

Операционные системы

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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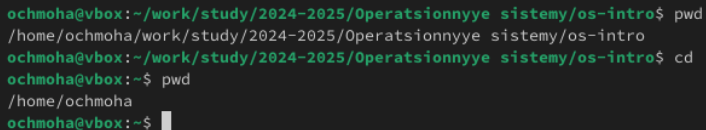
Цели и задачи работы

Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

- 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



```
ochmoha@vbox:~/work/study/2024-2025/Operatsionnyye sistemy/os-intro$ pwd
/home/ochmoha/work/study/2024-2025/Operatsionnyye sistemy/os-intro
ochmoha@vbox:~/work/study/2024-2025/Operatsionnyye sistemy/os-intro$ cd
ochmoha@vbox:~$ pwd
/home/ochmoha
ochmoha@vbox:~$
```

Рис. 1: Путь к домашнему каталогу

```
ochmoha@vbox:~$ cd /tmp
ochmoha@vbox:/tmp$ ls
systemd-private-15b6b1abf510419eacced6c60a04806-abrted.service-MDi8Vz
systemd-private-15b6b1abf510419eacced6c60a04806-chronyd.service-33MLS1
systemd-private-15b6b1abf510419eacced6c60a04806-colord.service-bz6Ie7
systemd-private-15b6b1abf510419eacced6c60a04806-dbus-broker.service-oXQQVL
systemd-private-15b6b1abf510419eacced6c60a04806-fwupd.service-AKSqBL
systemd-private-15b6b1abf510419eacced6c60a04806-low-memory-monitor.service-PdVXAt
systemd-private-15b6b1abf510419eacced6c60a04806-ModemManager.service-8fCrUb
systemd-private-15b6b1abf510419eacced6c60a04806-passim.service-s5ZuW4
systemd-private-15b6b1abf510419eacced6c60a04806-polkit.service-GtBFEL
systemd-private-15b6b1abf510419eacced6c60a04806-rtkit-daemon.service-mm7f36
systemd-private-15b6b1abf510419eacced6c60a04806-switcheroo-control.service-gmAwtJ
systemd-private-15b6b1abf510419eacced6c60a04806-systemd-logind.service-Zueqgq
systemd-private-15b6b1abf510419eacced6c60a04806-systemd-oomd.service-EcVF0Y
systemd-private-15b6b1abf510419eacced6c60a04806-systemd-resolved.service-gTQZvu
systemd-private-15b6b1abf510419eacced6c60a04806-upower.service-FeJras
```

Рис. 2: Команда ls

```
ochmoha@vbox:/tmp$ ls -a
.
..
.font-unix
.ICE-unix
.iprt-localipc-DRMIpcServer
systemd-private-15b6b1abf510419eacced6c60a04806-abrttd.service-MDi8Vz
systemd-private-15b6b1abf510419eacced6c60a04806-chronyd.service-33MLS1
systemd-private-15b6b1abf510419eacced6c60a04806-colord.service-bz6Ie7
systemd-private-15b6b1abf510419eacced6c60a04806-dbus-broker.service-oXQQVL
systemd-private-15b6b1abf510419eacced6c60a04806-fwupd.service-AKSqBL
systemd-private-15b6b1abf510419eacced6c60a04806-low-memory-monitor.service-PdVXAt
systemd-private-15b6b1abf510419eacced6c60a04806-ModemManager.service-8fCrUb
systemd-private-15b6b1abf510419eacced6c60a04806-passim.service-s5ZuW4
systemd-private-15b6b1abf510419eacced6c60a04806-polkit.service-GtBFEL
systemd-private-15b6b1abf510419eacced6c60a04806-rtkit-daemon.service-mm7f36
systemd-private-15b6b1abf510419eacced6c60a04806-switcheroo-control.service-gmAwTJ
systemd-private-15b6b1abf510419eacced6c60a04806-systemd-logind.service-Zueggq
systemd-private-15b6b1abf510419eacced6c60a04806-systemd-oomd.service-EcVFOY
systemd-private-15b6b1abf510419eacced6c60a04806-systemd-resolved.service-gTQZvu
systemd-private-15b6b1abf510419eacced6c60a04806-upower.service-FeJras
.X0-lock
.X1024-lock
.X1025-lock
.X11-unix
.X1-lock
.XIM-unix
ochmoha@vbox:/tmp$
```

Рис. 3: Команда ls -a


```
ochmoha@vbox:/tmp$ ls -l
total 0
drwx-----, 3 root root 60 Mar 22 20:34 systemd-private-15b6b1abf510419eacced6c60a04806-abrt.d.service-MD18Vz
drwx-----, 3 root root 60 Mar 22 20:34 systemd-private-15b6b1abf510419eacced6c60a04806-chronyd.service-33MLS1
drwx-----, 3 root root 60 Mar 22 20:34 systemd-private-15b6b1abf510419eacced6c60a04806-colord.service-bzGIe7
drwx-----, 3 root root 60 Mar 22 20:34 systemd-private-15b6b1abf510419eacced6c60a04806-dbus-broker.service-oXQQVL
drwx-----, 3 root root 60 Mar 22 20:35 systemd-private-15b6b1abf510419eacced6c60a04806-fwupd.service-AKSqBL
drwx-----, 3 root root 60 Mar 22 20:34 systemd-private-15b6b1abf510419eacced6c60a04806-low-memory-monitor.service-PdVXAt
drwx-----, 3 root root 60 Mar 22 20:34 systemd-private-15b6b1abf510419eacced6c60a04806-ModemManager.service-8fCrUb
drwx-----, 3 root root 60 Mar 22 20:35 systemd-private-15b6b1abf510419eacced6c60a04806-passim.service-s5ZuW4
drwx-----, 3 root root 60 Mar 22 20:34 systemd-private-15b6b1abf510419eacced6c60a04806-polkit.service-GtBFEL
drwx-----, 3 root root 60 Mar 22 20:34 systemd-private-15b6b1abf510419eacced6c60a04806-rtkit-daemon.service-mm7f36
drwx-----, 3 root root 60 Mar 22 20:34 systemd-private-15b6b1abf510419eacced6c60a04806-switcheroo-control.service-gmAwtJ
drwx-----, 3 root root 60 Mar 22 20:34 systemd-private-15b6b1abf510419eacced6c60a04806-systemd-logind.service-Zueqgq
drwx-----, 3 root root 60 Mar 22 20:34 systemd-private-15b6b1abf510419eacced6c60a04806-systemd-oomd.service-EcVFOY
drwx-----, 3 root root 60 Mar 22 20:34 systemd-private-15b6b1abf510419eacced6c60a04806-systemd-resolved.service-gTQZvu
drwx-----, 3 root root 60 Mar 22 20:34 systemd-private-15b6b1abf510419eacced6c60a04806-upower.service-FeJras
```

Рис. 4: Команда ls -l

```
ochmoha@vbox:/tmp$ ls -f
.
..
systemd-private-15b6b1abf510419eacced6c60a04806-passim.service-s5ZuW4
systemd-private-15b6b1abf510419eacced6c60a04806-fwupd.service-AKSqBL
.X1-lock
.X0-lock
systemd-private-15b6b1abf510419eacced6c60a04806-colord.service-bzGIe7
.X1025-lock
.X1024-lock
systemd-private-15b6b1abf510419eacced6c60a04806-ModemManager.service-8fCrUb
.iprt-localipc-DRMIpcServer
systemd-private-15b6b1abf510419eacced6c60a04806-upower.service-FeJras
systemd-private-15b6b1abf510419eacced6c60a04806-systemd-logind.service-Zueqgq
systemd-private-15b6b1abf510419eacced6c60a04806-switcheroo-control.service-gmAwtJ
systemd-private-15b6b1abf510419eacced6c60a04806-rtkit-daemon.service-mm7f36
systemd-private-15b6b1abf510419eacced6c60a04806-polkit.service-GtBFEL
systemd-private-15b6b1abf510419eacced6c60a04806-low-memory-monitor.service-PdVXAt
systemd-private-15b6b1abf510419eacced6c60a04806-chronyd.service-33MLS1
systemd-private-15b6b1abf510419eacced6c60a04806-abrttd.service-MDi8Vz
systemd-private-15b6b1abf510419eacced6c60a04806-dbus-broker.service-oXQQVL
systemd-private-15b6b1abf510419eacced6c60a04806-systemd-resolved.service-gTQZvu
systemd-private-15b6b1abf510419eacced6c60a04806-systemd-oomd.service-EcVFOY
.font-unix
.XIM-unix
.ICE-unix
.X11-unix
ochmoha@vbox:/tmp$
```

Рис. 5: Команда ls -f

```
ochmoha@vbox:/tmp$ cd /var/spool
ochmoha@vbox:/var/spool$ ls -l
total 0
drwxr-x--x. 1 root abrt 62 Mar 22 20:34 abrt
drwx----- 1 abrt abrt  0 Nov 20 03:00 abrt-upload
drwx--x--- 1 root lp   6 Jan  7 03:00 cups
drwxr-xr-x. 1 root root  0 Jul 17  2024 lpd
drwxrwxr-x. 1 root mail 20 Mar  7 22:41 mail
drwxr-xr-x. 1 root root  0 Sep 21  2024 plymouth
ochmoha@vbox:/var/spool$
```

Рис. 6: Каталог /var/spool

```
ochmoha@vbox:~$ ls
Desktop  Linux-RDP  openvpn-install.sh  Public  Videos  work
Documents  msfinstall  paused.conf        site    VPS-RDP  x
Downloads  Music      Pictures           Templates  wordlist  xxx.conf

ochmoha@vbox:~$ ls -al
total 92
drwx-----, 1 ochmoha ochmoha  880 Mar 22 21:35 .
drwxr-xr-x, 1 root    root      14  Mar  7 22:41 ..
-rw-----, 1 ochmoha ochmoha 8920 Mar 22 21:30 .bash_history
-rw-r--r--, 1 ochmoha ochmoha  18 Aug 12 2024 .bash_logout
-rw-r--r--, 1 ochmoha ochmoha 144 Aug 12 2024 .bash_profile
-rw-r--r--, 1 ochmoha ochmoha 522 Aug 12 2024 .bashrc
drwx-----, 1 ochmoha ochmoha  630 Mar 22 01:17 .cache
drwxr-xr-x, 1 ochmoha ochmoha  384 Mar 22 00:36 .config
drwxr-xr-x, 1 ochmoha ochmoha   0 Mar 11 20:13 Desktop
drwxr-xr-x, 1 ochmoha ochmoha   0 Mar  7 22:42 Documents
drwxr-xr-x, 1 ochmoha ochmoha 112 Mar 15 23:55 Downloads
drwxr-xr-x, 1 ochmoha ochmoha 114 Mar  7 23:57 .fontconfig
-rw-r--r--, 1 ochmoha ochmoha 143 Mar  8 21:32 .gitconfig
drwx-----, 1 ochmoha ochmoha 136 Mar  8 21:41 .gnupg
drwxr-xr-x, 1 ochmoha ochmoha 242 Mar 11 20:17 Linux-RDP
drwxr-xr-x, 1 ochmoha ochmoha  32 Mar  8 23:05 .local
drwxr-xr-x, 1 ochmoha ochmoha  48 Mar  8 21:45 .mozilla
drwxr-xr-x, 1 ochmoha ochmoha 186 Mar 11 22:09 .msf4
-rwxr-xr-x, 1 ochmoha ochmoha 6139 Mar 11 22:04 msfinstall
drwxr-xr-x, 1 ochmoha ochmoha   0 Mar  7 22:42 Music
-rw-r--r--, 1 ochmoha ochmoha 24637 Mar 11 21:11 openvpn-install.sh
-rw-r--r--, 1 root    root      282 Mar 13 19:24 paused.conf
drwxr-xr-x, 1 ochmoha ochmoha   0 Mar  7 22:42 Pictures
drwxr-xr-x, 1 ochmoha ochmoha   0 Mar  7 22:42 Public
drwxr-xr-x, 1 ochmoha ochmoha  42 Mar 22 01:00 site
drwx-----, 1 ochmoha ochmoha  84 Mar  8 22:25 .ssh
```

Рис. 7: Файлы в домашнем каталоге

```
ochmoha@vbox:~$ mkdir newdir
ochmoha@vbox:~$ mkdir newdir/morefun
ochmoha@vbox:~$ mkdir letters memos misk
ochmoha@vbox:~$ ls
Desktop  letters  misk      newdir      Pictures  Templates  wordlist  xxx.conf
Documents Linux-RDP msfinstall openvpn-install.sh Public    Videos    work
Downloads memos     Music     paused.conf  site      VPS-RDP    x
ochmoha@vbox:~$ rm letters/ memos/ misk
rm: cannot remove 'letters/': Is a directory
rm: cannot remove 'memos/': Is a directory
rm: cannot remove 'misk': Is a directory
ochmoha@vbox:~$ rm -r letters/ memos/ misk
ochmoha@vbox:~$ rm -r newdir
ochmoha@vbox:~$ ls
Desktop  Linux-RDP  openvpn-install.sh  Public  Videos  work
Documents msfinstall  paused.conf         site    VPS-RDP  x
Downloads Music      Pictures           Templates wordlist xxx.conf
ochmoha@vbox:~$
```

Рис. 8: Действия с каталогами

```
./work/study/2024-2025/Operatsionnyye sistemy/os-intro/template/report/report':
bib image Makefile pandoc report.md

./work/study/2024-2025/Operatsionnyye sistemy/os-intro/template/report/report/bib':
cite.bib

./work/study/2024-2025/Operatsionnyye sistemy/os-intro/template/report/report/image':
placeimg_800_600_tech.jpg

./work/study/2024-2025/Operatsionnyye sistemy/os-intro/template/report/report/pandoc':
csl filters

./work/study/2024-2025/Operatsionnyye sistemy/os-intro/template/report/report/pandoc/csl':
gost-r-7-0-5-2008-numeric.csl

./work/study/2024-2025/Operatsionnyye sistemy/os-intro/template/report/report/pandoc/filters':
pandoc_eqnos.py pandoc_fignos.py pandoc_secnos.py pandoc_tablenos.py pandocxnos

./work/study/2024-2025/Operatsionnyye sistemy/os-intro/template/report/report/pandoc/filters/pandoc
xnos':
core.py __init__.py main.py pandocattributes.py

./work/study/2024-2025/Operatsionnyye sistemy/os-intro/template/report/scripts':
image-report mpv-shot

./x:
ochmoha@vbox:~$ ls -lt
site      xxx.conf  openvpn-install.sh Desktop Documents Public
Downloads x         Linux-RDP  VPS-RDP  Music    Templates
paused.conf msfinstall wordlist   work     Pictures Videos
ochmoha@vbox:~$
```

Рис. 9: Команда ls -R и ls -t

```
ochmoha@vbox:~$ help cd
cd: cd [-L|[-P [-e]] [-@]] [dir]
    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.

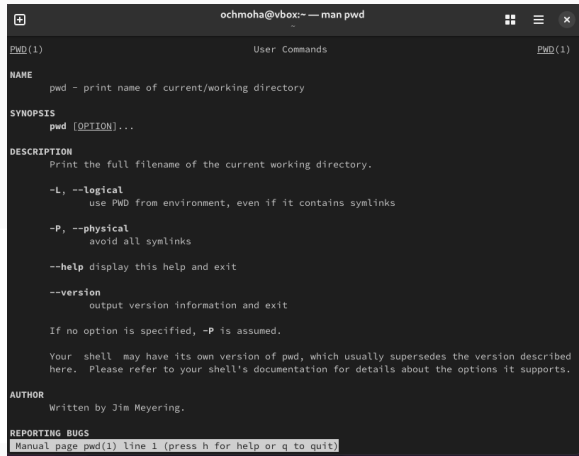
    The variable CDPATH defines the search path for the directory containing
    DIR.  Alternative directory names in CDPATH are separated by a colon (:).
    A null directory name is the same as the current directory.  If DIR begins
    with a slash (/), then CDPATH is not used.

    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.
```

Рис. 10: Справка по команде cd



```
ochmoha@vbox:~ -- 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

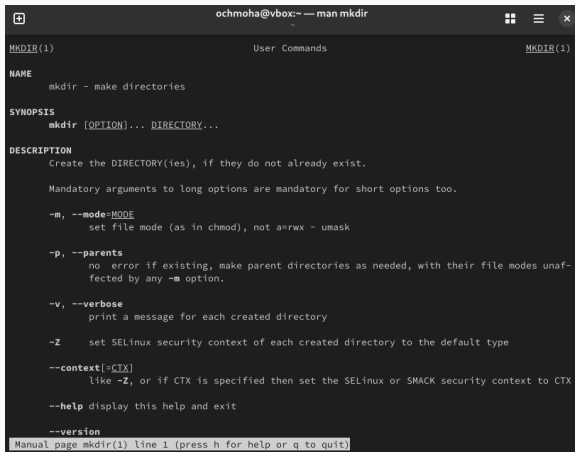
  If no option is specified, -P is assumed.

  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



```
ochmoha@vbox:~ -- 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

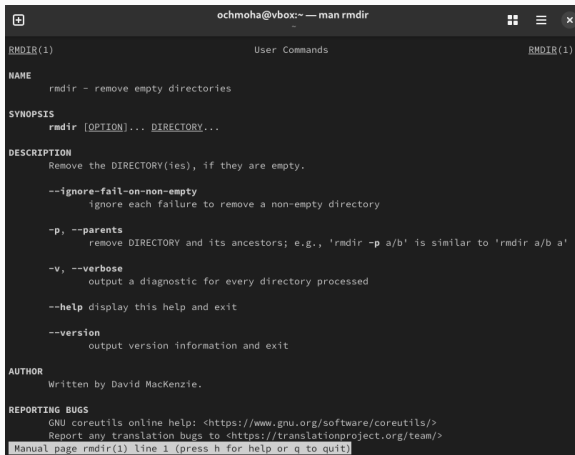
  --context[=CTX]
      like -Z, or if CTX is specified then set the SELinux or SMACK security context to CTX

  --help display this help and exit

  --version

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

Рис. 12: Справка по команде mkdir



```
ochmoha@vbox:~ -- 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

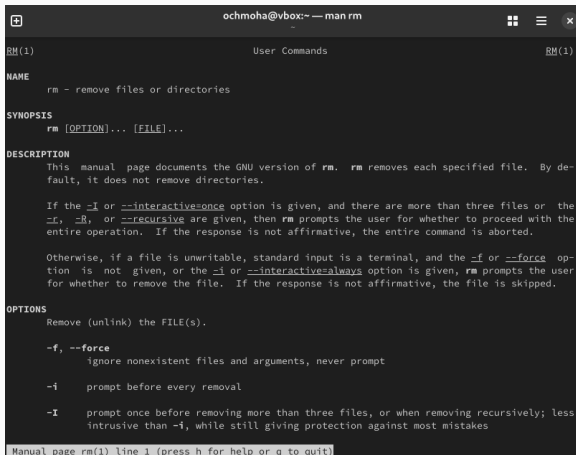
  --version
      output version information and exit

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



```
ochmoha@vbox:~ — 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 against most mistakes

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

Рис. 14: Справка по команде rm

```
276 mkdir newdir/morefun
277 mkdir letters memos misk
278 ls
279 rm letters/ memos/ misk
280 rm -r letters/ memos/ misk
281 rm -r newdir
282 ls
283 ls -R
284 ls -t
285 clear
286 help cd
287 ~
288 man pwd
289 man mkdir
290 man rmdir
291 man rm
292 history
ochmoha@vbox:~$
```

Рис. 15: Команда history

Выводы по проделанной работе

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