

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

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2 марта, 2023, Москва, Россия

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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.

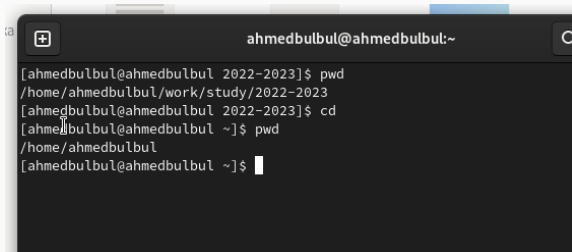
# Задачи лабораторной работы

- 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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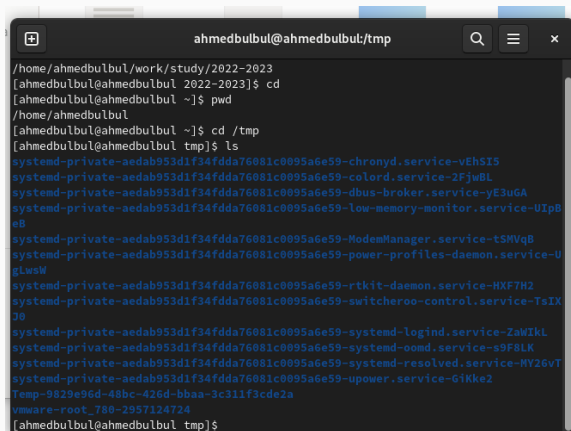
# Имя и путь к домашнему каталогу

A terminal window with a dark background and light text. The title bar at the top reads 'ahmedbulbul@ahmedbulbul:~'. The terminal shows a sequence of commands and their outputs: first, 'pwd' returns '/home/ahmedbulbul/work/study/2022-2023'; second, 'cd' returns to the prompt; third, 'pwd' returns '/home/ahmedbulbul'; finally, the prompt is shown with a cursor, indicating the user is now in their home directory.

```
ahmedbulbul@ahmedbulbul:~  
[ahmedbulbul@ahmedbulbul 2022-2023]$ pwd  
/home/ahmedbulbul/work/study/2022-2023  
[ahmedbulbul@ahmedbulbul 2022-2023]$ cd  
[ahmedbulbul@ahmedbulbul ~]$ pwd  
/home/ahmedbulbul  
[ahmedbulbul@ahmedbulbul ~]$
```

Рис. 1: Путь к домашнему каталогу

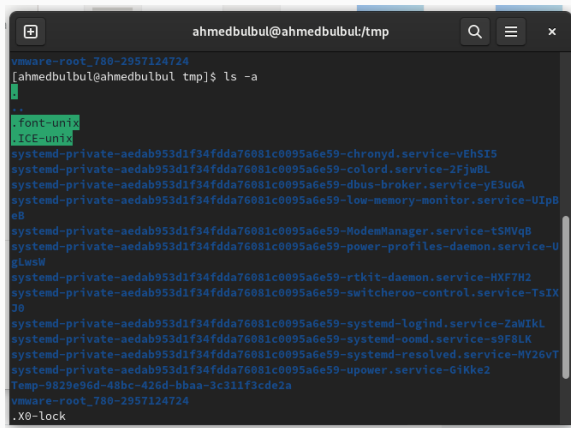
# Опции команды ls



```
ahmedbulbul@ahmedbulbul/tmp
/home/ahmedbulbul/work/study/2022-2023
[ahmedbulbul@ahmedbulbul 2022-2023]$ cd
[ahmedbulbul@ahmedbulbul ~]$ pwd
/home/ahmedbulbul
[ahmedbulbul@ahmedbulbul ~]$ cd /tmp
[ahmedbulbul@ahmedbulbul tmp]$ ls
systemd-private-aedab953d1f34fdda76081c0095a6e59-chrond.service-vEhSI5
systemd-private-aedab953d1f34fdda76081c0095a6e59-colord.service-2FjwBL
systemd-private-aedab953d1f34fdda76081c0095a6e59-dbus-broker.service-yE3uGA
systemd-private-aedab953d1f34fdda76081c0095a6e59-low-memory-monitor.service-UIpB
eB
systemd-private-aedab953d1f34fdda76081c0095a6e59-ModemManager.service-TSMVQB
systemd-private-aedab953d1f34fdda76081c0095a6e59-power-profiles-daemon.service-U
gLwW
systemd-private-aedab953d1f34fdda76081c0095a6e59-rtkit-daemon.service-HXF7H2
systemd-private-aedab953d1f34fdda76081c0095a6e59-switcheroo-control.service-TsIX
J0
systemd-private-aedab953d1f34fdda76081c0095a6e59-systemd-logind.service-ZaWIKL
systemd-private-aedab953d1f34fdda76081c0095a6e59-systemd-oomd.service-s9F8LK
systemd-private-aedab953d1f34fdda76081c0095a6e59-systemd-resolved.service-MY26VT
systemd-private-aedab953d1f34fdda76081c0095a6e59-upower.service-GiKke2
Temp-9829e96d-48bc-426d-bbaa-3c311f3cde2a
vmware-root_780-2957124724
[ahmedbulbul@ahmedbulbul tmp]$
```

Рис. 2: Команда ls

# Опции команды ls



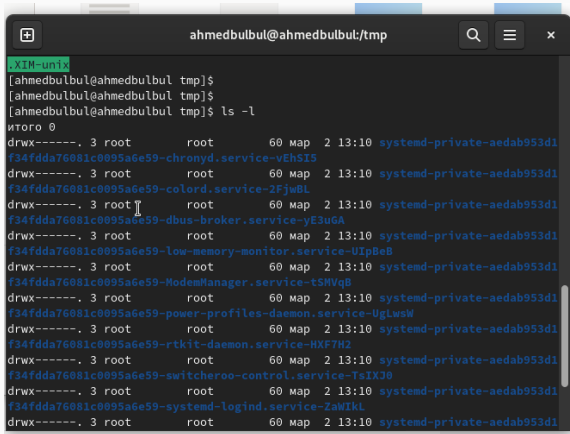
A terminal window titled 'ahmedbulbul@ahmedbulbul:tmp' with search, menu, and close icons. The prompt is 'vmware-root\_780-2957124724 [ahmedbulbul@ahmedbulbul tmp]\$'. The command 'ls -a' has been executed, displaying a list of files and directories. The output includes hidden files like '.font-unix' and '.ICE-unix', and various systemd service files with long names. The window has a scrollbar on the right side.

```
vmware-root_780-2957124724
[ahmedbulbul@ahmedbulbul tmp]$ ls -a
.
.
.font-unix
.ICE-unix
systemd-private-aedab953d1f34fdda76081c0095a6e59-chronyd.service-vEhSI5
systemd-private-aedab953d1f34fdda76081c0095a6e59-colord.service-2FjwBL
systemd-private-aedab953d1f34fdda76081c0095a6e59-dbus-broker.service-yE3uGA
systemd-private-aedab953d1f34fdda76081c0095a6e59-low-memory-monitor.service-UIpB
eB
systemd-private-aedab953d1f34fdda76081c0095a6e59-ModemManager.service-tSMVqB
systemd-private-aedab953d1f34fdda76081c0095a6e59-power-profiles-daemon.service-U
gLwsW
systemd-private-aedab953d1f34fdda76081c0095a6e59-rtkit-daemon.service-HXF7H2
systemd-private-aedab953d1f34fdda76081c0095a6e59-switcheroo-control.service-TsIX
J0
systemd-private-aedab953d1f34fdda76081c0095a6e59-systemd-logind.service-ZaWiKl
systemd-private-aedab953d1f34fdda76081c0095a6e59-systemd-oomd.service-s9F8LK
systemd-private-aedab953d1f34fdda76081c0095a6e59-systemd-resolved.service-MY26vT
systemd-private-aedab953d1f34fdda76081c0095a6e59-upower.service-GiKke2
Temp-9829e96d-48bc-426d-bbaa-3c311f3cde2a
vmware-root_780-2957124724
.X0-lock
```

Рис. 3: Команда ls -a



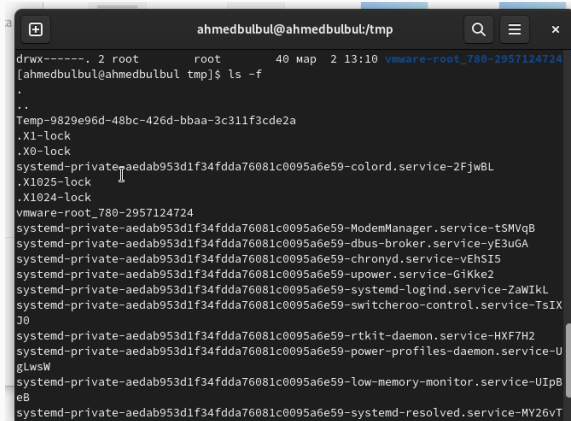
# Опции команды ls



```
ahmedbulbul@ahmedbulbul:/tmp
.XIM-unix
[ahmedbulbul@ahmedbulbul tmp]$
[ahmedbulbul@ahmedbulbul tmp]$
[ahmedbulbul@ahmedbulbul tmp]$ ls -l
итого 0
drwx-----, 3 root      root      60 Map  2 13:10 systemd-private-aedab953d1
f34fdda76081c0095a6e59-chronyd.service-vEhSI5
drwx-----, 3 root      root      60 Map  2 13:10 systemd-private-aedab953d1
f34fdda76081c0095a6e59-colord.service-2Fjw8L
drwx-----, 3 root      root      60 Map  2 13:10 systemd-private-aedab953d1
f34fdda76081c0095a6e59-dbus-broker.service-yE3u6A
drwx-----, 3 root      root      60 Map  2 13:10 systemd-private-aedab953d1
f34fdda76081c0095a6e59-low-memory-monitor.service-UIpBeB
drwx-----, 3 root      root      60 Map  2 13:10 systemd-private-aedab953d1
f34fdda76081c0095a6e59-ModemManager.service-tSMVq8
drwx-----, 3 root      root      60 Map  2 13:10 systemd-private-aedab953d1
f34fdda76081c0095a6e59-power-profiles-daemon.service-Uglw5W
drwx-----, 3 root      root      60 Map  2 13:10 systemd-private-aedab953d1
f34fdda76081c0095a6e59-rtkit-daemon.service-HXF7H2
drwx-----, 3 root      root      60 Map  2 13:10 systemd-private-aedab953d1
f34fdda76081c0095a6e59-switcheroo-control.service-TsIXJ0
drwx-----, 3 root      root      60 Map  2 13:10 systemd-private-aedab953d1
f34fdda76081c0095a6e59-systemd-logind.service-ZaWIKL
drwx-----, 3 root      root      60 Map  2 13:10 systemd-private-aedab953d1
```

Рис. 4: Команда ls -l

# Опции команды ls



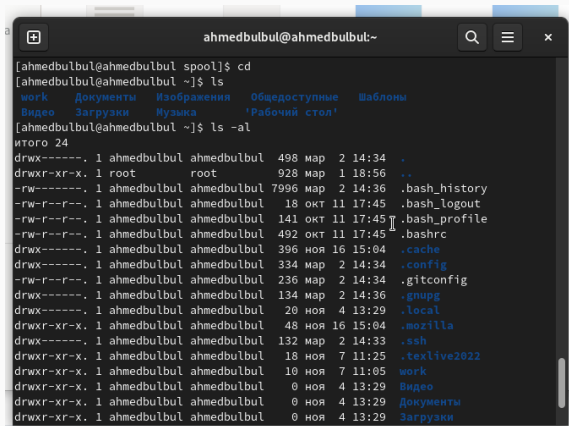
A terminal window titled 'ahmedbulbul@ahmedbulbul:/tmp' with search, menu, and close icons. The command 'ls -f' has been executed, displaying a list of files and directories in the current directory. The output includes permissions, owner, size, date, and filename for each item.

```
drwx-----, 2 root      root      40 map  2 13:10 vmware-root_780-2957124724
[ahmedbulbul@ahmedbulbul tmp]$ ls -f
.
..
Temp-9829e96d-48bc-426d-bbaa-3c311f3cde2a
.X1-lock
.X0-lock
systemd-private-aedab953d1f34fdda76081c0095a6e59-colord.service-2FjwBL
.X1025-lock
.X1024-lock
vmware-root_780-2957124724
systemd-private-aedab953d1f34fdda76081c0095a6e59-ModemManager.service-tSMVqB
systemd-private-aedab953d1f34fdda76081c0095a6e59-dbus-broker.service-yE3uGA
systemd-private-aedab953d1f34fdda76081c0095a6e59-chronyd.service-vEhSI5
systemd-private-aedab953d1f34fdda76081c0095a6e59-upower.service-GiKke2
systemd-private-aedab953d1f34fdda76081c0095a6e59-systemd-logind.service-ZaWIKL
systemd-private-aedab953d1f34fdda76081c0095a6e59-switcheroo-control.service-TsIX
J0
systemd-private-aedab953d1f34fdda76081c0095a6e59-rtkit-daemon.service-HXF7H2
systemd-private-aedab953d1f34fdda76081c0095a6e59-power-profiles-daemon.service-U
gLwsw
systemd-private-aedab953d1f34fdda76081c0095a6e59-low-memory-monitor.service-UIpB
eB
systemd-private-aedab953d1f34fdda76081c0095a6e59-systemd-resolved.service-MY26vT
```

Рис. 5: Команда ls -f

```
[ahmedbulbul@ahmedbulbul tmp]$  
[ahmedbulbul@ahmedbulbul tmp]$ cd /var/spool/  
[ahmedbulbul@ahmedbulbul spool]$ ls  
abrt abrt-upload cups lpd mail plymouth  
[ahmedbulbul@ahmedbulbul spool]$ ls -al  
итого 0  
drwxr-xr-x. 1 root root 68 авг 9 2022 .  
drwxr-xr-x. 1 root root 200 окт 1 11:36 ..  
drwxr-x--x. 1 root abrt 578 фев 21 15:05 abrt  
drwx-----. 1 abrt abrt 0 map 11 2022 abrt-upload  
drwx--x---. 1 root lp 6 окт 3 11:46 cups  
drwxr-xr-x. 1 root root 0 авг 9 2022 lpd  
drwxrwxr-x. 1 root mail 934 map 1 18:56 mail  
drwxr-xr-x. 1 root root 0 map 7 2022 plymouth  
[ahmedbulbul@ahmedbulbul spool]$
```

Рис. 6: Каталог /var/spool



A terminal window titled 'ahmedbulbul@ahmedbulbul:~' showing the output of the 'ls' and 'ls -al' commands. The window has a dark background and a light-colored text. The 'ls' command output shows a directory listing with links to various system and user files. The 'ls -al' command output shows a detailed listing of files in the home directory, including permissions, owner, group, size, date, and filename. The files listed are: ., .., .bash\_history, .bash\_logout, .bash\_profile, .bashrc, .cache, .config, .gitconfig, .gnupg, .local, .mozilla, .ssh, .texlive2022, work, Видео, Документы, and Загрузки.

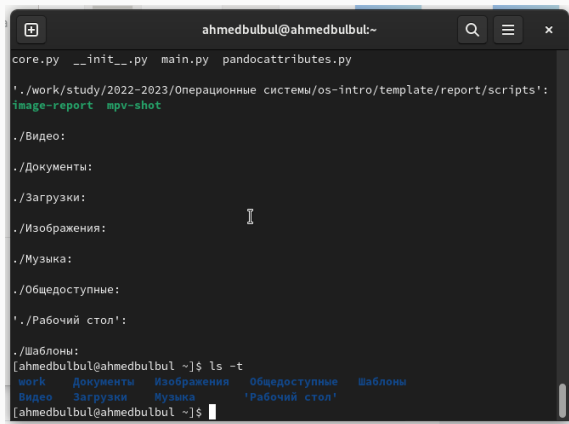
```
ahmedbulbul@ahmedbulbul:~$ cd
ahmedbulbul@ahmedbulbul:~$ ls
work  Документы  Изображения  Общедоступные  Шаблоны
Видео  Загрузки  Музыка  'Рабочий стол'
ahmedbulbul@ahmedbulbul:~$ ls -al
итого 24
drwx-----. 1 ahmedbulbul ahmedbulbul 498 мар  2 14:34 .
drwxr-xr-x. 1 root        root        928 мар  1 18:56 ..
-rw-----. 1 ahmedbulbul ahmedbulbul 7996 мар  2 14:36 .bash_history
-rw-r--r--. 1 ahmedbulbul ahmedbulbul   18 окт 11 17:45 .bash_logout
-rw-r--r--. 1 ahmedbulbul ahmedbulbul  141 окт 11 17:45 .bash_profile
-rw-r--r--. 1 ahmedbulbul ahmedbulbul   492 окт 11 17:45 .bashrc
drwx-----. 1 ahmedbulbul ahmedbulbul  396 ноя 16 15:04 .cache
drwx-----. 1 ahmedbulbul ahmedbulbul  334 мар  2 14:34 .config
-rw-r--r--. 1 ahmedbulbul ahmedbulbul  236 мар  2 14:34 .gitconfig
drwx-----. 1 ahmedbulbul ahmedbulbul   134 мар  2 14:36 .gnupg
drwx-----. 1 ahmedbulbul ahmedbulbul   20 ноя  4 13:29 .local
drwxr-xr-x. 1 ahmedbulbul ahmedbulbul   48 ноя 16 15:04 .mozilla
drwx-----. 1 ahmedbulbul ahmedbulbul   132 мар  2 14:33 .ssh
drwxr-xr-x. 1 ahmedbulbul ahmedbulbul   18 ноя  7 11:25 .texlive2022
drwxr-xr-x. 1 ahmedbulbul ahmedbulbul   10 ноя  7 11:05 work
drwxr-xr-x. 1 ahmedbulbul ahmedbulbul    0 ноя  4 13:29 Видео
drwxr-xr-x. 1 ahmedbulbul ahmedbulbul    0 ноя  4 13:29 Документы
drwxr-xr-x. 1 ahmedbulbul ahmedbulbul    0 ноя  4 13:29 Загрузки
```

Рис. 7: Файлы в домашнем каталоге

```
[ahmedbulbul@ahmedbulbul ~]$  
[ahmedbulbul@ahmedbulbul ~]$  
[ahmedbulbul@ahmedbulbul ~]$ mkdir newdir  
[ahmedbulbul@ahmedbulbul ~]$ mkdir newdir/morefun  
[ahmedbulbul@ahmedbulbul ~]$ mkdir letters memos misk  
[ahmedbulbul@ahmedbulbul ~]$ ls  
letters  misk  work  Документы  Изображения  Общедоступные  Шаблоны  
memos   newdir  Видео  Загрузки  Музыка  'Рабочий стол'  
[ahmedbulbul@ahmedbulbul ~]$ rm letters/ memos/ misk/  
rm: невозможно удалить 'letters/': Это каталог  
rm: невозможно удалить 'memos/': Это каталог  
rm: невозможно удалить 'misk/': Это каталог  
[ahmedbulbul@ahmedbulbul ~]$ rmdir letters/ memos/ misk/  
[ahmedbulbul@ahmedbulbul ~]$ rmdir newdir/  
rmdir: не удалось удалить 'newdir/': Каталог не пуст  
[ahmedbulbul@ahmedbulbul ~]$ rm -r newdir/  
[ahmedbulbul@ahmedbulbul ~]$ ls  
work  Документы  Изображения  Общедоступные  Шаблоны  
Видео  Загрузки  Музыка  'Рабочий стол'  
[ahmedbulbul@ahmedbulbul ~]$
```

Рис. 8: Действия с каталогами

# Опции команды ls



A terminal window titled 'ahmedbulbul@ahmedbulbul:~' with search, menu, and close icons. The window shows a list of files: core.py, \_\_init\_\_.py, main.py, and pandocattributes.py. Below this, a directory path is shown: './work/study/2022-2023/Операционные системы/os-intro/template/report/scripts/'. Two files are listed in green: 'image-report' and 'mpv-shot'. A series of directory listings follows: './Видео:', './Документы:', './Загрузки:', './Изображения:', './Музыка:', './Общедоступные:', './Рабочий стол:', and './Шаблоны:'. The command '[ahmedbulbul@ahmedbulbul ~]\$ ls -t' is entered, resulting in a sorted list of files and directories: 'work', 'Документы', 'Изображения', 'Общедоступные', 'Шаблоны', 'Видео', 'Загрузки', 'Музыка', and 'Рабочий стол'.

```
core.py __init__.py main.py pandocattributes.py

'./work/study/2022-2023/Операционные системы/os-intro/template/report/scripts':
image-report mpv-shot

./Видео:

./Документы:

./Загрузки:

./Изображения:

./Музыка:

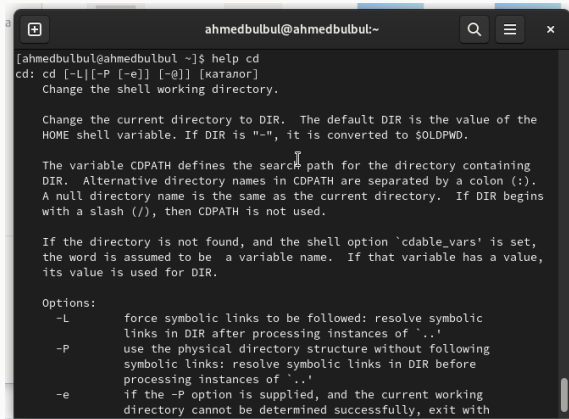
./Общедоступные:

'./Рабочий стол':

./Шаблоны:
[ahmedbulbul@ahmedbulbul ~]$ ls -t
work  Документы  Изображения  Öffentlich  Шаблоны
Видео  Загрузки  Музыка      'Рабочий стол'
```

Рис. 9: Команда ls -R и ls -t

# Справка по командам



```
ahmedbulbul@ahmedbulbul:~$ help cd
cd: cd [-L|[-P [-e]] [-@]] [karanor]
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.

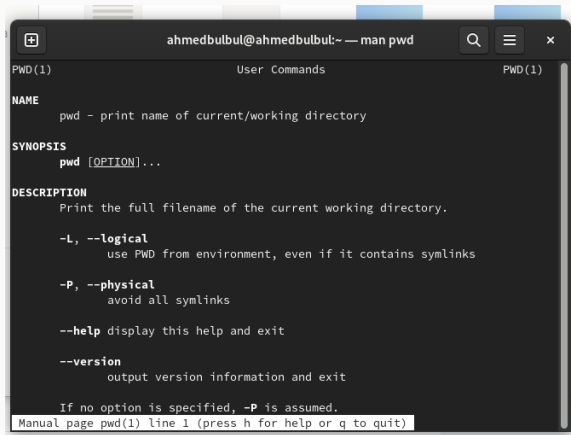
The variable CDPATH defines the search path for the directory containing
DIR. Alternative directory names in CDPATH are separated by a colon (:).
A null directory name is the same as the current directory. If DIR begins
with a slash (/), then CDPATH is not used.

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
```

Рис. 10: Справка по команде cd

# Справка по командам



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

```
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

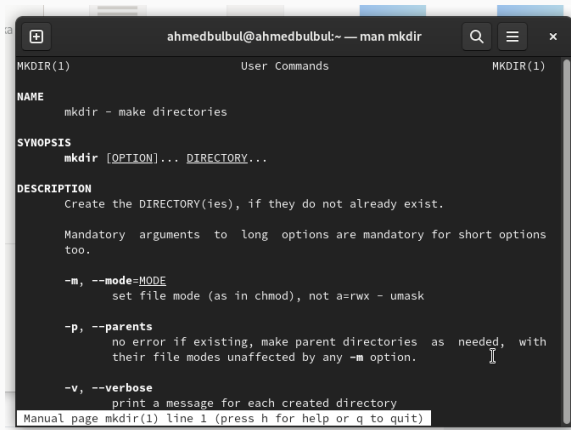
    If no option is specified, -P is assumed.

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

Рис. 11: Справка по команде pwd



# Справка по командам



The screenshot shows a terminal window with the title bar "ahmedbulbul@ahmedbulbul:~ — man mkdir". The window displays the manual page for the "mkdir" command. The content is as follows:

```
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.

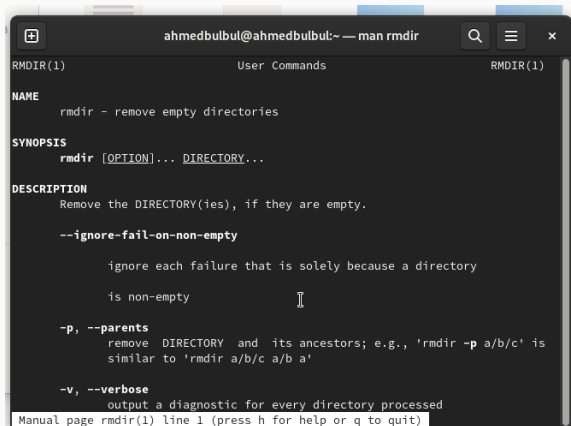
    -m, --mode=MODE
        set file mode (as in chmod), not a=rwx - umask

    -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

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

Рис. 12: Справка по команде mkdir



```
ahmedbulbul@ahmedbulbul:~ — 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 that is solely because a directory
        is non-empty

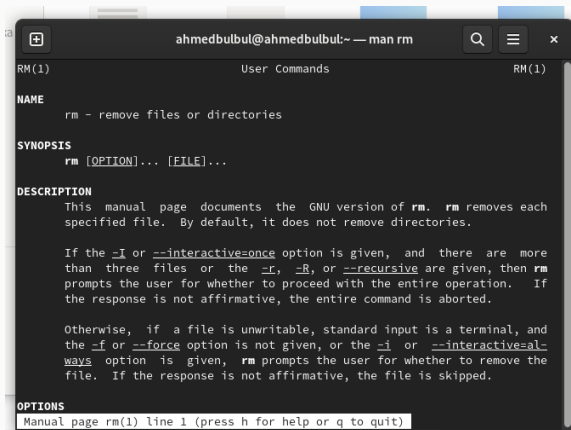
    -p, --parents
        remove DIRECTORY and its ancestors; e.g., 'rmdir -p a/b/c' is
        similar to 'rmdir a/b/c a/b a'

    -v, --verbose
        output a diagnostic for every directory processed

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

Рис. 13: Справка по команде rmdir

# Справка по командам



```
ahmedbulbul@ahmedbulbul:~ — 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.

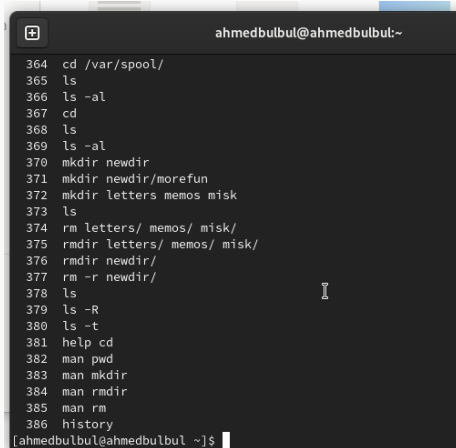
  If the -I or --interactive=once option is given, and there are more
  than three files or the -r, -R, or --recursive are given, then rm
  prompts the user for whether to proceed with the entire operation. If
  the response is not affirmative, the entire command is aborted.

  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=al-
ways option is given, rm prompts the user for whether to remove the
  file. If the response is not affirmative, the file is skipped.

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

Рис. 14: Справка по команде rm

# История командной строки

A terminal window with a dark background and light text. The title bar shows a plus icon and the text 'ahmedbulbul@ahmedbulbul:~'. The terminal displays a list of 21 commands, each preceded by a line number from 364 to 386. The commands are: cd /var/spool/, ls, ls -al, cd, ls, ls -al, mkdir newdir, mkdir newdir/morefun, mkdir letters memos misk, ls, rm letters/ memos/ misk/, rmdir letters/ memos/ misk/, rmdir newdir/, rm -r newdir/, ls, ls -R, ls -t, help cd, man pwd, man mkdir, man rmdir, man rm, and history. The prompt '[ahmedbulbul@ahmedbulbul ~]\$' is at the bottom with a cursor.

```
ahmedbulbul@ahmedbulbul:~  
364 cd /var/spool/  
365 ls  
366 ls -al  
367 cd  
368 ls  
369 ls -al  
370 mkdir newdir  
371 mkdir newdir/morefun  
372 mkdir letters memos misk  
373 ls  
374 rm letters/ memos/ misk/  
375 rmdir letters/ memos/ misk/  
376 rmdir newdir/  
377 rm -r newdir/  
378 ls  
379 ls -R  
380 ls -t  
381 help cd  
382 man pwd  
383 man mkdir  
384 man rmdir  
385 man rm  
386 history  
[ahmedbulbul@ahmedbulbul ~]$
```

Рис. 15: Команда history

## **Выводы по проделанной работе**

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