

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

Элза Синюшко¹

12 марта, 2024, Москва, Россия

¹Российский Университет Дружбы Народов

Цели и задачи работы

Цель лабораторной работы

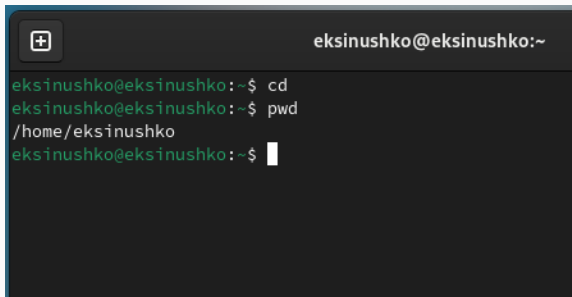
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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



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

A terminal window with a dark background. The title bar shows a window icon and the text 'eksinushko@eksinushko:~'. The terminal content shows a sequence of commands: 'cd' followed by 'pwd', which outputs '/home/eksinushko'. The prompt 'eksinushko@eksinushko:~\$' is shown at the end of the line.

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
eksinushko@eksinushko:~$ cd /tmp
eksinushko@eksinushko:/tmp$ ls
dbus-480uv97I
dbus-52A6i0TE
systemd-private-d0a3cf32e68e46bda70b285683aee571-chronyd.service-trKx5Q
systemd-private-d0a3cf32e68e46bda70b285683aee571-colord.service-1HTfnz
systemd-private-d0a3cf32e68e46bda70b285683aee571-dbus-broker.service-ANGpfp
systemd-private-d0a3cf32e68e46bda70b285683aee571-fwupd.service-lk8bbl
systemd-private-d0a3cf32e68e46bda70b285683aee571-geoclue.service-hQnUZ8
systemd-private-d0a3cf32e68e46bda70b285683aee571-low-memory-monitor.service-sujBJP
systemd-private-d0a3cf32e68e46bda70b285683aee571-ModemManager.service-CQs5hg
systemd-private-d0a3cf32e68e46bda70b285683aee571-polkit.service-X9o0js
systemd-private-d0a3cf32e68e46bda70b285683aee571-power-profiles-daemon.service-Not0k7
systemd-private-d0a3cf32e68e46bda70b285683aee571-rtkit-daemon.service-90lueg
systemd-private-d0a3cf32e68e46bda70b285683aee571-switcheroo-control.service-Pqn1AU
systemd-private-d0a3cf32e68e46bda70b285683aee571-systemd-hostnamed.service-3ygLNh
systemd-private-d0a3cf32e68e46bda70b285683aee571-systemd-logind.service-TuvB5I
systemd-private-d0a3cf32e68e46bda70b285683aee571-systemd-oomd.service-Ib8h6N
systemd-private-d0a3cf32e68e46bda70b285683aee571-systemd-resolved.service-mCpHCf
systemd-private-d0a3cf32e68e46bda70b285683aee571-upower.service-u9Lo5u
vmware-root_920-2731086625
eksinushko@eksinushko:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
eksinushko@eksinushko:/tmp$ ls -la
.
..
dbus-480uvG7I
dbus-52A6i0TE
.font-unix
.ICE-unix
systemd-private-d0a3cf32e68e46bda70b285683aee571-chrond.service-trKx5Q
systemd-private-d0a3cf32e68e46bda70b285683aee571-colord.service-1HTfnz
systemd-private-d0a3cf32e68e46bda70b285683aee571-dbus-broker.service-ANGpfp
systemd-private-d0a3cf32e68e46bda70b285683aee571-fwupd.service-lk8bbl
systemd-private-d0a3cf32e68e46bda70b285683aee571-geoclue.service-hQnUzB
systemd-private-d0a3cf32e68e46bda70b285683aee571-low-memory-monitor.service-suj8jP
systemd-private-d0a3cf32e68e46bda70b285683aee571-ModemManager.service-CqsShg
systemd-private-d0a3cf32e68e46bda70b285683aee571-polkit.service-X9o0j5
systemd-private-d0a3cf32e68e46bda70b285683aee571-power-profiles-daemon.service-Not0k7
systemd-private-d0a3cf32e68e46bda70b285683aee571-rtkit-daemon.service-90lueg
systemd-private-d0a3cf32e68e46bda70b285683aee571-switcheroo-control.service-Pqn1AU
systemd-private-d0a3cf32e68e46bda70b285683aee571-systemd-logind.service-iUvB5I
systemd-private-d0a3cf32e68e46bda70b285683aee571-systemd-oomd.service-Ib8h6N
systemd-private-d0a3cf32e68e46bda70b285683aee571-systemd-resolved.service-mCpNcf
systemd-private-d0a3cf32e68e46bda70b285683aee571-upower.service-u9Lo5u
vmware-root_920-2731086625
.X0-lock
```

Рис. 3: Команда ls -a

Опции команды ls

```
eks@mushkoeks1nushko:/tmp$ ls -l
итого 0
srwxrwxrwx. 1 root root 0 map 12 11:15 dbus-480uv97I
srwxrwxrwx. 1 root root 0 map 12 11:15 dbus-52A616TE
drwx----- 3 root root 60 map 12 11:15 systemd-private-d0a3cf32e68e46bda70b28563aee571-chromyd.service-trKsDQ
drwx----- 3 root root 60 map 12 11:15 systemd-private-d0a3cf32e68e46bda70b28563aee571-colord.service-lHTfnz
drwx----- 3 root root 60 map 12 11:15 systemd-private-d0a3cf32e68e46bda70b28563aee571-dbus-broker.service-ANGgfp
drwx----- 3 root root 60 map 12 11:17 systemd-private-d0a3cf32e68e46bda70b28563aee571-fwupd.service-lk8bbl
drwx----- 3 root root 60 map 12 11:15 systemd-private-d0a3cf32e68e46bda70b28563aee571-low-memory-monitor.service-sujBJP
drwx----- 3 root root 60 map 12 11:15 systemd-private-d0a3cf32e68e46bda70b28563aee571-ModemManager.service-CQs5hg
drwx----- 3 root root 60 map 12 11:15 systemd-private-d0a3cf32e68e46bda70b28563aee571-polkit.service-K9e0j5
drwx----- 3 root root 60 map 12 11:15 systemd-private-d0a3cf32e68e46bda70b28563aee571-power-profiles-daemon.service-N0t0k7
drwx----- 3 root root 60 map 12 11:15 systemd-private-d0a3cf32e68e46bda70b28563aee571-rlkit-daemon.service-90luog
drwx----- 3 root root 60 map 12 11:15 systemd-private-d0a3cf32e68e46bda70b28563aee571-switcheroo-control.service-PqnIAU
drwx----- 3 root root 60 map 12 11:15 systemd-private-d0a3cf32e68e46bda70b28563aee571-systemd-logind.service-U0VB5I
drwx----- 3 root root 60 map 12 11:15 systemd-private-d0a3cf32e68e46bda70b28563aee571-systemd-oomd.service-Ib8h0H
drwx----- 3 root root 60 map 12 11:15 systemd-private-d0a3cf32e68e46bda70b28563aee571-systemd-resolved.service-mCp8CF
drwx----- 3 root root 40 map 12 11:15 systemd-private-d0a3cf32e68e46bda70b28563aee571-upower.service-u9Lo5u
drwx----- 2 root root 40 map 12 11:15 vmware-root_320-2731866625
eks@mushkoeks1nushko:/tmp$
```

Рис. 4: Команда ls -l

Опции команды ls

```
eksinushko@eksinushko: /tmp$ ls -f
.
..
.X11-unix
.ICE-unix
.XIM-unix
.font-unix
systemd-private-d0a3cf32e68e46bda70b285683aee571-systemd-oond.service-Ib8h6N
systemd-private-d0a3cf32e68e46bda70b285683aee571-systemd-resolved.service-mCpNCf
systemd-private-d0a3cf32e68e46bda70b285683aee571-dbus-broker.service-ANGpfp
systemd-private-d0a3cf32e68e46bda70b285683aee571-chronyd.service-trKx5Q
systemd-private-d0a3cf32e68e46bda70b285683aee571-low-memory-monitor.service-sujBjP
systemd-private-d0a3cf32e68e46bda70b285683aee571-polkit.service-X9o0j5
systemd-private-d0a3cf32e68e46bda70b285683aee571-power-profiles-daemon.service-N0t0k7
systemd-private-d0a3cf32e68e46bda70b285683aee571-rtkit-daemon.service-90lueg
systemd-private-d0a3cf32e68e46bda70b285683aee571-switcheroo-control.service-Pqn1AU
systemd-private-d0a3cf32e68e46bda70b285683aee571-systemd-logind.service-iUv85I
systemd-private-d0a3cf32e68e46bda70b285683aee571-upower.service-u9Lo5u
vmware-root_920-2731086625
systemd-private-d0a3cf32e68e46bda70b285683aee571-ModemManager.service-CQsShg
dbus-52A6i0TE
dbus-480uv7I
.X1024-lock
.X1025-lock
systemd-private-d0a3cf32e68e46bda70b285683aee571-colord.service-IHTfnz
.X0-lock
.X1-lock
systemd-private-d0a3cf32e68e46bda70b285683aee571-fwupd.service-lk8bb1
eksinushko@eksinushko: /tmp$
```

Рис. 5: Команда ls -f

```
eksinushko@eksinushko:~$ cd /var/spool/  
eksinushko@eksinushko:/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  
eksinushko@eksinushko:/var/spool$
```

Рис. 6: Каталог /var/spool

```
eksinushko@eksinushko: /var/spool$  
eksinushko@eksinushko: /var/spool$ cd  
eksinushko@eksinushko: ~$ ls  
  git-extended  Видео      Загрузки    Музыка      'Рабочий стол'  
  work          Документы  Изображения  Общедоступные  Шаблоны  
eksinushko@eksinushko: ~$ ls -al  
итого 20  
drwx-----. 1 eksinushko eksinushko 498 мар 6 11:46 .  
drwxr-xr-x. 1 root root 1216 мар 8 17:40 ..  
-rw-----. 1 eksinushko eksinushko 1270 мар 6 11:46 .bash_history  
-rw-r--r--. 1 eksinushko eksinushko 18 июл 19 2023 .bash_logout  
-rw-r--r--. 1 eksinushko eksinushko 144 июл 19 2023 .bash_profile  
-rw-r--r--. 1 eksinushko eksinushko 680 мар 6 11:32 .bashrc  
drwx-----. 1 eksinushko eksinushko 452 мар 12 11:17 .cache  
drwx-----. 1 eksinushko eksinushko 402 мар 6 11:34 .config  
-rw-r--r--. 1 eksinushko eksinushko 234 мар 6 11:46 .gitconfig  
drwxr-xr-x. 1 eksinushko eksinushko 74 мар 6 11:39 git-extended  
drwx-----. 1 eksinushko eksinushko 136 фев 29 18:42 .gnupg  
drwx-----. 1 eksinushko eksinushko 20 фев 29 18:38 .local  
drwxr-xr-x. 1 eksinushko eksinushko 48 фев 29 18:38 .mozilla  
drwx-----. 1 eksinushko eksinushko 132 фев 29 18:45 .ssh  
drwxr-xr-x. 1 eksinushko eksinushko 10 фев 29 18:44 work  
drwxr-xr-x. 1 eksinushko eksinushko 0 фев 29 18:38 Видео  
drwxr-xr-x. 1 eksinushko eksinushko 0 фев 29 18:38 Документы  
drwxr-xr-x. 1 eksinushko eksinushko 0 фев 29 18:38 Загрузки  
drwxr-xr-x. 1 eksinushko eksinushko 0 фев 29 18:38 Изображения  
drwxr-xr-x. 1 eksinushko eksinushko 0 фев 29 18:38 Музыка  
drwxr-xr-x. 1 eksinushko eksinushko 0 фев 29 18:38 Общедоступные  
drwxr-xr-x. 1 eksinushko eksinushko 0 фев 29 18:38 'Рабочий стол'  
drwxr-xr-x. 1 eksinushko eksinushko 0 фев 29 18:38 Шаблоны  
eksinushko@eksinushko: ~$
```

Рис. 7: Файлы в домашнем каталоге

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

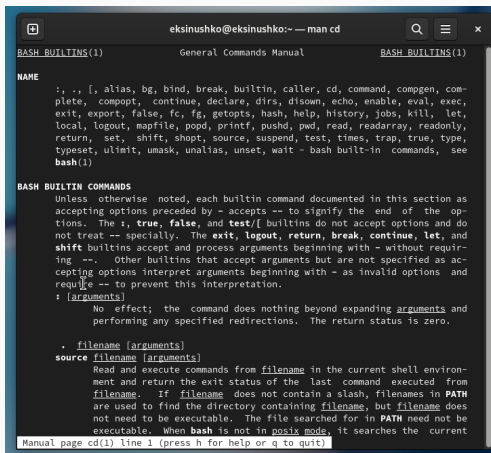
eksinushko@eksinushko:~$ rm letters/ memos/ misk/
rm: невозможно удалить 'letters/': Это каталог
rm: невозможно удалить 'memos/': Это каталог
rm: невозможно удалить 'misk/': Это каталог
eksinushko@eksinushko:~$ rm -r letters/ memos/ misk/
eksinushko@eksinushko:~$ rm -r newdir/
eksinushko@eksinushko:~$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

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

Рис. 9: Команда ls -R и ls -t



The screenshot shows a terminal window titled "eksinushko@eksinushko:~ — man cd". The window displays the manual page for the "cd" command, titled "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, 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.

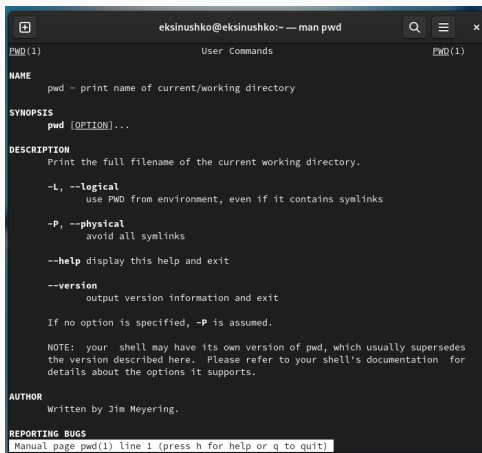
`. filename [arguments]`

`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` are used to find the directory containing `filename`, but `filename` does not need to be executable. The file searched for in `PATH` need not be executable. When `bash` is not in `posix mode`, it searches the current

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

Рис. 10: Справка по команде cd



```
eksinushko@eksinushko:~ — 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.

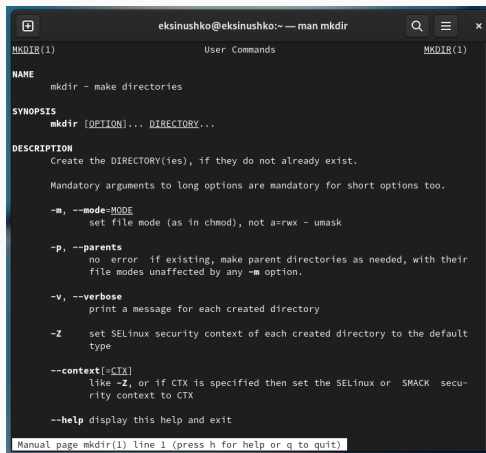
    NOTE: your shell may have its own version of pwd, which usually supersedes
    the version described here. Please refer to your shell's documentation for
    details about the options it supports.

AUTHOR
    Written by Jim Meyering.

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

Рис. 11: Справка по команде pwd

Справка по командам



```
eksinushko@eksinushko:~$ 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

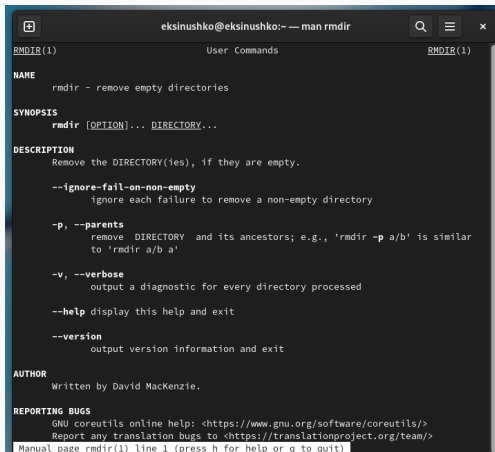
  -Z
        set SELinux security context of each created directory to the default
        type

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

  --help display this help and exit

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

Рис. 12: Справка по команде mkdir



```
eksinushko@eksinushko:~ — 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

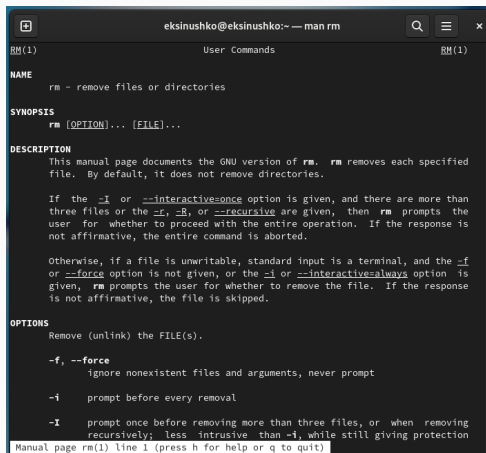
    --help display this help and exit

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

Рис. 13: Справка по команде rmdir



```
eksinushko@eksinushko:~ — 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

-I
    prompt once before removing more than three files, or when removing
    recursively; less intrusive than -i, while still giving protection

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

Рис. 14: Справка по команде rm

История командной строки

```
56 mkdir newdir
57 mkdir newdir/morefun
58 mkdir letters memos misk
59 ls
60 rm letters/ memos/ misk/
61 rm -r letters/ memos/ misk/
62 rm -r newdir/
63 ls
64 ls -R
65 ls -t
66 man cd
67 man pwd
68 man mkdir
69 man rmdir
70 man rm
71 history
eksinushko@eksinushko:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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