

# Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

---

Скруха Евгений<sup>1</sup>

19 июня, 2024, Москва, Россия

<sup>1</sup>Российский Университет Дружбы Народов

# Цели и задачи работы

---

## Цель лабораторной работы

Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

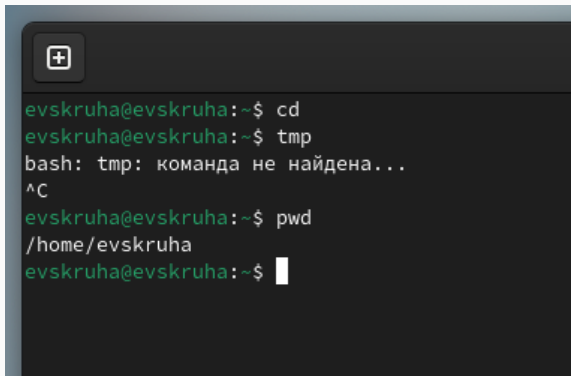
# Задачи лабораторной работы

- 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

A terminal window with a dark background and a light gray title bar. The title bar contains a square icon with a plus sign. The terminal text is as follows:

```
evskruha@evskruha:~$ cd
evskruha@evskruha:~$ tmp
bash: tmp: команда не найдена...
^C
evskruha@evskruha:~$ pwd
/home/evskruha
evskruha@evskruha:~$
```

**Рис. 1:** Путь к домашнему каталогу

# Опции команды ls

```
evskruha@evskruha:~$  
evskruha@evskruha:~$ cd /tmp  
evskruha@evskruha:/tmp$ ls  
dbus-fychRjX4  
dbus-Q0Mxy57U  
hspanfdata_evskruha  
nautilus-sendto-F1KZP2  
systemd-private-0005ea561eb44cb38e925f70839c8c67-chrond.service-UHMFbP  
systemd-private-0005ea561eb44cb38e925f70839c8c67-colord.service-sqtrb  
systemd-private-0005ea561eb44cb38e925f70839c8c67-dbus-broker.service-r2ijZj  
systemd-private-0005ea561eb44cb38e925f70839c8c67-low-memory-monitor.service-IQA9AB  
systemd-private-0005ea561eb44cb38e925f70839c8c67-ModemManager.service-CKAHDP  
systemd-private-0005ea561eb44cb38e925f70839c8c67-polkit.service-IVRNws  
systemd-private-0005ea561eb44cb38e925f70839c8c67-power-profiles-daemon.service-ZvSCks  
systemd-private-0005ea561eb44cb38e925f70839c8c67-rtkit-daemon.service-CW7MAC  
systemd-private-0005ea561eb44cb38e925f70839c8c67-switcheroo-control.service-qPTmFS  
systemd-private-0005ea561eb44cb38e925f70839c8c67-systemd-logind.service-96JXNv  
systemd-private-0005ea561eb44cb38e925f70839c8c67-systemd-oomd.service-eXGccN  
systemd-private-0005ea561eb44cb38e925f70839c8c67-systemd-resolved.service-5Pheim  
systemd-private-0005ea561eb44cb38e925f70839c8c67-upower.service-o7ciau  
VMwareDnD  
vmware-root_908-2688685236  
evskruha@evskruha:/tmp$
```

Рис. 2: Команда ls

# Опции команды ls

```
evskruha@evskruha: /tmp$ ls -la
..
dbus-fychRjX4
dbus-Q0Mxy57U
.font-unix
hspcrdata_evskruha
.ICE-unix
nautilus-sendto-F1KZP2
systemd-private-8005ea561eb44cb38e925f70839c8c67-chrond.service-UHMFbP
systemd-private-8005ea561eb44cb38e925f70839c8c67-colord.service-sngtrb
systemd-private-8005ea561eb44cb38e925f70839c8c67-dbus-broker.service-r2ijZj
systemd-private-8005ea561eb44cb38e925f70839c8c67-low-memory-monitor.service-IQA9A8
systemd-private-8005ea561eb44cb38e925f70839c8c67-ModemManager.service-CKAHPD
systemd-private-8005ea561eb44cb38e925f70839c8c67-polkit.service-IVRNws
systemd-private-8005ea561eb44cb38e925f70839c8c67-power-profiles-daemon.service-ZvSCKs
systemd-private-8005ea561eb44cb38e925f70839c8c67-rtkit-daemon.service-CW7MAC
systemd-private-8005ea561eb44cb38e925f70839c8c67-switcheroo-control.service-qPtmFS
systemd-private-8005ea561eb44cb38e925f70839c8c67-systemd-logind.service-96JXNv
systemd-private-8005ea561eb44cb38e925f70839c8c67-systemd-oomd.service-eXGccN
systemd-private-8005ea561eb44cb38e925f70839c8c67-systemd-resolved.service-5Pheim
systemd-private-8005ea561eb44cb38e925f70839c8c67-upower.service-o7ciau
VMwareDnD
vmware-root_908-2688685236
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
evskruha@evskruha: /tmp$
```

Рис. 3: Команда ls -la



# Опции команды ls

```
evskruha@evskruha:~/tmp$  
evskruha@evskruha:~/tmp$ ls -l  
total 0  
drwxr-xr-x. 1 root root 0 19 10:51 dbus-fychhjX4  
drwxr-xr-x. 1 root root 0 19 10:51 dbus-Q0xY57U  
drwxr-xr-x. 2 evskruha evskruha 48 19 11:07 hyperfdata_evskruha  
drwx----- 2 evskruha evskruha 60 19 11:14 netfilter-tendo-21KPP  
drwx----- 3 root root 60 19 10:51 systemd-private-0005ea561eb44cb38e925f70839c8c67-chronyd.service-UMFNP  
drwx----- 3 root root 60 19 10:51 systemd-private-0005ea561eb44cb38e925f70839c8c67-color.service-sqtrb  
drwx----- 3 root root 60 19 10:51 systemd-private-0005ea561eb44cb38e925f70839c8c67-dbus-braker.service-r21j2  
drwx----- 3 root root 60 19 10:51 systemd-private-0005ea561eb44cb38e925f70839c8c67-low-memory-monitor.service-1QASAS  
drwx----- 3 root root 60 19 10:51 systemd-private-0005ea561eb44cb38e925f70839c8c67-modemmanager.service-CLAMP  
drwx----- 3 root root 60 19 10:51 systemd-private-0005ea561eb44cb38e925f70839c8c67-polkit.service-7U0uq  
drwx----- 3 root root 60 19 10:51 systemd-private-0005ea561eb44cb38e925f70839c8c67-power-profiles-daemon.service-2v5Cks  
drwx----- 3 root root 60 19 10:51 systemd-private-0005ea561eb44cb38e925f70839c8c67-rtkit-daemon.service-CNTRAC  
drwx----- 3 root root 60 19 10:51 systemd-private-0005ea561eb44cb38e925f70839c8c67-switcheroo-control.service-qTnfS  
drwx----- 3 root root 60 19 10:51 systemd-private-0005ea561eb44cb38e925f70839c8c67-systemd-logind.service-96XWv  
drwx----- 3 root root 60 19 10:51 systemd-private-0005ea561eb44cb38e925f70839c8c67-systemd-oomd.service-8b0cR  
drwx----- 3 root root 60 19 10:51 systemd-private-0005ea561eb44cb38e925f70839c8c67-systemd-resolved.service-9Phwq  
drwx----- 3 root root 60 19 10:51 systemd-private-0005ea561eb44cb38e925f70839c8c67-upower.service-0Tclau  
drwxr-xr-x. 2 evskruha evskruha 200 19 11:28 VMware001  
evskruha@evskruha:~/tmp$
```

Рис. 4: Команда ls -l

# Опции команды ls

```
evskruha@evskruha:/tmp$ ls -f
..
.X11-unix
.ICE-unix
.XIM-unix
.font-unix
systemd-private-0005ea561eb44cb38e925f70839c8c67-systemd-oond.service-eXGccN
systemd-private-0005ea561eb44cb38e925f70839c8c67-systemd-resolved.service-5Pheim
systemd-private-0005ea561eb44cb38e925f70839c8c67-dbus-broker.service-r2ijZj
systemd-private-0005ea561eb44cb38e925f70839c8c67-chronyd.service-UMMFbP
systemd-private-0005ea561eb44cb38e925f70839c8c67-low-memory-monitor.service-IQA9A8
systemd-private-0005ea561eb44cb38e925f70839c8c67-polkit.service-IVRNws
systemd-private-0005ea561eb44cb38e925f70839c8c67-power-profiles-daemon.service-ZvSCKs
systemd-private-0005ea561eb44cb38e925f70839c8c67-rtkit-daemon.service-CW7MAC
systemd-private-0005ea561eb44cb38e925f70839c8c67-switcheroo-control.service-qPTmFs
systemd-private-0005ea561eb44cb38e925f70839c8c67-systemd-logind.service-96JXNv
systemd-private-0005ea561eb44cb38e925f70839c8c67-upower.service-o7ciau
vmware-root_908-2688685236
systemd-private-0005ea561eb44cb38e925f70839c8c67-ModemManager.service-CKAHDP
dbus-fychRjX4
dbus-Q0Mxy57U
.X1024-lock
.X1025-lock
systemd-private-0005ea561eb44cb38e925f70839c8c67-colord.service-sqtrb
.X0-lock
.X1-lock
VMwareDnD
hsperfdata_evskruha
nautilus-sendto-F1KZP2
evskruha@evskruha:/tmp$
```

Рис. 5: Команда ls -f

```
evskruha@evskruha:~/tmp$ cd /var/spool/  
evskruha@evskruha:/var/spool$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 1510 июн 10 10:47 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 1578 июн 19 10:50 mail  
drwxr-xr-x. 1 root root 0 июл 21 2023 plymouth  
evskruha@evskruha:/var/spool$
```

Рис. 6: Каталог /var/spool

```
evskruha@evskruha: /var/spool$  
evskruha@evskruha: /var/spool$ cd  
evskruha@evskruha: $ ls  
git-extended work Видео Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны  
evskruha@evskruha: $ ls -al  
итого 24  
drwx----- 1 evskruha evskruha 526 июн 19 11:30 .  
drwxr-xr-x 1 root root 1572 июн 19 10:59 ..  
-rw----- 1 evskruha evskruha 1500 июн 19 11:31 .bash_history  
-rw-r--r-- 1 evskruha evskruha 18 янв 22 03:00 .bash_logout  
-rw-r--r-- 1 evskruha evskruha 144 янв 22 03:00 .bash_profile  
-rw-r--r-- 1 evskruha evskruha 678 июн 19 11:17 .bashrc  
drwx----- 1 evskruha evskruha 452 июн 19 11:19 .cache  
drwx----- 1 evskruha evskruha 398 июн 19 11:19 .config  
-rw-r--r-- 1 evskruha evskruha 334 мар 25 03:00 .emacs  
drwx----- 1 evskruha evskruha 18 июн 19 11:14 .emacs.d  
-rw-r--r-- 1 evskruha evskruha 232 июн 19 11:30 .gitconfig  
drwxr-xr-x 1 evskruha evskruha 74 июн 19 11:24 git-extended  
drwx----- 1 evskruha evskruha 136 июн 19 10:55 group  
drwx----- 1 evskruha evskruha 20 июн 19 10:51 .local  
drwxr-xr-x 1 evskruha evskruha 48 июн 19 10:57 .mozilla  
drwx----- 1 evskruha evskruha 132 июн 19 10:59 .ssh  
drwxr-xr-x 1 evskruha evskruha 10 июн 19 10:59 work  
drwxr-xr-x 1 evskruha evskruha 0 июн 19 10:51 Видео  
drwxr-xr-x 1 evskruha evskruha 0 июн 19 10:51 Документы  
drwxr-xr-x 1 evskruha evskruha 0 июн 19 10:51 Загрузки  
drwxr-xr-x 1 evskruha evskruha 0 июн 19 10:51 Изображения  
drwxr-xr-x 1 evskruha evskruha 0 июн 19 10:51 Музыка  
drwxr-xr-x 1 evskruha evskruha 0 июн 19 10:51 Общедоступные  
drwxr-xr-x 1 evskruha evskruha 0 июн 19 10:51 'Рабочий стол'  
drwxr-xr-x 1 evskruha evskruha 0 июн 19 10:51 Шаблоны  
evskruha@evskruha: $
```

Рис. 7: Файлы в домашнем каталоге

```
evskruha@evskruha:~$  
evskruha@evskruha:~$ mkdir newdir  
evskruha@evskruha:~$ mkdir newdir/morefun  
evskruha@evskruha:~$ mkdir letters memos misk  
evskruha@evskruha:~$ ls  
git-extended  letters  memos  misk  newdir  work  Виде  
evskruha@evskruha:~$ rm letters/ memos/ misk/  
rm: невозможно удалить 'letters/': Это каталог  
rm: невозможно удалить 'memos/': Это каталог  
rm: невозможно удалить 'misk/': Это каталог  
evskruha@evskruha:~$ rm -r letters/ memos/ misk/  
evskruha@evskruha:~$ rm -r newdir/  
evskruha@evskruha:~$ ls  
git-extended  work  Видео  Документы  Загрузки  Изобра  
evskruha@evskruha:~$
```

Рис. 8: Действия с каталогами

# Опции команды ls

```
^./work/study/2023-2024/Операционные системы/os-intro/template/report/report/pandoc/filters/pandocxnos':
core.py __init__.py main.py pandocattrIBUTES.py

^./work/study/2023-2024/Операционные системы/os-intro/template/report/scripts':
image-report mpv-shot

./Видео:
./Документы:
./Загрузки:
./Изображения:
./Музыка:
./Общедоступные:
^./Рабочий стол':

./Шаблоны:
evskruha@evskruha:~$ ls -t
git-extended work Видео Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны
evskruha@evskruha:~$
```

Рис. 9: Команда ls -R и ls -t

```
evskruha@evskruha:~$ help cd
cd: cd [-L|[-P [-e]] [-@]] [wananor]
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.

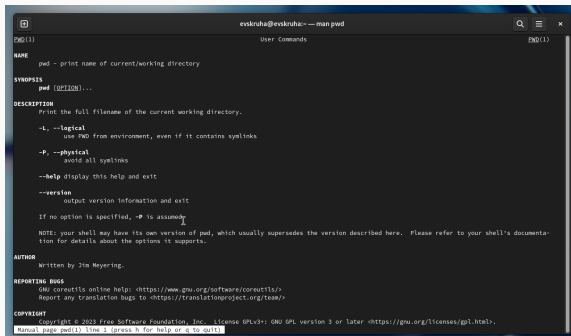
Options:
  -L      force symbolic links to be followed: resolve symbolic
          links in DIR after processing instances of '..'
  -P      use the physical directory structure without following
          symbolic links: resolve symbolic links in DIR before
          processing instances of '..'
  -e      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 $PWD is set successfully when
-P is used; non-zero otherwise.
evskruha@evskruha:~$
```

Рис. 10: Справка по команде cd

# Справка по командам



```
evskruha@evskruha:~$ man pwd
pwd(1)                                User Commands                                pwd(1)

NAME
  pwd - print name of current/working directory

SYNOPSIS
  pwd [OPTION]...

DESCRIPTION
  Print the full filename of the current working directory.

  -L, --logical
      use PWD from environment, even if it contains symlinks

  -P, --physical
      avoid all symlinks

  --help
      display this help and exit

  --version
      output version information and exit

  If no option is specified, -P is assumed.

NOTE: your shell may have its own version of pwd, which usually supersedes the version described here. Please refer to your shell's documentation for details about the options it supports.

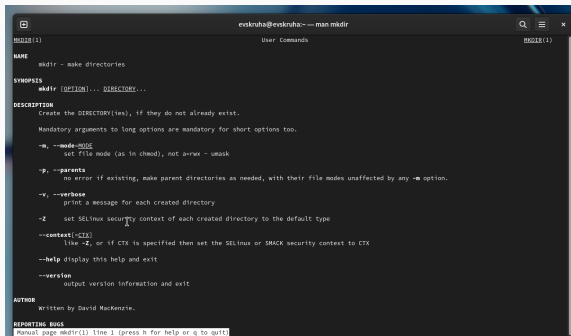
AUTHOR
  Written by Jim Meyering.

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

COPYRIGHT
  Copyright © 2023 Free Software Foundation, Inc.  License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
  Manual page pwd(1) line 1 (press h for help or q to quit)
```

Рис. 11: Справка по команде pwd





```
evskruha@evskruha:~$ man mkdir
mkdir(1)                                User Commands                                mkdir(1)

NAME
  mkdir - make directories

SYNOPSIS
  mkdir [OPTION]... DIRECTORY...

DESCRIPTION
  Create the DIRECTORY(ies), if they do not already exist.

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

  -m, --mode=MODE
      set file mode (as in chmod), not a-rwx - umask

  -p, --parents
      no error if existing, make parent directories as needed, with their file modes unaffected by any -m option.

  -v, --verbose
      print a message for each created directory

  -Z
      set SELinux security context of each created directory to the default type

  --context=CTX
      like -Z, or if CTX is specified then set the SELinux or SMACK security context to CTX

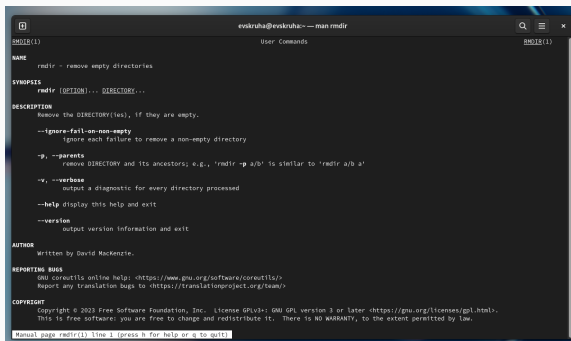
  --help
      display this help and exit

  --version
      output version information and exit

AUTHOR
  Written by David MacKenzie.

REPORTING BUGS
  Report mkdir(1) line 1 (press h for help or q to quit)
```

Рис. 12: Справка по команде mkdir



```
evskruha@evskruha:~ — man rmdir
rmdir(1)                                User Commands                                rmdir(1)

NAME
  rmdir - remove empty directories

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

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

  --ignore-fail-on-non-empty
    ignore each failure 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

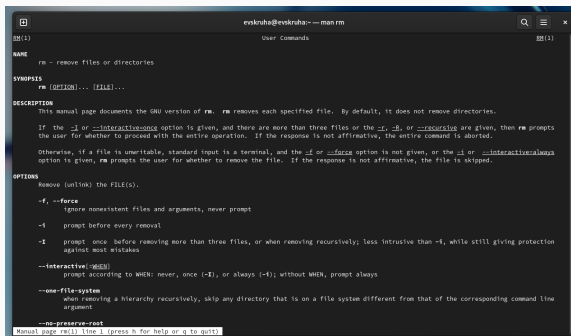
AUTHOR
  Written by David Mackenzie.

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

COPYRIGHT
  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.

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

Рис. 13: Справка по команде rmdir



```
evskruha@evskruha:~ -- man rm
rm(1)                                User Commands
NAME
  rm - remove files or directories
SYNOPSIS
  rm [OPTION]... [FILE]...
DESCRIPTION
  This manual page documents the GNU version of rm. rm removes each specified file. By default, it does not remove directories.

  If the -i or --interactive=once option is given, and there are more than three files or the -f, -B, 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
      Manual page rm(1) line 1 (press h for help or q to quit)
```

Рис. 14: Справка по команде rm

# История командной строки

```
84 ls
85 ls -al
86 mkdir newdir
87 mkdir newdir/morefun
88 mkdir letters memos misk
89 ls
90 rm letters/ memos/ misk/
91 rm -r letters/ memos/ misk/
92 rm -r newdir/
93 ls
94 ls -R
95 ls -t
96 help cd
97 man pwd
98 man mkdir
99 man rmdir
100 man rm
101 history
evskruha@evskruha:~$
```

Рис. 15: Команда history

## **Выводы по проделанной работе**

---

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