

Операционные системы

Командная оболочка Midnight Commander

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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

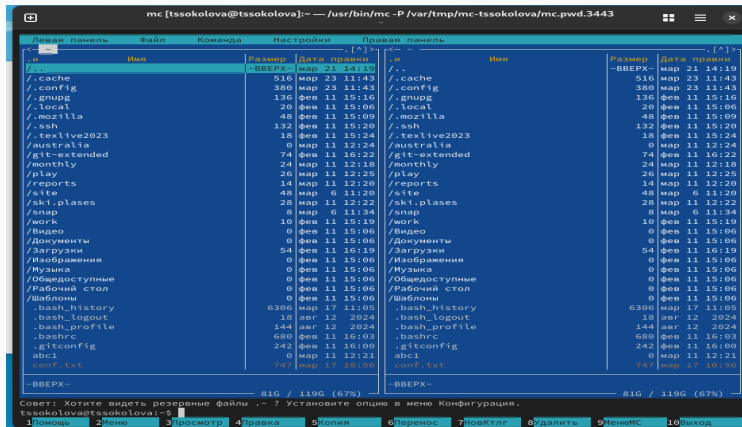


Рис. 1: Запуск mc

Работа с Midnight Commander

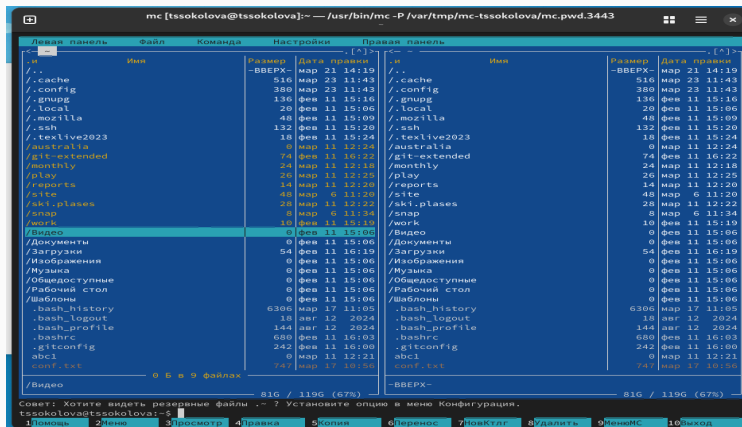


Рис. 2: Выделение

Работа с Midnight Commander

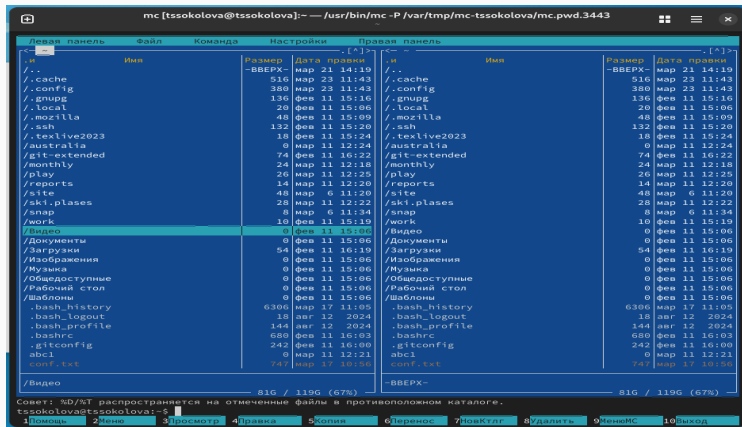


Рис. 3: Отмена

Работа с Midnight Commander

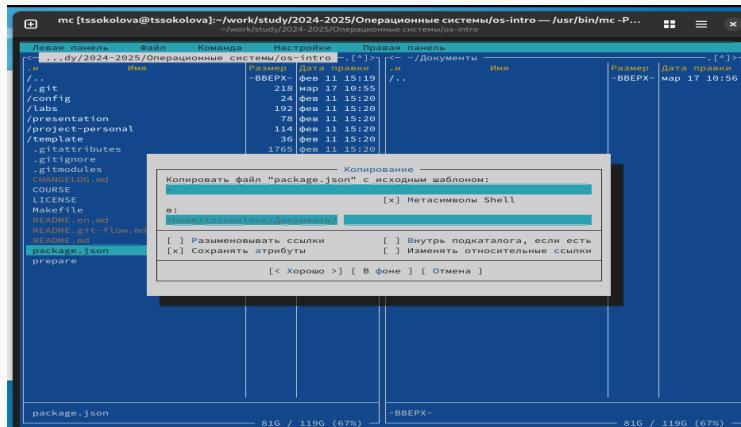


Рис. 4: Копирование

Работа с Midnight Commander

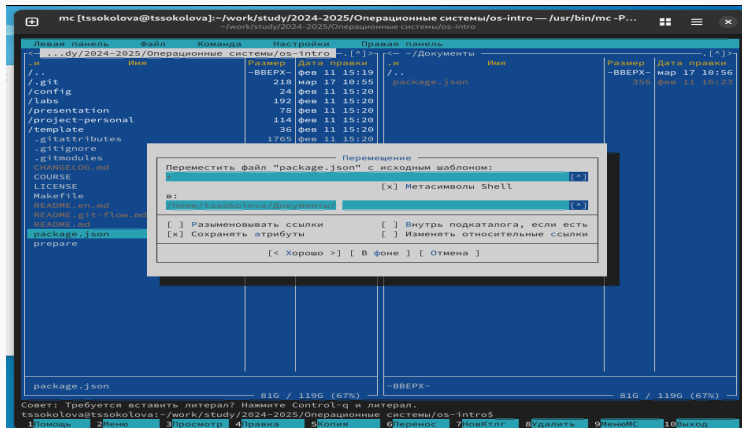


Рис. 5: Перемещение

Работа с Midnight Commander

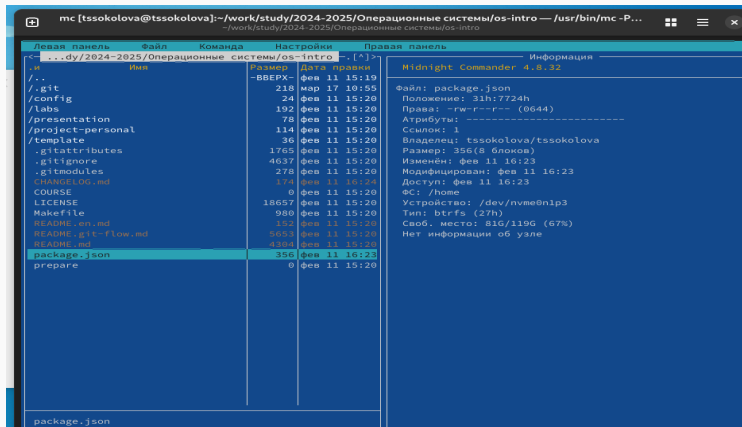


Рис. 6: Информация

Работа с Midnight Commander

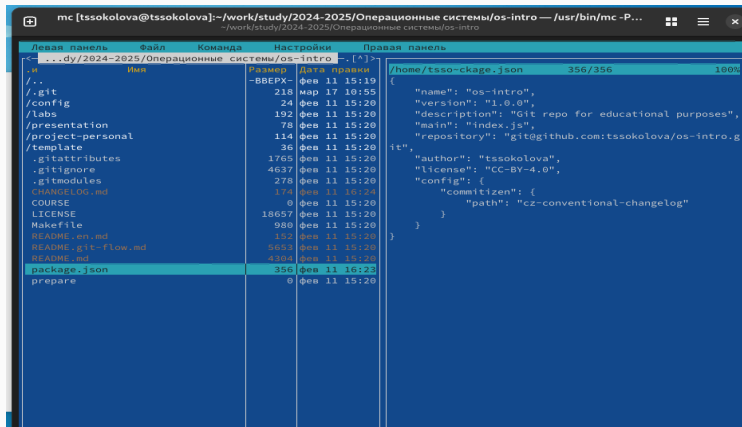


Рис. 7: Быстрый просмотр

Работа с Midnight Commander

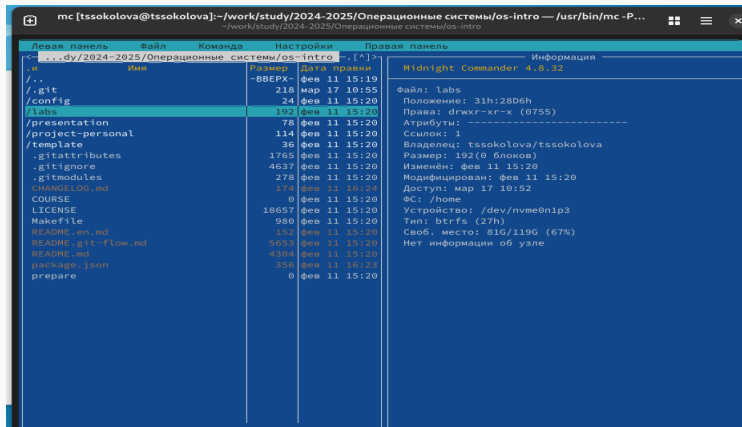


Рис. 8: Информация

Работа с Midnight Commander

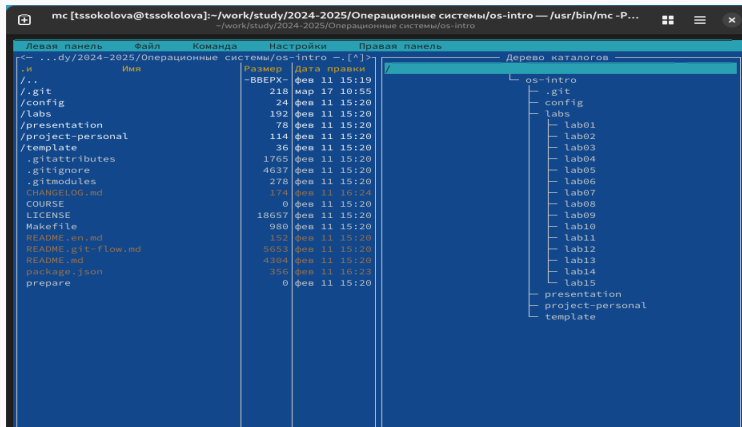
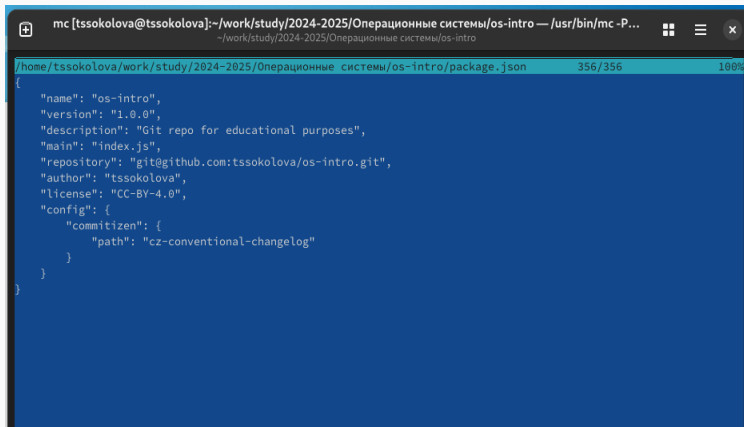


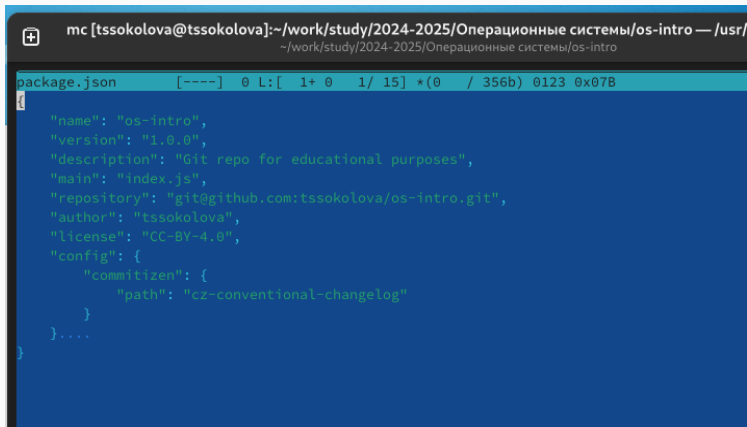
Рис. 9: Дерево каталогов



The image shows a terminal window of the Midnight Commander file manager. The title bar indicates the user is 'mc [tssokolova@tssokolova]' and the current directory is '/work/study/2024-2025/Операционные системы/os-intro'. The main pane displays the contents of the file 'package.json' located at '/home/tssokolova/work/study/2024-2025/Операционные системы/os-intro/package.json'. The file size is 356/356 bytes and it is 100% zoomed. The content is a JSON object with the following fields: 'name' (os-intro), 'version' (1.0.0), 'description' (Git repo for educational purposes), 'main' (index.js), 'repository' (git@github.com:tssokolova/os-intro.git), 'author' (tssokolova), 'license' (CC-BY-4.0), and 'config' (which contains 'commitizen' with a 'path' of 'cz-conventional-changelog').

```
{
  "name": "os-intro",
  "version": "1.0.0",
  "description": "Git repo for educational purposes",
  "main": "index.js",
  "repository": "git@github.com:tssokolova/os-intro.git",
  "author": "tssokolova",
  "license": "CC-BY-4.0",
  "config": {
    "commitizen": {
      "path": "cz-conventional-changelog"
    }
  }
}
```

Рис. 10: Просмотр содержимого текстового файла



The screenshot shows the Midnight Commander (mc) interface. The title bar at the top reads: `mc [tssokolova@tssokolova]:~/work/study/2024-2025/Операционные системы/os-intro — /usr/`. Below the title bar, the current file is `package.json`, with a status bar showing `[----] 0 L: [1+ 0 1/ 15] *(0 / 356b) 0123 0x07B`. The file content is displayed in a blue background with white text, showing a JSON object for a project named "os-intro".

```
{
  "name": "os-intro",
  "version": "1.0.0",
  "description": "Git repo for educational purposes",
  "main": "index.js",
  "repository": "git@github.com:tssokolova/os-intro.git",
  "author": "tssokolova",
  "license": "CC-BY-4.0",
  "config": {
    "commitizen": {
      "path": "cz-conventional-changelog"
    }
  }
}
```

Рис. 11: Отредактируем содержимое текстового файла без сохранения результатов

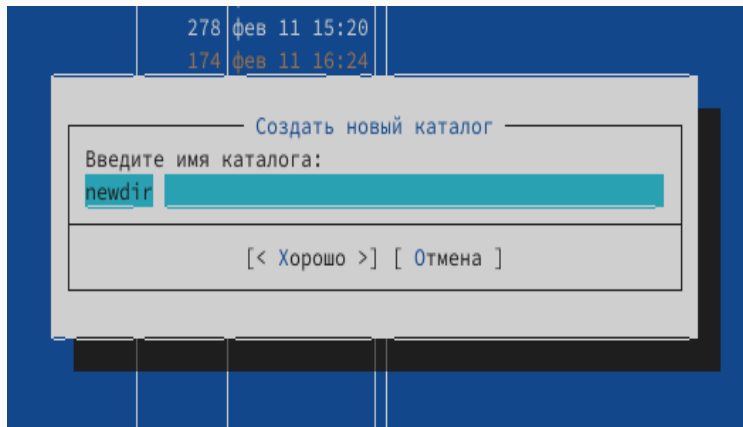


Рис. 12: Создание каталога

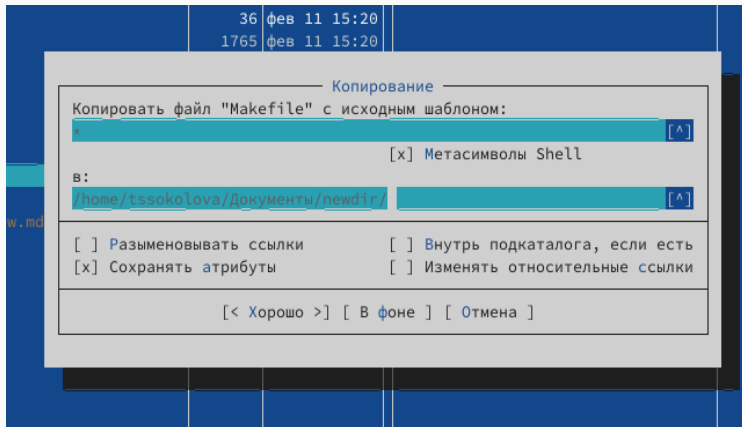


Рис. 13: Копирование в файлов в созданный каталог

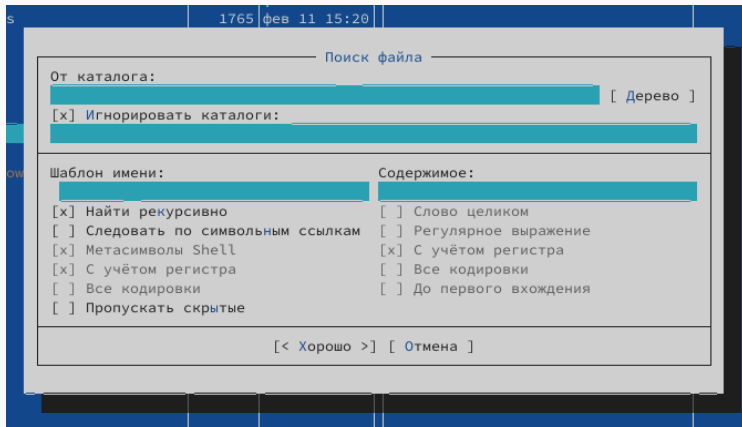


Рис. 14: Поиск файлов

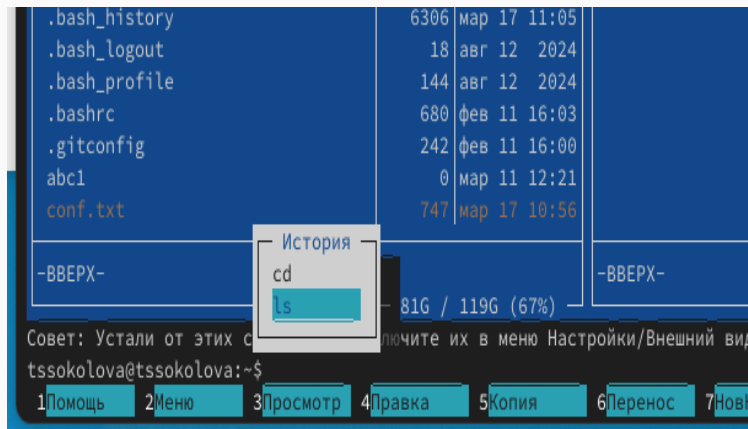


Рис. 15: История команд

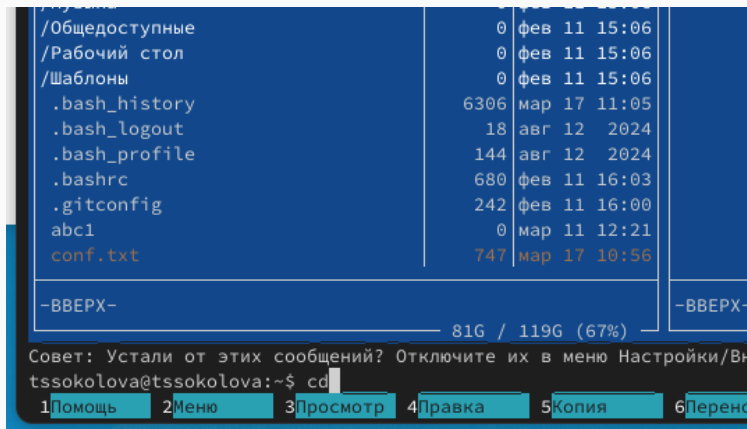


Рис. 16: Переход в домашний каталог



```
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 title is 'menu' with standard window controls. The menu is open, showing a list of options. At the top, it says 'shell_patterns=0'. The menu items include: '%%' 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, and a section for '%view' followed by '{', recognizing keywords like 'ascii', 'hex', 'nroff', and 'uniform'. There is a section for uppercase letters referring to the other panel. Then, a section for turning quoting on/off with examples like '%f' quote expanded macro, '%lf' ditto, and '%0f' don't quote expanded macro. Below this are two sections for running commands: one for the current file ('! t t', 'Do something on the current file', 'CMD=%{Enter command}', '\$CMD %f') and one for tagged files ('t t', 'Do something on the tagged files', 'CMD=%{Enter command}', 'for i in %t ; do'). At the bottom, there is a status bar with numbered shortcuts: 1.Помощь, 2.Сохранить, 3.Блок, 4.Замена, 5.Копия, 6.Перем-тить, 7.Поиск, 8.Удалить, 9.МенюМС, 10.Выход.

```
menu [=====] 1 L: [ 1*16 17/370 ] *(732 /11821b) 0010 0x00A [ * ] [ X ]
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 uniform
#
# 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
#   %lf  ditto
#   %0f  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

1.Помощь  2.Сохранить  3.Блок  4.Замена  5.Копия  6.Перем-тить  7.Поиск  8.Удалить  9.МенюМС  10.Выход
```

Рис. 18: Просмотр файла меню



Рис. 19: Конфигурация



Рис. 20: Внешний вид



Рис. 21: Настройки панелей



Рис. 22: Подтверждение



Рис. 23: Оформление

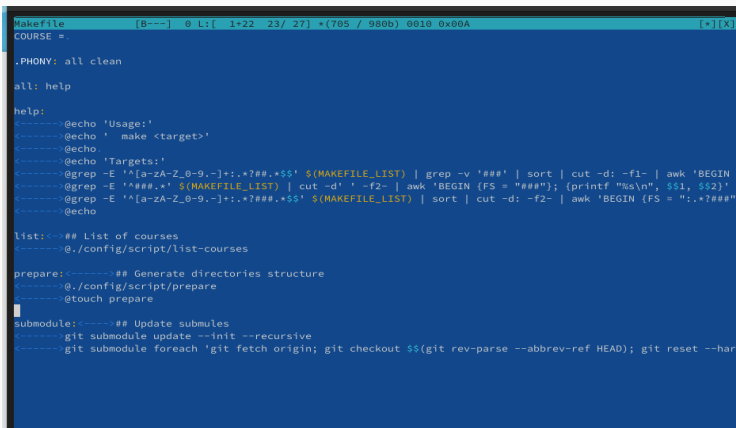


Рис. 24: Кодировка символов



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

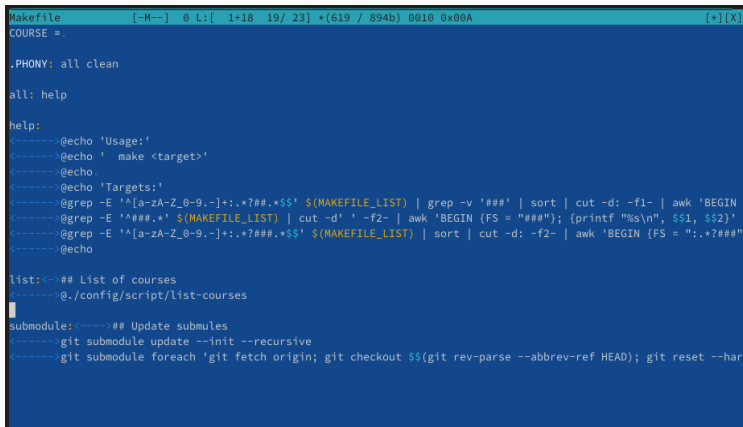
list:<-->## List of courses
<----->@./config/script/list-courses

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

submodule:<----->## Update submules
<----->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

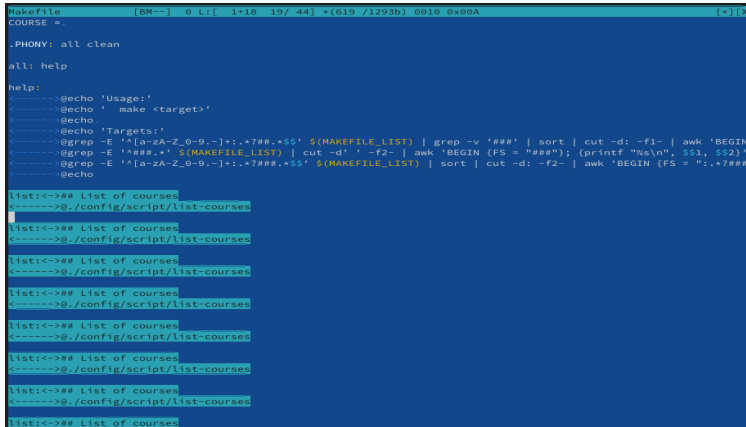
all: help

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



```
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

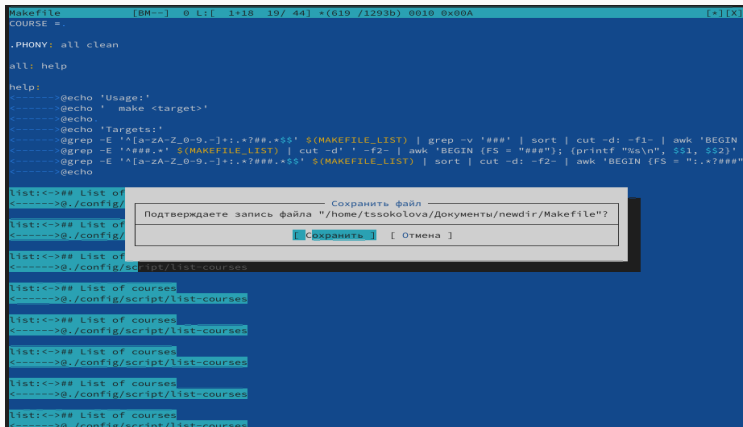
list:<->## List of courses
<----->@./config/script/list-courses

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

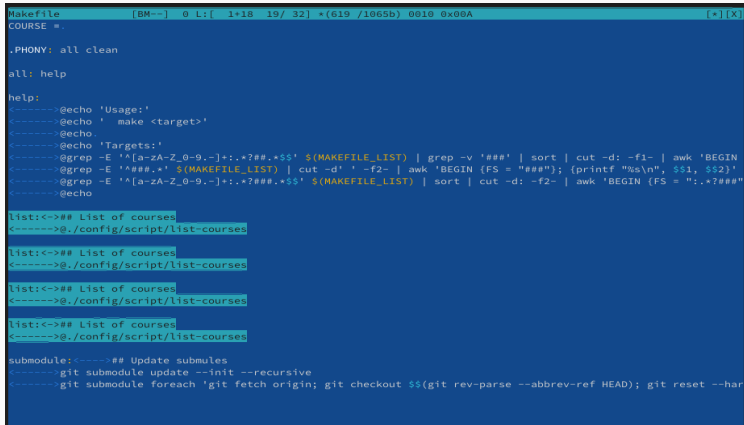
list:<->## List of
----->@./config/
list:<->## List of
----->@./config/
list:<->## List of
----->@./config/script/list-courses
list:<->## List of courses
----->@./config/script/list-courses
list:<->## List of courses
----->@./config/script/list-courses
list:<->## List of courses
----->@./config/script/list-courses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

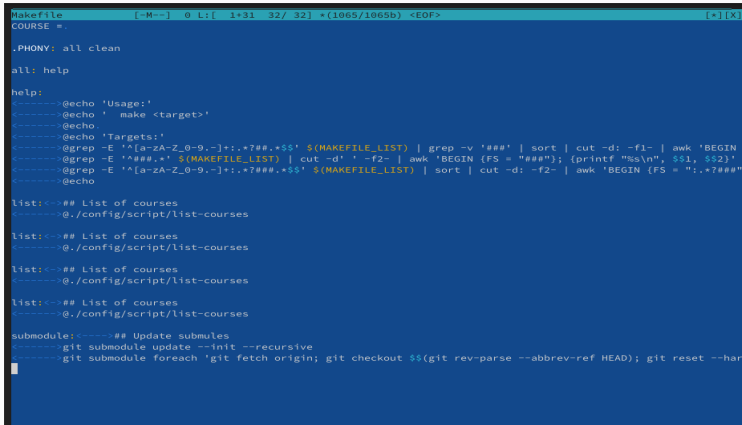
list:<->## List of courses
<----->@./config/script/list-courses

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

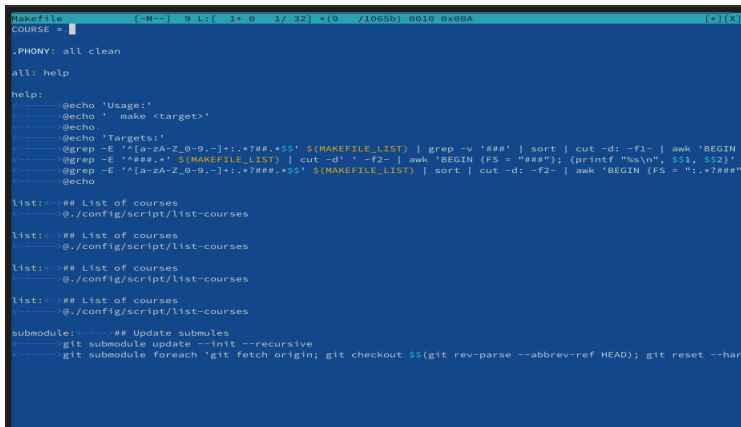
list:<-->## List of courses
<----->@./config/script/list-courses

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

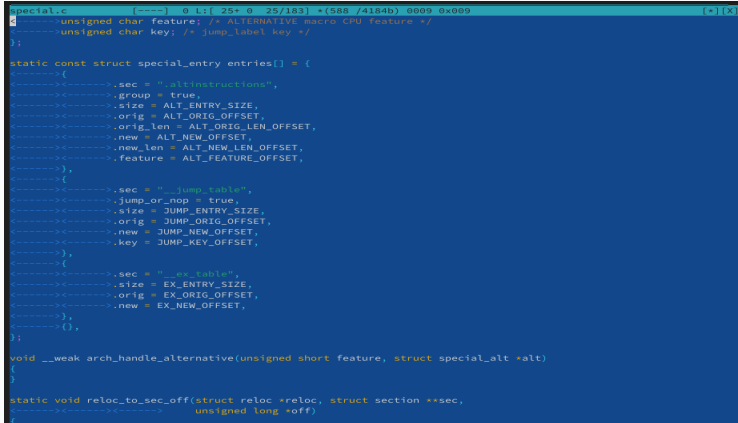
list:<->## List of courses
-----@./config/script/list-courses

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

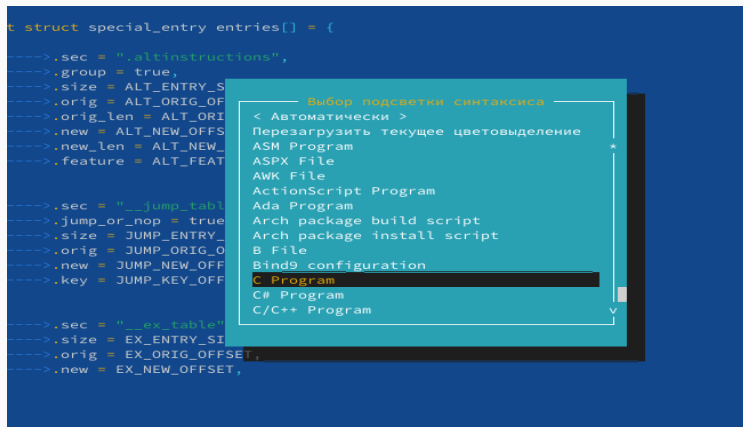


Рис. 34: Цветовыделение синтаксиса

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.