

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

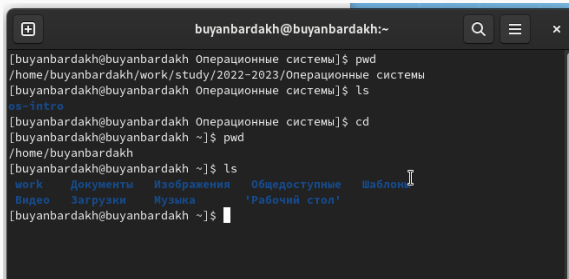
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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

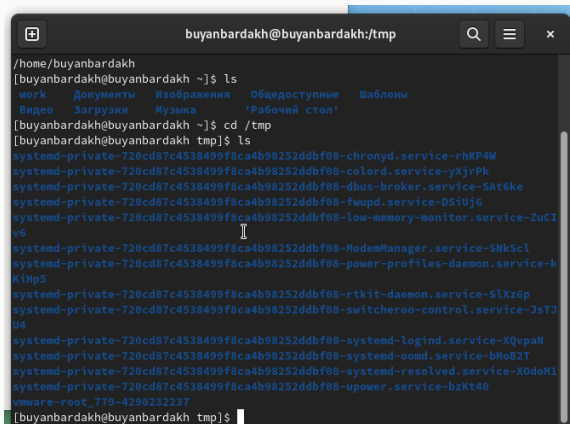
Имя и путь к домашнему каталогу



```
buyanbardakh@buyanbardakh:~  
[buyanbardakh@buyanbardakh Операционные системы]$ pwd  
/home/buyanbardakh/work/study/2022-2023/Операционные системы  
[buyanbardakh@buyanbardakh Операционные системы]$ ls  
os-intro  
[buyanbardakh@buyanbardakh Операционные системы]$ cd  
[buyanbardakh@buyanbardakh ~]$ pwd  
/home/buyanbardakh  
[buyanbardakh@buyanbardakh ~]$ ls  
work  документы  Изображения  Общедоступные  Шаблоны  
Видео  Загрузки  Музыка  'Рабочий стол'  
[buyanbardakh@buyanbardakh ~]$
```

Рис. 1: Путь к домашнему каталогу

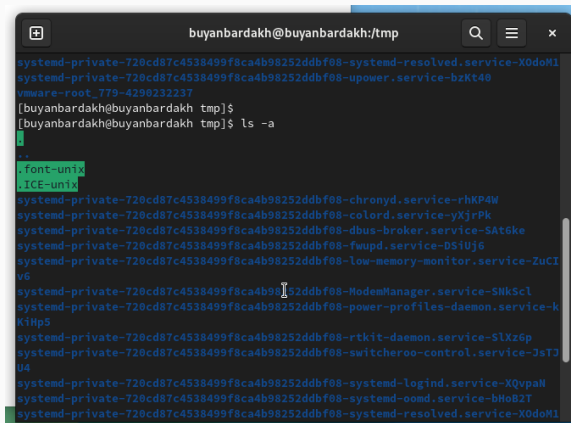
Опции команды ls



```
buyanbardakh@buyanbardakh:tmp
/home/buyanbardakh
[buyanbardakh@buyanbardakh ~]$ ls
work  Документы  Изображения  Общедоступные  Шаблоны
Видео  Загрузки  Музыка  'Рабочий стол'
[buyanbardakh@buyanbardakh ~]$ cd /tmp
[buyanbardakh@buyanbardakh tmp]$ ls
systemd-private-720cd87c4538499f8ca4b98252ddb08-chrond.service-rhKP4W
systemd-private-720cd87c4538499f8ca4b98252ddb08-colord.service-yXjrPk
systemd-private-720cd87c4538499f8ca4b98252ddb08-dbus-broker.service-5At6ke
systemd-private-720cd87c4538499f8ca4b98252ddb08-fwupd.service-DSiUj6
systemd-private-720cd87c4538499f8ca4b98252ddb08-low-memory-monitor.service-ZuCI
v6
systemd-private-720cd87c4538499f8ca4b98252ddb08-ModemManager.service-SNkScl
systemd-private-720cd87c4538499f8ca4b98252ddb08-power-profiles-daemon.service-k
KiHp5
systemd-private-720cd87c4538499f8ca4b98252ddb08-rtkit-daemon.service-SlXzGp
systemd-private-720cd87c4538499f8ca4b98252ddb08-switcheroo-control.service-JsTJ
U4
systemd-private-720cd87c4538499f8ca4b98252ddb08-systemd-logind.service-XQvpaN
systemd-private-720cd87c4538499f8ca4b98252ddb08-systemd-oomd.service-bHoB2T
systemd-private-720cd87c4538499f8ca4b98252ddb08-systemd-resolved.service-X0doM1
systemd-private-720cd87c4538499f8ca4b98252ddb08-upower.service-bzKt40
vmware-root_779-429023237
[buyanbardakh@buyanbardakh tmp]$
```

Рис. 2: Команда ls

Опции команды ls

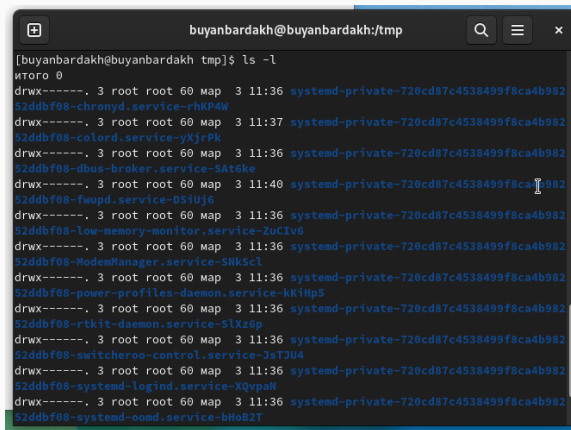


A terminal window titled 'buyanbardakh@buyanbardakh:tmp' with search, menu, and close icons in the title bar. The terminal shows the execution of the 'ls -a' command. The output lists hidden files and system services. Two lines, '.font-unix' and '.ICE-unix', are highlighted with green boxes. A cursor is visible on the line 'systemd-private-720cd87c4538499f8ca4b98252ddb08-ModemManager.service-SNkScl'.

```
buyanbardakh@buyanbardakh:tmp
systemd-private-720cd87c4538499f8ca4b98252ddb08-systemd-resolved.service-X0doM1
systemd-private-720cd87c4538499f8ca4b98252ddb08-upower.service-bzKt40
vmware-root_779-4290232237
[buyanbardakh@buyanbardakh tmp]$
[buyanbardakh@buyanbardakh tmp]$ ls -a
.
..
.font-unix
.ICE-unix
systemd-private-720cd87c4538499f8ca4b98252ddb08-chronyd.service-rhKP4W
systemd-private-720cd87c4538499f8ca4b98252ddb08-colord.service-yXjrPk
systemd-private-720cd87c4538499f8ca4b98252ddb08-dbus-broker.service-SAt6ke
systemd-private-720cd87c4538499f8ca4b98252ddb08-fwupd.service-DSiUj6
systemd-private-720cd87c4538499f8ca4b98252ddb08-low-memory-monitor.service-ZuCI
v6
systemd-private-720cd87c4538499f8ca4b98252ddb08-ModemManager.service-SNkScl
systemd-private-720cd87c4538499f8ca4b98252ddb08-power-profiles-daemon.service-K
KiHp5
systemd-private-720cd87c4538499f8ca4b98252ddb08-rtkit-daemon.service-SLxz6p
systemd-private-720cd87c4538499f8ca4b98252ddb08-switcheroo-control.service-JsTJ
u4
systemd-private-720cd87c4538499f8ca4b98252ddb08-systemd-logind.service-XQvpaN
systemd-private-720cd87c4538499f8ca4b98252ddb08-systemd-oomd.service-bHoB2T
systemd-private-720cd87c4538499f8ca4b98252ddb08-systemd-resolved.service-X0doM1
```

Рис. 3: Команда ls -a

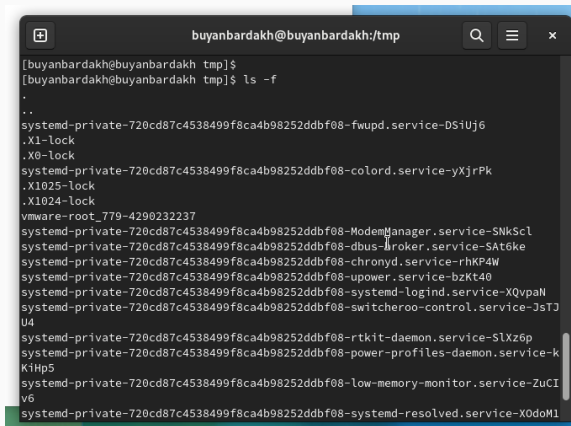
Опции команды ls



```
buyanbardakh@buyanbardakh:/tmp
[buyanbardakh@buyanbardakh tmp]$ ls -l
итого 0
drwx-----, 3 root root 60 map  3 11:36 systemd-private-720cd87c4538499f8ca4b982
52ddb08-chronyd.service-rhKP4W
drwx-----, 3 root root 60 map  3 11:37 systemd-private-720cd87c4538499f8ca4b982
52ddb08-colord.service-yXjrPk
drwx-----, 3 root root 60 map  3 11:36 systemd-private-720cd87c4538499f8ca4b982
52ddb08-dbus-broker.service-SAtske
drwx-----, 3 root root 60 map  3 11:40 systemd-private-720cd87c4538499f8ca4b982
52ddb08-fwupd.service-DSiUj6
drwx-----, 3 root root 60 map  3 11:36 systemd-private-720cd87c4538499f8ca4b982
52ddb08-low-memory-monitor.service-ZuCIv6
drwx-----, 3 root root 60 map  3 11:36 systemd-private-720cd87c4538499f8ca4b982
52ddb08-ModemManager.service-SNkScI
drwx-----, 3 root root 60 map  3 11:36 systemd-private-720cd87c4538499f8ca4b982
52ddb08-power-profiles-daemon.service-kKiHp5
drwx-----, 3 root root 60 map  3 11:36 systemd-private-720cd87c4538499f8ca4b982
52ddb08-rtkit-daemon.service-SlXz6p
drwx-----, 3 root root 60 map  3 11:36 systemd-private-720cd87c4538499f8ca4b982
52ddb08-switcheroo-control.service-JsTJU4
drwx-----, 3 root root 60 map  3 11:36 systemd-private-720cd87c4538499f8ca4b982
52ddb08-systemd-logind.service-XQvpaN
drwx-----, 3 root root 60 map  3 11:36 systemd-private-720cd87c4538499f8ca4b982
52ddb08-systemd-oomd.service-bHoB2T
```

Рис. 4: Команда ls -l

Опции команды ls

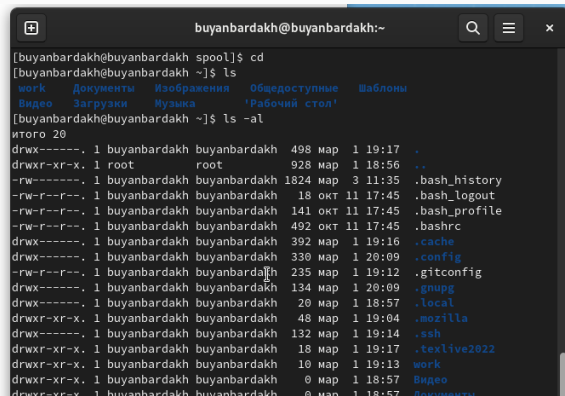
A terminal window with a dark background and light text. The title bar shows the user 'buyanbardakh' and the directory 'tmp'. The prompt is '[buyanbardakh@buyanbardakh tmp]\$'. The command 'ls -f' has been entered, and the output is a list of files and directories. The output includes: '.', '..', 'systemd-private-720cd87c4538499f8ca4b98252ddbf08-fwupd.service-DSiUj6', '.X1-lock', '.X0-lock', 'systemd-private-720cd87c4538499f8ca4b98252ddbf08-colord.service-yXjrPk', '.X1025-lock', '.X1024-lock', 'vmware-root_779-4290232237', 'systemd-private-720cd87c4538499f8ca4b98252ddbf08-ModemManager.service-SNkScL', 'systemd-private-720cd87c4538499f8ca4b98252ddbf08-dbus-broker.service-SAt6ke', 'systemd-private-720cd87c4538499f8ca4b98252ddbf08-chrond.service-rhKP4W', 'systemd-private-720cd87c4538499f8ca4b98252ddbf08-upower.service-bzKt40', 'systemd-private-720cd87c4538499f8ca4b98252ddbf08-systemd-logind.service-XQvpaN', 'systemd-private-720cd87c4538499f8ca4b98252ddbf08-switcheroo-control.service-JsTJU4', 'systemd-private-720cd87c4538499f8ca4b98252ddbf08-rtkit-daemon.service-SLxz6p', 'systemd-private-720cd87c4538499f8ca4b98252ddbf08-power-profiles-daemon.service-kKiHp5', 'systemd-private-720cd87c4538499f8ca4b98252ddbf08-low-memory-monitor.service-ZuCIv6', and 'systemd-private-720cd87c4538499f8ca4b98252ddbf08-systemd-resolved.service-X0doM1'.

```
buyanbardakh@buyanbardakh/tmp
[buyanbardakh@buyanbardakh tmp]$
[buyanbardakh@buyanbardakh tmp]$ ls -f
.
..
systemd-private-720cd87c4538499f8ca4b98252ddbf08-fwupd.service-DSiUj6
.X1-lock
.X0-lock
systemd-private-720cd87c4538499f8ca4b98252ddbf08-colord.service-yXjrPk
.X1025-lock
.X1024-lock
vmware-root_779-4290232237
systemd-private-720cd87c4538499f8ca4b98252ddbf08-ModemManager.service-SNkScL
systemd-private-720cd87c4538499f8ca4b98252ddbf08-dbus-broker.service-SAt6ke
systemd-private-720cd87c4538499f8ca4b98252ddbf08-chrond.service-rhKP4W
systemd-private-720cd87c4538499f8ca4b98252ddbf08-upower.service-bzKt40
systemd-private-720cd87c4538499f8ca4b98252ddbf08-systemd-logind.service-XQvpaN
systemd-private-720cd87c4538499f8ca4b98252ddbf08-switcheroo-control.service-JsTJU4
systemd-private-720cd87c4538499f8ca4b98252ddbf08-rtkit-daemon.service-SLxz6p
systemd-private-720cd87c4538499f8ca4b98252ddbf08-power-profiles-daemon.service-kKiHp5
systemd-private-720cd87c4538499f8ca4b98252ddbf08-low-memory-monitor.service-ZuCIv6
systemd-private-720cd87c4538499f8ca4b98252ddbf08-systemd-resolved.service-X0doM1
```

Рис. 5: Команда ls -f

```
[buyanbardakh@buyanbardakh ~]$  
[buyanbardakh@buyanbardakh tmp]$ cd /var/spool/  
[buyanbardakh@buyanbardakh spool]$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 578 фев 21 15:05 abrt  
drwx----- 1 abrt abrt 0 мар 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 мар 1 18:56 mail  
drwxr-xr-x. 1 root root 0 мар 7 2022 plymouth  
[buyanbardakh@buyanbardakh spool]$
```

Рис. 6: Каталог /var/spool



The screenshot shows a terminal window titled "buyanbardakh@buyanbardakh:~". The user has executed the command `ls`, which displays a list of files and directories in the home directory. The output is as follows:

```
[buyanbardakh@buyanbardakh ~]$ ls
work  Документы  Изображения  Общедоступные  Шаблоны
Видео  Загрузки  Музыка  'Рабочий стол'
```

Then, the user has executed the command `ls -al`, which displays a detailed list of files and directories, including permissions, owner, group, size, date, and filename. The output is as follows:

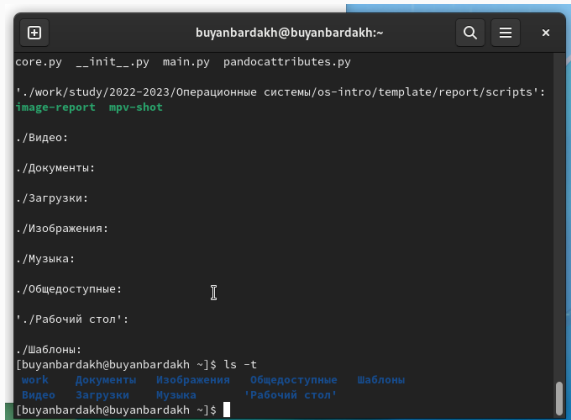
```
[buyanbardakh@buyanbardakh ~]$ ls -al
итого 20
drwx-----. 1 buyanbardakh buyanbardakh 498 мар 1 19:17 .
drwxr-xr-x. 1 root root 928 мар 1 18:56 ..
-rw-----. 1 buyanbardakh buyanbardakh 1824 мар 3 11:35 .bash_history
-rw-r--r--. 1 buyanbardakh buyanbardakh 18 окт 11 17:45 .bash_logout
-rw-r--r--. 1 buyanbardakh buyanbardakh 141 окт 11 17:45 .bash_profile
-rw-r--r--. 1 buyanbardakh buyanbardakh 492 окт 11 17:45 .bashrc
drwx-----. 1 buyanbardakh buyanbardakh 392 мар 1 19:16 .cache
drwx-----. 1 buyanbardakh buyanbardakh 330 мар 1 20:09 .config
-rw-r--r--. 1 buyanbardakh buyanbardakh 235 мар 1 19:12 .gitconfig
drwx-----. 1 buyanbardakh buyanbardakh 134 мар 1 20:09 .gnupg
drwx-----. 1 buyanbardakh buyanbardakh 20 мар 1 18:57 .local
drwxr-xr-x. 1 buyanbardakh buyanbardakh 48 мар 1 19:04 .mozilla
drwx-----. 1 buyanbardakh buyanbardakh 132 мар 1 19:14 .ssh
drwxr-xr-x. 1 buyanbardakh buyanbardakh 18 мар 1 19:17 .texlive2022
drwxr-xr-x. 1 buyanbardakh buyanbardakh 10 мар 1 19:13 work
drwxr-xr-x. 1 buyanbardakh buyanbardakh 0 мар 1 18:57 Видео
drwxr-xr-x. 1 buyanbardakh buyanbardakh 0 мар 1 18:57 Документы
```

Рис. 7: Файлы в домашнем каталоге

```
[buyanbardakh@buyanbardakh ~]$  
[buyanbardakh@buyanbardakh ~]$  
[buyanbardakh@buyanbardakh ~]$ mkdir newdr  
[buyanbardakh@buyanbardakh ~]$ mkdir newdir/morefun  
mkdir: невозможно создать каталог «newdir/morefun»: Нет такого файла или каталог  
a  
[buyanbardakh@buyanbardakh ~]$ mkdir newdr/morefun  
[buyanbardakh@buyanbardakh ~]$ mkdir letters memos misk  
[buyanbardakh@buyanbardakh ~]$ ls  
letters  misk  work  Документы  Изображения  Общедоступные  Шаблоны  
memos   newdr  Видео  Загрузки  Музыка      'Рабочий стол'  
[buyanbardakh@buyanbardakh ~]$ rm letters/ memos/ misk/  
rm: невозможно удалить 'letters/': Это каталог  
rm: невозможно удалить 'memos/': Это каталог  
rm: невозможно удалить 'misk/': Это каталог  
[buyanbardakh@buyanbardakh ~]$ rm -r letters/ memos/ misk/  
[buyanbardakh@buyanbardakh ~]$ rm -r newdr/  
[buyanbardakh@buyanbardakh ~]$ ls  
work  Документы  Изображения  Общедоступные  Шаблоны  
Видео  Загрузки  Музыка      'Рабочий стол'  
[buyanbardakh@buyanbardakh ~]$
```

Рис. 8: Действия с каталогами

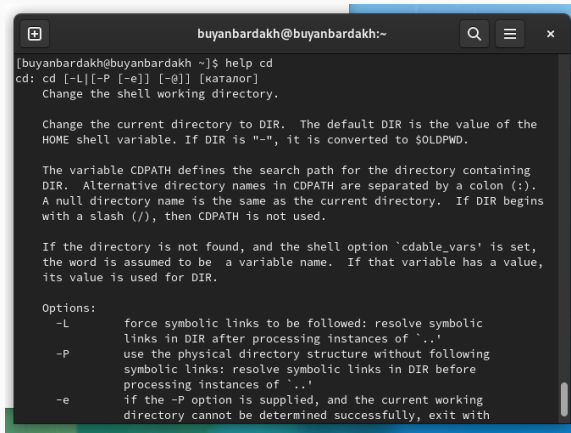
Опции команды ls



A terminal window titled 'buyanbardakh@buyanbardakh:~' showing the output of the 'ls -t' command. The output lists files and directories sorted by modification time. The files are: 'core.py', '__init__.py', 'main.py', and 'pandocattributes.py'. The directory listing is as follows:

```
./work/study/2022-2023/Операционные системы/os-intro/template/report/scripts':  
image-report mpv-shot  
  
./Видео:  
  
./Документы:  
  
./Загрузки:  
  
./Изображения:  
  
./Музыка:  
  
./Общедоступные:  
  
./Рабочий стол':  
  
./Шаблоны:  
[buyanbardakh@buyanbardakh ~]$ ls -t  
work      Документы  Изображения  Общедоступные  Шаблоны  
Видео     Загрузки  Музыка      'Рабочий стол'  
[buyanbardakh@buyanbardakh ~]$
```

Рис. 9: Команда ls -R и ls -t



```
buyanbardakh@buyanbardakh:~$ help cd
cd: cd [-L|[-P [-e]] [-@]] [катанор]
    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.

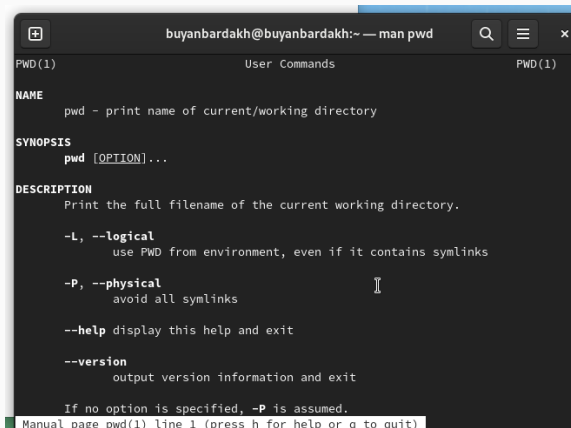
    The variable CDPATH defines the search path for the directory containing
    DIR.  Alternative directory names in CDPATH are separated by a colon (:).
    A null directory name is the same as the current directory.  If DIR begins
    with a slash (/), then CDPATH is not used.

    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



```
buyanbardakh@buyanbardakh:~ — 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

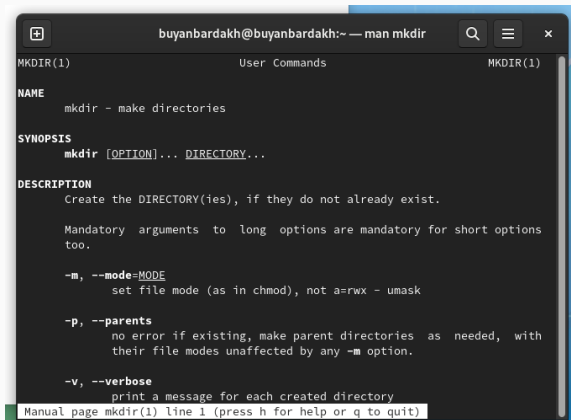
    --version
        output version information and exit

    If no option is specified, -P is assumed.

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

Рис. 11: Справка по команде pwd

Справка по командам



```
buyanbardakh@buyanbardakh:~ — 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.

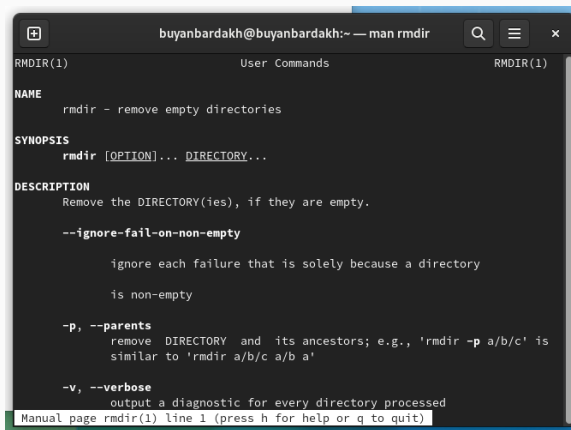
    -m, --mode=MODE
        set file mode (as in chmod), not a=rwx - umask

    -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

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

Рис. 12: Справка по команде mkdir



```
buyanbardakh@buyanbardakh:~ — 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.

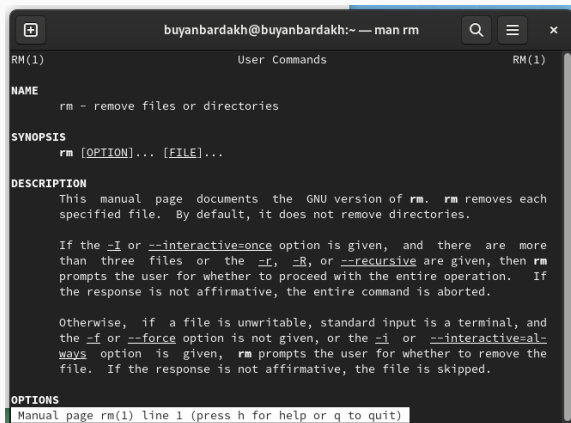
    --ignore-fail-on-non-empty
        ignore each failure that is solely because a directory
        is non-empty

    -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



```
buyanbardakh@buyanbardakh:~ — 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.

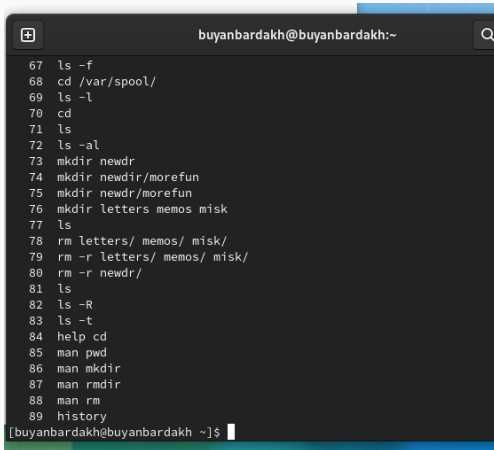
    If the -I or --interactive=once option is given, and there are more
    than three files or the -I, -R, or --recursive are given, then rm
    prompts the user for whether to proceed with the entire operation. If
    the response is not affirmative, the entire command is aborted.

    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 the user 'buyanbardakh@buyanbardakh:~'. The terminal displays a list of 21 commands, each preceded by a line number from 67 to 89. The commands are: 'ls -f', 'cd /var/spool/', 'ls -l', 'cd', 'ls', 'ls -al', 'mkdir newdr', 'mkdir newdir/morefun', 'mkdir newdr/morefun', 'mkdir letters memos msk', 'ls', 'rm letters/ memos/ msk/', 'rm -r letters/ memos/ msk/', 'rm -r newdr/', 'ls', 'ls -R', 'ls -t', 'help cd', 'man pwd', 'man mkdir', 'man rmdir', 'man rm', and 'history'. The prompt '[buyanbardakh@buyanbardakh ~]\$' is visible at the bottom.

```
buyanbardakh@buyanbardakh:~  
67 ls -f  
68 cd /var/spool/  
69 ls -l  
70 cd  
71 ls  
72 ls -al  
73 mkdir newdr  
74 mkdir newdir/morefun  
75 mkdir newdr/morefun  
76 mkdir letters memos msk  
77 ls  
78 rm letters/ memos/ msk/  
79 rm -r letters/ memos/ msk/  
80 rm -r newdr/  
81 ls  
82 ls -R  
83 ls -t  
84 help cd  
85 man pwd  
86 man mkdir  
87 man rmdir  
88 man rm  
89 history  
[buyanbardakh@buyanbardakh ~]$
```

Рис. 15: Команда history

Выводы по проделанной работе

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