

Лабораторная работа №4

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Вводная часть

В операционной системе типа Linux взаимодействие пользователя с системой обычно осуществляется с помощью командной строки посредством построчного ввода команд. При этом обычно используется командные интерпретаторы языка shell: /bin/sh; /bin/csh; /bin/ksh. Формат команды. Командой в операционной системе называется записанный по специальным правилам текст (возможно с аргументами), представляющий собой указание на выполнение какой-либо функций (или действий) в операционной системе. Обычно первым словом идёт имя команды, остальной текст — аргументы или опции, конкретизирующие действие.

Объект и предмет исследования

- Команда man
- Команда cd
- Команда pwd
- Команда ls
- Команда mkdir
- Команда rm
- Команда history

Цель работы

Цель работы

Целью лабораторной работы является приобретение практических навыков взаимодействия пользователя с системой по-средством командной строки.

Выполнение лабораторной работы

Первый этап

Определим полное имя вашего домашнего каталога. Далее относительно этого каталога будут выполняться последующие упражнения.

```
kmsaljkova@dk8n81 ~ $ cd  
kmsaljkova@dk8n81 ~ $ pwd  
/afs/.dk.sci.pfu.edu.ru/home/k/m/kmsaljkova
```

Рис. 1: Имя домашнего каталога

Второй этап

Перейдём в каталог /tmp

```
kmsaljikova@dk8n81 ~ $ cd /tmp
```

Рис. 2: Переход в каталог /tmp

Выведем на экран содержимое каталога /tmp с помощью команды ls

```
kmsaljkova@dk8n81: /tmp $ ls
ayoshina
deovchinikov
gnome-desktop-thumbnailer-068901
gnome-desktop-thumbnailer-3X0011
gnome-desktop-thumbnailer-4KNO11
gnome-desktop-thumbnailer-4QL11
gnome-desktop-thumbnailer-4TQ0011
gnome-desktop-thumbnailer-5FP011
gnome-desktop-thumbnailer-5JEN11
gnome-desktop-thumbnailer-650011
gnome-desktop-thumbnailer-6LMN11
gnome-desktop-thumbnailer-6XTM11
gnome-desktop-thumbnailer-7J4E11
gnome-desktop-thumbnailer-7HDH11
gnome-desktop-thumbnailer-8XNO11
gnome-desktop-thumbnailer-A3QF11
gnome-desktop-thumbnailer-ALAP11
gnome-desktop-thumbnailer-AR8M11
gnome-desktop-thumbnailer-CR5B11
gnome-desktop-thumbnailer-CRQ0011
gnome-desktop-thumbnailer-D20011
gnome-desktop-thumbnailer-DL0011
gnome-desktop-thumbnailer-DHO0011
gnome-desktop-thumbnailer-E1BN11
gnome-desktop-thumbnailer-FD7G11
gnome-desktop-thumbnailer-f0BD011
gnome-desktop-thumbnailer-G90011
gnome-desktop-thumbnailer-GJ7M11
gnome-desktop-thumbnailer-GHNf11
gnome-desktop-thumbnailer-HVY011
gnome-desktop-thumbnailer-I9K011
gnome-desktop-thumbnailer-IKQ9011
gnome-desktop-thumbnailer-IUWH11
gnome-desktop-thumbnailer-JDHO11
gnome-desktop-thumbnailer-JRQ9011
gnome-desktop-thumbnailer-KYQH11
gnome-desktop-thumbnailer-MC0011
gnome-desktop-thumbnailer-MCQ011
gnome-desktop-thumbnailer-MKN011
gnome-desktop-thumbnailer-O3D0011
gnome-desktop-thumbnailer-OLMH11
gnome-desktop-thumbnailer-QILP11
gnome-desktop-thumbnailer-QND9011
gnome-desktop-thumbnailer-QQ20011
gnome-desktop-thumbnailer-S00A11
gnome-desktop-thumbnailer-S44E11
gnome-desktop-thumbnailer-S77I11
gnome-desktop-thumbnailer-S97F11
gnome-desktop-thumbnailer-U7AH11
gnome-desktop-thumbnailer-V695011
gnome-desktop-thumbnailer-V9Q7011
gnome-desktop-thumbnailer-XMYH11
gnome-desktop-thumbnailer-XYO011
gnome-desktop-thumbnailer-YIHN11
gnome-desktop-thumbnailer-YMXF11
gnome-desktop-thumbnailer-YSPO011
gnome-desktop-thumbnailer-YXUJ11
gnome-desktop-thumbnailer-YZH111
gnome-desktop-thumbnailer-ZVOJ11
grilo-plugin-cache-0R0R11
grilo-plugin-cache-UPPR11
kmsaljkova
krb5cc_4953_pE55nA
krb5cc_4953_TebDZH
krb5cc_5070_c3kMoJ
pulse-PKdhtXHmr18n
root
systemd-private-a47cf4662f63469fba03625c8dc0b353-colord.service-zMZ
systemd-private-a47cf4662f63469fba03625c8dc0b353-systemd-logind.ser
systemd-private-a47cf4662f63469fba03625c8dc0b353-upower.service-DMV
Temp-f035f59b-6980-4b3d-bd07-6b75c83b40db
tmux-0
tracker-extract-3-files.4953
```

Рис. 3: ls

Сравним команды `ls -a` и `ls -F`

```
ls -a
```

Команда ls с опцией -a отображает имена скрытых файлов

Рис. 4: ls -a

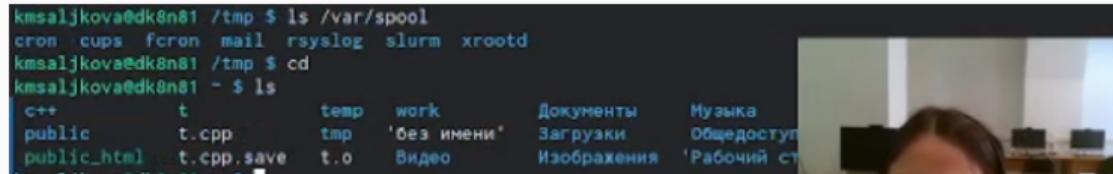
ls -F

Команда ls с опцией -F даёт информацию о типах файлов

```
kmsaljkova@dk8n81 /tmp $ ls -F  
aykashina/  
deovchinnikov/  
gnome-desktop-thumbnailer-068901/  
gnome-desktop-thumbnailer-0A3F11/  
gnome-desktop-thumbnailer-3X0011/  
gnome-desktop-thumbnailer-4KNO11/  
gnome-desktop-thumbnailer-4QVL11/  
gnome-desktop-thumbnailer-4TOO11/  
gnome-desktop-thumbnailer-5FF011/  
gnome-desktop-thumbnailer-5JEN11/  
gnome-desktop-thumbnailer-650011/  
gnome-desktop-thumbnailer-6LMN11/  
gnome-desktop-thumbnailer-6X7M11/  
gnome-desktop-thumbnailer-7J4E11/  
gnome-desktop-thumbnailer-7H0H11/  
gnome-desktop-thumbnailer-8XN011/  
gnome-desktop-thumbnailer-A3QF11/  
gnome-desktop-thumbnailer-ALAP11/  
gnome-desktop-thumbnailer-ARBM11/  
gnome-desktop-thumbnailer-CR3B11/  
gnome-desktop-thumbnailer-CR0Q11/  
gnome-desktop-thumbnailer-D20011/  
gnome-desktop-thumbnailer-DL0011/  
gnome-desktop-thumbnailer-DMO011/  
gnome-desktop-thumbnailer-E1BN11/  
gnome-desktop-thumbnailer-F07G11/  
gnome-desktop-thumbnailer-FD8D11/  
gnome-desktop-thumbnailer-G80011/  
gnome-desktop-thumbnailer-G77M11/  
gnome-desktop-thumbnailer-GMNF11/  
gnome-desktop-thumbnailer-HYYG11/  
gnome-desktop-thumbnailer-HZP011/  
gnome-desktop-thumbnailer-I9K011/  
gnome-desktop-thumbnailer-IKQ901/  
gnome-desktop-thumbnailer-IUHM11/  
gnome-desktop-thumbnailer-JDM011/  
gnome-desktop-thumbnailer-JEO011/  
gnome-desktop-thumbnailer-JRQ901/
```

Рис. 5: ls -F

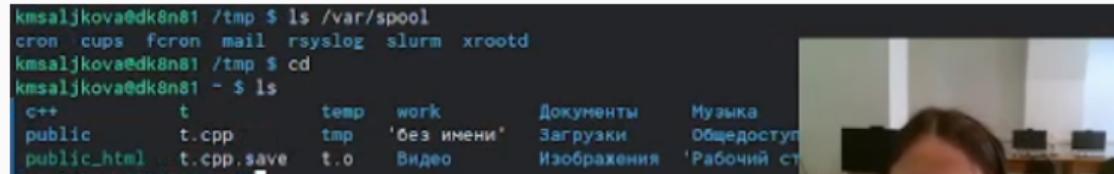
Определим, есть ли в каталоге /var/spool подкаталог с именем cron



```
kmsaljkova@dk8n81 /tmp $ ls /var/spool
cron cups fcron mail rsyslog slurm xrootd
kmsaljkova@dk8n81 /tmp $ cd
kmsaljkova@dk8n81 ~ $ ls
c++      t      temp  work      Документы      Музыка
public    t.cpp   tmp  'без имени'  Загрузки  Общедоступ
public_html t.cpp.save t.o  Видео  Изображения  'Рабочий ст...
```

Рис. 6: Проверяем содержимое каталога /var/spool

Переходим в домашний каталог и выводим на экран его содержимое.



A screenshot of a terminal window showing the user's home directory contents. The terminal output is as follows:

```
kmsaljkova@dk8n81 /tmp $ ls /var/spool  
cron cups fcron mail rsyslog slurm xrootd  
kmsaljkova@dk8n81 /tmp $ cd  
kmsaljkova@dk8n81 ~ $ ls  
c++ t temp work Документы Музыка  
public t.cpp tmp 'без имени' Загрузки Общедоступ  
public_html t.cpp.save t.o Видео Изображения 'Рабочий ст
```

The terminal window has a dark background and light-colored text. The cursor is visible at the end of the command line. In the background, a blurred image of a person wearing headphones is visible.

Рис. 7: Домашний каталог

Определим, кто является владельцем файлов и подкаталогов с помощью команды ls -l

```
kmsaljkova@dk8n81 ~ $ ls -l
итого 53
drwxr-xr-x 2 kmsaljkova studsci 2048 окт  6 16:12 c++
drwxr-xr-x 3 kmsaljkova root     2048 сен  2 21:29 public
lrwxr=xr-x 1 kmsaljkova root     18 фев  5 13:19 public_html -> public/public_html
-rwxr-xr-x 1 kmsaljkova studsci 17032 мар  2 11:47 t
-rw-r--r-- 1 kmsaljkova studsci  776 мар  2 11:54 t.cpp
-rw-r--r-- 1 kmsaljkova studsci   43 мар  2 11:54 t.cpp.save
drwxr-xr-x 2 kmsaljkova studsci 2048 сен 29 16:25 temp
drwxr-xr-x 2 kmsaljkova studsci 2048 сен 29 15:53 tmp
-rw-r--r-- 1 kmsaljkova studsci 5872 мар  2 11:47 t.o
drwxr-xr-x 3 kmsaljkova studsci 2048 мар  2 13:19 work
-rw-r--r-- 1 kmsaljkova studsci   81 мар  1 16:39 'без имени'
drwxr-xr-x 2 kmsaljkova studsci 2048 сен  7 11:12 Видео
drwxr-xr-x 2 kmsaljkova studsci 2048 сен  7 11:12 Документы
drwxr-xr-x 2 kmsaljkova studsci 2048 мар  2 13:43 Загрузки
drwxr-xr-x 2 kmsaljkova studsci 2048 мар  2 11:30 Изображения
drwxr-xr-x 2 kmsaljkova studsci 2048 сен  7 11:12 Музыка
drwxr-xr-x 2 kmsaljkova studsci 2048 сен  7 11:12 Общедоступные
drwxr-xr-x 2 kmsaljkova studsci 2048 ноя 25 12:16 'Рабочий стол'
drwxr-xr-x 2 kmsaljkova studsci 2048 сен  7 11:12 Шаблоны
```

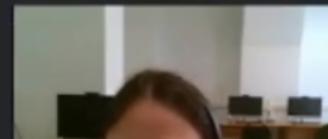
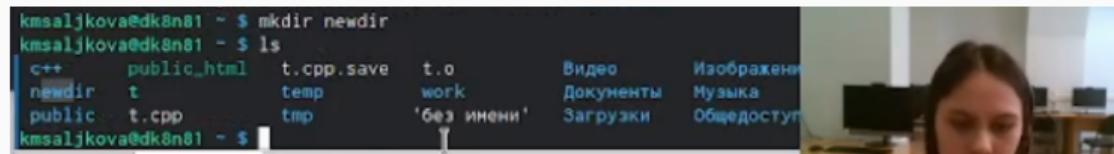


Рис. 8: Имя домашнего каталога

Третий этап

В домашнем каталоге создаём новый каталог с именем newdir.



```
kmsaljкова@dk8n81 ~ $ mkdir newdir
kmsaljкова@dk8n81 ~ $ ls
c++    public_html   t.cpp.save  t.o          Видео      Изображени
newdir  t            temp       work        Документы  Музыка
public  t.cpp        tmp        'без имени' Загрузки  Общедоступ
kmsaljкова@dk8n81 ~ $
```

A screenshot of a terminal window on a Linux desktop. The terminal shows the command 'mkdir newdir' being run and the resulting directory listing. The desktop environment includes a dock with icons for 'c++', 'public_html', 't.cpp.save', 't.o', 'Видео' (Video), 'Изображени' (Images), 'newdir', 't', 'temp', 'work', 'Документы' (Documents), 'Музыка' (Music), 'public', 't.cpp', 'tmp', "'без имени'" (Nameless), 'Загрузки' (Downloads), and 'Общедоступ' (Public). A woman's face is visible in the background, looking down at the screen.

Рис. 9: Создание каталога newdir

В каталоге ~/newdir создаём новый каталог с именем morefun.

```
kmsaljkova@dk8n81 ~ $ cd newdir  
kmsaljkova@dk8n81 ~/newdir $ mkdir morefun  
kmsaljkova@dk8n81 ~/newdir $ ls  
morefun
```

Рис. 10: Создание каталога morefun

В домашнем каталоге создаём одной командой три новых каталога с именами letters, memos, misk. Затем удаляем эти каталоги одной командой

```
kmsaljkova@dk8n81 ~ $ mkdir letters memos misk
kmsaljkova@dk8n81 ~ $ ls
c++      misk      public_html    t.cpp.save    t.o          Видео      Изображения   'Рабочий стол'
letters  newdir    t              temp         work        Документы   Музыка       Шаблоны
memos    public    t.cpp         tmp          'без имени'  Загрузки   Общедоступные
kmsaljkova@dk8n81 ~ $ rm letters memos misk
rm: невозможно удалить 'letters': Это каталог
rm: невозможно удалить 'memos': Это каталог
rm: невозможно удалить 'misk': Это каталог
kmsaljkova@dk8n81 ~ $ rm -r letters memos misk
kmsaljkova@dk8n81 ~ $ ls
```

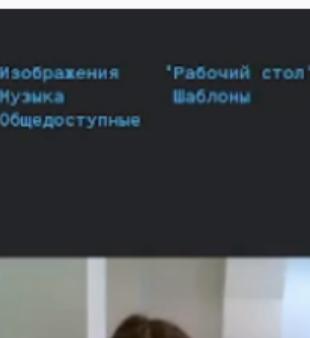
A screenshot of a terminal window showing a file listing and removal process. The terminal shows the user's home directory (~) and lists files and directories including 'c++', 'misk', 'public_html', 't.cpp.save', 't.o', 'letters', 'newdir', 't', 'temp', 'work', 'memos', 'public', 't.cpp', 'tmp', and a folder named 'без имени'. The user runs 'rm letters memos misk' which fails because each is a directory. Then they run 'rm -r letters memos misk' successfully, and the directory entries are removed from the list.

Рис. 11: Создание каталогов и их удаление

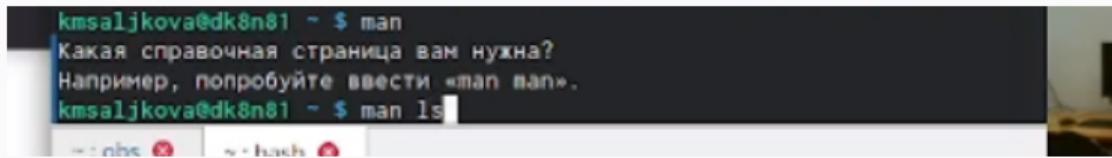
Удалим каталог `~/newdir/morefun` из домашнего каталога. Проверьте, был ли каталог удалён.

```
kmsaljкова@dk8n81 ~ $ rm -r newdir
kmsaljкова@dk8n81 ~ $ ls
c++          t          temp   work      Документы      Музыка
public       t.cpp       tmp     'без имени'  Загрузки    общедоступ
public_html  t.cpp.save  t.o     Видео        Изображения 'Рабочий ст...
```

Рис. 12: Удаление каталога `newdir`

Четвёртый этап

С помощью команды man определяем, какую опцию команды ls нужно использовать для просмотра содержимого не только указанного каталога, но и подкаталогов, входящих в него.



A screenshot of a terminal window titled 'Terminal'. The window shows a user's session on a Linux system. The user has typed 'man' followed by a space, and the terminal is prompting for a page number or command. Below the prompt, it says 'Например, попробуйте ввести «man ls».' (For example, try entering 'man ls'). The user has then typed 'ls' and pressed Enter. The terminal shows the command 'kmsaljkova@dk8n81 ~ \$ man ls' at the bottom. The background of the terminal window shows a blurred image of a landscape with mountains and water.

Рис. 13: Команда man ls

```
LS(1)                               User Commands
NAME
ls - list directory contents
SYNOPSIS
ls [OPTION]... [FILE]...
DESCRIPTION
List information about the FILEs (the current directory by default). Sort entries alphabetically if neither -cftuvSUX nor --sort is specified.

Mandatory arguments to long options are mandatory for short options too.

-a, --all
      do not ignore entries starting with .

-A, --almost-all
      do not list implied . and ..

--author
      with -l, print the author of each file

--b, --escape
      print C-style escapes for nongraphic characters

--block-size=SIZE
      with -l, scale sizes by SIZE when printing them; e.g., '--block-size=M'; see SIZE format

-B, --ignore-backups
      do not list implied entries ending with ~

-c      with -lt: sort by, and show, ctime (time of last modification of file status information)
      -lt   show ctime and sort by name; otherwise: sort by ctime, newest first

-C      list entries by columns

--color[=WHEN]
      color the output WHEN; more info below

-d, --directory
      list directories themselves, not their contents

-D, --dired
      generate output designed for Emacs' dired mode

-f      list all entries in directory order

-F, --classify[=WHEN]
      append indicator (one of */=>#) to entries WHEN

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



Рис. 14: Команда man ls

```
like -l, but list numeric user and group IDs
-N, --literal
    print entry names without quoting
-o   like -l, but do not list group information
-p, --indicator-style=linux
    append / indicator to directories
-q, --hide-control-chars
    print ? instead of nongraphic characters
--show-control-chars
    show nongraphic characters as-is (the default, unless program is 'ls' and output is a terminal)
-Q, --quote-name
    enclose entry names in double quotes
--quoting-style=WORD
    use quoting style WORD for entry names: literal, locale, shell, shell-always, shell-escape,
    shell-escape-always, c. escape (overrides QUOTING_STYLE environment variable)
-r, --reverse
    reverse order while sorting
-R, --recursive
    list subdirectories recursively
-s, --size
    print the allocated size of each file, in blocks
-S    sort by file size, largest first
--sort=WORD
    sort by WORD instead of name: none (-N), size (-S), time (-t), version (-v), extension (-x), width
--time=WORD
    change the default of using modification times; access time (-u): atime, access, use; change time
    (-c): ctime, status; birth time: birth, creation;

    with -l, WORD determines which time to show; with --sort=long, sort by WORD (newest first)
--time-style=TIME_STYLE
    time/date format with -l; see TIME_STYLE below
-t    sort by time, newest first; see --time
-T, --tabsize=COLS
    assume tab stops at each COLS instead of 8
ls: page 1 of 1 line 199 (press h for help or q to quit)
```

Рис. 15: -R, -recursive

Нужно использовать команду ls -R

Пятый этап

С помощью команды man определяем набор опций команды ls, позволяющий отсортировать по времени последнего изменения выводимый список содержимого каталога с развёрнутым описанием файлов.

-time-style

```
list subdirectories recursively
--size
print the allocated size of each file, in blocks
-S    sort by file size, largest first
--sort=WORD
      sort by WORD instead of name: none (-U), size (-S), time (-t), version (-v), extension (-x), width
--time=WORD
      change the default of using modification times; access time (-u): atime, access, use; change time
      (-c): ctime, status; birth time: birth, creation;
      with -l, WORD determines which time to show; with --sort=time, sort by WORD (newest first)
--time-style=TIME_STYLE
      time/date format with -l; see TIME_STYLE below
-t    sort by time, newest first; see --time
-T, --tabsize=COLS
      assume tab stops at each COLS instead of 8
-U    with -lt: sort by, and show, access time; with -l: show access time and sort by name; otherwise:
      sort by access time, newest first
-U    do not sort; list entries in directory order
-v    natural sort of (version) numbers within text
-w, --width=COLS
      set output width to COLS.  0 means no limit
-x    list entries by lines instead of by columns
-X    sort alphabetically by entry extension
-z, --context
      print any security context of each file
--zero end each output line with NUL, not newline
-l    list one file per line
--help display this help and exit
--version
      output version information and exit
ini page 1 of 1 line 136 (press h for help or q to quit)
```

Рис. 16: -time-style=TIME_STYLE

Шестой этап

Используйте команду `man` для просмотра описания следующих команд: `cd`, `pwd`, `mkdir`, `rmdir`, `rm`. Поясните основные опции этих команд.

cd

```
(CD(1P)                               POSIX Programmer's Manual                               [Linux-specific documentation]
```

PROLOG
This manual page is part of the POSIX Programmer's Manual. The Linux implementation of this interface may differ (consult the corresponding Linux manual page for details of Linux behavior), or the interface may not be implemented on Linux.

NAME
`cd` – change the working directory

SYNOPSIS
`cd [-L|-P] [directory]`

`cd -`

DESCRIPTION
The `cd` utility shall change the working directory of the current shell execution environment (see [Section 2.12, Shell Execution Environment](#)) by executing the following steps in sequence. (In the following steps, the symbol `curpath` represents an intermediate value used to simplify the description of the algorithm used by `cd`. There is no requirement that `curpath` be made visible to the application.)

1. If no `directory` operand is given and the `HOME` environment variable is empty or undefined, the default behavior is implementation-defined and no further steps shall be taken.
2. If no `directory` operand is given and the `HOME` environment variable is set to a non-empty value, the `cd` utility shall behave as if the directory named in the `HOME` environment variable was specified as the `directory` operand.
3. If the `directory` operand begins with a <slash> character, set `curpath` to the operand and proceed to step 7.
4. If the first component of the `directory` operand is dot or dot-dot, proceed to step 6.
5. Starting with the first pathname in the <icolon>-separated pathnames of `CDPATH` (see the ENVIRONMENT VARIABLES section) if the pathname is non-null, test if the concatenation of that pathname, a <slash> character (if that pathname did not end with a <slash> character, and the `directory` operand names a directory). If the pathname is null, test if the concatenation of dot, a <slash> character, and the operand names a directory. In either case, if the resulting string names an existing directory, set `curpath` to that string and proceed to step 7. Otherwise, repeat this step with the next pathname in `CDPATH` until all pathnames have been tested.
6. Set `curpath` to the `directory` operand.
7. If the “`-P`” option is in effect, proceed to step 10. If `curpath` does not begin with a <slash> character, set `curpath` to the string formed by the concatenation of the value of `PWD`, a <slash> character if the value of `PWD` did not end with a <slash> character, and `curpath`.
8. The `curpath` value shall then be converted to canonical form as follows, considering each component from beginning to end, in sequence:

`[Manual page cd(1p) line 1 (press h for help or q to quit)]`

Рис. 17: Команда man cd

pwd

```
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/>
    Report any translation bugs to <https://translationproject.org/team/>

SEE ALSO
    getcwd(3)

    Full documentation <https://www.gnu.org/software/coreutils/pwd>
    or available locally via: info '(coreutils) pwd invocation'

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GNU coreutils 9.1           April 2022
Manual page pwd(1) line 1/47 (END) (press h for help or q to quit)
```

Рис. 18: Команда man pwd

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 umask - 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

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/>

SEE ALSO
    mdir(2)

    Full documentation <https://www.gnu.org/software/coreutils/mkdir>
    or available locally via: info '(coreutils) mkdir invocation'

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```



Рис. 19: Команда man mkdir

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'

    -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/>

SEE ALSO
    rmdir(2)

    Full documentation <https://www.gnu.org/software/coreutils/rmdir>
    or available locally via: info '(coreutils) rmdir invocation'

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```

Рис. 20: Команда man rmdir

```
rm(1)                               User Commands                               rm(1)

NAME
    rm - remove files or directories
    I
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 option is given, and there are more than three files or the -t, -d, 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 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]
        prompt according to WHEN: never, once (-i), or always (-I); without WHEN, prompt always

    --one-file-system
        when removing a hierarchy recursively, skip any directory that is on a file system different
        from that of the corresponding command line argument

    --no-preserve-root
        do not treat '/' specially

    --preserve-root[=ALL]
        do not remove '/' (default); with 'all', reject any command line argument on a separate device
        from its parent

    -r, -R, --recursive
        remove directories and their contents recursively

    -d, --dir
        remove empty directories

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

Рис. 21: Команда man rm

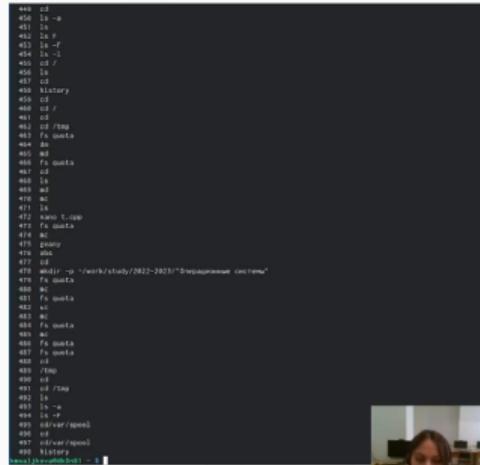
Седьмой этап

Получим при помощи команды history



```
root@kali:~# history
```

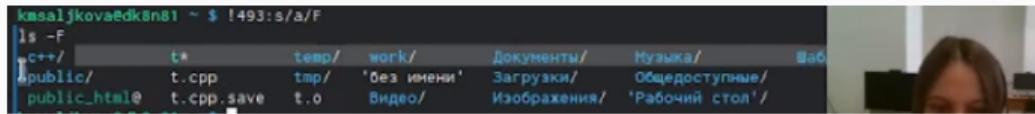
Рис. 22: Команда history



```
499 cd ~
500 ls
501 ls -p
502 ls -r
503 ls -l
504 ls /
505 cd /
506 ls
507 cd
508 history
509 cd
510 cd /tmp
511 ls -a
512 ls -a
513 ls -a
514 ls -a
515 ls -a
516 ls -a
517 ls -a
518 ls -a
519 ls -a
520 ls -a
521 ls -a
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567 ls -a
568 ls -a
569 ls -a
570 ls -a
571 ls -a
572 nano t.sh
573 nano t.sh
574 ac
575 poway
576 ac
577 cd
578 mkdir -p ~/work/study/2022-2023/"Операционные системы"
579 nano t.sh
580 ac
581 ls -a
582 ls -a
583 ac
584 ls -a
585 ac
586 ls -a
587 ls -a
588 ls -a
589 ls -a
590 ls -a
591 cd
592 /tmp
593 ls
594 ls -a
595 cdvar/spool
596 cdvar/spool
597 cdvar/spool
598 history
```

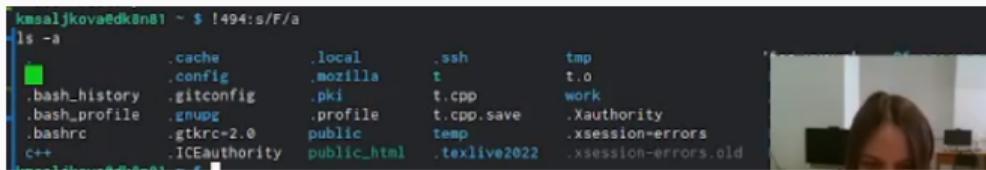
Рис. 23: Команда history

Выполним модификацию и исполнение нескольких команд из буфера команд



```
kmsaljkova@dkan81 ~ $ !493:s/a/F
ls -F
c++/      t*      temp/   work/    Документы/   Музыка/   Шаблонов/
public/    t.cpp     tmp/   'без имени'   Загрузки/   Общедоступные/
public_html@ t.cpp.save  t.o   Видео/   Изображения/ 'Рабочий стол'/
```

Рис. 24: Модификация команды №493



```
kmsaljkova@dkan81 ~ $ !494:s/F/a
ls -a
.cache      .local      .ssh      .tmp
.config     .mozilla    t*       t.o
.gitconfig  .pkj        t.cpp    work
.bash_history .gitconfig .profile  t.cpp.save .Xauthority
.bash_profile .gnupg     .public   .temp    .xsession-errors
.bashrc      .gtkrc=2.0 .public_html .texlive2022 .xsession-errors.old
.c++         .ICEAuthority .public_html .texlive2022 .xsession-errors.old
```

Рис. 25: Модификация команды №494

Вывод

Выводы

Мы приобрели практические навыки взаимодействия пользователя с системой по-средством командной строки