

Операционные системы

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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1. Цели и задачи работы
2. Процесс выполнения лабораторной работы
3. Выводы по проделанной работе

1. Цели и задачи работы

1.1 Цель лабораторной работы

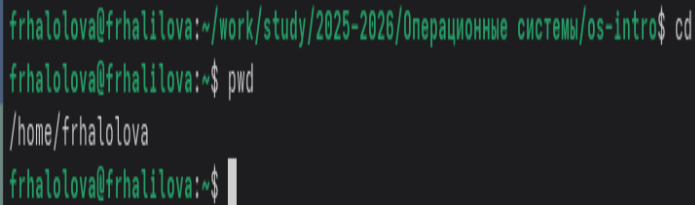
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

1.2 Задачи лабораторной работы

- 1 Определить имя и путь домашнего каталога
- 2 Изучить команду `ls`.
- 3 Выполнить действия с каталогами.
- 4 Получить дополнительные сведения при помощи справки по командам.
- 5 Изучить команду `history`.

2. Процесс выполнения лабораторной работы

2.1 Имя и путь к домашнему каталогу



```
frhalolova@frhalilova:~/work/study/2025-2026/Операционные системы/os-intro$ cd  
frhalolova@frhalilova:~$ pwd  
/home/frhalolova  
frhalolova@frhalilova:~$
```

Рисунок 1: Путь к домашнему каталогу

2.2 Опции команды ls

```
frhalilova@frhalilova: /tmp$ ls
node-compile-cache
par-667268616c6f6c6f7661
systemd-private-d7e9b30b07614956a02d83ada711211f-abrt.service-Q8wlXx
systemd-private-d7e9b30b07614956a02d83ada711211f-chrond.service-LzgHco
systemd-private-d7e9b30b07614956a02d83ada711211f-colord.service-AfvRe2
systemd-private-d7e9b30b07614956a02d83ada711211f-dbus-broker.service-W1KsL4
systemd-private-d7e9b30b07614956a02d83ada711211f-fwupd.service-24PwEM
systemd-private-d7e9b30b07614956a02d83ada711211f-irqbalance.service-eRtq7x
systemd-private-d7e9b30b07614956a02d83ada711211f-low-memory-monitor.service-Bgie0N
systemd-private-d7e9b30b07614956a02d83ada711211f-ModemManager.service-v3DEMl
systemd-private-d7e9b30b07614956a02d83ada711211f-polkit.service-02g6vn
systemd-private-d7e9b30b07614956a02d83ada711211f-rtkit-daemon.service-8C69V2
systemd-private-d7e9b30b07614956a02d83ada711211f-switcheroo-control.service-wjbWhP
systemd-private-d7e9b30b07614956a02d83ada711211f-systemd-logind.service-Ez89Ti
systemd-private-d7e9b30b07614956a02d83ada711211f-systemd-oomd.service-YiniyC
systemd-private-d7e9b30b07614956a02d83ada711211f-systemd-resolved.service-3A7F7e
systemd-private-d7e9b30b07614956a02d83ada711211f-upower.service-Ec7L79
```

Рисунок 2: Команда ls

2.3 Опции команды ls

```
frhalolova@frhalilova:/tmp$ ls -a
.
..
.font-unix
.ICE-unix
node-compile-cache
par-667268616c6f6c6f7661
systemd-private-d7e9b30b07614956a02d83ada711211f-abrt.service-Q8wlXx
systemd-private-d7e9b30b07614956a02d83ada711211f-chronyd.service-LzgHco
systemd-private-d7e9b30b07614956a02d83ada711211f-colord.service-AfvRe2
systemd-private-d7e9b30b07614956a02d83ada711211f-dbus-broker.service-W1KsL4
systemd-private-d7e9b30b07614956a02d83ada711211f-fwupd.service-24PwEM
systemd-private-d7e9b30b07614956a02d83ada711211f-irqbalance.service-eRtq7x
systemd-private-d7e9b30b07614956a02d83ada711211f-low-memory-monitor.service-Bgie0N
systemd-private-d7e9b30b07614956a02d83ada711211f-ModemManager.service-v3DEMl
systemd-private-d7e9b30b07614956a02d83ada711211f-polkit.service-02g6vn
systemd-private-d7e9b30b07614956a02d83ada711211f-rtkit-daemon.service-8CG9V2
systemd-private-d7e9b30b07614956a02d83ada711211f-switcheroo-control.service-wjbWhP
systemd-private-d7e9b30b07614956a02d83ada711211f-systemd-logind.service-Ez89T1
systemd-private-d7e9b30b07614956a02d83ada711211f-systemd-oomd.service-YiniyC
systemd-private-d7e9b30b07614956a02d83ada711211f-systemd-resolved.service-3A7F7e
systemd-private-d7e9b30b07614956a02d83ada711211f-upower.service-Ec7L79
```

Рисунок 3: Команда ls -a

2.4 Опции команды ls

```
frhalolova@frhalilova:/tmp$ ls -l
total 0
drwxr-xr-x. 3 frhalolova frhalolova 60 Nov 12 18:18 node-compile-cache
drwx-----. 3 frhalolova frhalolova 60 Nov 12 18:45 par-667268616c6f6c6f7661
drwx-----. 3 root      root      60 Nov 12 18:15 systemd-private-d7e9b30b07614956a02d83ad
a711211f-abrt.service-Q8wLXx
drwx-----. 3 root      root      60 Nov 12 18:15 systemd-private-d7e9b30b07614956a02d83ad
a711211f-chronyd.service-LzgHco
drwx-----. 3 root      root      60 Nov 12 18:15 systemd-private-d7e9b30b07614956a02d83ad
a711211f-colord.service-AfvRe2
drwx-----. 3 root      root      60 Nov 12 18:15 systemd-private-d7e9b30b07614956a02d83ad
a711211f-dbus-broker.service-WlKsL4
drwx-----. 3 root      root      60 Nov 12 18:16 systemd-private-d7e9b30b07614956a02d83ad
a711211f-fwupd.service-24PwEM
drwx-----. 3 root      root      60 Nov 12 18:15 systemd-private-d7e9b30b07614956a02d83ad
a711211f-irqbalance.service-eRtq7x
drwx-----. 3 root      root      60 Nov 12 18:15 systemd-private-d7e9b30b07614956a02d83ad
a711211f-low-memory-monitor.service-Bgie0N
drwx-----. 3 root      root      60 Nov 12 18:15 systemd-private-d7e9b30b07614956a02d83ad
a711211f-ModemManager.service-v3DEMl
drwx-----. 3 root      root      60 Nov 12 18:15 systemd-private-d7e9b30b07614956a02d83ad
a711211f-polkit.service-02g6vn
drwx-----. 3 root      root      60 Nov 12 18:15 systemd-private-d7e9b30b07614956a02d83ad
a711211f-rtkit-daemon.service-8C69V2
drwx-----. 3 root      root      60 Nov 12 18:15 systemd-private-d7e9b30b07614956a02d83ad
a711211f-switcheroo-control.service-wjbWhP
drwx-----. 3 root      root      60 Nov 12 18:15 systemd-private-d7e9b30b07614956a02d83ad
a711211f-systemd-logind.service-Ez89Ti
```

Рисунок 4: Команда ls -l

2.5 Опции команды ls

```
frhalolova@frhalilova:/tmp$ ls -f
.
..
par-667268616c6f6c6f7661
VMwareDnD
.wget-hpkip_lck_1007
.wget-hsts_lck_1007
node-compile-cache
systemd-private-d7e9b30b07614956a02d83ada711211f-fwupd.service-24PwEM
.X1-lock
.X0-lock
systemd-private-d7e9b30b07614956a02d83ada711211f-colord.service-AfvRe2
.X1025-lock
.X1024-lock
systemd-private-d7e9b30b07614956a02d83ada711211f-ModemManager.service-v3DEm1
vmware-root_922-2722632355
systemd-private-d7e9b30b07614956a02d83ada711211f-upower.service-Ec7L79
systemd-private-d7e9b30b07614956a02d83ada711211f-systemd-logind.service-Ez89Ti
systemd-private-d7e9b30b07614956a02d83ada711211f-switcheroo-control.service-wjbWhP
systemd-private-d7e9b30b07614956a02d83ada711211f-rtkit-daemon.service-8CG9V2
systemd-private-d7e9b30b07614956a02d83ada711211f-polkit.service-02g6vn
systemd-private-d7e9b30b07614956a02d83ada711211f-low-memory-monitor.service-Bgie0N
systemd-private-d7e9b30b07614956a02d83ada711211f-chrond.service-LzgHco
systemd-private-d7e9b30b07614956a02d83ada711211f-irqbalance.service-eRtq7x
systemd-private-d7e9b30b07614956a02d83ada711211f-abrt.service-Q8wlXx
systemd-private-d7e9b30b07614956a02d83ada711211f-dbus-broker.service-W1Ksl4
systemd-private-d7e9b30b07614956a02d83ada711211f-systemd-resolved.service-3A7F7e
systemd-private-d7e9b30b07614956a02d83ada711211f-systemd-oomd.service-YinlyC
```

Рисунок 5: Команда ls -f

2.6 Каталог /var/spool

```
frhalilova@frhalilova:/tmp$ cd /var/spool/
frhalilova@frhalilova:/var/spool$ ls -l
total 0
drwxr-x--x. 1 root abrt    0 Jan 16  2025 abrt
drwx-----. 1 abrt abrt    0 Jan 16  2025 abrt-upload
drwxr-xr-x. 1 root root   66 Apr  9  2025 anacron
drwx-----. 1 root root   18 Apr  9  2025 at
drwx-----. 1 root root    0 Jan 27  2025 cron
drwx--x---. 1 root lp      6 Apr  9  2025 cups
drwxr-xr-x. 1 root root    0 Jan 16  2025 lpd
drwxrwxr-x. 1 root mail 156 Nov 12 16:13 mail
drwxr-xr-x. 1 root root    0 Mar  6  2025 plymouth
frhalilova@frhalilova:/var/spool$
```

Рисунок 6: Каталог /var/spool

2.7 Домашний каталог

```
frhalolova@frhalilova:/var/spool$ cd
frhalolova@frhalilova:~$ ls
Desktop    Downloads  Music      Public     Videos
Documents  git-extended Pictures    Templates  work
frhalolova@frhalilova:~$ ls -al
total 20
drwx-----. 1 frhalolova frhalolova 334 Nov 12 18:43 .
drwxr-xr-x. 1 root      root      156 Nov 12 16:13 ..
-rw-----. 1 frhalolova frhalolova 1611 Nov 12 18:45 .bash_history
-rw-r--r--. 1 frhalolova frhalolova 18 Nov 8 2024 .bash_logout
-rw-r--r--. 1 frhalolova frhalolova 144 Nov 8 2024 .bash_profile
-rw-r--r--. 1 frhalolova frhalolova 680 Nov 12 18:18 .bashrc
drwx-----. 1 frhalolova frhalolova 512 Nov 12 18:24 .cache
drwx-----. 1 frhalolova frhalolova 372 Nov 12 18:24 .config
drwxr-xr-x. 1 frhalolova frhalolova 0 Nov 12 16:28 Desktop
drwxr-xr-x. 1 frhalolova frhalolova 0 Nov 12 16:28 Documents
drwxr-xr-x. 1 frhalolova frhalolova 0 Nov 12 16:28 Downloads
-rw-r--r--. 1 frhalolova frhalolova 232 Nov 12 18:43 .gitconfig
drwxr-xr-x. 1 frhalolova frhalolova 128 Nov 12 18:37 git-extended
drwx-----. 1 frhalolova frhalolova 136 Nov 12 16:43 .gnupg
drwx-----. 1 frhalolova frhalolova 20 Nov 12 16:28 .local
drwxr-xr-x. 1 frhalolova frhalolova 48 Nov 12 16:29 .mozilla
drwxr-xr-x. 1 frhalolova frhalolova 0 Nov 12 16:28 Music
drwxr-xr-x. 1 frhalolova frhalolova 0 Nov 12 16:28 Pictures
drwxr-xr-x. 1 frhalolova frhalolova 0 Nov 12 16:28 Public
drwx-----. 1 frhalolova frhalolova 132 Nov 12 16:48 .ssh
drwxr-xr-x. 1 frhalolova frhalolova 0 Nov 12 16:28 Templates
drwxr-xr-x. 1 frhalolova frhalolova 0 Nov 12 16:28 Videos
drwxr-xr-x. 1 frhalolova frhalolova 10 Nov 12 16:47 work
frhalolova@frhalilova:~$
```

Рисунок 7: Файлы в домашнем каталоге

2.8 Работа с каталогами

```
frhalilova@frhalilova:~$  
frhalilova@frhalilova:~$ mkdir newdir  
frhalilova@frhalilova:~$ mkdir newdir/morefun  
frhalilova@frhalilova:~$ mkdir letters memos misk  
frhalilova@frhalilova:~$ ls  
Desktop  Downloads  letters  misk  newdir  Public  Videos  
Documents  git-extended  memos  Music  Pictures  Templates  work  
frhalilova@frhalilova:~$ rm letters/ memos/ misk/  
rm: cannot remove 'letters/': Is a directory  
rm: cannot remove 'memos/': Is a directory  
rm: cannot remove 'misk/': Is a directory  
frhalilova@frhalilova:~$ rm -r letters/ memos/ misk/  
frhalilova@frhalilova:~$ rm -r newdir/  
frhalilova@frhalilova:~$ ls  
Desktop  Downloads  Music  Public  Videos  
Documents  git-extended  Pictures  Templates  work  
frhalilova@frhalilova:~$
```

Рисунок 8: Действия с каталогами

2.9 Опции команды ls

```
'./work/study/2025-2026/Операционные системы/os-intro/template/report/report/bib':  
cite.bib  
  
'./work/study/2025-2026/Операционные системы/os-intro/template/report/report/image':  
solvay.jpg  
  
'./work/study/2025-2026/Операционные системы/os-intro/template/report/report/_resources':  
csl  
  
'./work/study/2025-2026/Операционные системы/os-intro/template/report/report/_resources/csl':  
:  
gost-r-7-0-5-2008-numeric.csl  
  
'./work/study/2025-2026/Операционные системы/os-intro/template/report/scripts':  
image-report mpv-shot  
frhalolova@frhalilova:~$ ls -t  
git-extended Music Videos Documents Public  
work Pictures Desktop Downloads Templates  
frhalolova@frhalilova:~$
```

Рисунок 9: Команда ls -R и ls -t

2.10 Справка по командам

```
frhalolova@frhalilova:~$  
frhalolova@frhalilova:~$ help cd  
cd: cd [-L|[-P [-e]] [-@]] [dir]  
Change the shell working directory.  
  
Change the current directory to DIR. The default DIR is the value of the  
HOME shell variable. If DIR is "-", it is converted to $OLDPWD.  
  
The variable CDPATH defines the search path for the directory containing  
DIR. Alternative directory names in CDPATH are separated by a colon (:).  
A null directory name is the same as the current directory. If DIR begins  
with a slash (/), then CDPATH is not used.  
  
If the directory is not found, and the shell option `cdable_vars' is set,  
the word is assumed to be a variable name. If that variable has a value,  
its value is used for DIR.  
  
Options:  
-L      force symbolic links to be followed: resolve symbolic  
        links in DIR after processing instances of `..'  
-P      use the physical directory structure without following  
        symbolic links: resolve symbolic links in DIR before  
        processing instances of `..'  
-e      if the -P option is supplied, and the current working  
        directory cannot be determined successfully, exit with  
        a non-zero status  
-@      on systems that support it, present a file with extended  
        attributes as a directory containing the file attributes  
  
The default is to follow symbolic links, as if `-L' were specified.  
`..' is processed by removing the immediately previous pathname component  
back to a slash or the beginning of DIR.
```

Рисунок 10: Справка по команде cd

2.11 Справка по командам

```
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
        resolve all symlinks

    --help display this help and exit

    --version
        output version information and exit

    If no option is specified, -P is assumed.

    Your shell may have its own version of pwd, which usually supersedes the version de-
    scribed here. Please refer to your shell's documentation for details about the op-
    tions 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/>

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

Рисунок 11: Справка по команде pwd

2.12 Справка по командам

```
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 con-
        text to CTX

    --help display this help and exit

    --version
        output version information and exit

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

Рисунок 12: Справка по команде mkdir

2.13 Справка по командам

```
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/>

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

Рисунок 13: Справка по команде rmdir

2.14 Справка по командам

```
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 affirma-
    tive, 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 recur-
        sively; less intrusive than -i, while still giving protection against most
        mistakes

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

Рисунок 14: Справка по команде rm

2.15 История командной строки

```
60  ls -f
61  cd /var/spool/
62  ls -l
63  cd
64  ls
65  ls -al
66  mkdir newdir
67  mkdir newdir/morefun
68  mkdir letters memos misk
69  ls
70  rm letters/ memos/ misk/
71  rm -r letters/ memos/ misk/
72  rm -r newdir/
73  ls
74  ls -R
75  ls -t
76  help cd
77  man pwd
78  man mkdir
79  man rmdir
80  man rm
81  history
frhalolova@frhalilova:~$
```

Рисунок 15: Команда history

3. Выводы по проделанной работе

3.1 Вывод

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