

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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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



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

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
ahmedfarg@ahmedfarg:~$ cd /tmp
ahmedfarg@ahmedfarg:/tmp$ ls
dbus-RpqoMdBH
dbus-UmgjsIES
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-chrond.service-teEamy
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-colord.service-jgHAHY
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-dbus-broker.service-6dErOL
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-fwupd.service-T17BNY
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-low-memory-monitor.service-WjXk
08
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-ModemManager.service-KQtB2i
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-polkit.service-BavDNH
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-power-profiles-daemon.service-e
ojjVc
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-rtkit-daemon.service-dnS2kb
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-switcheroo-control.service-z7tE
2S
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-systemd-logind.service-2n1QdT
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-systemd-oomd.service-z7qq4A
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-systemd-resolved.service-fhvbX
```

Рис. 2: Команда ls

Опции команды ls

```
ahmedfarg@ahmedfarg:/tmp$ ls -la
..
dbus-RpgoMdBH
dbus-UmgjsIES
.font-unix
.ICE-unix
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-chrond.service-teEamy
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-colord.service-jgHAHY
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-dbus-broker.service-6dEzOL
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-fwupd.service-T17BNY
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-low-memory-monitor.service-NjXk
08
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-ModemManager.service-KQtB2i
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-polkit.service-BavDNM
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-power-profiles-daemon.service-e
oJJjVc
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-rtkit-daemon.service-dns2kb
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-switcheroo-control.service-z7tE
2S
systemd-private-c8c6a1f7ec60496a928b3c2215192a17-systemd-logind.service-2niQdT
```

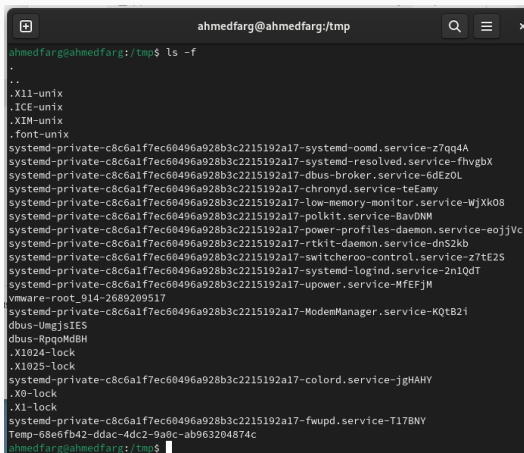
Рис. 3: Команда ls -la

Опции команды ls

```
ahmedfarg@ahmedfarg:/tmp$ ls -l
итого 0
-rw-rw-rw-. 1 root    root      0 май 12 20:07 dbus-RpgoM8H
-rw-rw-rw-. 1 root    root      0 май 12 20:07 dbus-UngjAEE
draw----- 3 root    root      0 май 12 20:07 systemd-private-c86a1f7ec0496a920b3c2215192a17-chronyd.service-tedany
draw----- 3 root    root      0 май 12 20:07 systemd-private-c86a1f7ec0496a920b3c2215192a17-colord.service-jpHARY
draw----- 3 root    root      0 май 12 20:07 systemd-private-c86a1f7ec0496a920b3c2215192a17-dbus-broker.service-6DE2OL
draw----- 3 root    root      0 май 12 20:18 systemd-private-c86a1f7ec0496a920b3c2215192a17-fwupd.service-T17BNY
draw----- 3 root    root      0 май 12 20:07 systemd-private-c86a1f7ec0496a920b3c2215192a17-lvm-memory-monitor.service-qYK08
draw----- 3 root    root      0 май 12 20:07 systemd-private-c86a1f7ec0496a920b3c2215192a17-ModemManager.service-RqIEZ1
draw----- 3 root    root      0 май 12 20:07 systemd-private-c86a1f7ec0496a920b3c2215192a17-polkit.service-Bav0M
draw----- 3 root    root      0 май 12 20:07 systemd-private-c86a1f7ec0496a920b3c2215192a17-power-profiles-daemon.service-wojJV
draw----- 3 root    root      0 май 12 20:07 systemd-private-c86a1f7ec0496a920b3c2215192a17-rtkit-daemon.service-dn52kb
draw----- 3 root    root      0 май 12 20:07 systemd-private-c86a1f7ec0496a920b3c2215192a17-switcheroo-control.service-27IE15
draw----- 3 root    root      0 май 12 20:07 systemd-private-c86a1f7ec0496a920b3c2215192a17-systemd-logind.service-2n50T
draw----- 3 root    root      0 май 12 20:07 systemd-private-c86a1f7ec0496a920b3c2215192a17-systemd-oomd.service-z7qQA
draw----- 3 root    root      0 май 12 20:07 systemd-private-c86a1f7ec0496a920b3c2215192a17-systemd-resolved.service-thugX
draw----- 3 root    root      0 май 12 20:07 systemd-private-c86a1f7ec0496a920b3c2215192a17-upower.service-MTEFJH
draw----- 2 ahmedfarg ahmedfarg 48 май 12 20:20 Temp-88efb62-dbac-4dc3-9a8c-ab963204874c
draw----- 2 root      root      48 май 12 20:07 vmware-root_914-2685209517
ahmedfarg@ahmedfarg:/tmp$
```

Рис. 4: Команда ls -l

Опции команды ls

A terminal window with a dark background and light-colored text. The title bar shows the user 'ahmedfarg' at host 'ahmedfarg' in the directory '/tmp'. The prompt is 'ahmedfarg@ahmedfarg:/tmp\$'. The command 'ls -f' has been executed, resulting in a long list of files and directories. The output includes various system service files (e.g., systemd-private-...), configuration files (e.g., .X11-unix, .ICE-unix), and other system-related files. The prompt 'ahmedfarg@ahmedfarg:/tmp\$' is visible at the bottom of the terminal.

```
ahmedfarg@ahmedfarg:/tmp$ ls -f
..
.X11-unix
.ICE-unix
.XIM-unix
.font-unix
systemd-private-c8c6alf7ec60496a928b3c2215192a17-systemd-oomd.service-z7qq4A
systemd-private-c8c6alf7ec60496a928b3c2215192a17-systemd-resolved.service-fhvgbX
systemd-private-c8c6alf7ec60496a928b3c2215192a17-dbus-broker.service-6dEzOL
systemd-private-c8c6alf7ec60496a928b3c2215192a17-chrond.service-teEamy
systemd-private-c8c6alf7ec60496a928b3c2215192a17-low-memory-monitor.service-WjXkO8
systemd-private-c8c6alf7ec60496a928b3c2215192a17-polkit.service-BavDNM
systemd-private-c8c6alf7ec60496a928b3c2215192a17-power-profiles-daemon.service-eojjVc
systemd-private-c8c6alf7ec60496a928b3c2215192a17-rtkit-daemon.service-dnS2kb
systemd-private-c8c6alf7ec60496a928b3c2215192a17-switcheroo-control.service-z7tE2S
systemd-private-c8c6alf7ec60496a928b3c2215192a17-systemd-logind.service-2n1QdT
systemd-private-c8c6alf7ec60496a928b3c2215192a17-upower.service-MfEFjM
vmware-root_914-2689209517
systemd-private-c8c6alf7ec60496a928b3c2215192a17-ModemManager.service-KQtB2i
dbus-UmgjsIES
dbus-RpqoMdBH
.X1024-lock
.X1025-lock
systemd-private-c8c6alf7ec60496a928b3c2215192a17-colord.service-jgHAHY
.X0-lock
.X1-lock
systemd-private-c8c6alf7ec60496a928b3c2215192a17-fwupd.service-T17BNY
Temp-68e6fb42-ddac-4dc2-9a0c-ab963204874c
ahmedfarg@ahmedfarg:/tmp$
```

Рис. 5: Команда ls -f

```
ahmedfarg@ahmedfarg:/tmp$ cd /var/spool/  
ahmedfarg@ahmedfarg:/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 1258 мар 12 20:06 mail  
drwxr-xr-x. 1 root root  0 июл 21 2023 plymouth  
ahmedfarg@ahmedfarg:/var/spool$
```

Рис. 6: Каталог /var/spool

Домашний каталог

```
ahmedfarg@ahmedfarg: /var/spool$  
ahmedfarg@ahmedfarg: /var/spool$ cd  
ahmedfarg@ahmedfarg: ~$ ls  
work      Документы  Изображения  Общедоступные  Шаблоны  
Видео     Загрузки   Музыка       'Рабочий стол'  
ahmedfarg@ahmedfarg: ~$ ls -al  
итого 16  
drwx-----. 1 ahmedfarg ahmedfarg 462 мар 12 20:23 .  
drwxr-xr-x. 1 root      root    1252 мар 12 20:06 ..  
-rw-----. 1 ahmedfarg ahmedfarg   0 мар 12 20:23 .bash_history  
-rw-r--r--. 1 ahmedfarg ahmedfarg  18 янв 22 03:00 .bash_logout  
-rw-r--r--. 1 ahmedfarg ahmedfarg 144 янв 22 03:00 .bash_profile  
-rw-r--r--. 1 ahmedfarg ahmedfarg 522 янв 22 03:00 .bashrc  
drwx-----. 1 ahmedfarg ahmedfarg 342 мар 12 20:20 .cache  
drwx-----. 1 ahmedfarg ahmedfarg 352 мар 12 20:22 .config  
-rw-r--r--. 1 ahmedfarg ahmedfarg 149 мар 12 20:20 .gitconfig  
drwx-----. 1 ahmedfarg ahmedfarg  20 мар 12 20:18 .local  
drwxr-xr-x. 1 ahmedfarg ahmedfarg  48 мар 12 20:20 .mozilla  
drwx-----. 1 ahmedfarg ahmedfarg 132 мар 12 20:23 .ssh  
drwxr-xr-x. 1 ahmedfarg ahmedfarg  10 мар 12 20:23 work  
drwxr-xr-x. 1 ahmedfarg ahmedfarg   0 мар 12 20:18 Видео  
drwxr-xr-x. 1 ahmedfarg ahmedfarg   0 мар 12 20:18 Документы  
drwxr-xr-x. 1 ahmedfarg ahmedfarg   0 мар 12 20:18 Загрузки  
drwxr-xr-x. 1 ahmedfarg ahmedfarg   0 мар 12 20:18 Изображения  
drwxr-xr-x. 1 ahmedfarg ahmedfarg   0 мар 12 20:18 Музыка  
drwxr-xr-x. 1 ahmedfarg ahmedfarg   0 мар 12 20:18 Общедоступные  
drwxr-xr-x. 1 ahmedfarg ahmedfarg   0 мар 12 20:18 'Рабочий стол'  
drwxr-xr-x. 1 ahmedfarg ahmedfarg   0 мар 12 20:18 Шаблоны  
ahmedfarg@ahmedfarg: ~$
```

Рис. 7: Файлы в домашнем каталоге

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

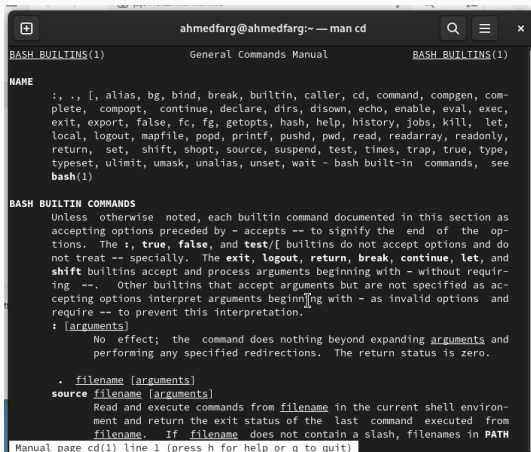
Рис. 8: Действия с каталогами

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:  
ahmedfarg@ahmedfarg:~$ ls -t  
work  Изображения  Загрузки  Общедоступные  Шаблоны  
Видео  Документы  Музыка  'Рабочий стол'  
ahmedfarg@ahmedfarg:~$
```

Рис. 9: Команда ls -R и ls -t

Справка по командам



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

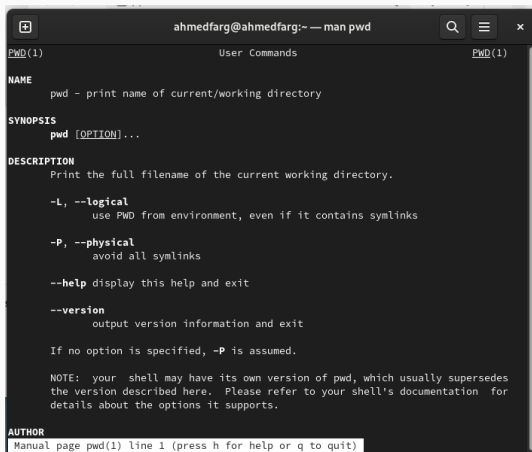
NAME
:, ., [, alias, bg, bind, break, builtin, caller, cd, command, compgen, complete,
compt, continue, declare, dirs, disown, echo, enable, eval, exec, exit, export,
false, fc, fg, getopts, hash, help, history, jobs, kill, let, local, logout,
mapfile, popd, printf, pushd, pwd, read, readarray, readonly, 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, continue, 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 environment
    and return the exit status of the last command executed from filename.
    If filename does not contain a slash, filenames in PATH
Manual page cd(1) line 1 (press h for help or q to quit)
```

Рис. 10: Справка по команде cd

Справка по командам



```
ahmedfarg@ahmedfarg:~ — 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

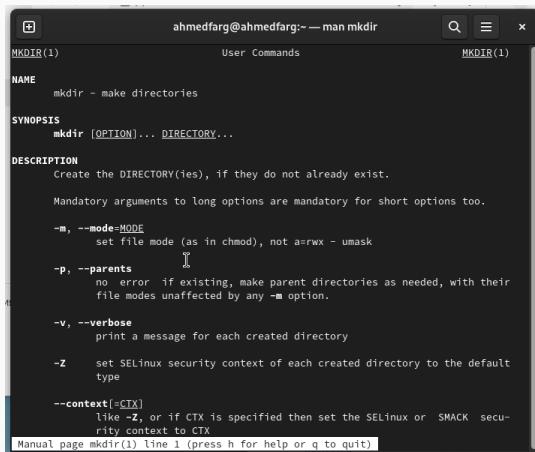
    If no option is specified, -P is assumed.

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

Рис. 11: Справка по команде pwd

Справка по командам



```
ahmedfarg@ahmedfarg:~ — 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

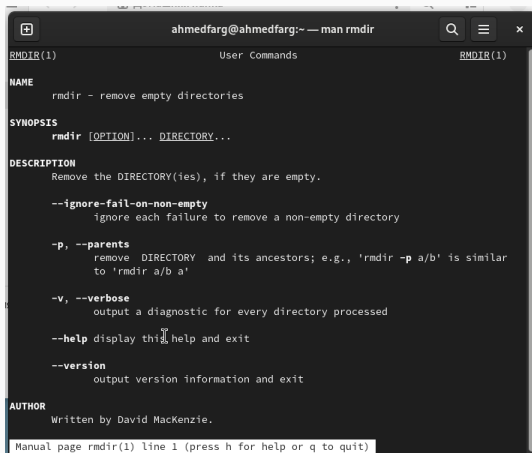
    -Z
        set SELinux security context of each created directory to the default
        type

    --context[=CTX]
        like -Z, or if CTX is specified then set the SELinux or SMACK secu-
        rity 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



```
ahmedfarg@ahmedfarg:~ — 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

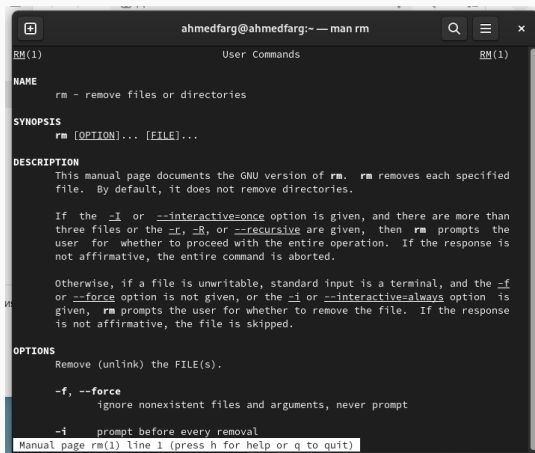
    --help
        display this help and exit

    --version
        output version information and exit

AUTHOR
    Written by David MacKenzie.

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

Рис. 13: Справка по команде rmdir



```
ahmedfarg@ahmedfarg:~ — man rm
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

```
18 rm -r letters/ memos/ mfsk/
19 rm -r newdir/
20 ls
21 ls -R
22 ls -t
23 man cd
24 man pwd
25 man mkdir
26 man rmdir
27 man rm
28 history
ahmedfarg@ahmedfarg:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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