

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

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# Цели и задачи работы

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# Цель лабораторной работы

Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

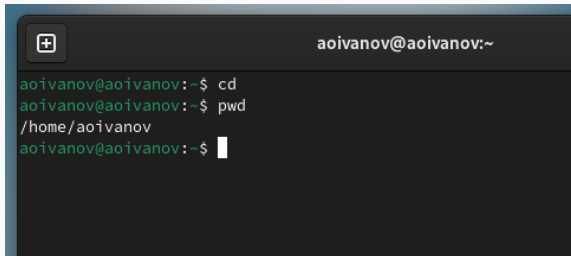
# Задачи лабораторной работы

- 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**

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# Имя и путь к домашнему каталогу



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

A terminal window with a dark background. The title bar shows a window icon and the text 'aoivanov@aoivanov:~'. The terminal content shows a series of commands and their outputs: 'cd' is entered, then 'pwd' is entered, resulting in the output '/home/aoivanov'. The prompt 'aoivanov@aoivanov:~\$' is followed by a cursor.

**Рис. 1:** Путь к домашнему каталогу

# Опции команды ls

```
aoivanov@aoivanov:~$ cd /tmp
aoivanov@aoivanov:/tmp$ ls
dbus-0AIEcI2T
dbus-Wl5urYS6
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-chronyd.service-uLg9X3
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-colord.service-qIIEKv
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-dbus-broker.service-LQnKFV
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-fwupd.service-PpkmQz
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-low-memory-monitor.service-llok
6V
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-ModemManager.service-Buet26
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-polkit.service-irjZ0g
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-power-profiles-daemon.service-n
bLboI
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-rtkit-daemon.service-9tFNP1
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-switcheroo-control.service-aGtd
Iz
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-systemd-logind.service-8b0Yw2
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-systemd-oomd.service-D0YkQ1
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-systemd-resolved.service-a73tDv
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-upower.service-T4ud5v
vmware-root_913-4013723377
aoivanov@aoivanov:/tmp$
```

Рис. 2: Команда ls

# Опции команды ls

```
aoivanov@aoivanov:/tmp$ ls -la
.
..
dbus-0AIEcI2T
dbus-Wl5urYS6
.font-unix
.ICE-unix
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-chronyd.service-ULg9X3
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-colord.service-qIEXv
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-dbus-broker.service-LQnKFV
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-fwupd.service-PpkmQz
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-low-memory-monitor.service-llok6V
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-ModemManager.service-Buet26
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-polkit.service-irjZ0g
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-power-profiles-daemon.service-nbLbo1
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-rtkit-daemon.service-9tFNpL
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-switcheroo-control.service-aGtdIz
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-systemd-logind.service-8b0Yw2
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-systemd-oomd.service-D0YkQ1
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-systemd-resolved.service-a73tDv
```

Рис. 3: Команда ls -a



# Опции команды ls

```
as@ivanovga:ivanov:/tmp$ ls -l
итого 0
srw-rw-rw-. 1 root root 0 map 11 18:03 dbus-GAIEci2T
srw-rw-rw-. 1 root root 0 map 11 18:03 dbus-UIsurY96
drwx----- 3 root root 60 map 11 18:03 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-chrond.service-ulg9X3
drwx----- 3 root root 60 map 11 18:03 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-colord.service-g1LEXs
drwx----- 3 root root 60 map 11 18:03 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-dbus-broker.service-lQnKfV
drwx----- 3 root root 60 map 11 18:07 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-fsmpd.service-PpkQz
drwx----- 3 root root 60 map 11 18:03 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-low-memory-monitor.service-liok6V
drwx----- 3 root root 60 map 11 18:03 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-ModemManager.service-Buot26
drwx----- 3 root root 60 map 11 18:03 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-polkit.service-trj20g
drwx----- 3 root root 60 map 11 18:03 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-power-profiles-daemon.service-nb1boI
drwx----- 3 root root 60 map 11 18:03 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-rtkit-daemon.service-91FwP1
drwx----- 3 root root 60 map 11 18:03 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-switcheroo-control.service-a6tdiz
drwx----- 3 root root 60 map 11 18:03 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-systemd-logind.service-8b6fwJ
drwx----- 3 root root 60 map 11 18:03 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-systemd-oomd.service-D0YkQ1
drwx----- 3 root root 60 map 11 18:03 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-systemd-resolved.service-a73tDv
drwx----- 3 root root 60 map 11 18:03 systemd-private-b55449fc6d3048168bc4b6eaa6e97ff-upower.service-T4ud3v
drwx----- 2 root root 40 map 11 18:03 vmware-root_913-4013723377
as@ivanovga:ivanov:/tmp$
```

Рис. 4: Команда ls -l

# Опции команды ls

```
aoivanov@aoivanov: /tmp$  
aoivanov@aoivanov: /tmp$ ls -f  
.  
..  
.X11-unix  
.ICE-unix  
.XIM-unix  
.font-unix  
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-systemd-oomd.service-D0YkQ1  
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-systemd-resolved.service-a73tDv  
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-dbus-broker.service-LQnKFV  
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-chronyd.service-uLg9X3  
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-low-memory-monitor.service-llok6V  
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-polkit.service-irjZ0g  
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-power-profiles-daemon.service-nbLbo1  
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-rtkit-daemon.service-9tFNPl  
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-switcheroo-control.service-aGtdIz  
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-systemd-logind.service-8b0Yw2  
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-upower.service-T4ud5v  
vmware-root_913-4013723377  
systemd-private-b55449fc6d3048168bc4b6eaa6e6e97f-ModemManager.service-Buet26  
dbus-OAIEcI2T  
dbus-WL5urYS6  
.X1024-lock
```

Рис. 5: Команда ls -f

# Каталог /var/spool

```
aoivanov@aoivanov:/tmp$ cd /var/spool/  
aoivanov@aoivanov:/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 1222 мар  8 17:40 mail  
drwxr-xr-x. 1 root root  0 июл 21 2023 plymouth  
aoivanov@aoivanov:/var/spool$
```

Рис. 6: Каталог /var/spool

```
aoivanov@aoivanov:/var/spool$ cd
aoivanov@aoivanov:~$ ls
git-extended  Видео      Загрузки    Музыка      'Рабочий стол'
work          Документы  Изображения Общедоступные  Шаблоны
aoivanov@aoivanov:~$ ls -al
итого 20
drwx-----. 1 aoivanov aoivanov 498 мар  5 21:17 .
drwxr-xr-x.  1 root     root    1216 мар  8 17:40 ..
-rw-----. 1 aoivanov aoivanov 162 мар  5 21:18 .bash_history
-rw-r--r--. 1 aoivanov aoivanov 18 июл 19 2023 .bash_logout
-rw-r--r--. 1 aoivanov aoivanov 144 июл 19 2023 .bash_profile
-rw-r--r--. 1 aoivanov aoivanov 678 мар  5 21:07 .bashrc
drwx-----. 1 aoivanov aoivanov 452 мар 11 18:06 .cache
drwx-----. 1 aoivanov aoivanov 402 мар  5 21:10 .config
-rw-r--r--. 1 aoivanov aoivanov 236 мар  5 21:17 .gitconfig
drwxr-xr-x.  1 aoivanov aoivanov 74 мар  5 21:12 git-extended
drwx-----. 1 aoivanov aoivanov 136 мар  5 21:08 .gnupg
drwx-----. 1 aoivanov aoivanov 20 фев 24 17:09 .local
drwxr-xr-x.  1 aoivanov aoivanov 48 фев 24 17:10 .mozilla
drwx-----. 1 aoivanov aoivanov 132 фев 24 17:17 .ssh
drwxr-xr-x.  1 aoivanov aoivanov 10 фев 24 17:17 work
drwxr-xr-x.  1 aoivanov aoivanov 0 фев 24 17:09 Видео
drwxr-xr-x.  1 aoivanov aoivanov 0 фев 24 17:09 Документы
drwxr-xr-x.  1 aoivanov aoivanov 0 фев 24 17:09 Загрузки
drwxr-xr-x.  1 aoivanov aoivanov 0 фев 24 17:09 Изображения
drwxr-xr-x.  1 aoivanov aoivanov 0 фев 24 17:09 Музыка
```

Рис. 7: Файлы в домашнем каталоге

# Работа с каталогами

```
aoivanov@aoivanov:~$ mkdir newdir
aoivanov@aoivanov:~$ mkdir newdir/morefun
aoivanov@aoivanov:~$ mkdir letters memos misk
aoivanov@aoivanov:~$ ls
git-extended  misk      Видео      Изображения  'Рабочий стол'
letters       newdir    Документы  Музыка       Шаблоны
memos         work      Загрузки   Общедоступные

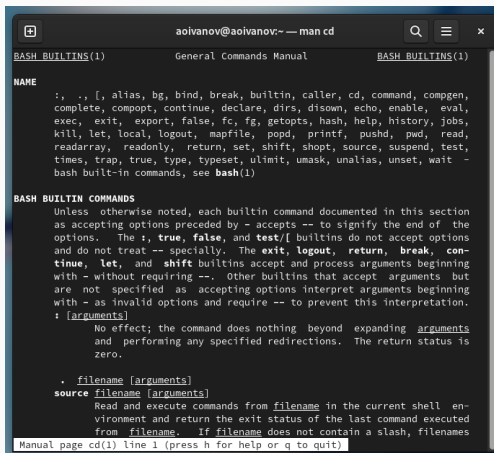
aoivanov@aoivanov:~$ rm letters/ memos/ misk/
rm: невозможно удалить 'letters/': Это каталог
rm: невозможно удалить 'memos/': Это каталог
rm: невозможно удалить 'misk/': Это каталог
aoivanov@aoivanov:~$ rm -r letters/ memos/ misk/
aoivanov@aoivanov:~$ rm -r newdir/
aoivanov@aoivanov:~$ ls
git-extended  Видео      Загрузки    Музыка      'Рабочий стол'
work          Документы  Изображения  Общедоступные  Шаблоны
aoivanov@aoivanov:~$
```

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:  
aoivanov@aoivanov:~$ ls -lt  
git-extended Видео Изображения Загрузки 'Рабочий стол'  
work Документы Музыка Общедоступные Шаблоны  
aoivanov@aoivanov:~$
```

Рис. 9: Команда ls -R и ls -t



```
aoivanov@aoivanov:~ — man cd
BASH_BUILTINS(1)      General Commands Manual      BASH_BUILTINS(1)

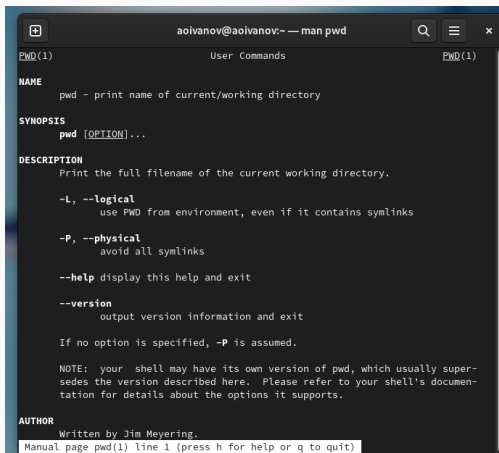
NAME
:, ., [, alias, bg, bind, break, builtin, caller, cd, command, compgen,
complete, compopt, continue, declare, dirs, disown, echo, enable, eval,
exec, exit, export, false, fc, fg, getopts, hash, help, history, jobs,
kill, let, local, logout, mapfile, popd, printf, pushd, pwd, read,
readarray, readonly, return, set, shift, shopt, source, suspend, test,
times, trap, true, type, typeset, ulimit, umask, unalias, unset, wait -
bash built-in commands, see bash(1)

BASH BUILTIN COMMANDS
Unless otherwise noted, each builtin command documented in this section
as accepting options preceded by - accepts -- to signify the end of the
options. The :, true, false, and test/[ builtins do not accept options
and do not treat -- specially. The exit, logout, return, break, con-
tinue, let, and shift builtins accept and process arguments beginning
with - without requiring --. Other builtins that accept arguments but
are not specified as accepting options interpret arguments beginning
with - as invalid options and require -- to prevent this interpretation.
: [arguments]
    No effect; the command does nothing beyond expanding arguments
    and performing any specified redirections. The return status is
    zero.

. filename [arguments]
source filename [arguments]
    Read and execute commands from filename in the current shell en-
    vironment and return the exit status of the last command executed
    from filename. If filename does not contain a slash, filenames
Manual page cd(1) line 1 (press h for help or q to quit)
```

Рис. 10: Справка по команде cd

# Справка по командам



```
aoivanov@aoivanov:~ — 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.

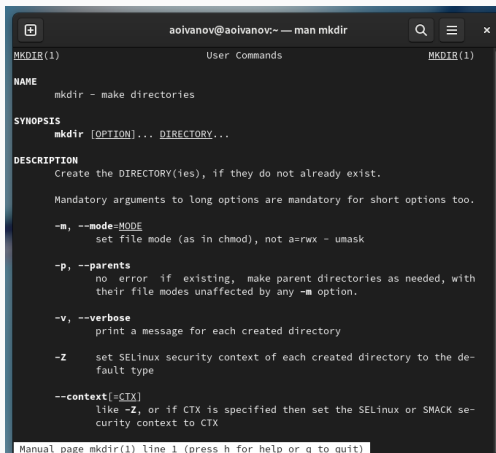
    NOTE: your shell may have its own version of pwd, which usually super-
    sedes the version described here. Please refer to your shell's documen-
    tation for details about the options it supports.

AUTHOR
    Written by Jim Meyering.

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

Рис. 11: Справка по команде pwd





```
aoivanov@aoivanov:~ — 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

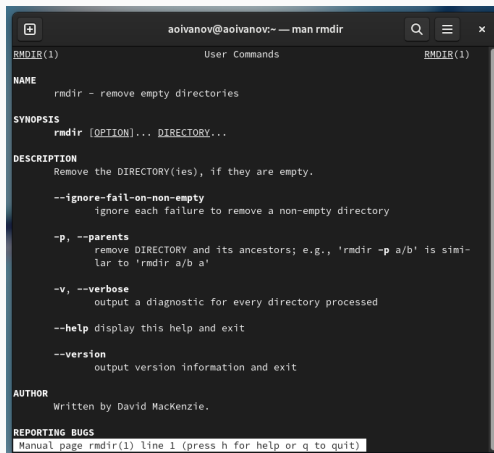
-Z
    set SELinux security context of each created directory to the de-
    fault type

--context[=CTX]
    like -Z, or if CTX is specified then set the SELinux or SMACK se-
    curity context to CTX

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

Рис. 12: Справка по команде mkdir

# Справка по командам



```
aoivanov@aoivanov:~ — 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

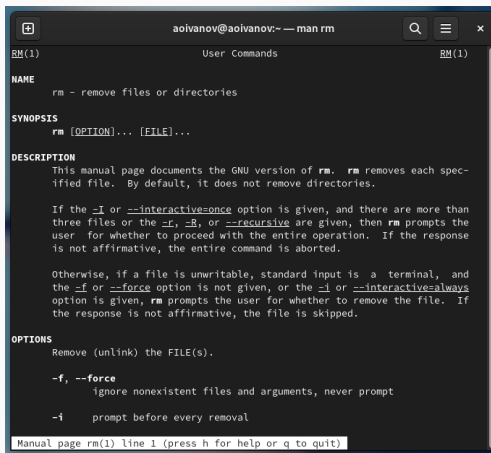
    --help
        display this help and exit

    --version
        output version information and exit

AUTHOR
    Written by David MacKenzie.

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

Рис. 13: Справка по команде rmdir



The screenshot shows a terminal window titled "aoivanov@aoivanov:~ — man rm". The window displays the manual page for the `rm` command. The content is as follows:

```
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
```

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

Рис. 14: Справка по команде `rm`

# История командной строки

```
27 mkdir newdir
28 mkdir newdir/morefun
29 mkdir letters memos misk
30 ls
31 rm letters/ memos/ misk/
32 rm -r letters/ memos/ misk/
33 rm -r newdir/
34 ls
35 ls -R
36 ls -t
37 man cd
38 man pwd
39 man mkdir
40 man rmdir
41 man rm
42 history
aoivanov@aoivanov:~$
```

Рис. 15: Команда history

## **Выводы по проделанной работе**

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