

# Операционные системы

Командная оболочка Midnight Commander

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## Цели и задачи работы

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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

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# Работа с Midnight Commander

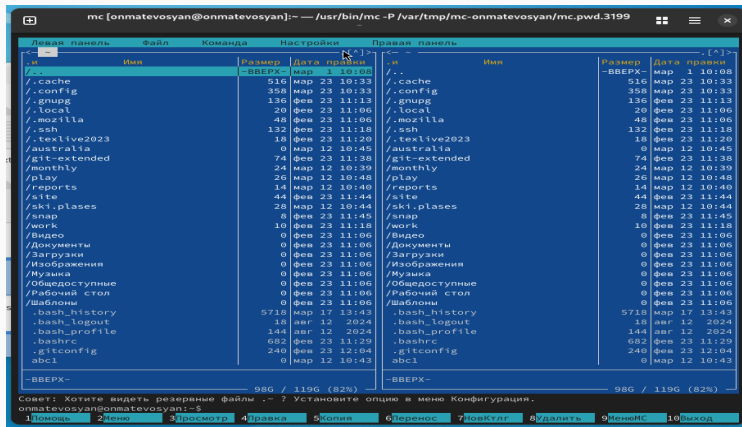


Рис. 1: Запуск mc

# Работа с Midnight Commander

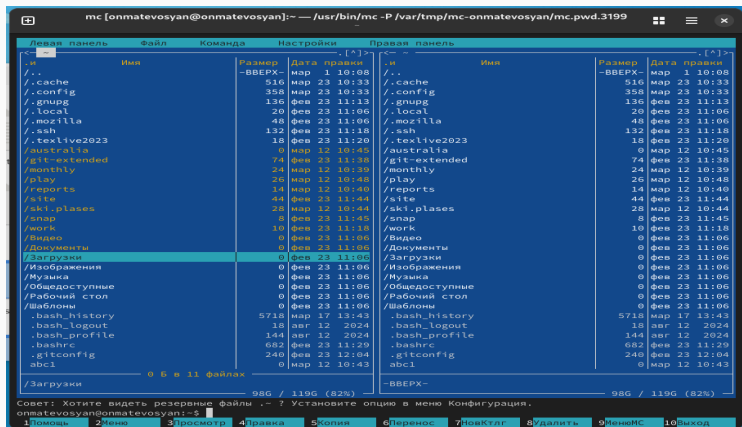


Рис. 2: Выделение

# Работа с Midnight Commander

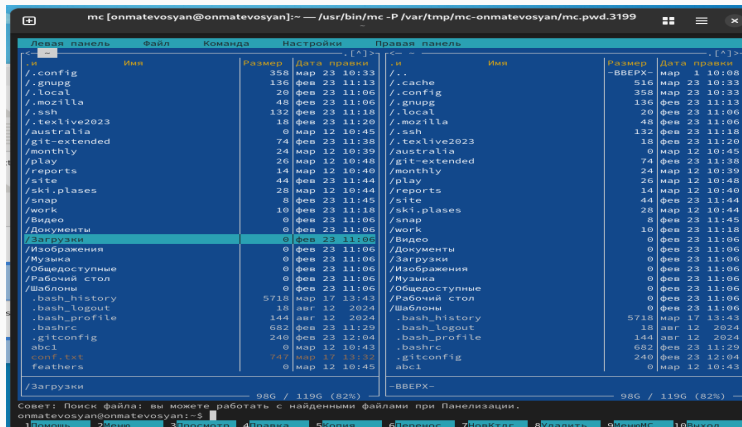


Рис. 3: Отмена



# Работа с Midnight Commander

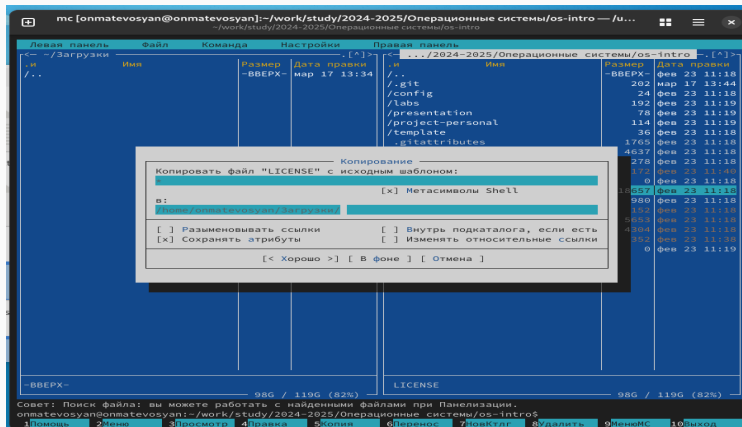


Рис. 4: Копирование

# Работа с Midnight Commander

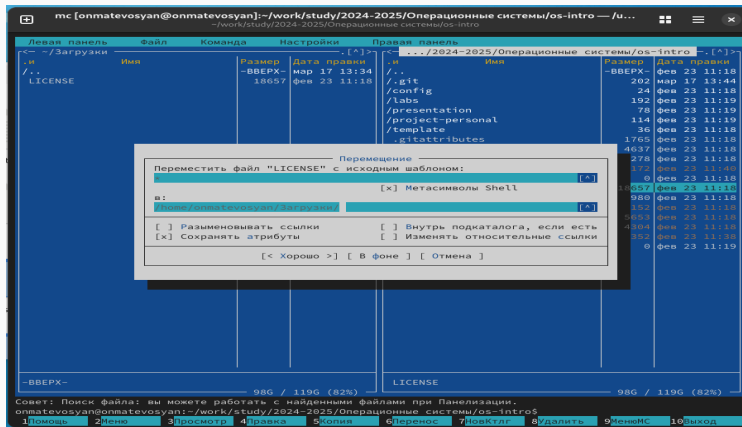


Рис. 5: Перемещение

# Работа с Midnight Commander

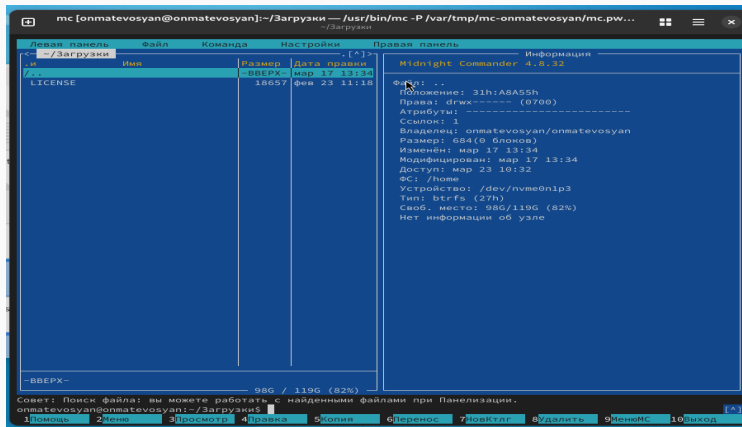


Рис. 6: Информация

# Работа с Midnight Commander

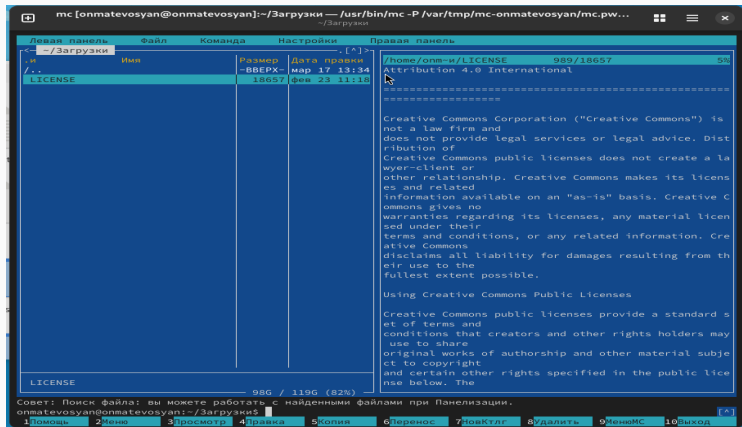


Рис. 7: Быстрый просмотр

# Работа с Midnight Commander

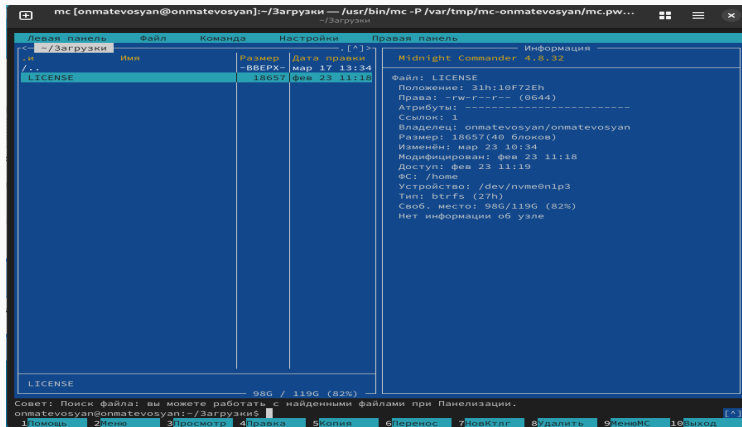


Рис. 8: Информация

# Работа с Midnight Commander

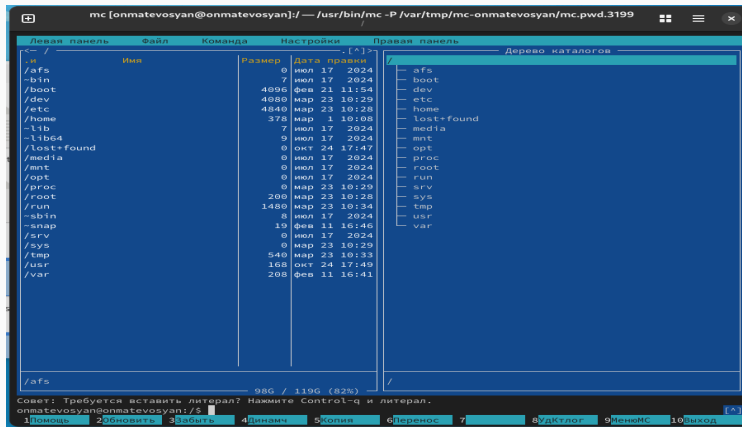
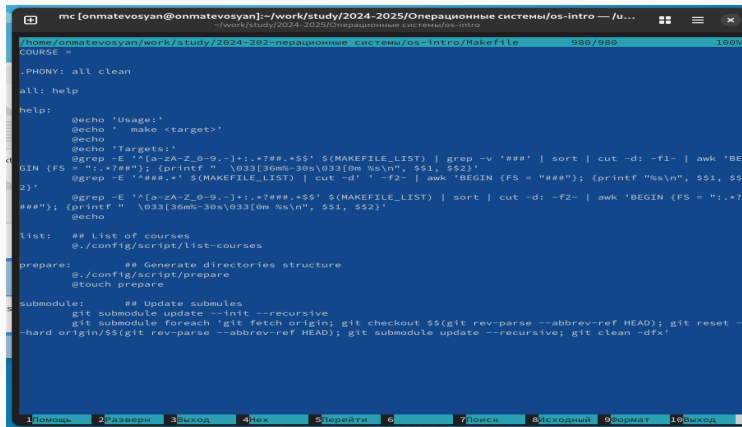


Рис. 9: Дерево каталогов



The screenshot shows the Midnight Commander (mc) interface. The title bar indicates the current directory is `~/work/study/2024-2025/Операционные системы/os-intro`. The main window displays the contents of a `Makefile` file. The file content includes a `COURSE` variable, a `.PHONY` declaration, a `help` target with usage and targets information, a `list` target, a `prepare` target, and a `submodule` target. The bottom status bar shows navigation shortcuts: 1Помощь, 2Разверн, 3Выход, 4Нех, 5Перейти, 6, 7Поиск, 8Исходный, 9Формат, 10Выход.

```
mc [onmatevosyan@onmatevosyan]:~/work/study/2024-2025/Операционные системы/os-intro — /u...
~/home/onmatevosyan/work/study/2024-2025-перационные системы/os-intro/Makefile 980/980 100%
COURSE =

.PHONY: all clean

all: help

help:
    @echo 'Usage:'
    @echo '  make <target>'
    @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

```
mc [onmatevosyan@onmatevosyan]:~/work/study/2024-2025/Операционные системы/os-intro — /u...
-~/work/study/2024-2025/Операционные системы/os-intro

Makefile [-----] 0 L: [ 1+ 0 1/ 27] *(0 / 980b) 8067 0x043 [*][X]
COURSE = .

.PHONY: all clean

all: help

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

Рис. 11: Отредактируем содержимое текстового файла без сохранения результатов



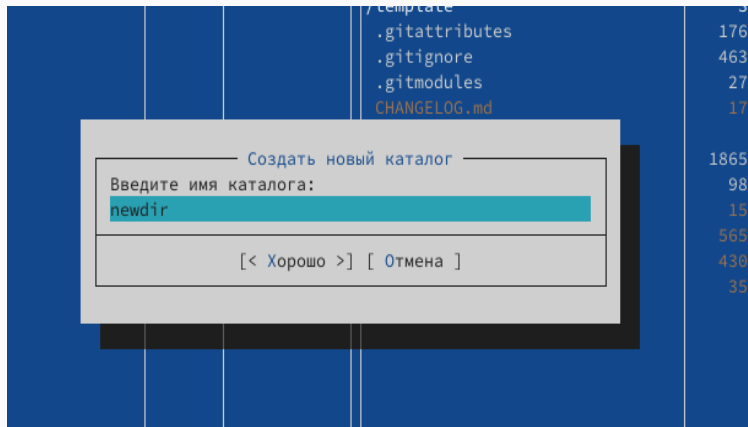


Рис. 12: Создание каталога

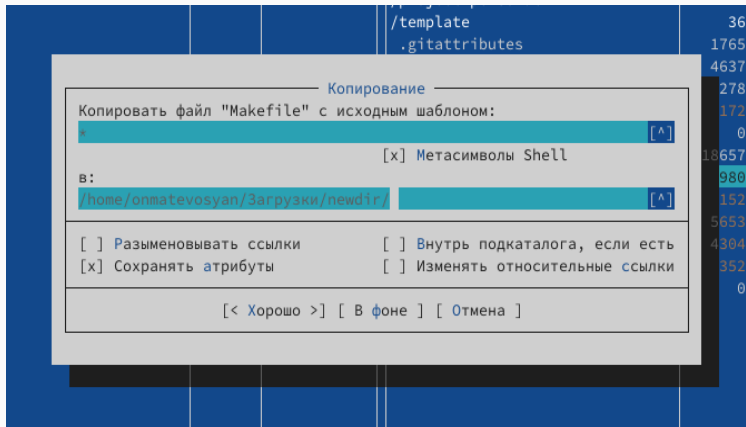


Рис. 13: Копирование в файлов в созданный каталог

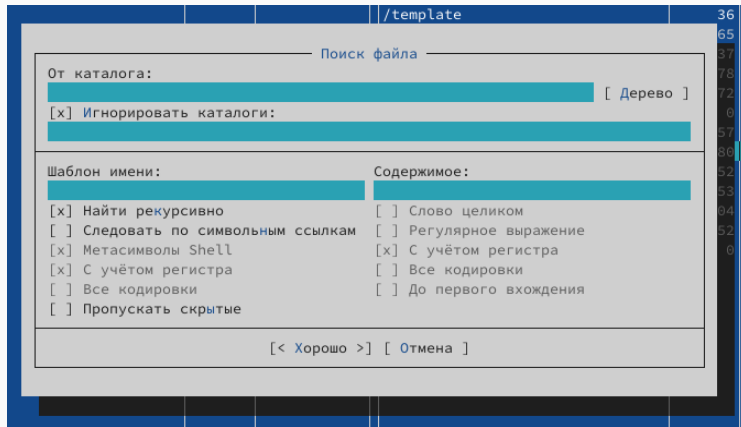


Рис. 14: Поиск файлов

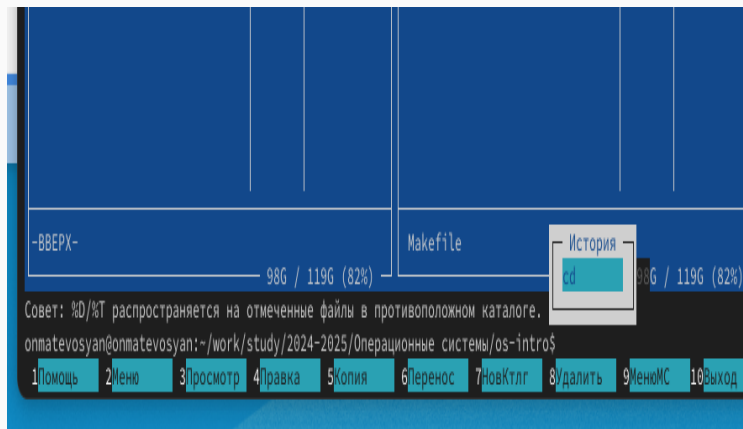


Рис. 15: История команд

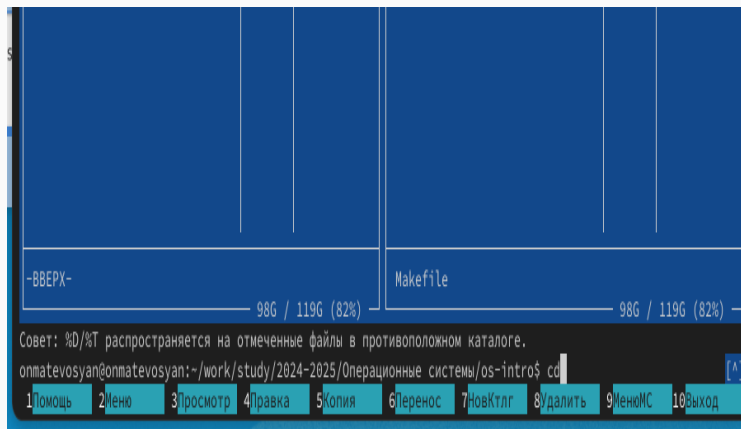


Рис. 16: Переход в домашний каталог

A screenshot of a Midnight Commander window. The title bar at the top shows the file path 'mc.ext.ini' and some system information. The main area has a blue background and displays the contents of the 'mc.ext.ini' file. The text is white and consists of several lines of comments and instructions. A mouse cursor is visible over the text. The bottom of the window shows a standard file manager interface with a list of files and folders.

```
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 (starting with '! t t') and one for tagged files (starting with 't t'). The bottom of the window shows a status bar with 10 numbered buttons: 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

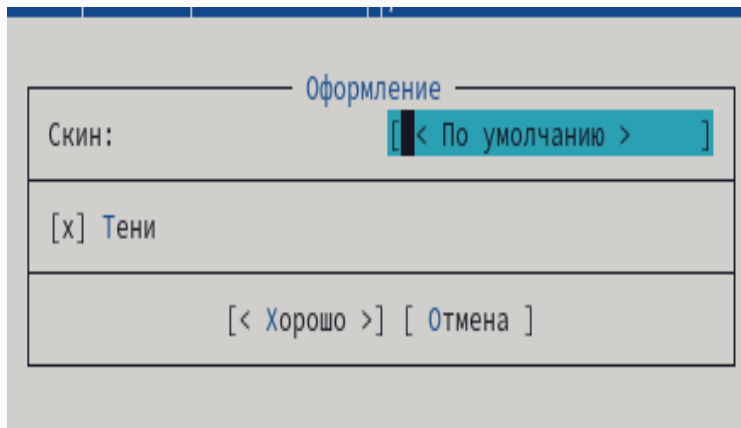


Рис. 23: Оформление



Рис. 24: Кодировка символов



Рис. 25: Распознавание клавиш

# Работа с редактором Midnight Commander

```
mc [onmatevosyan@onmatevosyan]:~/Зарядки/newdir — /usr/bin/mc -P /var/tmp/mc-onmatevosya...
~Зарядки/newdir

[Makefile] [-M--] 0 L: 1+15 16/ 24] *(562 / 923b) 0010 0x00A [*][X]
COURSE =.

.PHONY: all clean

all: help

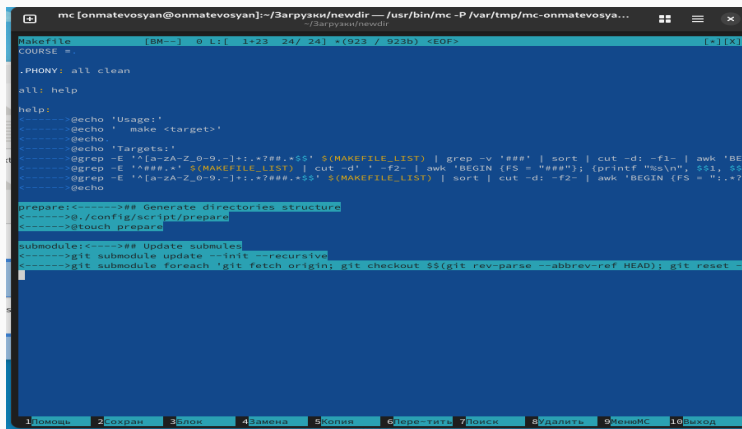
help:
<----->@echo 'Usage:'
<----->@echo '  make <target>'
<----->@echo.
<----->@echo 'Targets:'
<----->@grep -E '^[a-zA-Z_0-9-~]*:.*?###.*$$' $(MAKEFILE_LIST) | grep -v '###' | sort | cut -d: -f1- | awk 'BE
<----->@grep -E '^[a-zA-Z_0-9-~]*:.*?###.*$$' $(MAKEFILE_LIST) | cut -d: -f2- | awk 'BEGIN {FS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

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 -
```

Рис. 26: Файл с текстом

# Работа с редактором Midnight Commander



```
mc [onmatevosyan@onmatevosyan]:~/Зарядки/newdir — /usr/bin/mc -P /var/tmp/mc-onmatevosya...
~Зарядки/newdir

Makefile [BM--] 0 L: [ 1+23 24/ 24] *(923 / 923b) <EOF> [*] [X]
COURSE =.

.PHONY: all clean

all: help

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

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 --
```

Рис. 27: Файл с текстом



# Работа с редактором Midnight Commander

```
mc [onmatevosyan@onmatevosyan]: ~/Зарядки/newdir — /usr/bin/mc -P /var/tmp/mc-onmatevosya...
~/Зарядки/newdir
Makefile [BM--] 0 L: [ 1+23 24/ 48] *(923/2006b) 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-]*:.*?##.*$$' $(MAKEFILE_LIST) | grep -v '###' | sort | cut -d: -f1- | awk 'BE
<----->@grep -E '###.*' $(MAKEFILE_LIST) | cut -d' ' -f2- | awk 'BEGIN {FS = "###"; (printf "%s\n", $$1, $$
<----->@grep -E '^[a-zA-Z_0-9-]*:.*?##.*$$' $(MAKEFILE_LIST) | sort | cut -d: -f2- | awk 'BEGIN {FS = ".*?
<----->@echo

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

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

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

submodule:<----->## Update submules
<----->git submodule update --init --recursive
```

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

Рис. 28: Копирование фрагмента

# Работа с редактором Midnight Commander

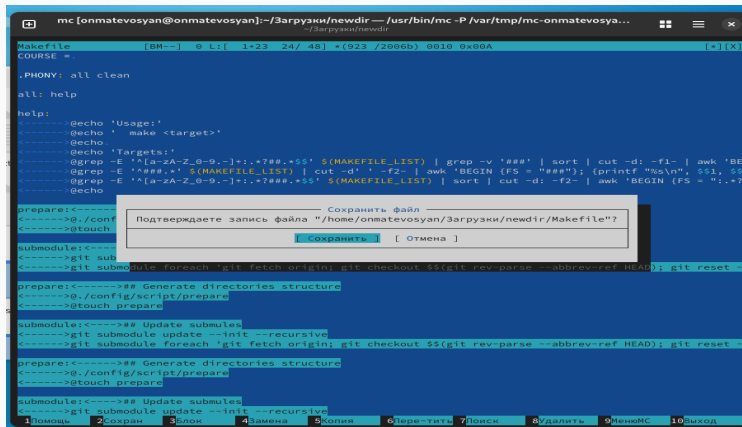


Рис. 29: Сохранение

# Работа с редактором Midnight Commander

```
mc [onmatevosyan@onmatevosyan]: ~/Зарпaysки/newdir — /usr/bin/mc -P /var/tmp/mc-onmatevosya...
~ /Зарпaysки/newdir

Makefile [BM--] 0 L: [ 1+23 24/ 32] *(923 /1284b) 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-~]+.*?##.*$$' $(MAKEFILE_LIST) | grep -v '###' | sort | cut -d: -f1- | awk 'BE
----->@grep -E '###.*' $(MAKEFILE_LIST) | cut -d: -f2- | awk 'BEGIN {FS = "###"}; {printf "%s\n", $1, $
----->@grep -E '^[a-zA-Z_0-9-~]+.*?##.*$$' $(MAKEFILE_LIST) | sort | cut -d: -f2- | awk 'BEGIN {FS = "
----->@echo

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

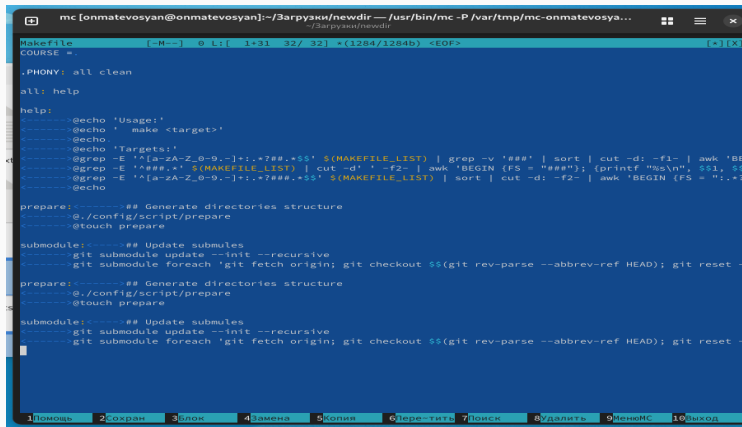
submodule:----->## Update submules
----->git submodule update --init --recursive
----->git submodule foreach 'git fetch origin; git checkout $$ (git rev-parse --abbrev-ref HEAD); git reset --

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 --
```

Рис. 30: Отмена

# Работа с редактором Midnight Commander



```
mc [onmatevosyan@onmatevosyan]:~/Зарядки/newdir — /usr/bin/mc -P /var/tmp/mc-onmatevosya...
~ /Зарядки/newdir

Makefile  [-M--]  0 L: [ 1+31 32/ 32] *(1284/1284b) <EOF>  [*] [X]
COURSE *.

.PHONY: all clean

all: help

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

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 -

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. 31: Переход в конец файла

# Работа с редактором Midnight Commander

```
mc [onmatevosyan@onmatevosyan]:~/Зарядки/newdir — /usr/bin/mc -P /var/tmp/mc-onmatevosya...
[~H~] 9 L: [ 1+ 0 1/ 32] *(9 /1284b) 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-~]+:.*?##.*$$' $(MAKEFILE_LIST) | grep -v '###' | sort | cut -d: -f1- | awk 'BE
<----->@grep -E '^###.*' $(MAKEFILE_LIST) | cut -d' ' -f2- | awk 'BEGIN {FS = "###"}; {printf "%s\n", $$1, $$
<----->@grep -E '^[a-zA-Z_0-9-~]+:.*?###.*$$' $(MAKEFILE_LIST) | sort | cut -d: -f2- | awk 'BEGIN {FS = ".*?
<----->@echo

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

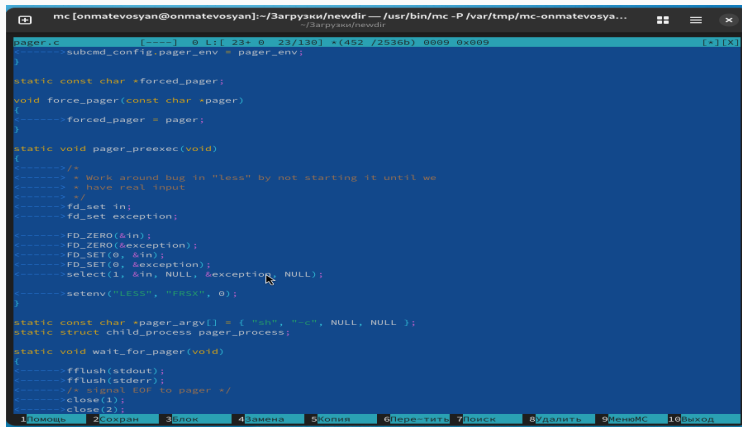
submodule:<----->## Update submules
<----->git submodule update --init --recursive
<----->git submodule foreach 'git fetch origin; git checkout $(git rev-parse --abbrev-ref HEAD); git reset -

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 -
```

Рис. 32: Переход в начало файла

# Работа с редактором Midnight Commander



```
mc [onmatevosyan@onmatevosyan]:~/Загрузки/newdir — /usr/bin/mc -P /var/tmp/mc-onmatevosya...
~/Загрузки/newdir
pager.c [-----] 0 L;[ 23* 0 23/130] *(452 /2536b) 0009 0x009 [*][X]
<----->subcmd_config.pager_env = pager_env;
}

static const char *forced_pager;

void force_pager(const char *pager)
{
<----->forced_pager = pager;
}

static void pager_preexec(void)
{
<-----> /*
<-----> * Work around bug in "less" by not starting it until we
<-----> * have real input
<-----> */
<-----> fd_set in;
<-----> fd_set exception;

<-----> FD_ZERO(&in);
<-----> FD_ZERO(&exception);
<-----> FD_SET(0, &in);
<-----> FD_SET(0, &exception);
<-----> select(1, &in, NULL, &exception, NULL);
<-----> setenv("LESS", "FRSX", 0);
}

static const char *pager_argv[] = { "sh", "-c", NULL, NULL };
static struct child_process pager_process;

static void wait_for_pager(void)
{
<-----> fflush(stdout);
<-----> fflush(stderr);
<-----> /* signal EOF to pager */
<-----> close(1);
<-----> close(2);
}

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

Рис. 33: Файл с программой

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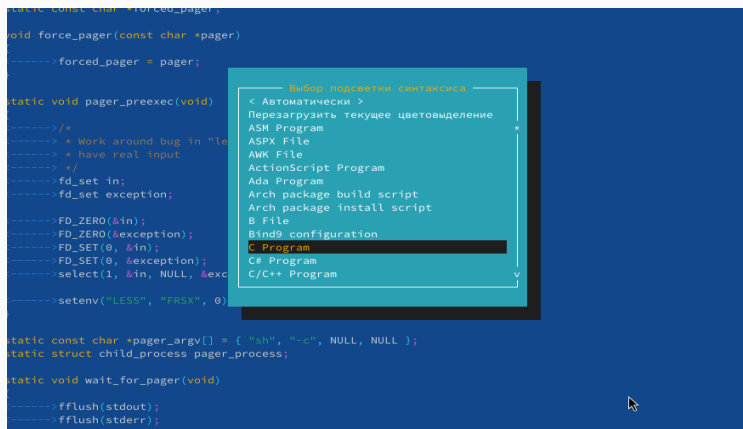


Рис. 34: Цветовыделение синтаксиса

## Выводы по проделанной работе

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