

Операционные системы

Командная оболочка Midnight Commander

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23 марта 2025

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Цели и задачи работы

Ознакомление с файловой системой Linux, её структурой, именами и содержанием каталогов. Приобретение практических навыков по применению команд для работы с файлами и каталогами, по управлению процессами, по проверке использования диска и обслуживанию файловой системы.

- 1 Изучить возможности Midnight Commander
- 2 Изучить редактор Midnight Commander

Процесс выполнения лабораторной работы

Работа с Midnight Commander

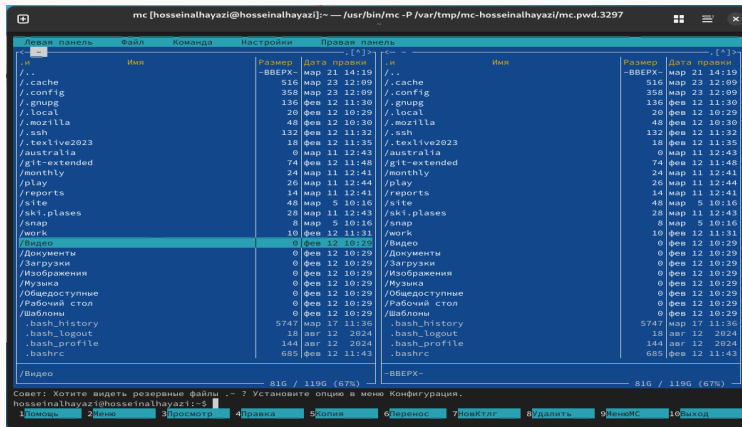


Рис. 1: Запуск mc

Работа с Midnight Commander

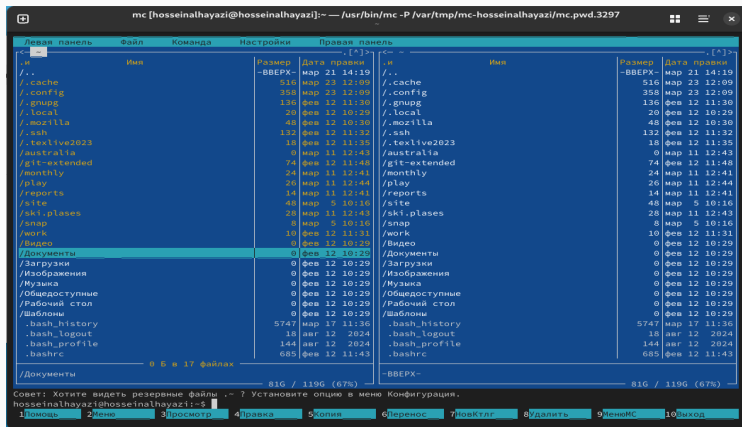


Рис. 2: Выделение

Работа с Midnight Commander

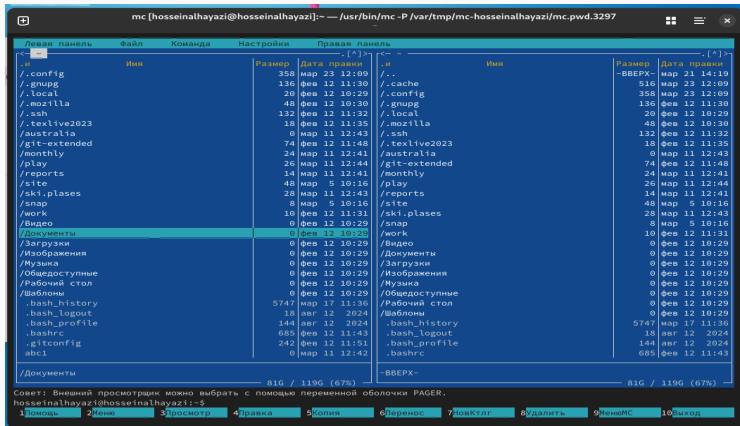


Рис. 3: Отмена

Работа с Midnight Commander

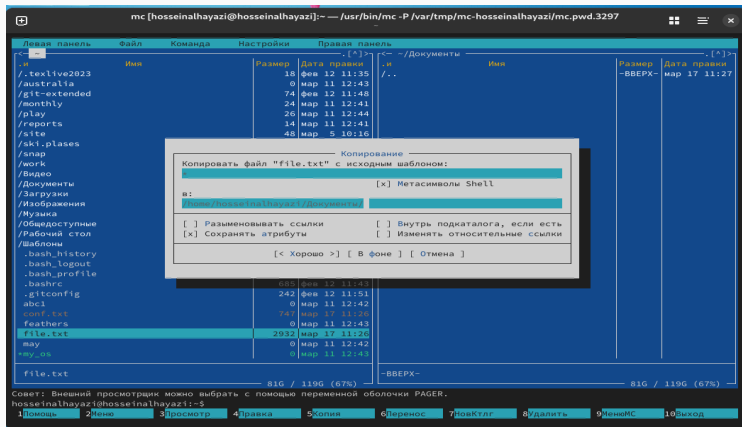


Рис. 4: Копирование

Работа с Midnight Commander

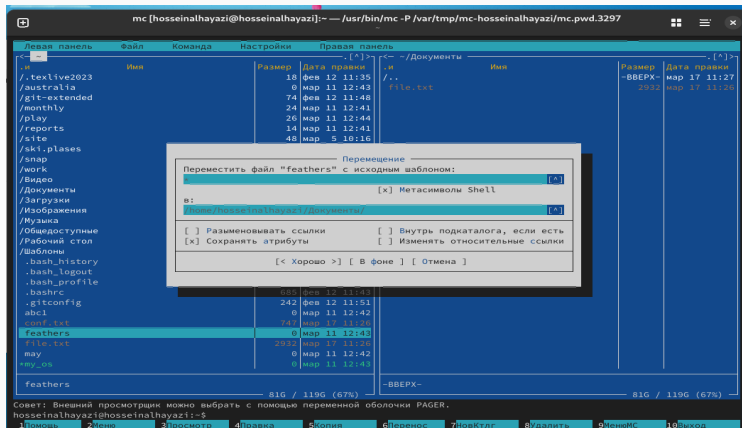


Рис. 5: Перемещение

Работа с Midnight Commander

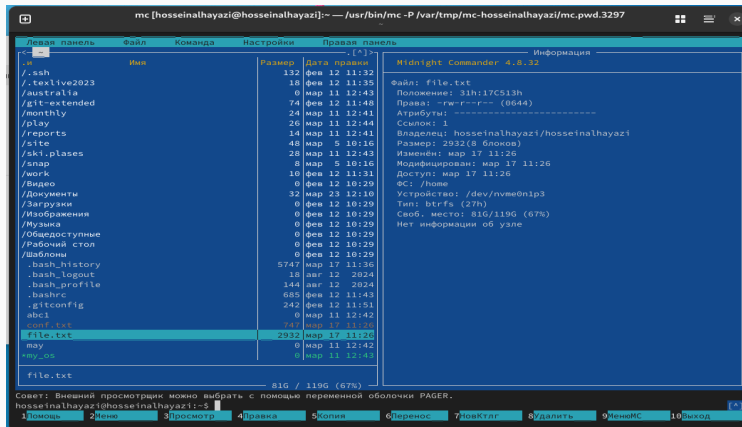


Рис. 6: Информация

Работа с Midnight Commander

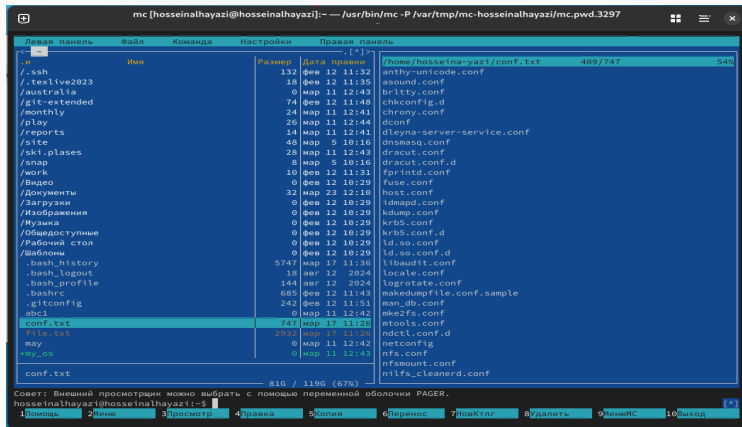


Рис. 7: Быстрый просмотр

Работа с Midnight Commander

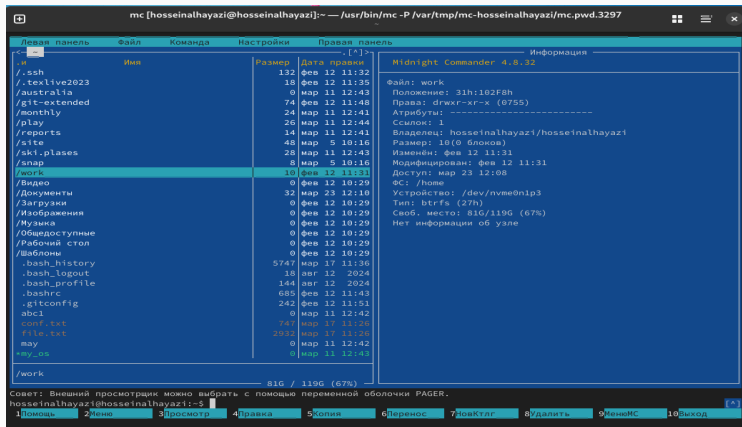


Рис. 8: Информация

Работа с Midnight Commander

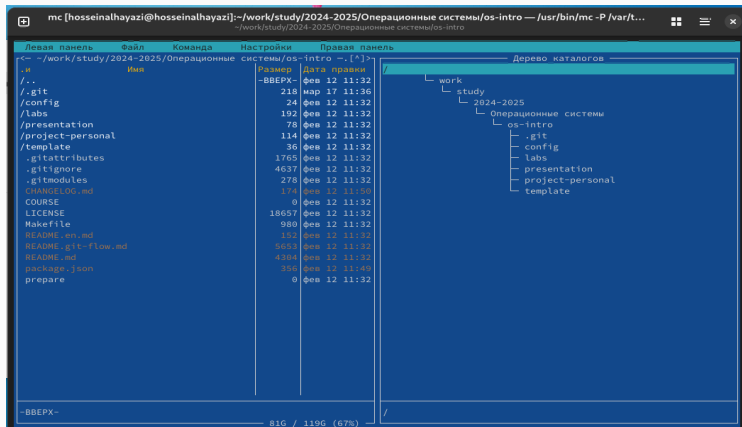
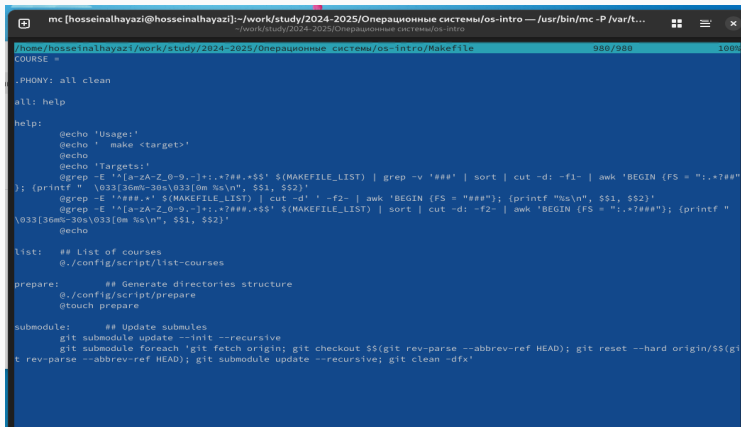


Рис. 9: Дерево каталогов

Работа с Midnight Commander



The screenshot shows the Midnight Commander interface. The title bar indicates the current directory is `/work/study/2024-2025/Операционные системы/os-intro` and the file being viewed is `Makefile`. The file size is 980 bytes and it is 100% readable. The main pane displays the content of the `Makefile` file, which includes targets like `.PHONY: all clean`, `all: help`, `help:` (with usage and targets information), `list: ## List of courses`, `prepare: ## Generate directories structure`, and `submodule: ## Update submodules`.

```
mc [hosseinalhayazi@hosseinalhayazi]:~/work/study/2024-2025/Операционные системы/os-intro — /usr/bin/mc -P /var/t...
~/work/study/2024-2025/Операционные системы/os-intro
/home/hosseinalhayazi/work/study/2024-2025/Операционные системы/os-intro/Makefile 980/980 100%
COURSE =

.PHONY: all clean

all: help

help:
    @echo 'Usage:'
    @echo ' make <target>'
    @echo
    @echo 'Targets:'
    @grep -E '^[a-zA-Z_0-9-]+:.*?##.*$$' $(MAKEFILE_LIST) | grep -v '###' | sort | cut -d: -f1- | awk 'BEGIN {FS = ":.*?##"}
); (printf " \033[36m%-30s\033[0m %s\n", $$1, $$2)'
    @grep -E '###.*' $(MAKEFILE_LIST) | cut -d: -f2- | awk 'BEGIN {FS = "###"}; {printf "%s\n", $$1, $$2}'
    @grep -E '^[a-zA-Z_0-9-]+:.*?##.*$$' $(MAKEFILE_LIST) | sort | cut -d: -f2- | awk 'BEGIN {FS = ":.*?##"}; {printf "
\033[36m%-30s\033[0m %s\n", $$1, $$2}'
    @echo

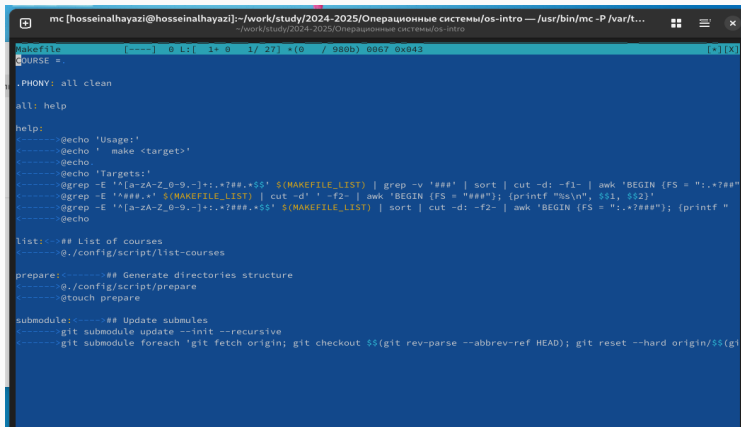
list: ## List of courses
    @./config/script/list-courses

prepare: ## Generate directories structure
    @./config/script/prepare
    @touch prepare

submodule: ## Update submodules
    git submodule update --init --recursive
    git submodule foreach 'git fetch origin; git checkout $(git rev-parse --abbrev-ref HEAD); git reset --hard origin/$(git
    rev-parse --abbrev-ref HEAD); git submodule update --recursive; git clean -dfx'
```

Рис. 10: Просмотр содержимого текстового файла

Работа с Midnight Commander



The screenshot shows the Midnight Commander interface with a file named 'Makefile' open for editing. The top status bar indicates the current directory is '/work/study/2024-2025/Операционные системы/os-intro' and the file is encoded in UTF-8. The main window displays the content of the Makefile, which includes a 'COURSE =' line, a '.PHONY: all clean' declaration, and a 'help:' target. The 'help:' target contains several echo commands for usage and targets, followed by complex grep and awk commands to list and prepare submodules. The bottom status bar shows the current line and column as '0 L: 1+ 0 1/ 27'.

```
Makefile [----] 0 L: 1+ 0 1/ 27 * (0 / 980b) 0067 0x043 [*][X]
COURSE =

.PHONY: all clean

all: help

help:
<----->@echo 'Usage:'
<----->@echo ' make <target>'
<----->@echo
<----->@echo 'Targets:'
<----->@grep -E '^[a-zA-Z_0-9-]+:.*?##.*$$' $(MAKEFILE_LIST) | grep -v '###' | sort | cut -d: -f1- | awk 'BEGIN {FS = ":.*?##"}
<----->@grep -E '###.*' $(MAKEFILE_LIST) | cut -d' ' -f2- | awk 'BEGIN {FS = "###"}; {printf "%s\n", $$1, $$2}'
<----->@grep -E '^[a-zA-Z_0-9-]+:.*?##.*$$' $(MAKEFILE_LIST) | sort | cut -d: -f2- | awk 'BEGIN {FS = ":.*?##"}; {printf "
<----->@echo

list:<-->## List of courses
<----->@./config/script/list-courses

prepare:<----->## Generate directories structure
<----->@./config/script/prepare
<----->@touch prepare

submodule:<----->## Update submules
<----->git submodule update --init --recursive
<----->git submodule foreach 'git fetch origin; git checkout $$ (git rev-parse --abbrev-ref HEAD); git reset --hard origin/$(git
```

Рис. 11: Отредактируем содержимое текстового файла без сохранения результатов

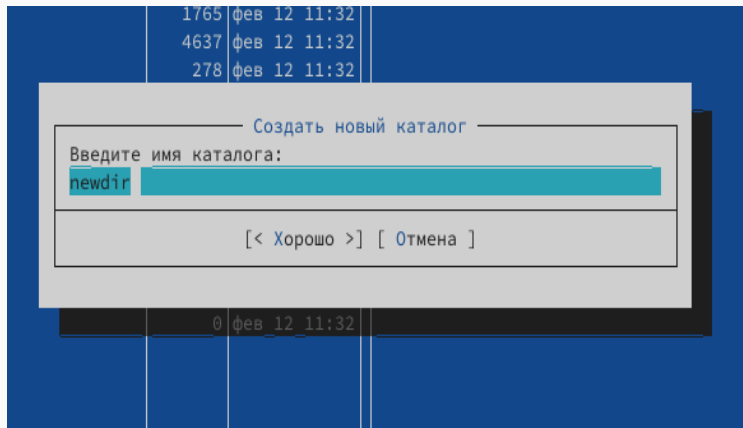


Рис. 12: Создание каталога

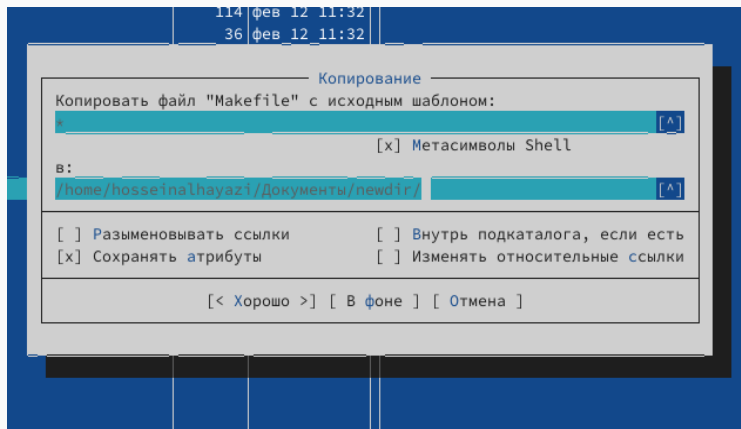


Рис. 13: Копирование в файлов в созданный каталог

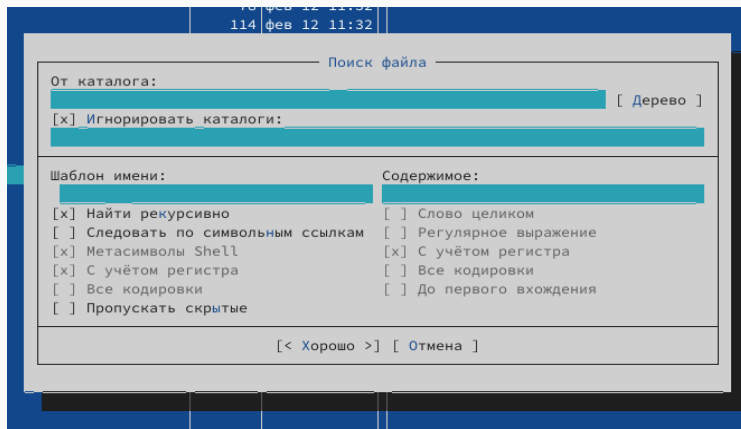


Рис. 14: Поиск файлов

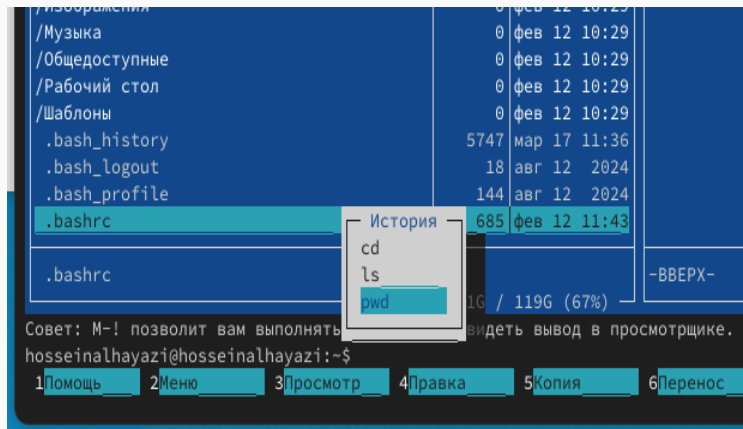


Рис. 15: История команд

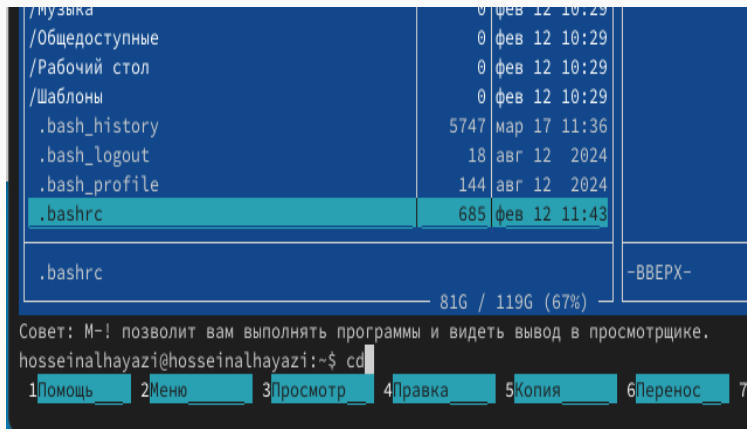


Рис. 16: Переход в домашний каталог



```
mc.ext.ini [----] 0 L: [ 1+ 0 1/1136] *(0 /26909b) 0035 0x023 [*][X]
# Midnight Commander 4.0 extension file

# Warning: The structure of this file has been completely changed with the version 4.0!
#
# All lines starting with # or empty lines are ignored.
#
# IMPORTANT: mc scans this file only upon first use or after editing it using the
# mc "Edit extension file" command (F9-c-e). If you edit this file in any other way
# while mc is running, you will need to press F9-c-e and exit the editor for your
# changes to take effect, or exit mc and start it again.
#
# Section name can be anything with following exceptions:
#   there are two reserved section names:
#       mc.ext.ini
#       Default
#   special name pattern:
#       Include/xxxxx
# See below for more details.
#
# Section [mc.ext.ini] is mandatory. It contains file metadata.
# "Version" parameter is mandatory. It contains the file format version.
#
# Section [Default] is optional. It is applied only if no other match was found.
#
# Sections like [Include/xxxx] can be referenced as "Include=xxxx" from other sections.
# Section [Include/xxxx] can be located as before as after sections that point to it.
#
# Sections are processed from top to bottom, thus the order is important.
# If there are more than one sections with the same name in this file, the first
# section will be used.
#
# [Default] should be a catch-all action and come last.
```

Рис. 17: Просмотр файла расширений

A screenshot of the Midnight Commander file manager's menu system. The window has a title bar with the text "menu" and a standard window control icon. The main area is a blue terminal window with white text. At the top, it shows "shell_patterns=0". Below this is a list of macros, each starting with a '#' and followed by a description. The macros include %%, %f, %p, %d, %s, %t, %u, %view, and %I. A mouse cursor is pointing at the '%I' macro. At the bottom of the window, there is a status bar with a row of numbered buttons: 1.Помощь, 2.Сохранить, 3.Блок, 4.Замена, 5.Копия, 6.Перем-тить, 7.Поиск, 8.Удалить, 9.МенюМС, 10.Выход.

```
menu
shell_patterns=0

#####
# %% The % character
# %f The current file (if non-local vfs, file will be copied locally and
#    %f will be full path to it)
# %p The current file
# %d The current working directory
# %s "Selected files"; the tagged files if any, otherwise the current file
# %t Tagged files
# %u Tagged files (and they are untagged on return from expand_format)
# %view Runs the commands and pipes standard output to the view command
# If %view is immediately followed by '{', recognize keywords
#    ascii, hex, nroff and unform
#
# If the format letter is in uppercase, it refers to the other panel
#
# With a number followed the % character you can turn quoting on (default)
# and off. For example:
# %f quote expanded macro
# %If ditto
# %Of don't quote expanded macro
#####

+ ! t t
@ Do something on the current file
  CMD=%{Enter command}
  $CMD %f

+ t t
@ Do something on the tagged files
  CMD=%{Enter command}
  for i in %t ; do
```

Рис. 18: Просмотр файла меню



Рис. 19: Конфигурация



Рис. 20: Внешний вид



Рис. 21: Настройки панелей



Рис. 22: Подтверждение



Рис. 23: Оформление

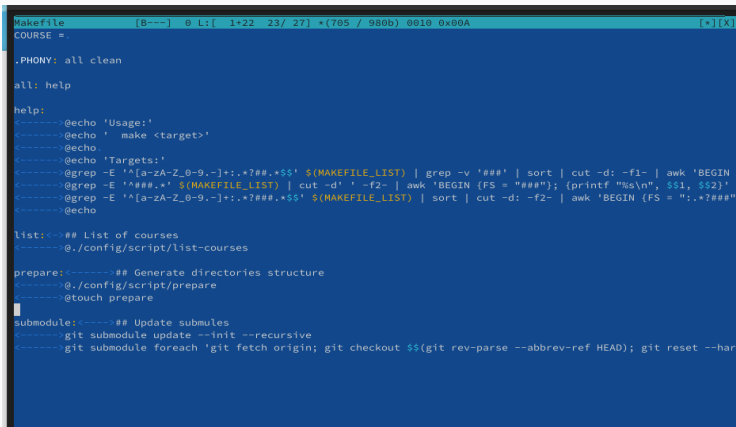


Рис. 24: Кодировка символов



Рис. 25: Распознавание клавиш

Работа с редактором Midnight Commander



```
Makefile [B---] 0 L: [ 1+22 23/ 27] *(705 / 980b) 0010 0x00A [*] [X]
COURSE = .

.PHONY: all clean

all: help

help:
<----->@echo 'Usage:'
<----->@echo '  make <target>'
<----->@echo .
<----->@echo 'Targets:'
<----->@grep -E '^([a-zA-Z_0-9.-]+).*?###.*$$' $(MAKEFILE_LIST) | grep -v '###' | sort | cut -d: -f1- | awk 'BEGIN
<----->@grep -E '^###.*' $(MAKEFILE_LIST) | cut -d' ' -f2- | awk 'BEGIN {FS = "###"; {printf "%s\n", $$1, $$2}}'
<----->@grep -E '^([a-zA-Z_0-9.-]+).*?###.*$$' $(MAKEFILE_LIST) | sort | cut -d: -f2- | awk 'BEGIN {FS = ".*?###"
<----->@echo

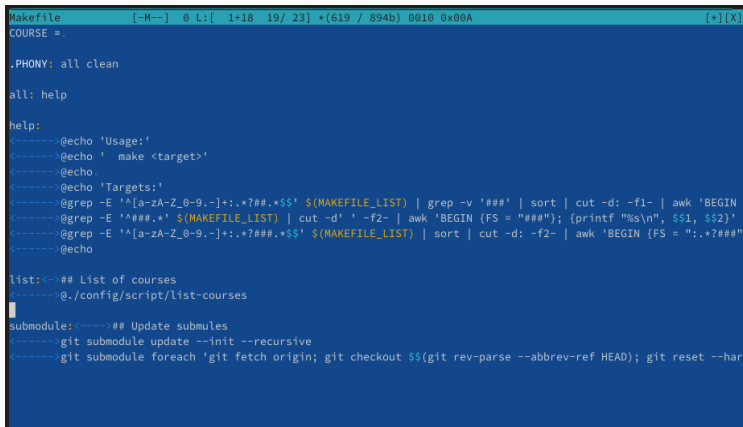
list:<-->## List of courses
<----->@./config/script/list-courses

prepare:<----->## Generate directories structure
<----->@./config/script/prepare
<----->@touch prepare

submodule:<----->## Update submodules
<----->git submodule update --init --recursive
<----->git submodule foreach 'git fetch origin; git checkout $$ (git rev-parse --abbrev-ref HEAD); git reset --har
```

Рис. 26: Файл с текстом

Работа с редактором Midnight Commander



```
Makefile [M--] 0 L: [ 1+18 19/ 23] *(619 / 894b) 0010 0x00A [X]
COURSE =.

.PHONY: all clean

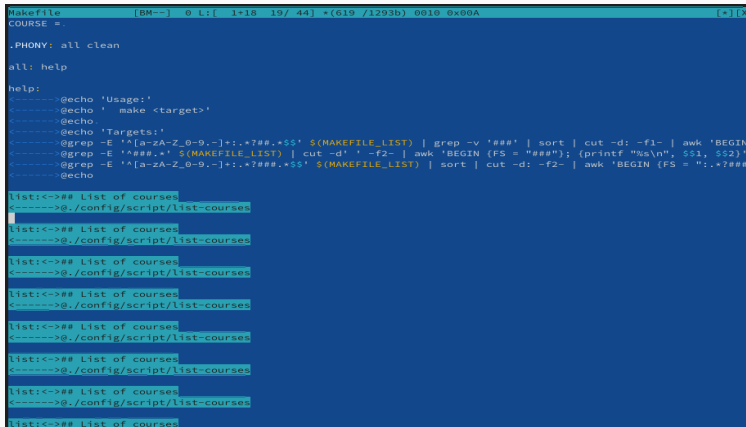
all: help

help:
<----->@echo 'Usage:'
<----->@echo ' make <target>'
<----->@echo.
<----->@echo 'Targets:'
<----->@grep -E '^[a-zA-Z_0-9.-]+:.*?##.*$$' $(MAKEFILE_LIST) | grep -v '###' | sort | cut -d: -f1- | awk 'BEGIN
<----->@grep -E '###.*' $(MAKEFILE_LIST) | cut -d' ' -f2- | awk 'BEGIN {FS = "###"; {printf "%s\n", $$1, $$2}}'
<----->@grep -E '^[a-zA-Z_0-9.-]+:.*?##.*$$' $(MAKEFILE_LIST) | sort | cut -d: -f2- | awk 'BEGIN {FS = ".*?###"
<----->@echo

list:<-->## List of courses
<----->@./config/script/list-courses
█
submodule:<---->## Update submules
<----->git submodule update --init --recursive
<----->git submodule foreach 'git fetch origin; git checkout $$ (git rev-parse --abbrev-ref HEAD); git reset --har
```

Рис. 27: Файл с текстом

Работа с редактором Midnight Commander



```
Makefile [BM--] 0 L: [ 1+18 19/ 44] *(619 /1293b) 0010 0x00A [*]X
COURSE =.

.PHONY: all clean

all: help

help:
<----->@echo 'Usage:'
<----->@echo ' make <target>'
<----->@echo
<----->@echo 'Targets:'
<----->@grep -E '[a-zA-Z_0-9-]+.*?###.*$$' $(MAKEFILE_LIST) | grep -v '###' | sort | cut -d: -f1- | awk 'BEGIN
<----->@grep -E '###.*' $(MAKEFILE_LIST) | cut -d: ' -f2- | awk 'BEGIN {FS = "###"; (printf "%s\n", $$1, $$2)'
<----->@grep -E '[a-zA-Z_0-9-]+.*?###.*$$' $(MAKEFILE_LIST) | sort | cut -d: -f2- | awk 'BEGIN {FS = ".*?###
<----->@echo

list:<->## List of courses
<----->@./config/script/list-courses

list:<->## List of courses
<----->@./config/script/list-courses

list:<->## List of courses
<----->@./config/script/list-courses

list:<->## List of courses
<----->@./config/script/list-courses

list:<->## List of courses
<----->@./config/script/list-courses

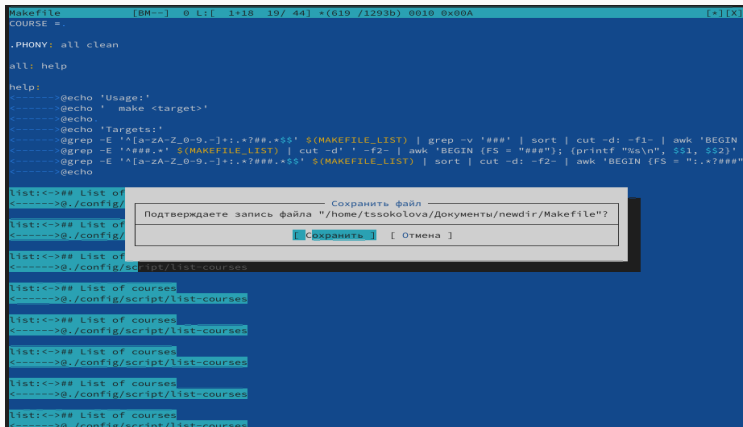
list:<->## List of courses
<----->@./config/script/list-courses

list:<->## List of courses
<----->@./config/script/list-courses

list:<->## List of courses
```

Рис. 28: Копирование фрагмента

Работа с редактором Midnight Commander



```
Makefile [BM--] 0 L: [ 1+18 19/ 44] *(619 /1293b) 0010 0x00A [*][X]
COURSE =.

.PHONY: all clean

all: help

help:
----->@echo 'Usage:'
----->@echo '  make <target>'
----->@echo
----->@echo 'Targets:'
----->@grep -E '^[a-zA-Z_0-9-]+:.*?###.*$$' $(MAKEFILE_LIST) | grep -v '###' | sort | cut -d: -f1- | awk 'BEGIN
----->@grep -E '###.*' $(MAKEFILE_LIST) | cut -d: -f2- | awk 'BEGIN {FS = "###"; (printf "%s\n", $51, $52)'}
----->@grep -E '^[a-zA-Z_0-9-]+:.*?###.*$$' $(MAKEFILE_LIST) | sort | cut -d: -f2- | awk 'BEGIN {FS = ":.*?###"
----->@echo

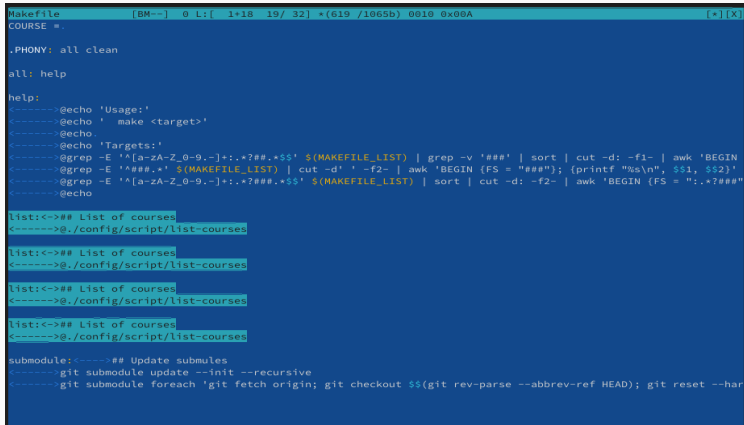
list:<->## List of
----->@./config/
list:<->## List of
----->@./config/
list:<->## List of
----->@./config/script/list-courses
list:<->## List of courses
----->@./config/script/list-courses
list:<->## List of courses
----->@./config/script/list-courses
list:<->## List of courses
----->@./config/script/list-courses
list:<->## List of courses
----->@./config/script/list-courses
list:<->## List of courses
----->@./config/script/list-courses
```

Сохранить файл

Подтверждаете запись файла "/home/tssokolova/Документы/newdir/Makefile"?

Рис. 29: Сохранение

Работа с редактором Midnight Commander



```
Makefile [BM--] 0 L:[ 1+18 19/ 32] *(619 /1065b) 0010 0x00A [*][X]
COURSE =.

.PHONY: all clean

all: help

help:
<----->@echo 'Usage:'
<----->@echo '  make <target>'
<----->@echo.
<----->@echo 'Targets:'
<----->@grep -E '^[a-zA-Z_0-9.-]+:.*?##.*$$' $(MAKEFILE_LIST) | grep -v '###' | sort | cut -d: -f1- | awk 'BEGIN
<----->@grep -E '###.*' $(MAKEFILE_LIST) | cut -d' ' -f2- | awk 'BEGIN {FS = "###"; {printf "%s\n", $$1, $$2}}'
<----->@grep -E '^[a-zA-Z_0-9.-]+:.*?##.*$$' $(MAKEFILE_LIST) | sort | cut -d: -f2- | awk 'BEGIN {FS = ".*?###"
<----->@echo

list:<->## List of courses
<----->@./config/script/list-courses

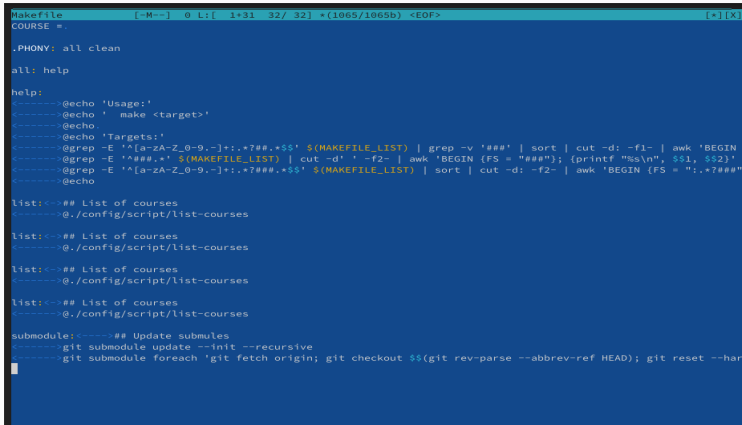
list:<->## List of courses
<----->@./config/script/list-courses

list:<->## List of courses
<----->@./config/script/list-courses

list:<->## List of courses
<----->@./config/script/list-courses

submodule:<----->## Update submules
<----->git submodule update --init --recursive
<----->git submodule foreach 'git fetch origin; git checkout $(git rev-parse --abbrev-ref HEAD); git reset --har
```

Рис. 30: Отмена



```
Makefile      [-M--]  0 L:[ 1+31 32/ 32] *(1065/1065b) <EOF>      [*][X]
COURSE =.

.PHONY: all clean

all: help

help:
<----->@echo 'Usage:'
<----->@echo '  make <target>'
<----->@echo.
<----->@echo 'Targets:'
<----->@grep -E '^[a-zA-Z_0-9.-]+:.*?##.*$$' $(MAKEFILE_LIST) | grep -v '###' | sort | cut -d: -f1- | awk 'BEGIN
<----->@grep -E '###.*' $(MAKEFILE_LIST) | cut -d' ' -f2- | awk 'BEGIN {FS = "###"}; {printf "%s\n", $$1, $$2}'
<----->@grep -E '^[a-zA-Z_0-9.-]+:.*?###.*$$' $(MAKEFILE_LIST) | sort | cut -d: -f2- | awk 'BEGIN {FS = ".*?###"
<----->@echo

list:<-->## List of courses
<----->@./config/script/list-courses

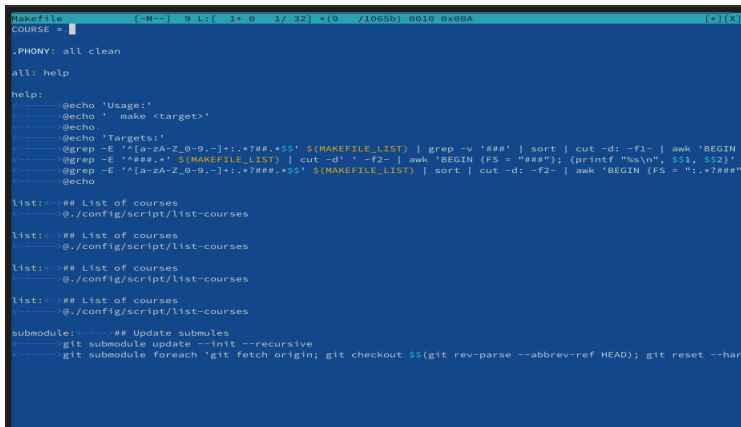
list:<-->## List of courses
<----->@./config/script/list-courses

list:<-->## List of courses
<----->@./config/script/list-courses

list:<-->## List of courses
<----->@./config/script/list-courses

submodule:<---->## Update submules
<----->git submodule update --init --recursive
<----->git submodule foreach 'git fetch origin; git checkout $(git rev-parse --abbrev-ref HEAD); git reset --har
```

Рис. 31: Переход в конец файла



```
Makefile      [-M--]  9 L: [ 1+ 0  1/ 32] *(9  /1065b) 0010 0x00A  [ * ] [ X ]
COURSE = .

.PHONY: all clean

all: help

help:
-----@echo 'Usage:'
-----@echo '  make <target>'
-----@echo
-----@echo 'Targets:'
-----@grep -E '^ [a-zA-Z_0-9-]+:.*?##.*$$' $(MAKEFILE_LIST) | grep -v '###' | sort | cut -d: -f1- | awk 'BEGIN
-----@grep -E '^###.*' $(MAKEFILE_LIST) | cut -d' ' -f2- | awk 'BEGIN {FS = "##"}; {printf "%s\n", $$1, $$2}'
-----@grep -E '^ [a-zA-Z_0-9-]+:.*?##.*$$' $(MAKEFILE_LIST) | sort | cut -d: -f2- | awk 'BEGIN {FS = ".*?##"}
-----@echo

list:<->## List of courses
-----@./config/script/list-courses

list:<->## List of courses
-----@./config/script/list-courses

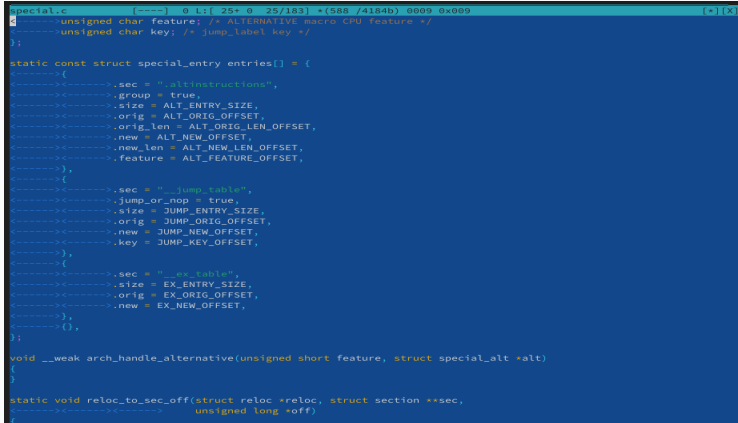
list:<->## List of courses
-----@./config/script/list-courses

list:<->## List of courses
-----@./config/script/list-courses

submodule:<->## Update submules
-----git submodule update --init --recursive
-----git submodule foreach 'git fetch origin; git checkout $$ (git rev-parse --abbrev-ref HEAD); git reset --har
```

Рис. 32: Переход в начало файла

Работа с редактором Midnight Commander



```
special.c      [----]  0 L: [ 25+ 0 25/183] *(588 /4184b) 0009 0x009      [*][X]
<-----> unsigned char feature; /* ALTERNATIVE macro CPU feature */
<-----> unsigned char key; /* jump_label key */
};

static const struct special_entry entries[] = {
<-----> {
<-----> <-----> .sec = ".altinstructions",
<-----> <-----> .group = true,
<-----> <-----> .size = ALT_ENTRY_SIZE,
<-----> <-----> .orig = ALT_ORIG_OFFSET,
<-----> <-----> .orig_len = ALT_ORIG_LEN_OFFSET,
<-----> <-----> .new = ALT_NEW_OFFSET,
<-----> <-----> .new_len = ALT_NEW_LEN_OFFSET,
<-----> <-----> .feature = ALT_FEATURE_OFFSET,
<-----> },
<-----> {
<-----> <-----> .sec = "__jump_table",
<-----> <-----> .jump_or_nop = true,
<-----> <-----> .size = JUMP_ENTRY_SIZE,
<-----> <-----> .orig = JUMP_ORIG_OFFSET,
<-----> <-----> .new = JUMP_NEW_OFFSET,
<-----> <-----> .key = JUMP_KEY_OFFSET,
<-----> },
<-----> {
<-----> <-----> .sec = "__ex_table",
<-----> <-----> .size = EX_ENTRY_SIZE,
<-----> <-----> .orig = EX_ORIG_OFFSET,
<-----> <-----> .new = EX_NEW_OFFSET,
<-----> },
<-----> {}
};

void __weak arch_handle_alternative(unsigned short feature, struct special_alt *alt)
{
}

static void reloc_to_sec_off(struct reloc *reloc, struct section **sec,
<-----> <-----> <-----> unsigned long *off)
```

Рис. 33: Файл с программой

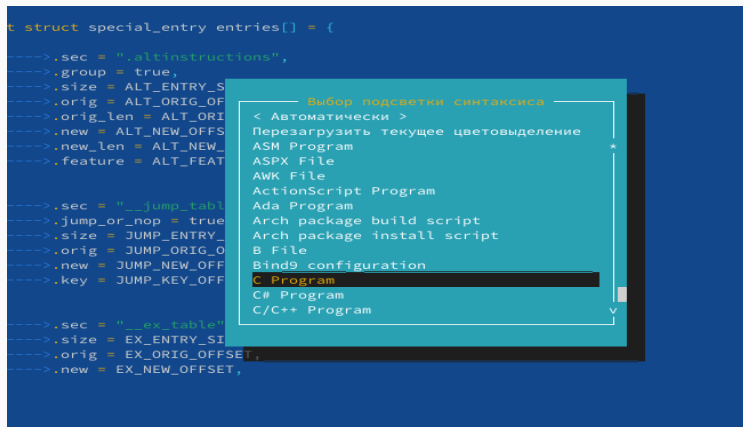


Рис. 34: Цветовыделение синтаксиса

Выводы по проделанной работе

В данной работе мы ознакомились с инструментами поиска файлов и фильтрации текстовых данных. А также приобрели практические навыки по управлению процессами.