

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

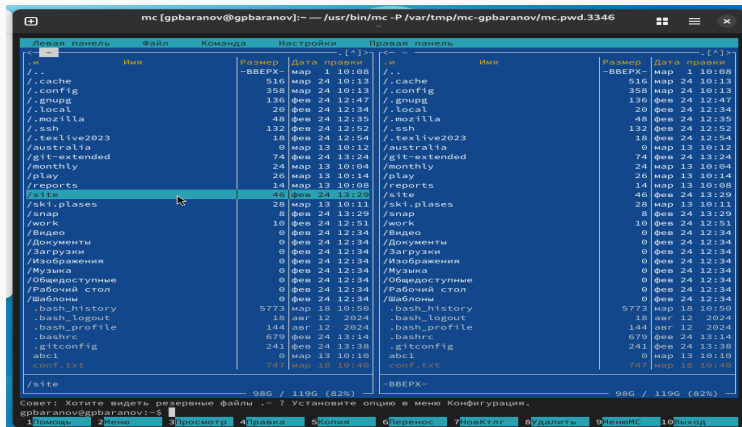


Рис. 1: Запуск mc

Работа с Midnight Commander

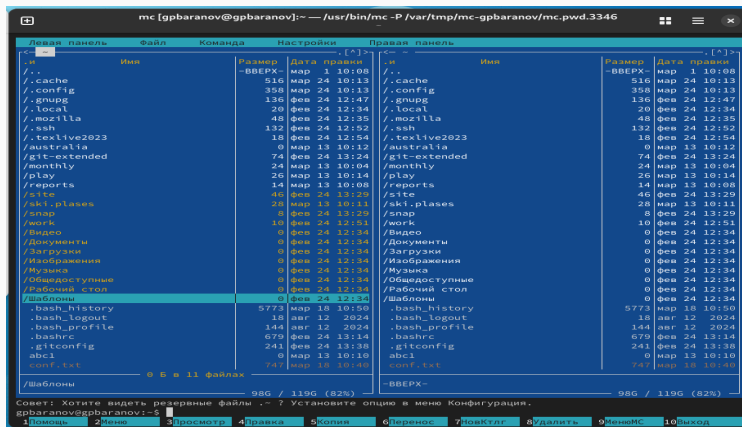


Рис. 2: Выделение

Работа с Midnight Commander

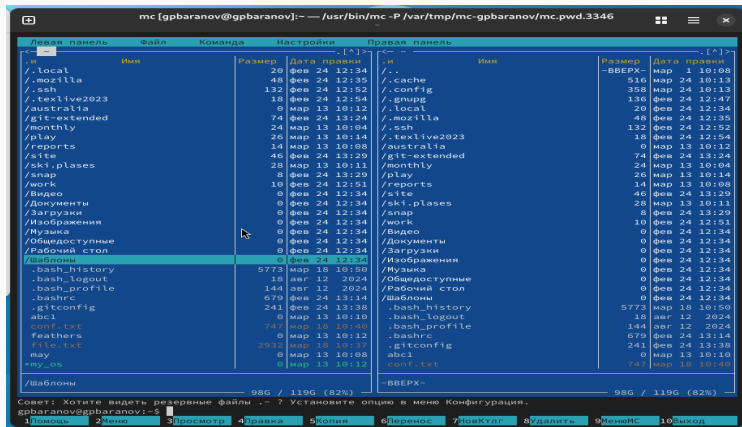


Рис. 3: Отмена

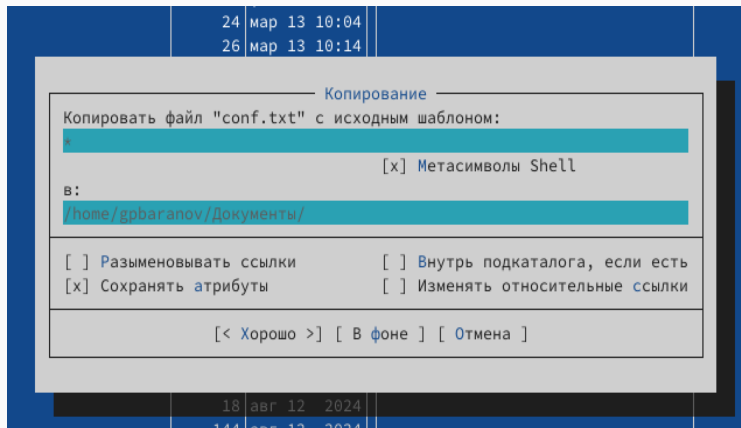


Рис. 4: Копирование

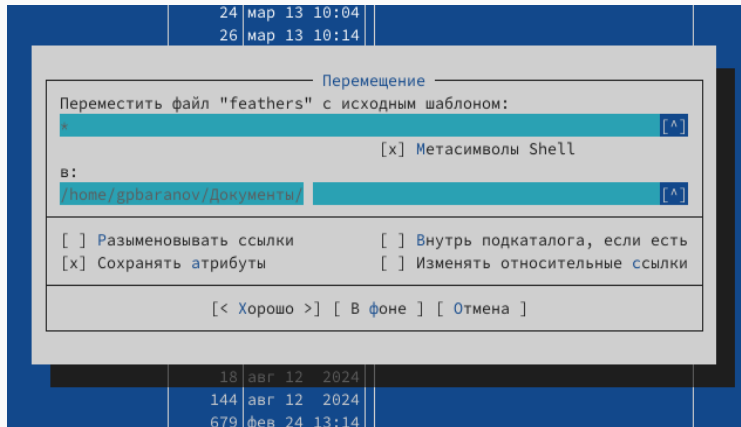


Рис. 5: Перемещение

Работа с Midnight Commander

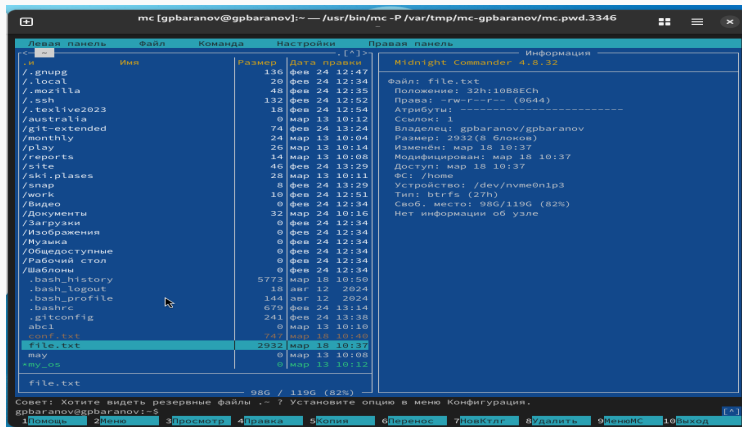


Рис. 6: Информация

Работа с Midnight Commander

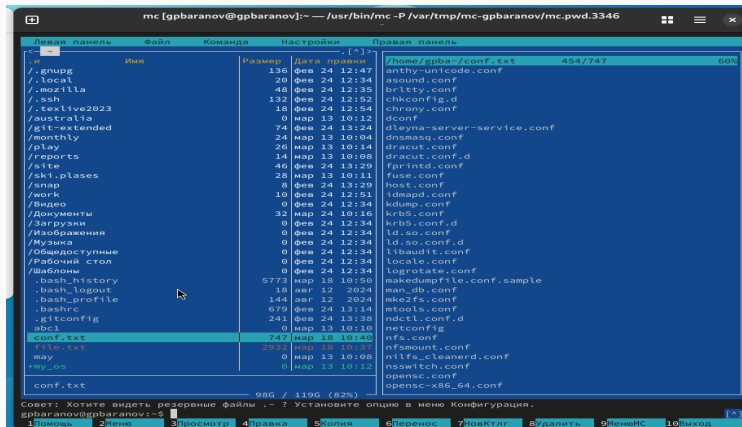


Рис. 7: Быстрый просмотр

Работа с Midnight Commander

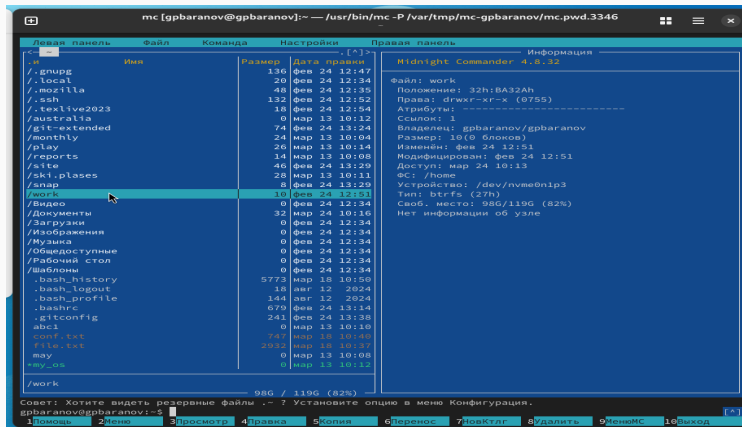


Рис. 8: Информация

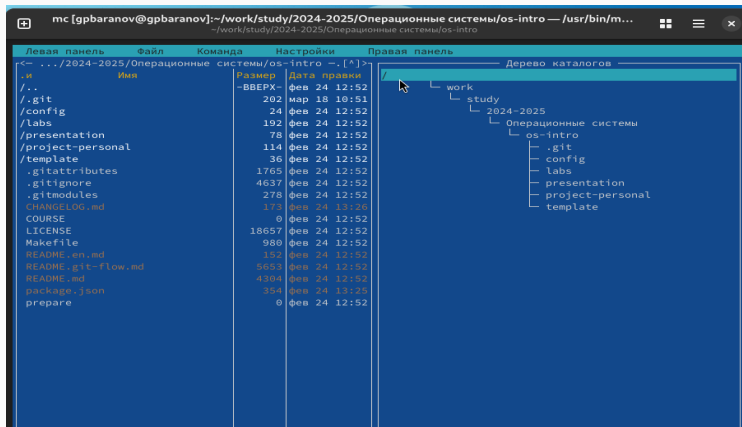
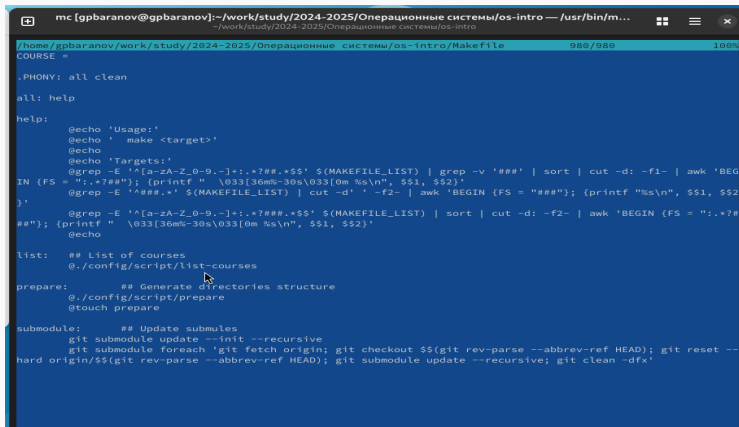


Рис. 9: Дерево каталогов

Работа с Midnight Commander



The screenshot shows a terminal window of the Midnight Commander file manager. The title bar indicates the user is 'mc [gpbaranov@gpbaranov]' in the directory '~/work/study/2024-2025/Операционные системы/os-intro'. The main window displays the contents of a file named 'Makefile' in the directory '/home/gpbaranov/work/study/2024-2025/Операционные системы/os-intro/'. The file content is as follows:

```
COURSE =

.PHONY: all clean

all: help

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

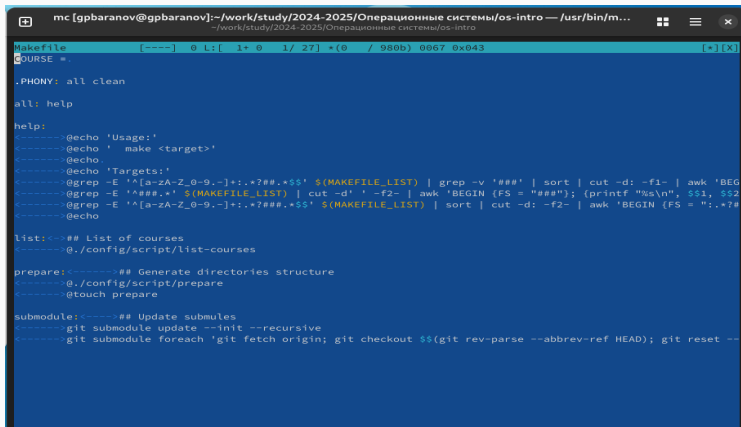
list:  ## List of courses
    @./config/script/list-courses

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



```
mc [gpbaranov@gpbaranov]:~/work/study/2024-2025/Операционные системы/os-intro — /usr/bin/m...
- /work/study/2024-2025/Операционные системы/os-intro

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

Рис. 11: Отредактируем содержимое текстового файла без сохранения результатов

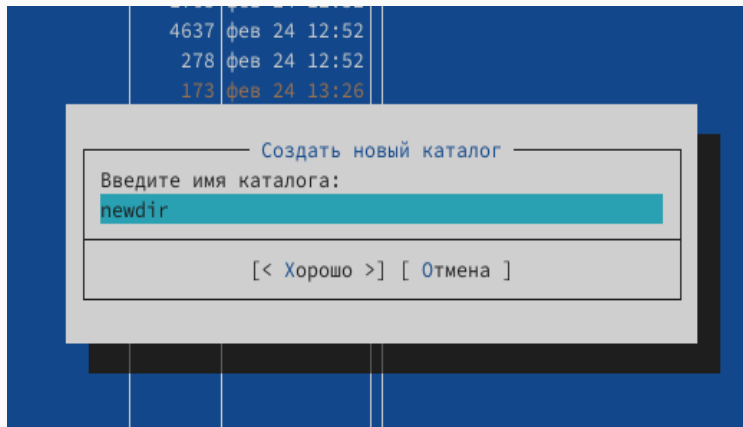


Рис. 12: Создание каталога

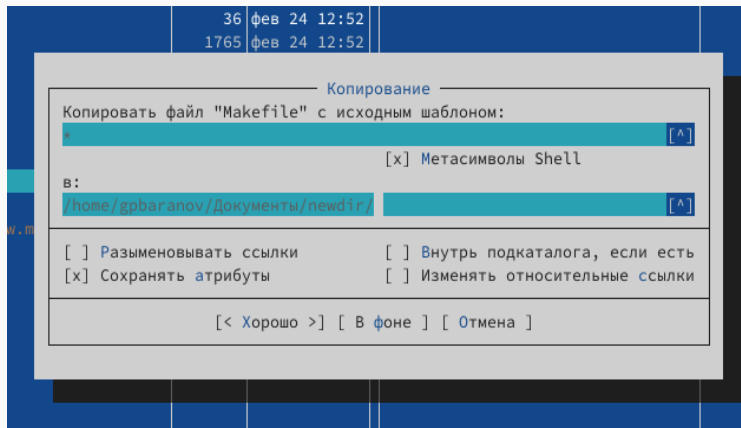


Рис. 13: Копирование в файлов в созданный каталог

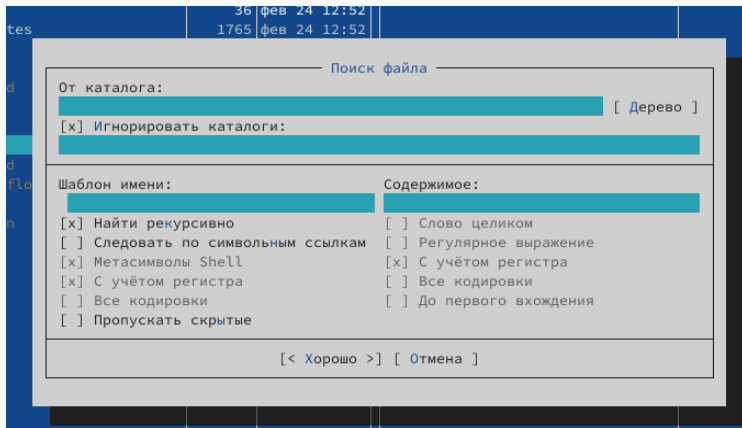


Рис. 14: Поиск файлов

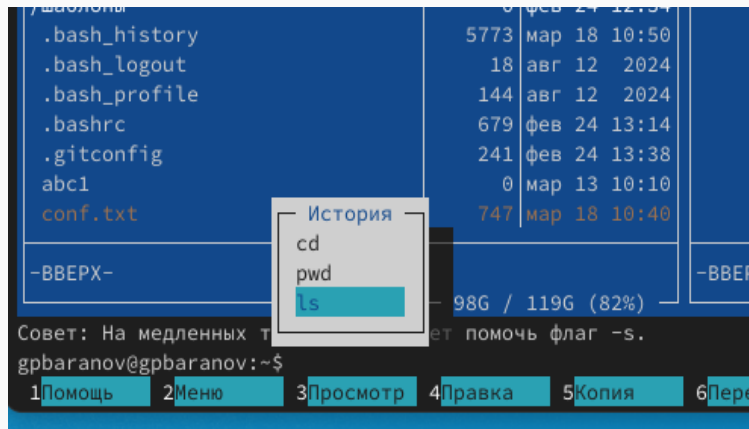


Рис. 15: История команд

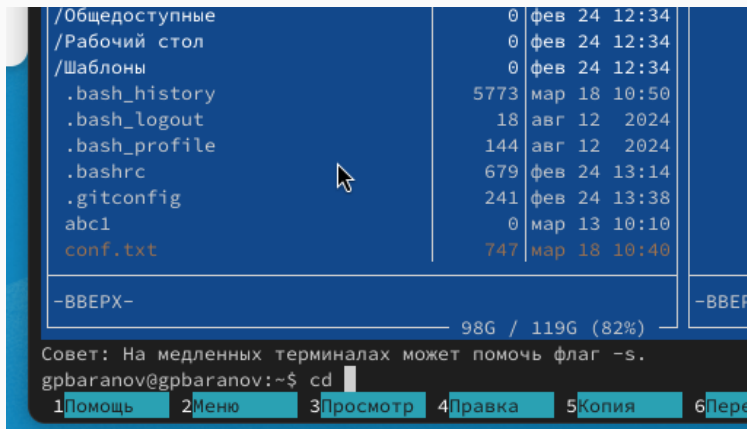


Рис. 16: Переход в домашний каталог



```
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), '%p' (The current file), '%d' (The current working directory), '%s' (Selected files), '%t' (Tagged files), '%u' (Tagged files), '%view' (Runs commands), and a section for format letters (ascii, hex, nroff, uniform). Below this, there are two sections for macros: one for the current file (CMD=%{Enter command}) and one for tagged files (CMD=%{Enter command} for i in %t ; do). At the bottom, a status bar shows 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
# %!f 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

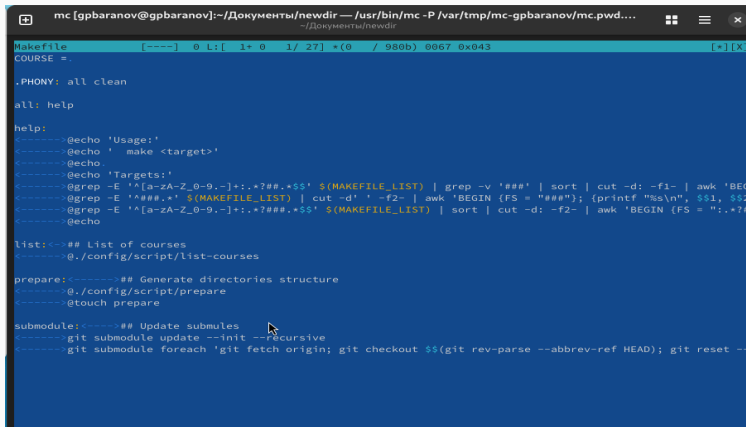


Рис. 24: Кодировка символов



Рис. 25: Распознавание клавиш

Работа с редактором Midnight Commander



The screenshot shows the Midnight Commander (MC) file editor interface. The title bar at the top indicates the current file is `mc [gpbaranov@gpbaranov]:~/Документы/newdir` and the editor is `— /usr/bin/mc -P /var/tmp/mc-gpbaranov/mc.pwd....`. The main window displays the content of a `Makefile` with the following text:

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

.PHONY: all clean

all: help

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

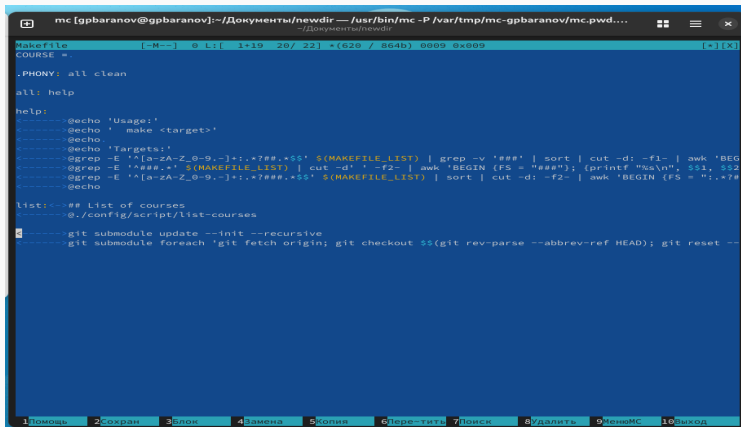
list:<-->## List of courses
<----->@./config/script/list-courses

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 --
```

Рис. 26: Файл с текстом

Работа с редактором Midnight Commander



The screenshot shows the Midnight Commander (MC) interface. The title bar indicates the current directory is ~/Документы/newdir and the file being edited is /usr/bin/mc -P /var/tmp/mc-gpbaranov/mc.pwd.... The main window displays the contents of a file named Makefile. The file contains a Makefile for a project named 'COURSE'. It includes a 'help' target that runs a series of echo commands to display usage, targets, and a list of courses. The 'list' target runs a script to list courses. The 'git' target runs a series of git commands to update submodules. The bottom status bar shows various keyboard shortcuts for file operations.

```
mc [gpbaranov@gpbaranov]:~/Документы/newdir — /usr/bin/mc -P /var/tmp/mc-gpbaranov/mc.pwd....
~//Документы/newdir

Makefile      [-M--]  0 L: [ 1+19 20/ 22] *(620 / 864b) 0009 0x009 [*][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

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

Рис. 27: Файл с текстом

Работа с редактором Midnight Commander

```
mc [gpbaranov@gpbaranov]:~/Документы/newdir — /usr/bin/mc -P /var/tmp/mc-gpbaranov/mc.pwd....
~/Документы/newdir
Makefile [0M--] 0 L:[ 1+16 17/ 31] *(563 /1035b) 0108 0x06C [*)(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

-----git submodule update --init --recursive
-----git submodule foreach 'git fetch origin; git checkout $$ (git rev-parse --abbrev-ref HEAD); git reset --
```

Рис. 28: Копирование фрагмента

Работа с редактором Midnight Commander

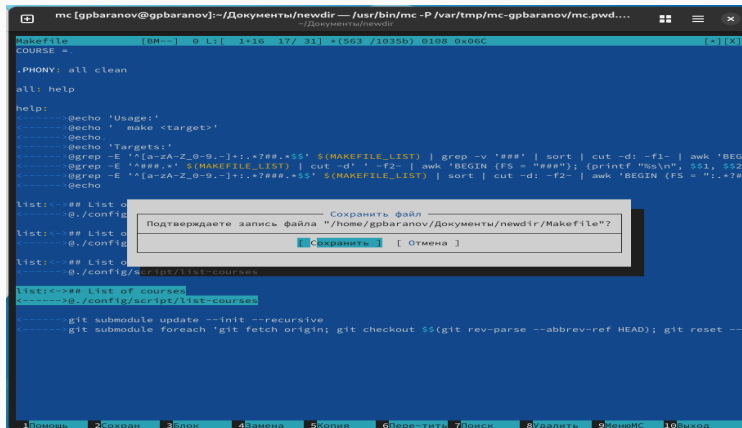
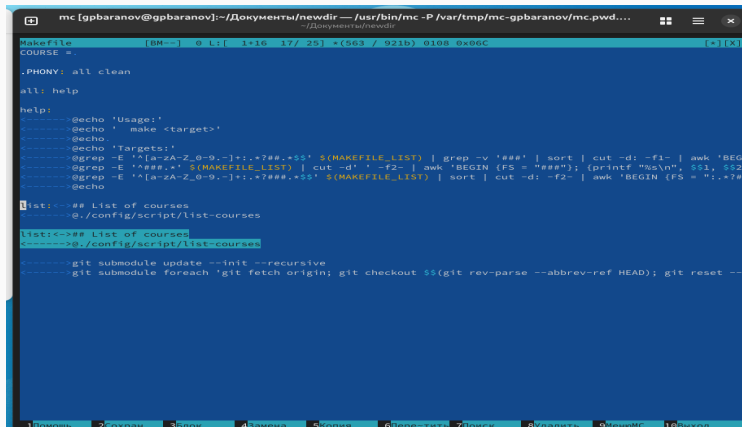


Рис. 29: Сохранение

Работа с редактором Midnight Commander



The screenshot shows the Midnight Commander (MC) interface. The title bar indicates the current directory is ~/Документы/newdir. The main window displays a Makefile with the following content:

```
Makefile
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

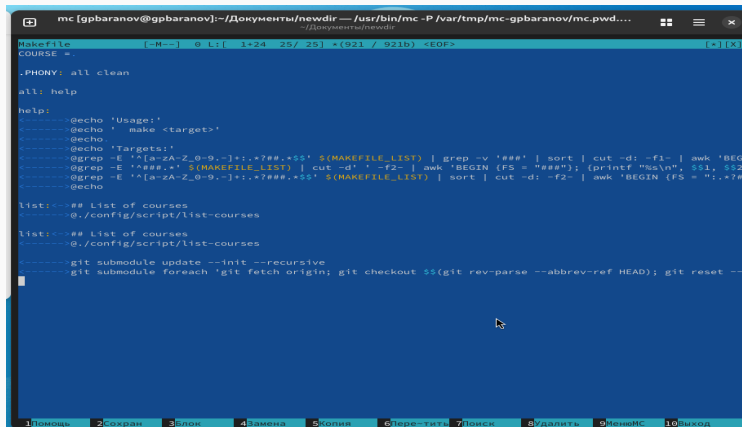
list:<->## List of courses
#####@./config/script/list-courses

#####git submodule update --init --recursive
#####git submodule foreach 'git fetch origin; git checkout $$ (git rev-parse --abbrev-ref HEAD); git reset --
```

At the bottom of the window, there is a menu bar with the following options: 1. Помощь, 2. Сохран, 3. Блок, 4. Замена, 5. Копия, 6. Пере-тит, 7. Поиск, 8. Удалить, 9. Имена, 10. Выход.

Рис. 30: Отмена

Работа с редактором Midnight Commander



```
mc [gpbaranov@gpbaranov]:~/Документы/newdir — /usr/bin/mc -P /var/tmp/mc-gpbaranov/mc.pwd....
~ /Документы/newdir
Makefile  [-M--]  0 L: [ 1+24 25/ 25] *(921 / 921b) <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

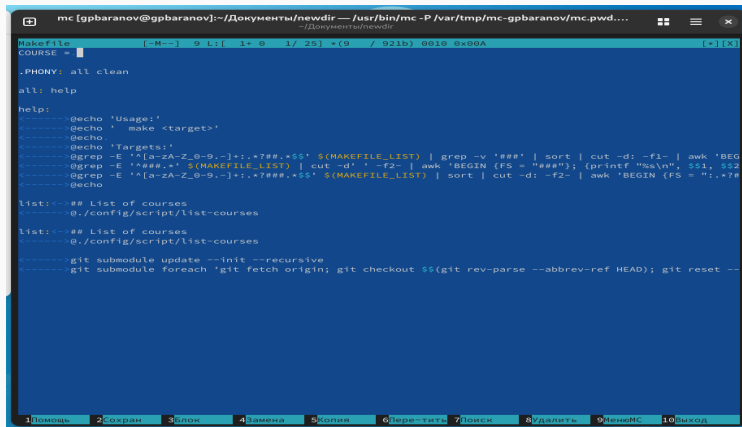
list:<->## List of courses
<----->@./config/script/list-courses

<----->git submodule update --init --recursive
<----->git submodule foreach 'git fetch origin; git checkout $$ (git rev-parse --abbrev-ref HEAD); git reset --

```

Рис. 31: Переход в конец файла

Работа с редактором Midnight Commander



```
mc [gpbaranov@gpbaranov]:~/Документы/newdir — /usr/bin/mc -P /var/tmp/mc-gpbaranov/mc.pwd....
[~M--] 9 L: [ 1+ 0 1/ 25] *(9 / 921b) 0010 0x00A [~][X]
Makefile
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

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

1 Помощь 2 Сохран 3 Блок 4 Замена 5 Копия 6 Пере-тить 7 Поиск 8 Удалить 9 МенюМС 10 Выход

Рис. 32: Переход в начало файла

Работа с редактором Midnight Commander

```
weak.c      [----]  0 L: [ 1+ 0 1/ 27] *(0 / 558b) 0047 0x02F
// SPDX-License-Identifier: GPL-2.0-or-later
/*
 * Copyright (C) 2020 Matt Helsley <mhelsley@vmware.com>
 * Weak definitions necessary to compile objtool without
 * some subcommands (e.g. check, orc).
 */

#include <stdbool.h>
#include <errno.h>
#include <objtool/objtool.h>

#define UNSUPPORTED(name) <-----><-----><-----><-----><-----><----->\
({<-----><-----><-----><-----><-----><-----><----->\
<----->fprintf(stderr, "error: objtool: " name " not implemented\n");<-\
<----->return ENOSYS;<-----><-----><-----><-----><-----><----->\
})

int __weak orc_dump(const char *_objname)
{
    <----->UNSUPPORTED("ORC");
}

int __weak orc_create(struct objtool_file *file)
{
    <----->UNSUPPORTED("ORC");
}
```

Рис. 33: Файл с программой

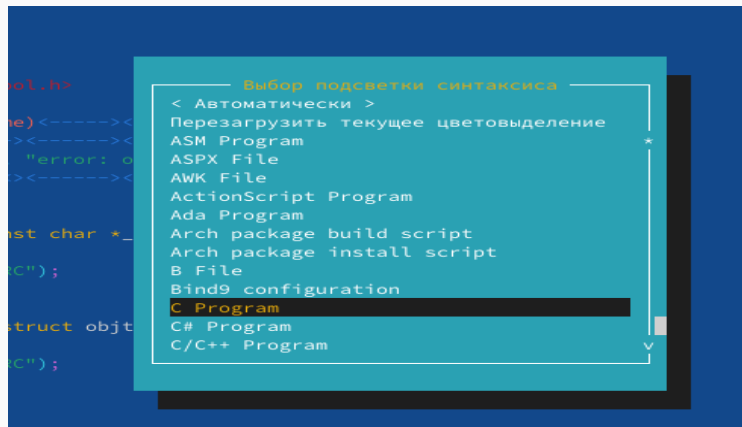


Рис. 34: Цветовыделение синтаксиса

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.