имя вашего домашнего каталога.

```
elarutyunyan@dk8n64 ~ $ cd  
elarutyunyan@dk8n64 ~ $ pwd  
/afs/.dk.sci.pfu.edu.ru/home/e/l/elarutyunyan  
elarutyunyan@dk8n64 ~ $ █
```

Рис. 1: Имя домашнего каталога

Перейдём в каталог /tmp

```
elarutyunyan@dk8n64 ~ $ cd /tmp  
elarutyunyan@dk8n64 /tmp $
```

Рис. 2: Переход в каталог /tmp

Выведем на экран содержимое каталога /tmp с помощью команды ls

```
elarutyunyan@dk8n64 /tmp $ ls
elarutyunyan
hsperfdata_elarutyunyan
krb5cc_5421_g0qd5e
krb5cc_5421_U6CqhI
lu4727h3kc.tmp
OSL_PIPE_5421_SingleOfficeIPC_63a6bcc025f2e06786f0783ac31f25f8
portage
pulse-PKdhtXMmr18n
root
screen
sddm-:0-KnghhI
sddm-auth-c16ee5d6-e01e-401f-9975-4add2e506897
systemd-private-805e6beacafa46bcad91d0f8688c7369-color.service-neVmJ2
systemd-private-805e6beacafa46bcad91d0f8688c7369-polkit.service-5Yp2x4
systemd-private-805e6beacafa46bcad91d0f8688c7369-power-profiles-daemon.service-HuNyr
systemd-private-805e6beacafa46bcad91d0f8688c7369-systemd-hostnamed.service-6TzC2o
systemd-private-805e6beacafa46bcad91d0f8688c7369-systemd-logind.service-2DW6sz
systemd-private-805e6beacafa46bcad91d0f8688c7369-systemd-resolved.service-EEd2cL
systemd-private-805e6beacafa46bcad91d0f8688c7369-systemd-timesyncd.service-aUmk1y
systemd-private-805e6beacafa46bcad91d0f8688c7369-upower.service-oA6M02
Temp-aa9c931d-8aa6-444b-bec9-b87738c0cf6a
tmux-0
elarutyunyan@dk8n64 /tmp $ █
```

Рис. 3: ls

Сравним команды ls -a и ls -F

```
elarutyunyan@dk8n64 /tmp $ ls -a
.
..
elarutyunyan
hsperfdata_elarutyunyan
.XICE-unix
.java_pid4727
krb5cc_5421_gQqd5e
krb5cc_5421_U6CqhI
lu4727h3kc.tmp
OSL_PIPE_5421_SingleOfficeIPC_63a6bcc025f2e06786f0783ac31f25f8
portage
pulse-PKdhtXMmr18n
root
screen
sddm-:0-KnghhI
sddm-auth-c16ee5d6-e01e-401f-9975-4add2e506897
systemd-private-805e6beacafa46bcad91d0f8688c7369-color.service-neVmJ2
systemd-private-805e6beacafa46bcad91d0f8688c7369-polkit.service-5Yp2x4
systemd-private-805e6beacafa46bcad91d0f8688c7369-power-profiles-daemon.service-HuNnYr
systemd-private-805e6beacafa46bcad91d0f8688c7369-systemd-logind.service-2DW6sz
systemd-private-805e6beacafa46bcad91d0f8688c7369-systemd-resolved.service-EEed2cl
systemd-private-805e6beacafa46bcad91d0f8688c7369-systemd-timesyncd.service-aUmklY
systemd-private-805e6beacafa46bcad91d0f8688c7369-upower.service-oA6M02
Temp-aa9c931d-8aa6-444b-bec9-b87738c0cf6a
tmux-0
.X11-unix
.X1-lock
.X2-lock
```

```
elarutyunyan@dk8n64 /tmp $ ls -F
elarutyunyan/
hsperfdata_elarutyunyan/
krb5cc_5421_gQqd5e
krb5cc_5421_U6CqhI
lu4727h3kc.tmp/
OSL_PIPE_5421_SingleOfficeIPC_63a6bcc025f2e06786f0783ac31f25f8=
portage/
pulse-PKdhtXMmr18n/
root/
screen/
sddm-:0-KnghhI=
sddm-auth-c16ee5d6-e01e-401f-9975-4add2e506897=
systemd-private-805e6beacafa46bcad91d0f8688c7369-color.service-neVmJ2/
```


Переходим в домашний каталог

```
elarutyunyan@dk8n64 /tmp $ cd
elarutyunyan@dk8n64 ~ $ ls
Architecture_PC  GNUstep      parentdir    test1.txt    Видео      Изображения  'Рабочий стол'
bin              main2.cpp    public       tmp          Документы  Музыка       Шаблоны
dir              main3.cpp    public_html  work        Загрузки   Общедоступные  эрик
elarutyunyan@dk8n64 ~ $
```

Рис. 5: Домашний каталог

Определим, кто является владельцем файлов и подкаталогов с помощью команды `ls -l`

```
elarutyunyan@dk8n64 ~ $ ls
Architecture_PC  GNUstep      parentdir    test1.txt    Видео        Изображения  'Рабочий стол'
bin              main2.cpp    public       tmp          Документы    Музыка        Шаблоны
dir              main3.cpp    public_html  work        Загрузки     Общедоступные  эрик
elarutyunyan@dk8n64 ~ $ ls -l
Architecture_PC
bin
dir
GNUstep
main2.cpp
main3.cpp
parentdir
public
public_html
test1.txt
tmp
work
Видео
Документы
Загрузки
Изображения
Музыка
Общедоступные
'Рабочий стол'
Шаблоны
эрик
elarutyunyan@dk8n64 ~ $
```

Рис. 6: Имя домашнего каталога

В домашнем каталоге создаём новый каталог с именем newdir.

```
elarutyunyan@dk8n64 ~ $ mkdir newdir
elarutyunyan@dk8n64 ~ $ ls
Architecture_PC  GNUstep      newdir       public_html  work        Загрузки      Общедоступные
bin              main2.cpp    parentdir    test1.txt    Видео       Изображения   'Рабочий стол'
dir              main3.cpp    public       tmp          Документы   Музыка        Шаблоны
elarutyunyan@dk8n64 ~ $
```

Рис. 7: Создание каталога newdir

В каталоге `~/newdir` создаём новый каталог с именем `morefun`.

```
elarutyunyan@dk8n64 ~/newdir $ mkdir morefun
elarutyunyan@dk8n64 ~/newdir $ ls
morefun
elarutyunyan@dk8n64 ~/newdir $ mkdir letters nemos nisk
elarutyunyan@dk8n64 ~/newdir $ ls
letters morefun nemos nisk
elarutyunyan@dk8n64 ~/newdir $
```

Рис. 8: Создание каталога `morefun`

Создаём одной командой три новых каталога с именами

```
elarutyunyan@dk8n64 ~ $ rm -r newdir
elarutyunyan@dk8n64 ~ $ ls
Architecture_PC  GNUstep      parentdir    test1.txt    Видео      Изображения  'Рабочий стол'
bin              main2.cpp    public       tmp          Документы  Музыка       Шаблоны
dir              main3.cpp    public_html  work        Загрузки   Общедоступные  эрик
elarutyunyan@dk8n64 ~ $
```

Рис. 9: Создание каталогов и их удаление

```
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 for
        format below

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

    -c
        with -lt: sort by, and show, ctime (time of last change 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]
        color the output WHEN; more info below

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

    -D, --dired

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

Рис. 10: Команда man ls

```

-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 output is
    terminal)

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

--quoting-style=WORD
    use quoting style WORD for entry names: literal, locale, shell, shell-always, shell-e
    cape, shell-escape-always, c, escape (overrides QUOTING_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: none (-U), size (-S), time (-t), version (-v), extensi
    (-X), width

--time=WORD
    select which timestamp used to display or sort; access time (-u): atime, access, us
    metadata change time (-c): ctime, status; modified time (default): mtime, modificatio
    birth time: birth, creation;

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

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

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

```

Manual page ls(1) line 118 (press h for help or q to quit)

Рис. 11: -R, --recursive

```

-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: none (-U), size (-S), time (-t), version (-v), extension (-X), width

--time=WORD
    select which timestamp used to display or sort; access time (-u): atime, access, use;
    metadata change time (-c): ctime, status; modified time (default): mtime, modification
    birth time: birth, creation;

    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

-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

```

Manual page ls(1) line 140/235 76% (press h for help or q to quit)

Рис. 12: `--time-style=TIME_STYLE`


```
cd(1P)                                POSIX Programmer's Manual                                cd(1)
PROLOG
This manual page is part of the POSIX Programmer's Manual. The Linux implementation of the
interface may differ (consult the corresponding Linux manual page for details of Linux beha-
ior), or the interface may not be implemented on Linux.

NAME
cd - change the working directory

SYNOPSIS
cd [-L|-P] [directory]

cd -

DESCRIPTION
The cd utility shall change the working directory of the current shell execution environme-
nt (see Section 2.12, Shell Execution Environment) by executing the following steps in sequen-
ce. (In the following steps, the symbol curpath represents an intermediate value used to simpli-
fy the description of the algorithm used by cd. There is no requirement that curpath be ma-
nipulated or visible to the application.)

1. If no directory operand is given and the HOME environment variable is empty or undefined,
the default behavior is implementation-defined and no further steps shall be taken.

2. If no directory operand is given and the HOME environment variable is set to a non-empty
value, the cd utility shall behave as if the directory named in the HOME environment vari-
able was specified as the directory operand.

3. If the directory operand begins with a <slash> character, set curpath to the operand and
proceed to step 7.

4. If the first component of the directory operand is dot or dot-dot, proceed to step 6.

5. Starting with the first pathname in the <colon>-separated pathnames of CDPATH (see the E-
Nvironment Variables section) if the pathname is non-null, test if the concatenation of
that pathname, a <slash> character if that pathname did not end with a <slash> character,
and the directory operand names a directory. If the pathname is null, test if the concat-
nation of dot, a <slash> character, and the operand names a directory. In either case,
if the resulting string names an existing directory, set curpath to that string and proce-
ed to step 7. Otherwise, repeat this step with the next pathname in CDPATH until all pat-
hnames have been tested.

6. Set curpath to the directory operand.

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

Рис. 13: Команда man cd

```
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 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/>

SEE ALSO
    getcwd(3)

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

    Packaged by Gentoo (9.4 (p0))
    Copyright © 2023 Free Software Foundation, Inc.
    License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
    This is free software: you are free to change and redistribute it.

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

Рис. 14: Команда man pwd

```
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/>

SEE ALSO
    mkdir(2)

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

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

Рис. 15: Команда man mkdir

```
RMDir(1)                                User Commands                                RMDir(1)

NAME
    rmdir - remove empty directories

SYNOPSIS
    rmdir [OPTION]... DIRECTORY...

DESCRIPTION
    Remove the DIRECTORY(ies), if they are empty.

    --ignore-fail-on-non-empty
        ignore each failure to remove a non-empty directory

    -p, --parents
        remove DIRECTORY and its ancestors; e.g., 'rmdir -p a/b' is similar to 'rmdir a/b a'

    -v, --verbose
        output a diagnostic for every directory processed

    --help
        display this help and exit

    --version
        output version information and exit

AUTHOR
    Written by David MacKenzie.

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

SEE ALSO
    rmdir(2)

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

    Packaged by Gentoo (9.4 (p0))
    Copyright © 2023 Free Software Foundation, Inc.
    License GPLv3+: GNU GPL version 3 or later <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 permitted by law.

GNU coreutils 9.4                                August 2023                                RMDir(1)
Manual page rmdir(1) line 1 (press h for help or q to quit)
```

Рис. 16: Команда man rmdir

```

rm(1)                                User Commands                                rm(1)
NAME
    rm - remove files or directories

SYNOPSIS
    rm [OPTION]... [FILE]...

DESCRIPTION
    This manual page documents the GNU version of rm. rm removes each specified file. By default, it does not remove directories.

    If the -i or --interactive=once option is given, and there are more than three files or the -r, -R, or --recursive are given, then rm prompts the user for whether to proceed with the entire operation. If the response is not affirmative, the entire command is aborted.

    Otherwise, if a file is unwritable, standard input is a terminal, and the -f or --force option is not given, or the -i or --interactive=always option is given, rm prompts the user for whether to remove the file. If the response is not affirmative, the file is skipped.

OPTIONS
    Remove (unlink) the FILE(s).

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

    -i
        prompt before every removal

    -I
        prompt once before removing more than three files, or when removing recursively; less intrusive than -i, while still giving protection against most mistakes

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

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

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

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

```

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

Рис. 17: Команда man rm

Получим при помощи команды history

```
elarutyunyan@dk8n64 ~ $ history
```

```
467 pandoc lab02_report.md -o lab02_report.docx
468 pandoc lab02_report.md -o lab02_report.pdf
469 cd /work/study/2023-2024/Операционные системы/os-intro/labs/lab03/report
470 cd /work/study/2023-2024/Операционные системы/os-intro/labs/lab03/report/
471 cd /work/study/2023-2024/Операционные системы/os-intro/labs/lab03/report'
472 cd
473 cleasr
474 make
475 cd work/study/2023-2024/Операционные системы/os-intro/labs/lab03/report
476 cd work/study/2023-2024/Операционные системы/os-intro/labs/lab03/report
477 cd
478 pwd
479 cd /tmp
480 ls
481 ls -a
482 ls -F
483 ls -F
484 ls /var/spool
485 cd
486 ls
487 ls -l
488 mkdir newdir
489 ls
490 cd ~/newdir
491 mkdir morefun
492 ls
493 mkdir letters nemos nisk
494 ls
495 rm -r newdir
496 cd
497 rm -r newdir
498 ls
499 man
500 man ls
501 man cd
502 man pwd
503 man mkdir
504 man rmdir
505 man rm
```

Выполним модификацию и исполнение нескольких команд из буфера команд

```
elaryutyunyan@dk8n64 ~ $ ls -F
Architecture_PC/  GNUstep/  parentdir/  test1.txt  Видео/  Изображения/  'Рабочий стол'/
bin/              main2.cpp  public/     tmp/       Документы/  Музыка/        Шаблоны/
dir/              main3.cpp  public_html@  work/      Загрузки/  Общедоступные/  эрик
elaryutyunyan@dk8n64 ~ $

elaryutyunyan@dk8n64 ~ $ ls -a
.                GNUstep         parentdir       test1.txt       Загрузки
.                 .config        .pki            tmp             Изображения
Architecture_PC  .gtkrc-2.0     .profile       work           Музыка
.bash_history    .icewm         public          .Xauthority     Общедоступные
.bash_profile    .dosbox        public_html     .xsession-errors.old  'Рабочий стол'
.bashrc          .elinks        .rnd           Видео
bin              .gitconfig     .ssh           Документы
.gnupg           .mozilla
elaryutyunyan@dk8n64 ~ $
```

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