

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

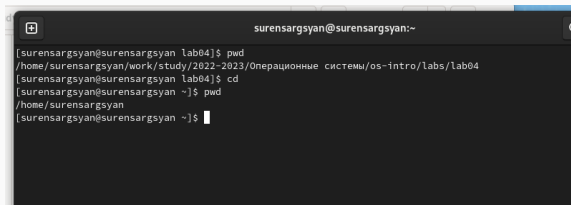
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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



```
surensargsyan@surensargsyan:~  
[surensargsyan@surensargsyan lab04]$ pwd  
/home/surensargsyan/work/study/2022-2023/Операционные системы/os-intro/labs/lab04  
[surensargsyan@surensargsyan lab04]$ cd  
[surensargsyan@surensargsyan ~]$ pwd  
/home/surensargsyan  
[surensargsyan@surensargsyan ~]$
```

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
[surensargsyan@surensargsyan ~]$  
[surensargsyan@surensargsyan ~]$ cd /tmp  
[surensargsyan@surensargsyan tmp]$ ls  
huperfdata_surensargsyan  
systemd-private-768959da35214abc98e43429dc41e599-chronyd.service-MtHkQp  
systemd-private-768959da35214abc98e43429dc41e599-colord.service-6GgKM1  
systemd-private-768959da35214abc98e43429dc41e599-dbus-broker.service-qbByh3  
systemd-private-768959da35214abc98e43429dc41e599-fwupd.service-BMhTKZ  
systemd-private-768959da35214abc98e43429dc41e599-low-memory-monitor.service-LFEiRX  
systemd-private-768959da35214abc98e43429dc41e599-ModemManager.service-kaB8t2  
systemd-private-768959da35214abc98e43429dc41e599-power-profiles-daemon.service-36qJEA  
systemd-private-768959da35214abc98e43429dc41e599-rtkit-daemon.service-8CMZuj  
systemd-private-768959da35214abc98e43429dc41e599-switcheroo-control.service-zI9vHQ  
systemd-private-768959da35214abc98e43429dc41e599-systemd-logind.service-3bmxyL  
systemd-private-768959da35214abc98e43429dc41e599-systemd-oomd.service-L1zKHg  
systemd-private-768959da35214abc98e43429dc41e599-systemd-resolved.service-nLW10m  
systemd-private-768959da35214abc98e43429dc41e599-upower.service-nr4HMo  
VMwareDnD  
vmware-root_779-4296232237  
[surensargsyan@surensargsyan tmp]$
```

Рис. 2: Команда ls

Опции команды ls

```
[suresargsyan@surensargsyan tmp] $ ls -la
.
..
.font-unix
haperdata.surensargsyan
.ICE-unix
systemd-private-768959da352114abc98e43429dc41e599-chronyd.service-WtHhQp
systemd-private-768959da352114abc98e43429dc41e599-colord.service-G0gKW1
systemd-private-768959da352114abc98e43429dc41e599-dbus-broker.service-QbYh3
systemd-private-768959da352114abc98e43429dc41e599-fwupd.service-BMhtKZ
systemd-private-768959da352114abc98e43429dc41e599-low-memory-monitor.service-LFEIrX
systemd-private-768959da352114abc98e43429dc41e599-ModemManager.service-kaB0t2
systemd-private-768959da352114abc98e43429dc41e599-power-profiles-daemon.service-36qJEA
systemd-private-768959da352114abc98e43429dc41e599-rtkit-daemon.service-8CHZuj
systemd-private-768959da352114abc98e43429dc41e599-switcheroo-control.service-zI9vHQ
systemd-private-768959da352114abc98e43429dc41e599-systemd-logind.service-3bmxyL
systemd-private-768959da352114abc98e43429dc41e599-systemd-oomd.service-1LzKHg
systemd-private-768959da352114abc98e43429dc41e599-systemd-resolved.service-niW1w
systemd-private-768959da352114abc98e43429dc41e599-upower.service-nr4MMo
VMwareDnD
vmware-root_779-4296232237
.X0-lock
.X1024-lock
.X1025-lock
.x11-unix
.X1-lock
```

Рис. 3: Команда ls -a

Опции команды ls

```
[surensargsyan@surensargsyan tmp]$ ls -l
итого 0
drwxr-xr-x. 2 surensargsyan surensargsyan 40 авр 29 13:47 hspcrdata_surensargsyan
drwx-----, 3 root root 60 авр 29 12:47 systemd-private-768959da35214abc98e43429dc41e599-ch
ronyd.service-MthkQp
drwx-----, 3 root root 60 авр 29 12:47 systemd-private-768959da35214abc98e43429dc41e599-co
lord.service-G0gKW1
drwx-----, 3 root root 60 авр 29 12:47 systemd-private-768959da35214abc98e43429dc41e599-db
us-broker.service-qB8yh3
drwx-----, 3 root root 60 авр 29 13:50 systemd-private-768959da35214abc98e43429dc41e599-fw
upd.service-BMhtKZ
drwx-----, 3 root root 60 авр 29 12:47 systemd-private-768959da35214abc98e43429dc41e599-to
w-memory-monitor.service-LFEiRX
drwx-----, 3 root root 60 авр 29 12:47 systemd-private-768959da35214abc98e43429dc41e599-Mo
demManager.service-kaB8t2
drwx-----, 3 root root 60 авр 29 12:47 systemd-private-768959da35214abc98e43429dc41e599-po
wer-profiles-daemon.service-36qJEA
drwx-----, 3 root root 60 авр 29 12:47 systemd-private-768959da35214abc98e43429dc41e599-rt
kit-daemon.service-8CMZuj
drwx-----, 3 root root 60 авр 29 12:47 systemd-private-768959da35214abc98e43429dc41e599-sw
itcheroo-control.service-zI9VNR
drwx-----, 3 root root 60 авр 29 12:47 systemd-private-768959da35214abc98e43429dc41e599-sy
stemd-logind.service-3bmxyL
drwx-----, 3 root root 60 авр 29 12:47 systemd-private-768959da35214abc98e43429dc41e599-sy
stemd-oomd.service-1LzKHg
drwx-----, 3 root root 60 авр 29 12:47 systemd-private-768959da35214abc98e43429dc41e599-sy
stemd-resolved.service-nLW10e
drwx-----, 3 root root 60 авр 29 12:47 systemd-private-768959da35214abc98e43429dc41e599-up
dater.service-M8Qe
```

Рис. 4: Команда ls -l

Опции команды ls

```
[surensargsyan@surensargsyan tmp]$ ls -f
.
..
systemd-private-768959da35214abc98e43429dc41e599-fwupd.service-BMhtKZ
hsperfdata_surensargsyan
VMwareDnD
.X11-lock
.X0-lock
systemd-private-768959da35214abc98e43429dc41e599-colord.service-G0gKWl
.X1025-lock
.X1024-lock
systemd-private-768959da35214abc98e43429dc41e599-ModemManager.service-ka80t2
vmware-root_779-4290232237
systemd-private-768959da35214abc98e43429dc41e599-dbus-broker.service-qbByh3
systemd-private-768959da35214abc98e43429dc41e599-chronyd.service-NthKQp
systemd-private-768959da35214abc98e43429dc41e599-upower.service-nr4MMo
systemd-private-768959da35214abc98e43429dc41e599-systemd-logind.service-3bmxyL
systemd-private-768959da35214abc98e43429dc41e599-switcheroo-control.service-zI9vHQ
systemd-private-768959da35214abc98e43429dc41e599-rtkit-daemon.service-8CMZuj
systemd-private-768959da35214abc98e43429dc41e599-power-profiles-daemon.service-36q3EA
systemd-private-768959da35214abc98e43429dc41e599-low-memory-monitor.service-LFEIrX
systemd-private-768959da35214abc98e43429dc41e599-systemd-resolved.service-nLWl0m
systemd-private-768959da35214abc98e43429dc41e599-systemd-oomd.service-Ll2KHg
.font-unix
.XIM-unix
.ICE-unix
```

Рис. 5: Команда ls -f

Каталог /var/spool

```
[surensargsyan@surensargsyan tmp]$  
[surensargsyan@surensargsyan tmp]$ cd /var/spool/  
[surensargsyan@surensargsyan spool]$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 578 июн 22 11:07 abrt  
drwx-----. 1 abrt abrt  0 мар 11  2022 abrt-upload  
drwx--x---. 1 root lp    6 окт  3  2022 cups  
drwxr-xr-x. 1 root root  0 авг  9  2022 lpd  
drwxrwxr-x. 1 root mail 454 авг 29 12:45 mail  
drwxr-xr-x. 1 root root  0 мар  7  2022 plymouth  
[surensargsyan@surensargsyan spool]$
```

Рис. 6: Каталог /var/spool

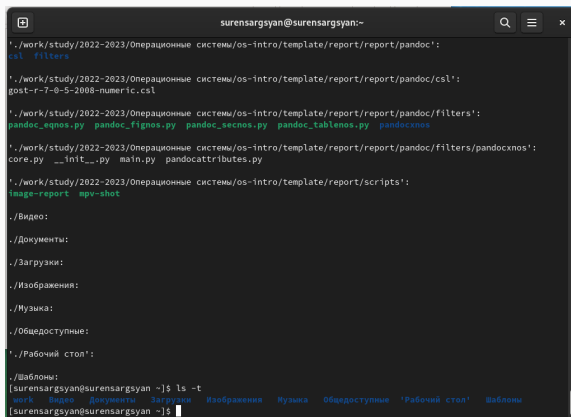
```
[surensargssyan@surensargssyan ~]$ ls
[surensargssyan@surensargssyan ~]$ cd
[surensargssyan@surensargssyan ~]$ ls
work Видео Документы Загрузки Изображения Музыка Общедоступные 'Рабочий стол' Шаблоны
[surensargssyan@surensargssyan ~]$ ls -al
итого 24
drwx----- 1 surensargssyan surensargssyan 510 авг 29 13:27 .
drwxr-xr-x 1 root root 448 авг 29 12:45 ..
-rw----- 1 surensargssyan surensargssyan 1465 авг 29 14:08 .bash_history
-rw-r--r-- 1 surensargssyan surensargssyan 18 окт 11 2022 .bash_logout
-rw-r--r-- 1 surensargssyan surensargssyan 141 окт 11 2022 .bash_profile
-rw-r--r-- 1 surensargssyan surensargssyan 492 окт 11 2022 .bashrc
drwx----- 1 surensargssyan surensargssyan 392 авг 29 13:26 .cache
drwx----- 1 surensargssyan surensargssyan 304 авг 29 13:47 .config
-rw-r--r-- 1 surensargssyan surensargssyan 334 янв 28 2023 .emacs
-rw-r--r-- 1 surensargssyan surensargssyan 236 авг 29 13:17 .gitconfig
drwx----- 1 surensargssyan surensargssyan 134 авг 29 13:20 .gnupg
drwx----- 1 surensargssyan surensargssyan 20 авг 29 12:49 .local
drwxr-xr-x 1 surensargssyan surensargssyan 48 авг 29 12:54 .mozilla
drwx----- 1 surensargssyan surensargssyan 132 авг 29 13:20 .ssh
drwxr-xr-x 1 surensargssyan surensargssyan 18 авг 29 13:27 .texlive2022
drwxr-xr-x 1 surensargssyan surensargssyan 10 авг 29 13:19 work
drwxr-xr-x 1 surensargssyan surensargssyan 0 авг 29 12:49 Видео
drwxr-xr-x 1 surensargssyan surensargssyan 0 авг 29 12:49 Документы
drwxr-xr-x 1 surensargssyan surensargssyan 0 авг 29 12:49 Загрузки
drwxr-xr-x 1 surensargssyan surensargssyan 0 авг 29 12:49 Изображения
drwxr-xr-x 1 surensargssyan surensargssyan 0 авг 29 12:49 Музыка
drwxr-xr-x 1 surensargssyan surensargssyan 0 авг 29 12:49 Общедоступные
drwxr-xr-x 1 surensargssyan surensargssyan 0 авг 29 12:49 'Рабочий стол'
drwxr-xr-x 1 surensargssyan surensargssyan 0 авг 29 12:49 Шаблоны
[surensargssyan@surensargssyan ~]$
```

Рис. 7: Файлы в домашнем каталоге

```
[surensargsyan@surensargsyan ~]$  
[surensargsyan@surensargsyan ~]$ mkdir newdir  
[surensargsyan@surensargsyan ~]$ mkdir newdir/morefun  
[surensargsyan@surensargsyan ~]$ mkdir letters memos misk  
[surensargsyan@surensargsyan ~]$ rm -r letters/ memos/ misk/  
[surensargsyan@surensargsyan ~]$ rm -r newdir/  
[surensargsyan@surensargsyan ~]$ ls  
work  Видео  Документы  Загрузки  Изображения  Музыка  Общедоступные  'Рабочий стол'  Шаблоны  
[surensargsyan@surensargsyan ~]$
```

Рис. 8: Действия с каталогами

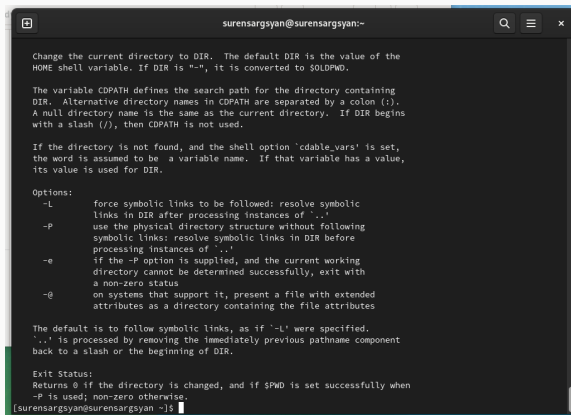
Опции команды ls



```
surensargssyan@surensargssyan:~  
$ ls -R  
./work/study/2022-2023/Операционные системы/os-intro/template/report/report/pandoc':  
cs1_filters  
  
'./work/study/2022-2023/Операционные системы/os-intro/template/report/report/pandoc/csl':  
gost-r-7-0-5-2008-numeric.csl  
  
'./work/study/2022-2023/Операционные системы/os-intro/template/report/report/pandoc/filters':  
pandoc_eqnos.py  pandoc_fignos.py  pandoc_secnos.py  pandoc_tablenos.py  pandocxnos  
  
'./work/study/2022-2023/Операционные системы/os-intro/template/report/report/pandoc/filters/pandocxnos':  
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:  
[surensargssyan@surensargssyan ~]$ ls -t  
work  Видео  Документы  Загрузки  Изображения  Музыка  Общедоступные  'Рабочий стол'  Шаблоны  
[surensargssyan@surensargssyan ~]$
```

Рис. 9: Команда ls -R и ls -t

Справка по командам



```
surensargsyan@surensargsyan:~$ cd --help

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.

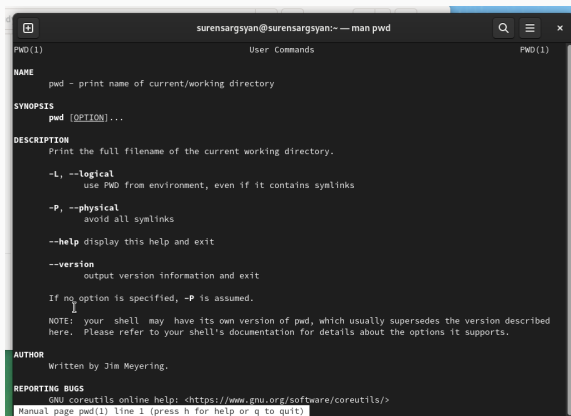
Options:
  -L      force symbolic links to be followed: resolve symbolic
          links in DIR after processing instances of '..'
  -P      use the physical directory structure without following
          symbolic links: resolve symbolic links in DIR before
          processing instances of '..'
  -e      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.

Exit Status:
Returns 0 if the directory is changed, and if $PWD is set successfully when
-P is used; non-zero otherwise.
[surensargsyan@surensargsyan ~]$
```

Рис. 10: Справка по команде cd

Справка по командам



```
surensargsyan@surensargsyan:~ — 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.

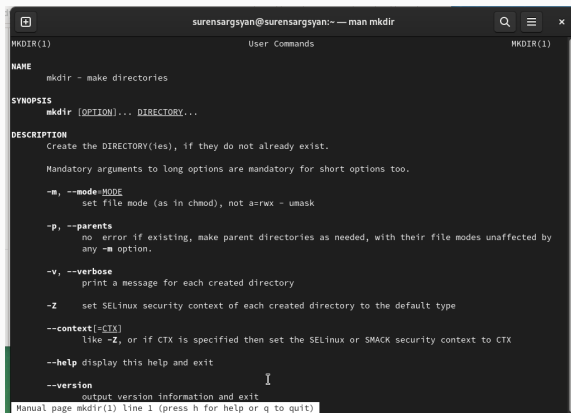
  NOTE: your shell may have its own version of pwd, which usually supersedes the version described
  here. Please refer to your shell's documentation for details about the options it supports.

AUTHOR
  Written by Jim Meyering.

REPORTING BUGS
  GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
  Manual page pwd(1) line 1 (press h for help or q to quit)
```

Рис. 11: Справка по команде pwd

Справка по командам



```
surensargsyan@surensargsyan:~ — 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

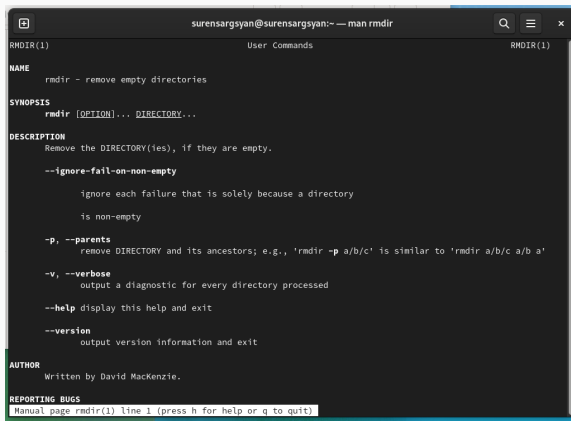
    --help
        display this help and exit

    --version
        output version information and exit

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

Рис. 12: Справка по команде mkdir

Справка по командам



```
surensargssyan@surensargssyan:~ — 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

    --help
        display this help and exit

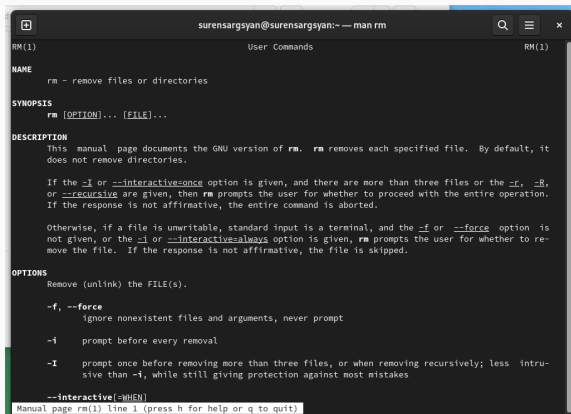
    --version
        output version information and exit

AUTHOR
    Written by David MacKenzie.

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

Рис. 13: Справка по команде rmdir

Справка по командам



```
surensargsyan@surensargsyan:~ -- 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 -E, -B, 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

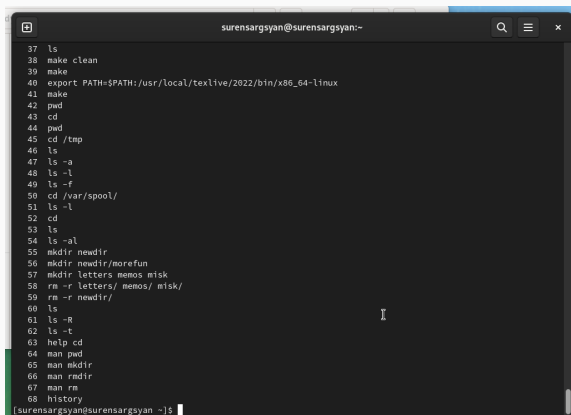
  -I
    prompt once before removing more than three files, or when removing recursively; less intrusive than -i, while still giving protection against most mistakes

  --interactive=[WHEN]

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 titled 'surensargssyan@surensargssyan:~' with search, menu, and close icons in the title bar. The terminal displays a list of 28 commands numbered 37 to 68. The commands include file system operations like 'ls', 'cd', 'pwd', 'mkdir', 'rm', and 'man'. The prompt at the bottom is '[surensargssyan@surensargssyan ~]\$'.

```
37 ls
38 make clean
39 make
40 export PATH=$PATH:/usr/local/texlive/2022/bin/x86_64-linux
41 make
42 pwd
43 cd
44 pwd
45 cd /tmp
46 ls
47 ls -a
48 ls -l
49 ls -f
50 cd /var/spool/
51 ls -l
52 cd
53 ls
54 ls -al
55 mkdir newdir
56 mkdir newdir/morefun
57 mkdir letters memos misk
58 rm -r letters/ memos/ misk/
59 rm -r newdir/
60 ls
61 ls -R
62 ls -t
63 help cd
64 man pwd
65 man mkdir
66 man rmdir
67 man rm
68 history
[surensargssyan@surensargssyan ~]$
```

Рис. 15: Команда history

Выводы по проделанной работе

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