

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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16 марта, 2024, Москва, Россия

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Цели и задачи работы

Цель лабораторной работы

Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

Задачи лабораторной работы

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

Процесс выполнения лабораторной работы

Имя и путь к домашнему каталогу



```
faisalahmad@faisalahmad:~  
faisalahmad@faisalahmad:~$ cd  
faisalahmad@faisalahmad:~$ pwd  
/home/faisalahmad  
faisalahmad@faisalahmad:~$
```

A terminal window with a dark background. The title bar shows a window icon and the text 'faisalahmad@faisalahmad:~'. The terminal content shows a user running 'cd' and 'pwd' commands, resulting in the path '/home/faisalahmad'. The prompt 'faisalahmad@faisalahmad:~\$' is visible at the end of each line. A cursor is positioned at the end of the last line.

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
faisalahmad@faisalahmad: /  
faisalahmad@faisalahmad:~$ cd /tmp  
faisalahmad@faisalahmad:/tmp$ ls  
dbus-7CL7CTgw  
dbus-OxVlmpMK  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-chronyd.service-g5kSWe  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-color.service-2YpBza  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-dbus-broker.service-DnmwU0  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-fwupd.service-tNxUp  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-low-memory-monitor.service-qCmQZG  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-ModemManager.service-5uQKLC  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-polkit.service-xJ8SHT  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-power-profiles-daemon.service-nkwx9C  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-rtkit-daemon.service-k6cDvx  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-switcheroo-control.service-HXboCG  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-systemd-logind.service-goMJCn  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-systemd-oond.service-Zm7ahq  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-systemd-resolved.service-cD5nlv  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-upower.service-o3489d  
Temp-ef13091c-6b48-4fda-9687-3fa8bd5cc595  
vmware-root_907-4021784429  
faisalahmad@faisalahmad:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
faisalahmad@faisalahmad:/tmp$ ls -la
..
.
dbus-7CL7CTgw
dbus-0xVlmpMK
.font-unix
.ICE-unix
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-chrond.service-g5kSwE
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-colord.service-2YPbza
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-dbus-broker.service-DnmwU0
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-fwupd.service-tHxuTp
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-low-memory-monitor.service-qCMqZG
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-ModemManager.service-SuQKLC
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-polkit.service-xJ85NT
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-power-profiles-daemon.service-nkwx9C
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-rtkit-daemon.service-k6cDvx
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-switcheroo-control.service-HXboCG
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-systemd-logind.service-goMJCn
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-systemd-oomd.service-Za7ahq
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-systemd-resolved.service-cD5nlv
systemd-private-f4ab4c5a25e6498c9e3e2a90alaeabc2-upower.service-o3489d
Vmp-ef13091c-6b48-4fda-9687-3fa8bd5cc595
vmware-root_907-4021784429
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
faisalahmad@faisalahmad:/tmp$
```

Рис. 3: Команда ls -a

Опции команды ls

```
faisal@head:~$ cat /etc/passwd | grep root | wc -l
итого 8
faisal@head:~$ ls -l
srwxrwxrwx. 1 root      root      8 мар 16 12:41 dbus-7CL7CTgw
srwxrwxrwx. 1 root      root      8 мар 16 12:41 dbus-GvVapHK
drwx----- 3 root      root      68 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-chromyd.service-gd9d
drwx----- 3 root      root      68 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-solaris.service-2YFuz
drwx----- 3 root      root      68 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-dbus-broker.service-bmaw8
drwx----- 3 root      root      68 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-fuopd.service-thuTp
drwx----- 3 root      root      68 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-low-memory-monitor.service-qChQZ
drwx----- 3 root      root      68 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-modemmanager.service-bupLC
drwx----- 3 root      root      68 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-polkit.service-x35Hf
drwx----- 3 root      root      68 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-power-profiles-daemon.service-ekw9C
drwx----- 3 root      root      68 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-rtkit-daemon.service-b6dDx
drwx----- 3 root      root      68 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-swftubevm-control.service-4BucC
drwx----- 3 root      root      68 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-systemd-logind.service-gu7Ca
drwx----- 3 root      root      68 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-systemd-oomd.service-Zu7ahq
drwx----- 3 root      root      68 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-systemd-resolved.service-cD5nV
drwx----- 3 root      root      48 мар 16 12:41 systemd-private-f4ab4c325e6488c9c3c2a981a5a8b2-upower.service-d3AB9d
drwx----- 2 faisalahad faisalahad 48 мар 16 13:38 tmp-ef3281c-d8d8-4f6a-b03f-3fa5b0cc3395
drwx----- 2 root      root      48 мар 16 12:41 vmware-root_907-4821784429
faisal@head:~$
```

Рис. 4: Команда ls -l

Опции команды ls

```
faisalalahmad@faisalalahmad: /tmp$  
faisalalahmad@faisalalahmad: /tmp$ ls -f  
..  
..  
.X11-unix  
.ICE-unix  
.XIM-unix  
.font-unix  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-systemd-oomb.service-Zm7ahq  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-systemd-resolved.service-cD5nlv  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-dbus-broker.service-DnmwU0  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-chrond.service-gSkSwE  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-low-memory-monitor.service-qCMqZG  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-polkit.service-xJ8SHT  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-power-profiles-daemon.service-nkwx9C  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-rtkit-daemon.service-k6cDvx  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-switcheroo-control.service-HXboCG  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-systemd-logind.service-goMJCn  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-upower.service-o34B9d  
vmware-root_907-4021784429  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-ModemManager.service-5uQKLC  
dbus-0xVlmpMK  
dbus-7CL7CTgw  
.X1024-lock  
.X1025-lock  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-colord.service-2YPbza  
.X0-lock  
.X1-lock  
systemd-private-f4ab4c5a25e6498c9e3e2a90a1aeabc2-fwupd.service-tNxuTp  
Temp-ef13091c-6b48-4fda-9687-3fa8bd5cc595  
faisalalahmad@faisalalahmad: /tmp$
```

Рис. 5: Команда ls -f

```
faisalalahmad@faisalalahmad:/tmp$  
faisalalahmad@faisalalahmad:/tmp$ cd /var/spool/  
faisalalahmad@faisalalahmad:/var/spool$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 1510 мар 11 12:08 abrt  
drwx----- 1 abrt abrt 0 июл 19 2023 abrt-upload  
drwx--x--- 1 root lp 6 фев 16 03:00 cups  
drwxr-xr-x. 1 root root 0 июл 21 2023 lpd  
drwxrwxr-x. 1 root mail 1296 мар 16 12:40 mail  
drwxr-xr-x. 1 root root 0 июл 21 2023 plymouth  
faisalalahmad@faisalalahmad:/var/spool$
```

Рис. 6: Каталог /var/spool

Домашний каталог

```
faisalalahmad@faisalalahmad: /var/spool$  
faisalalahmad@faisalalahmad: /var/spool$ cd  
faisalalahmad@faisalalahmad: $ ls  
work  Видео  Документы  Загрузки  Изображения  Музыка  Общедоступные  'Рабочий стол'  Шаблоны  
faisalalahmad@faisalalahmad: $ ls -al  
итого 16  
drwx----- 1 faisalahmad faisalahmad 474 мар 16 13:49 .  
drwxr-xr-x 1 root root 1290 мар 16 12:40 ..  
-rw----- 1 faisalahmad faisalahmad 0 мар 16 13:49 .bash_history  
-rw-r--r-- 1 faisalahmad faisalahmad 18 янв 22 03:00 .bash_logout  
-rw-r--r-- 1 faisalahmad faisalahmad 144 янв 22 03:00 .bash_profile  
-rw-r--r-- 1 faisalahmad faisalahmad 522 янв 22 03:00 .bashrc  
drwx----- 1 faisalahmad faisalahmad 342 мар 16 13:46 .cache  
drwx----- 1 faisalahmad faisalahmad 352 мар 16 13:47 .config  
-rw-r--r-- 1 faisalahmad faisalahmad 151 мар 16 13:46 .gitconfig  
drwx----- 1 faisalahmad faisalahmad 22 мар 16 13:47 .gnupg  
drwx----- 1 faisalahmad faisalahmad 20 мар 16 12:41 .local  
drwxr-xr-x 1 faisalahmad faisalahmad 48 мар 16 13:38 .mozilla  
drwx----- 1 faisalahmad faisalahmad 132 мар 16 13:48 .ssh  
drwxr-xr-x 1 faisalahmad faisalahmad 10 мар 16 13:48 work  
drwxr-xr-x 1 faisalahmad faisalahmad 0 мар 16 12:41 Видео  
drwxr-xr-x 1 faisalahmad faisalahmad 0 мар 16 12:41 Документы  
drwxr-xr-x 1 faisalahmad faisalahmad 0 мар 16 12:41 Загрузки  
drwxr-xr-x 1 faisalahmad faisalahmad 0 мар 16 12:41 Изображения  
drwxr-xr-x 1 faisalahmad faisalahmad 0 мар 16 12:41 Музыка  
drwxr-xr-x 1 faisalahmad faisalahmad 0 мар 16 12:41 Общедоступные  
drwxr-xr-x 1 faisalahmad faisalahmad 0 мар 16 12:41 'Рабочий стол'  
drwxr-xr-x 1 faisalahmad faisalahmad 0 мар 16 12:41 Шаблоны  
faisalalahmad@faisalalahmad: $
```

Рис. 7: Файлы в домашнем каталоге

```
faisalahmed@faisalahmed:~$  
faisalahmed@faisalahmed:~$ mkdir newdir  
faisalahmed@faisalahmed:~$ mkdir newdir/morefun  
faisalahmed@faisalahmed:~$ mkdir letters memos msk  
faisalahmed@faisalahmed:~$ ls  
letters  memos  msk  newdir  work  Видео  Документы  Загрузки  Изображения  Музыка  Общедоступные  'Рабочий стол'  Кабинеты  
faisalahmed@faisalahmed:~$ rm letters/ memos/ msk/  
rm: невозможно удалить 'letters/': Это каталог  
rm: невозможно удалить 'memos/': Это каталог  
rm: невозможно удалить 'msk/': Это каталог  
faisalahmed@faisalahmed:~$ rm -r letters/ memos/ msk/  
faisalahmed@faisalahmed:~$ rm -r newdir/  
faisalahmed@faisalahmed:~$ ls  
work  Видео  Документы  Загрузки  Изображения  Музыка  Общедоступные  'Рабочий стол'  Кабинеты  
faisalahmed@faisalahmed:~$
```

Рис. 8: Действия с каталогами

Опции команды ls

```
!./work/study/2023-2024/Операционные системы/os-intro/template/report/scripts':  
image-report mpv-shot  
./Видео:  
./Документы:  
./Загрузки:  
./Изображения:  
./Музыка:  
./Общедоступные:  
./Рабочий стол':  
./Шаблоны:  
faisalahmad@faisalahmad:~$ ls -t  
work Видео Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны  
faisalahmad@faisalahmad:~$
```

Рис. 9: Команда ls -R и ls -t

Справка по командам

```
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.

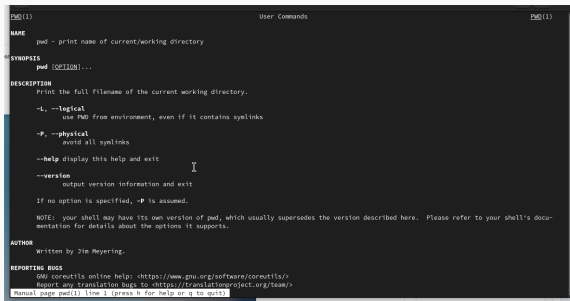
Options:
  -L      force symbolic links to be followed: resolve symbolic
          links in DIR after processing instances of '..'
  -P      use the physical directory structure without following
          symbolic links: resolve symbolic links in DIR before
          processing instances of '..'
  -e      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.

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

Рис. 10: Справка по команде cd

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
      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 Meyerling.

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)
```

Рис. 11: Справка по команде 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 - usask

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

Рис. 12: Справка по команде 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/>

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

Рис. 13: Справка по команде rmDir

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 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

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

Рис. 14: Справка по команде rm

История командной строки

```
faisalalahmad@faisalalahmad:~$  
faisalalahmad@faisalalahmad:~$ history  
1 cd  
2 pwd  
3 cd /tmp  
4 ls  
5 ls -a  
6 ls -l  
7 ls -f  
8 cd /var/spool/  
9 ls -l  
10 cd  
11 ls  
12 ls -al  
13 mkdir newdir  
14 mkdir newdir/morefun  
15 mkdir letters memos misk  
16 ls  
17 rm letters/ memos/ misk/  
18 rm -r letters/ memos/ misk/  
19 rm -r newdir/  
20 ls  
21 ls -R  
22 ls -t  
23 help cd  
24 man pwd  
25 man mkdir  
26 man rmdir  
27 man rm  
28 history  
faisalalahmad@faisalalahmad:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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