

Основы интерфейса взаимодействия пользователя с системой Unix на уровне командной строки

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Цели и задачи работы

Цель лабораторной работы

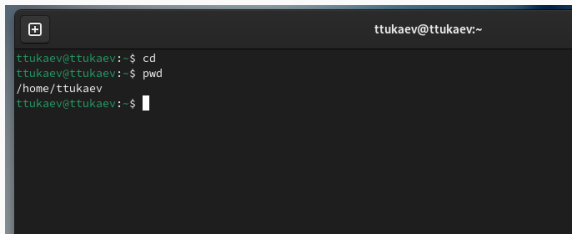
Приобретение практических навыков взаимодействия пользователя с системой посредством командной строки.

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



```
ttukaev@ttukaev:~  
ttukaev@ttukaev:~$ cd  
ttukaev@ttukaev:~$ pwd  
/home/ttukaev  
ttukaev@ttukaev:~$
```

Рис. 1: Путь к домашнему каталогу

Опции команды ls

```
ttukaev@ttukaev:~$  
ttukaev@ttukaev:~$ cd /tmp  
ttukaev@ttukaev:/tmp$ ls  
dbus-gN4eTc3u  
dbus-y2UfLLrs  
systemd-private-c0b6d99400134aa9847583f9e446038c-chronyd.service-fAqIWD  
systemd-private-c0b6d99400134aa9847583f9e446038c-colord.service-HNsffH  
systemd-private-c0b6d99400134aa9847583f9e446038c-dbus-broker.service-PYbKgU  
systemd-private-c0b6d99400134aa9847583f9e446038c-fwupd.service-CTDvjM  
systemd-private-c0b6d99400134aa9847583f9e446038c-low-memory-monitor.service-rw57tN  
systemd-private-c0b6d99400134aa9847583f9e446038c-ModemManager.service-JPXs8E  
systemd-private-c0b6d99400134aa9847583f9e446038c-polkit.service-nSsIot  
systemd-private-c0b6d99400134aa9847583f9e446038c-power-profiles-daemon.service-aZZEYN  
systemd-private-c0b6d99400134aa9847583f9e446038c-rtkit-daemon.service-AvbXEk  
systemd-private-c0b6d99400134aa9847583f9e446038c-switcheroo-control.service-JgCV0B  
systemd-private-c0b6d99400134aa9847583f9e446038c-systemd-logind.service-fpF0nF  
systemd-private-c0b6d99400134aa9847583f9e446038c-systemd-oomd.service-Z2GqCt  
systemd-private-c0b6d99400134aa9847583f9e446038c-systemd-resolved.service-e7DsY8  
systemd-private-c0b6d99400134aa9847583f9e446038c-upower.service-VvLzly  
vmware-root_.853-4022308820  
ttukaev@ttukaev:/tmp$
```

Рис. 2: Команда ls

Опции команды ls

```
ttukaev@ttukaev: /tmp$  
ttukaev@ttukaev: /tmp$ ls -a  
.  
..  
dbus-gN4eTc3u  
dbus-y2Ufllrs  
.font-unix  
.ICE-unix  
systemd-private-c0b6d99400134aa9847583f9e446038c-chronyd.service-fAqIWD  
systemd-private-c0b6d99400134aa9847583f9e446038c-colord.service-HNsffH  
systemd-private-c0b6d99400134aa9847583f9e446038c-dbus-broker.service-PYbKgU  
systemd-private-c0b6d99400134aa9847583f9e446038c-fwupd.service-CTDvjM  
systemd-private-c0b6d99400134aa9847583f9e446038c-low-memory-monitor.service-rw57tN  
systemd-private-c0b6d99400134aa9847583f9e446038c-ModemManager.service-JPXs8E  
systemd-private-c0b6d99400134aa9847583f9e446038c-polkit.service-nSsIot  
systemd-private-c0b6d99400134aa9847583f9e446038c-power-profiles-daemon.service-aZZEYN  
systemd-private-c0b6d99400134aa9847583f9e446038c-rtkit-daemon.service-AvbXEk  
systemd-private-c0b6d99400134aa9847583f9e446038c-switcheroo-control.service-3gCV0B  
systemd-private-c0b6d99400134aa9847583f9e446038c-systemd-logind.service-fpF8nP  
systemd-private-c0b6d99400134aa9847583f9e446038c-systemd-oomd.service-Z2GqCt  
systemd-private-c0b6d99400134aa9847583f9e446038c-systemd-resolved.service-e7DsY8  
systemd-private-c0b6d99400134aa9847583f9e446038c-upower.service-VvLzly  
vmware-root_853-4022308820  
.X0-lock  
.X1024-lock  
.X1025-lock  
.X11-unix  
.X1-lock  
.XIM-unix  
ttukaev@ttukaev: /tmp$
```

Рис. 3: Команда ls -a

Опции команды ls

```
ttukaev@ttukaev:/tmp$  
ttukaev@ttukaev:/tmp$ ls -l  
total 8  
srw-rw-rw-. 1 root root 0 map 7 10:13 dbus-gM4eTc3u  
srw-rw-rw-. 1 root root 0 map 7 10:13 dbus-y2Uflirs  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-chronyd.service-fAqIMD  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-color.service-HnsfFM  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-dbus-broker.service-PybKGu  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-fmupd.service-CTDvJH  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-low-memory-monitor.service-ru571N  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-ModemManager.service-3PKsBE  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-polkit.service-n5aIoT  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-power-profiles-daemon.service-aZZ  
cvs  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-rtkit-daemon.service-AvbXEX  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-switcheroo-control.service-3gCV0S  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-systemd-logind.service-fp8nP  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-systemd-oomd.service-Z2GqCt  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-systemd-resolved.service-e7DsY8  
drwx----- 3 root root 60 map 7 10:13 systemd-private-c0b6d99480134aa9847583f9e44683bc-upower.service-vLz1y  
drwx----- 2 root root 40 map 7 10:13 vmware-root_853-4022388620  
ttukaev@ttukaev:/tmp$
```

Рис. 4: Команда ls -l

Опции команды ls

```
ttukaev@ttukaev:/tmp$ ls -f
.
..
systemd-private-c0b6d99400134aa9847583f9e446038c-fwupd.service-CTDvjM
.X1-lock
.X0-lock
systemd-private-c0b6d99400134aa9847583f9e446038c-colord.service-HNsffH
.X1025-lock
.X1024-lock
dbus-gN4eTc3u
dbus-y2UfLlrs
systemd-private-c0b6d99400134aa9847583f9e446038c-ModemManager.service-JPXs8E
vmware-root_853-4022308820
systemd-private-c0b6d99400134aa9847583f9e446038c-upower.service-VvLz1y
systemd-private-c0b6d99400134aa9847583f9e446038c-systemd-logind.service-fpF0nP
systemd-private-c0b6d99400134aa9847583f9e446038c-switcheroo-control.service-JgCV0B
systemd-private-c0b6d99400134aa9847583f9e446038c-rtkit-daemon.service-AvbXEk
systemd-private-c0b6d99400134aa9847583f9e446038c-power-profiles-daemon.service-aZZEYN
systemd-private-c0b6d99400134aa9847583f9e446038c-polkit.service-nSsIot
systemd-private-c0b6d99400134aa9847583f9e446038c-low-memory-monitor.service-rw57tN
systemd-private-c0b6d99400134aa9847583f9e446038c-chronyd.service-fAqIWD
systemd-private-c0b6d99400134aa9847583f9e446038c-dbus-broker.service-PYbKgU
systemd-private-c0b6d99400134aa9847583f9e446038c-systemd-resolved.service-e7DsY8
systemd-private-c0b6d99400134aa9847583f9e446038c-systemd-oomd.service-Z2GqCt
.font-unix
.XIM-unix
.ICE-unix
.X11-unix
ttukaev@ttukaev:/tmp$
```

Рис. 5: Команда ls -f

```
ttukaev@ttukaev:/tmp$  
ttukaev@ttukaev:/tmp$ cd /var/spool  
ttukaev@ttukaev:/var/spool$ ls -l  
итого 0  
drwxr-x--x. 1 root abrt 1366 мар  7 10:09 abrt  
drwx-----. 1 abrt abrt   0 июл 19  2023 abrt-upload  
drwx--x---. 1 root lp      6 ноя  1 04:09 cups  
drwxr-xr-x. 1 root root    0 июл 21  2023 lpd  
drwxrwxr-x. 1 root mail 1178 мар  6 14:27 mail  
drwxr-xr-x. 1 root root    0 июл 21  2023 plymouth  
ttukaev@ttukaev:/var/spool$
```

Рис. 6: Каталог /var/spool

Домашний каталог

```
ttukaev@ttukaev:/var/spool$ cd
ttukaev@ttukaev:~$ ls
git-extended  work  Видео  Документы  Загрузки  Изображения  Музыка
ttukaev@ttukaev:~$ ls -al
итого 20
drwx-----, 1 ttukaev ttukaev 498 мар 1 14:19 .
drwxr-xr-x, 1 root root 1172 мар 6 14:27 ..
-rw-----, 1 ttukaev ttukaev 2393 мар 1 14:46 .bash_history
-rw-r--r--, 1 ttukaev ttukaev 18 июл 19 2023 .bash_logout
-rw-r--r--, 1 ttukaev ttukaev 144 июл 19 2023 .bash_profile
-rw-r--r--, 1 ttukaev ttukaev 677 мар 1 14:18 .bashrc
drwx-----, 1 ttukaev ttukaev 418 мар 1 14:21 .cache
drwx-----, 1 ttukaev ttukaev 424 мар 1 14:21 .config
-rw-r--r--, 1 ttukaev ttukaev 232 мар 1 14:18 .gitconfig
drwxr-xr-x, 1 ttukaev ttukaev 74 мар 1 14:25 git-extended
drwx-----, 1 ttukaev ttukaev 136 фев 9 17:32 .gnupg
drwx-----, 1 ttukaev ttukaev 20 фев 9 14:43 .local
drwxr-xr-x, 1 ttukaev ttukaev 48 фев 9 14:49 .mozilla
drwx-----, 1 ttukaev ttukaev 132 фев 9 17:35 .ssh
drwxr-xr-x, 1 ttukaev ttukaev 10 фев 9 17:34 work
drwxr-xr-x, 1 ttukaev ttukaev 0 фев 9 14:43 Видео
drwxr-xr-x, 1 ttukaev ttukaev 0 фев 9 14:43 Документы
drwxr-xr-x, 1 ttukaev ttukaev 0 фев 9 14:43 Загрузки
drwxr-xr-x, 1 ttukaev ttukaev 0 фев 9 14:43 Изображения
drwxr-xr-x, 1 ttukaev ttukaev 0 фев 9 14:43 Музыка
drwxr-xr-x, 1 ttukaev ttukaev 0 фев 9 14:43 Общедоступные
drwxr-xr-x, 1 ttukaev ttukaev 0 фев 9 14:43 'Рабочий стол'
drwxr-xr-x, 1 ttukaev ttukaev 0 фев 9 14:43 Шаблоны
ttukaev@ttukaev:~$
```

Рис. 7: Файлы в домашнем каталоге

```
ttukaev@ttukaev:~$ mkdir newdir
ttukaev@ttukaev:~$ mkdir newdir/morefun
ttukaev@ttukaev:~$ mkdir letters memos misk
ttukaev@ttukaev:~$ ls
git-extended  memos  newdir  Видео  Загрузки  Музыка  'Рабочий стол'
letters       misk   work    Документы  Изображения  Общедоступные  Шаблоны
ttukaev@ttukaev:~$ rm letters memos misk
rm: невозможно удалить 'letters': Это каталог
rm: невозможно удалить 'memos': Это каталог
rm: невозможно удалить 'misk': Это каталог
ttukaev@ttukaev:~$ rm -r letters/ memos/ misk/
ttukaev@ttukaev:~$ rm -r newdir/
ttukaev@ttukaev:~$ ls
git-extended  work  Видео  Документы  Загрузки  Изображения  Музыка  Общедоступные  Рабочий
ttukaev@ttukaev:~$
```

Рис. 8: Действия с каталогами

Опции команды ls

```
"/work/study/2023-2024/Операционные системы/os-intro/template/report/report/pandoc/filters/pandocxnos":
core.py __init__.py main.py pandocattributes.py

"/work/study/2023-2024/Операционные системы/os-intro/template/report/scripts":
ls -la report mpv-shot

./Видео:

./Документы:

./Загрузки:

./Изображения:

./Музыка:

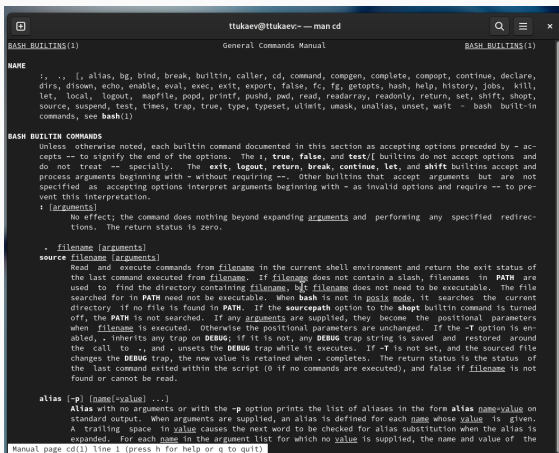
./Общедоступные:

"/Рабочий стол":

./Шаблоны:
ttukaev@ttukaev:~$ ls -l
ls: ключ должен использоваться с аргументом - «T»
По команде «ls --help» можно получить дополнительную информацию.
ttukaev@ttukaev:~$ ls -lt
git-extended work Видео Документы Загрузки Изображения Музыка Общедоступные "Рабочий стол" Шаблоны
ttukaev@ttukaev:~$
```

Рис. 9: Команда ls -R и ls -t

Справка по командам



```
ttukaev@ttukaev:~ -- man cd
BASH_BUILTINS(1)                                General Commands Manual                                BASH_BUILTINS(1)

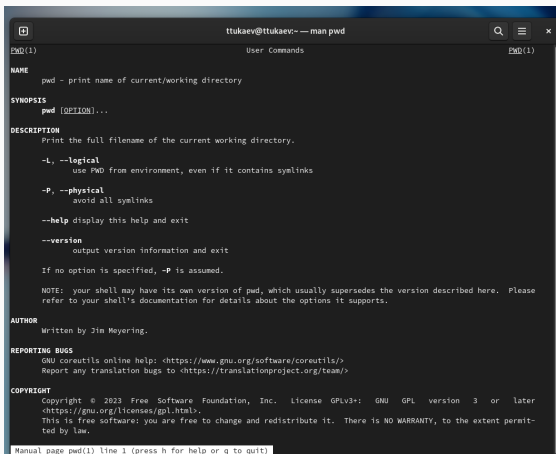
NAME
,; ., [, alias, bg, bind, break, builtin, caller, cd, command, compgen, complete, compopt, continue, declare,
dirs, disown, echo, enable, eval, exec, exit, export, false, fc, fg, getopts, hash, help, history, jobs, kill,
let, local, logout, mapfile, popd, printf, pushd, pwd, read, readarray, readonly, return, set, shift, shopt,
source, suspend, test, times, trap, true, type, typeset, ulimit, umask, unalias, unset, wait - bash built-in
commands, see bash(1)

BASH BUILTIN COMMANDS
Unless otherwise noted, each builtin command documented in this section as accepting options preceded by - ac-
cepts -- to signify the end of the options. The set, true, false, and test builtins do not accept options and
do not treat -- specially. The exit, logout, return, break, continue, let, and shift builtins accept and
process arguments beginning with - without requiring --. Other builtins that accept arguments but are not
specified as accepting options interpret arguments beginning with - as invalid options and require -- to pre-
vent this interpretation.
+ [arguments]
    No effect; the command does nothing beyond expanding arguments and performing any specified redirec-
    tions. The return status is zero.

. filename [arguments]
source filename [arguments]
    Read and execute commands from filename in the current shell environment and return the exit status of
    the last command executed from filename. If filename does not contain a slash, filenames in PATH are
    used to find the directory containing filename, but filename does not need to be executable. The file
    searched for in PATH need not be executable. When bash is not in posix mode, it searches the current
    directory if no file is found in PATH. If the sourcepath option to the shopt builtin command is turned
    off, the PATH is not searched. If any arguments are supplied, they become the positional parameters
    when filename is executed. Otherwise the positional parameters are unchanged. If the -T option is en-
    abled, - inherits any trap on DEBUG: if it is not, any DEBUG trap string is saved and restored around
    the call to ., and - unsets the DEBUG trap while it executes. If -T is not set, and the sourced file
    changes the DEBUG trap, the new value is retained when . completes. The return status is the status of
    the last command exited within the script (0 if no commands are executed), and false if filename is not
    found or cannot be read.

alias [-p] [name[-value] ...]
    Alias with no arguments or with the -p option prints the list of aliases in the form alias name=value on
    standard output. When arguments are supplied, an alias is defined for each name whose value is given.
    A trailing space in value causes the next word to be checked for alias substitution when the alias is
    expanded. For each name in the argument list for which no value is supplied, the name and value of the
    Manual page cd(1) line 1 (press h for help or q to quit)
```

Рис. 10: Справка по команде cd



```
ttukaev@ttukaev:~ -- 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.

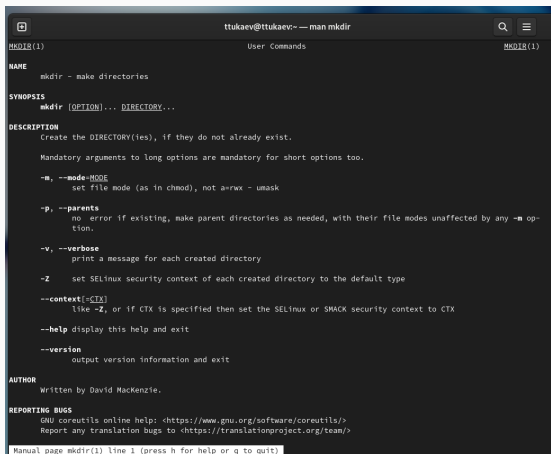
AUTHOR
  Written by Jim Meyering.

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

Рис. 11: Справка по команде pwd



```
ttukaev@ttukaev:~ -- 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

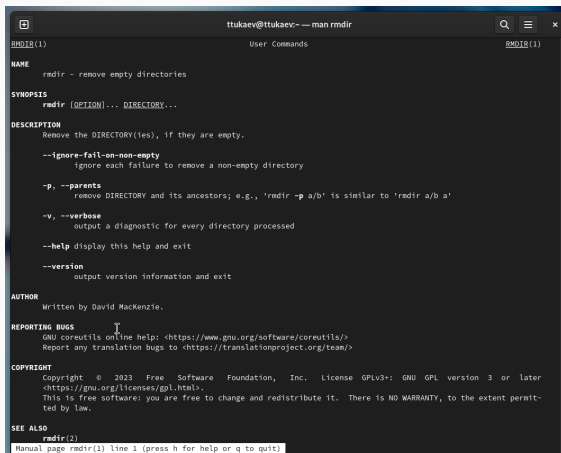
  --version
      output version information and exit

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

Рис. 12: Справка по команде mkdir



```
ttukaev@ttukaev:~ — 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.

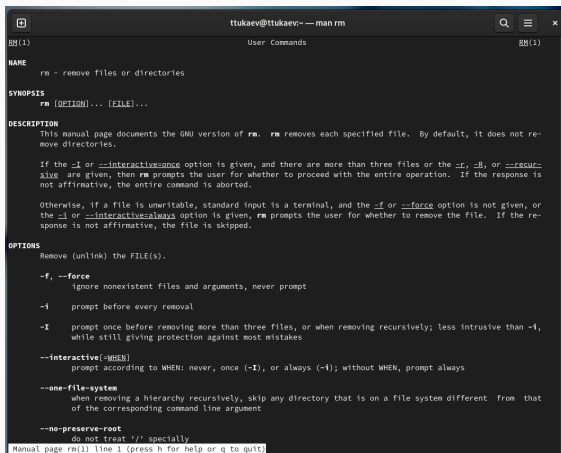
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SEE ALSO
  rmdir(2)

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

Рис. 13: Справка по команде rmdir



```
ttukaev@ttukaev:~ -- man rm
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

  --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

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 window icon and the text 'ttukaev@ttukaev:~'. The terminal displays a list of 24 commands, each preceded by a line number from 85 to 124. The commands include git operations, file navigation, and system utilities. At the bottom, the prompt 'ttukaev@ttukaev: \$' is followed by a cursor and a vertical bar.

```
85 standard-changelog --first-release
86 git add CHANGELOG.md
87 git commit -am 'chore(site): add changelog'
88 git flow release finish 1.0.0
89 git push --all
90 git push --tags
91 git add .
92 git commit -am "lab"
93 git push
94 make
95 make
96 cd
97 pwd
98 cd /tmp
99 ls
100 ls -a
101 ls -l
102 ls -F
103 cd /var/spool
104 ls -l
105 cd
106 ls
107 ls -al
108 mkdir newdir
109 mkdir newdir/morefun
110 mkdir letters memos misk
111 ls
112 rm letters memos misk
113 rm -r letters/ memos/ misk/
114 rm -r newdir/
115 ls
116 ls -R
117 ls -T
118 ls -t
119 man cd
120 man pwd
121 man mkdir
122 man rmdir
123 man rm
124 history
ttukaev@ttukaev: $
```

Рис. 15: Команда history

Выводы по проделанной работе

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