

“Київський фаховий коледж зв’язку”  
Циклова комісія Комп’ютерної інженерії

## **WORK-CASE №8**

з дисципліни: «Операційні системи»

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### Завдання:

1. При роботі з серверними системами або на комп'ютерах, що досить обмежені у ресурсах, досить часто графічну оболонку вимикають або взагалі не встановлюють. Іноді виникають задачі, які здається, що без графічної оболонки виконати не можливо, проте для ОС Linux це не так. Спробуйте через термінал виконати наступні дії та поясніть за допомогою яких команд (пакетів) їх можна виконати:

- Перегляд файлів та папок через файловий менеджер у терміналі.

**Midnight Commander** is a file manager with a command line interface. It is especially useful when there is no way to run a graphical shell, but can also be used as a basic file manager in a graphical interface. It can be run in almost any command line shell and even in an SSH session.

The user interface of the programme is divided into two panels, each displaying the contents of a directory. At the top of each panel the current directory is displayed. Navigation is performed using the arrow keys. The Enter key is used to open the folder. At the very top of the programme there is a menu with options for programme settings, left and right panels, and various operations for files.

- mouse and keyboard support in the graphical interface;
- built-in viewing and editing tool with syntax highlighting;
- support for creating and unpacking archives (rpm, deb, tgz, iso, rar, cpio);
- Unicode encoding support;
- hot function keys for different actions;
- terminal line for executing commands.

To install Midnight Commander in Ubuntu, you can use the command:

```
sofipxs@ubuntu:~$ sudo apt install mc
[sudo] password for sofipxs:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-headers-5.15.0-101 linux-headers-5.15.0-101-generic linux-image-5.15.0-101-generic
  linux-modules-5.15.0-101-generic linux-modules-extra-5.15.0-101-generic
Use 'sudo apt autoremove' to remove them.
```

To use Midnight Commander you need to use: mc

```
sofipxs@ubuntu:~$ mc
sofipxs@ubuntu:~$
```

```

mc [sofipxs@ubuntu:]-
Left  File      Command  Options  Right
<- ~ -> <- ~ ->
.n      Name      Size     Modify   time    .n      Name      Size     Modify   time
/..      UP--DIR    Apr 29 03:14  *lab10.txt    0 Apr 22 16:36
/byobu   4096 Mar 20 18:08  lab8.txt      32 Apr 15 13:01
/cache   4096 Apr 29 05:19  lab8_2.txt    32 Apr 15 13:19
/config  4096 Apr 29 05:19  lab8_3.txt    64 Apr 15 13:25
/cups    4096 Apr 14 22:37  lab8_4.txt    55 Apr 15 14:34
/gnupg   4096 Mar 24 20:43  lab8_5.txt    78 Apr 15 15:24
/local   4096 Mar 5 02:30   !link_name    11 Apr 22 17:33
/mozilla 4096 Mar 20 18:37  *mem_top.sh   185 Apr 2 20:25
/ssh     4096 Mar 5 02:10   *new.sh       276 Apr 2 21:12
/thunderbird 4096 Mar 20 18:37  *newsript.sh  262 Apr 2 19:57
/Desktop 4096 Apr 28 16:15  pict.jpg     130373 Jan 26 19:05
/Documents 4096 Apr 14 22:43  *script.sh    34 Apr 22 19:56
/Downloads 4096 Mar 24 20:37  *trashscript.sh 95 Apr 28 23:23

UP--DIR                                     *trashscript.sh

3030M/18G (16%)                             3030M/18G (16%)

Hint: The file listing format can be customized; do "man mc" for details.
sofipxs@ubuntu:~$
1Help 2Menu 3View 4Edit 5Copy 6RenMov 7Mkdir 8Delete 9PullDn 10Quit

```

**Ranger** is another top choice when looking for a console file manager. It has a vim-like interface, previews of the selected file or directory, support for mouse bookmarks, and tabbed browsing.

To use ranger, you can use the following command:

```
sofipxs@ubuntu: ~  
sofipxs@ubuntu:~$ ranger  
sofipxs@ubuntu:~$
```

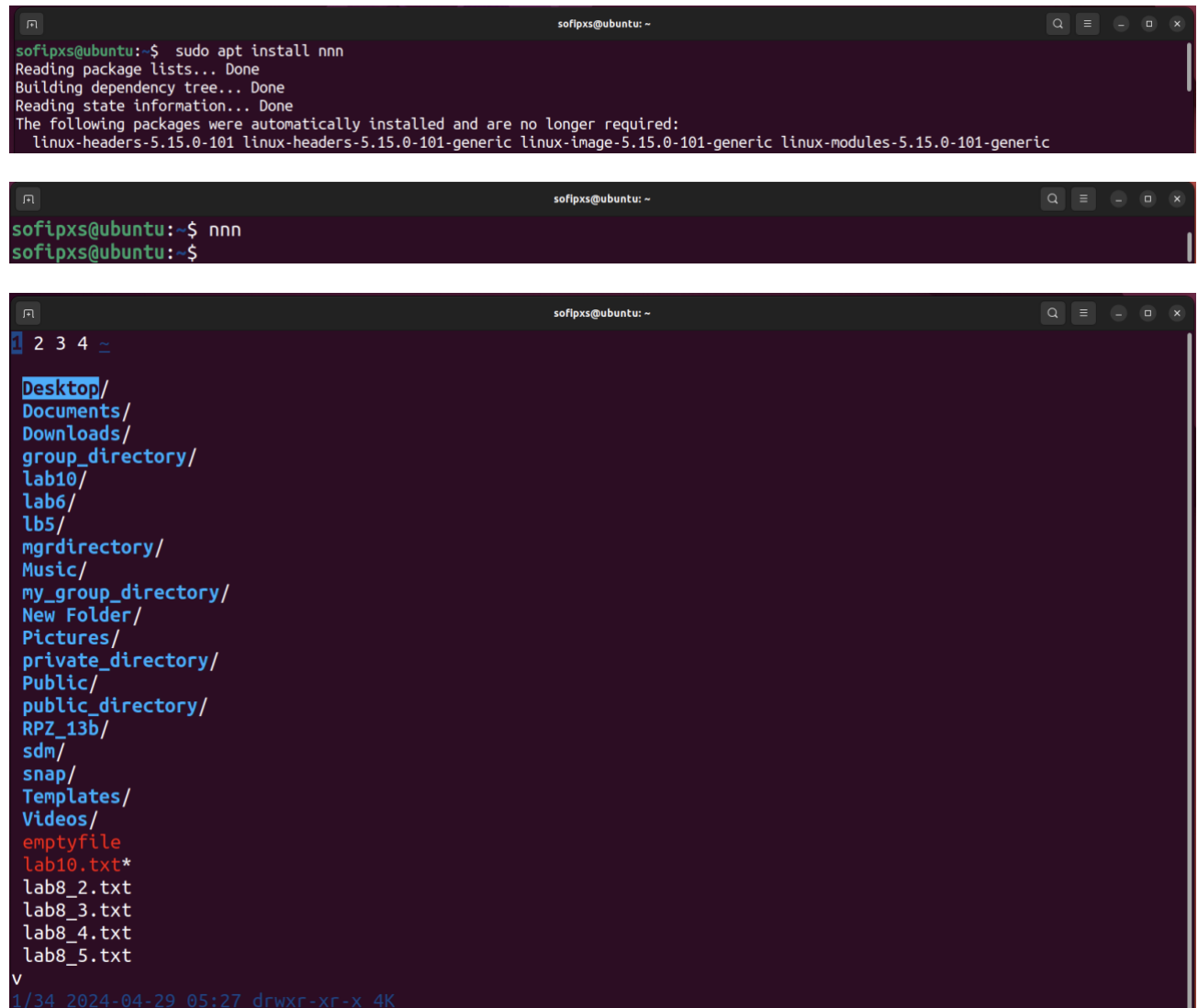
A screenshot of a terminal window with a dark background. The top bar shows the user 'sofipxs@ubuntu' and the current directory '/home/sofipxs/Desktop/text.txt'. The main content is divided into two columns. The left column lists files and directories: 'Desktop' (highlighted in blue), 'Documents', 'Downloads', 'group\_dire~', 'lab6', 'lab10', 'lb5', 'mgrdirecto~', 'Music', 'my\_group\_d~', 'New Folder', 'Pictures', 'private\_di~', 'Public', 'public\_dir~', 'RPZ\_13b', 'sdm', 'snap', 'Templates', and 'Videos'. The right column shows the file 'text.txt' with a size of '1.23 K'. Below this, a list of tasks is displayed: 'Завдання:' followed by two numbered items. Item 1 is 'При роботі з персональним комп'ютером дуже часто в' and includes two bullet points: 'В чому суть операції монтування, для чого вона вик' and 'В чому різниця при роботі з периферією у ОС Linux'. Item 2 is 'Підключіть до вашої віртуальної машини зі встановл'. At the bottom, a file listing command is shown: '-rw-r--r-- 1 sofipxs sofipxs 1.23K 2024-04-15 01:51', followed by disk usage statistics: '1.23K sum, 2.91G free 1/1 All'.

***Nnn*** is the fastest console file manager on our list. Despite having fewer features than other file managers, it is very lightweight and the closest thing to a desktop file

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manager in terms of features that can be accessed on the console. The interface is simple and makes it easy for new users to get used to the terminal.

To set nnn, you can use the following command:



```
sofipxs@ubuntu:~$ sudo apt install nnn
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-headers-5.15.0-101 linux-headers-5.15.0-101-generic linux-image-5.15.0-101-generic linux-modules-5.15.0-101-generic


sofipxs@ubuntu:~$ nnn
sofipxs@ubuntu:~$
```

```
1 2 3 4 ~
Desktop/
Documents/
Downloads/
group_directory/
lab10/
lab6/
lb5/
mgrdirectory/
Music/
my_group_directory/
New Folder/
Pictures/
private_directory/
Public/
public_directory/
RPZ_13b/
sdm/
snap/
Templates/
Videos/
emptyfile
lab10.txt*
lab8_2.txt
lab8_3.txt
lab8_4.txt
lab8_5.txt
v
1/34 2024-04-29 05:27 drwxr-xr-x 4K
```

- Переглядати веб-сторінки через браузер, що працює у терміналі.

**Lynx** is a text-based web browser that is used for accessing the internet through a command-line interface. It was developed in 1992 by the University of Kansas and is still actively maintained by a dedicated group of developers. Lynx is known for its simplicity and is used primarily by individuals who prefer text-based browsing, those with low bandwidth connections, or for accessibility reasons.

To install Lynx on Linux Ubuntu, use the following command:



```
sofipxs@ubuntu:~$ sudo apt install lynx
[sudo] password for sofipxs:
Reading package lists... Done
```

```
sofipxs@ubuntu: ~  
# Tecmint: Linux Howtos, Tutorials & Guides (p1 of 16)  
#next Tecmint: Linux Howtos, Tutorials & Guides » Feed Tecmint: Linux Howtos, Tutorials & Guides »  
Comments Feed  
  
Skip to content  
  
Tecmint: Linux Howtos, Tutorials & Guides  
  
(BUTTON) Menu  
  
(BUTTON) Menu  
* Learn Linux  
* Linux Distros  
  + Linux Distros for Beginners  
  + Linux Distros for Experts  
  + New Linux Distros  
  + Linux Server Distros  
  + Secure Linux Distros  
  + CentOS Alternatives  
  + RedHat Distributions  
(NORMAL LINK) Use right-arrow or <return> to activate.  
Arrow keys: Up and Down to move. Right to follow a link; Left to go back.  
H)elp O)ptions P)rint G)o M)ain screen Q)uit /=search [delete]=history list
```

**Links** is an advanced open-source text and graphical web browser that is known for its speed, efficiency, and low resource usage. With a more modern interface compared to Lynx, Links provides a balance between functionality and simplicity. Links is compatible with HTML4, features support for CSS, and also includes limited support for JavaScript. Additionally, it offers a wide range of features such as tabbed browsing, bookmarks, and SSL support.

To install Links on Ubuntu, use :

```
sofipxs@ubuntu:~$ sudo apt install links  
Reading package lists... Done  
Building dependency tree... Done
```

```
sofipxs@ubuntu:~$ links https://www.tecmint.com  
sofipxs@ubuntu:~$
```

```
sofipxs@ubuntu: ~  
Tecmint: Linux Howtos, Tutorials & Guides (p1 of 21)  
Link: canonical  
Lin  
Ski  
Tec  
Men  
Men  
*  
*  
+-----+  
| Welcome |  
+-----+  
| Welcome to links! |  
+-----+  
| To display menu, press ESC or click on the top line in window. Select Help->Manual |  
| in menu for user's manual. |  
+-----+  
| [ OK ] |  
+-----+  
* Secure Linux Distros  
* CentOS Alternatives  
https://www.tecmint.com/
```

```
sofipxs@ubuntu: ~  
Tecmint: Linux Howtos, Tutorials & Guides (p1 of 16)  
  
Link: canonical  
Link: next  
Skip to content  
Tecmint: Linux Howtos, Tutorials & Guides  
Menu  
Menu  
* Learn Linux  
* Linux Distros  
  * Linux Distros for Beginners  
  * Linux Distros for Experts  
  * New Linux Distros  
  * Linux Server Distros  
  * Secure Linux Distros  
  * CentOS Alternatives  
  * RedHat Distributions  
  * Debian Distributions  
  * Ubuntu Distributions  
  * Arch Linux Distros  
  
https://www.tecmint.com/centos-alternative-distributions/
```

```
sofipxs@ubuntu: ~  
Tecmint: Linux Howtos, Tutorials & Guides (p11 of 12)  
  
How To Create a Linux Swap File  
30 Useful 'ps Command' Examples for Linux Process Monitoring  
Linux Server Monitoring Tools  
  How to Install Nagios Core in Rocky Linux and AlmaLinux  
  Nethogs - Monitor Linux Network Traffic Usage Per Process  
  Observium: A Complete Network Management and Monitoring System for RHEL/CentOS  
  How To Install Pandora FMS Monitoring Tool in Ubuntu 18.04  
  6 Useful Tools to Monitor MongoDB Performance  
  rtop - An Interactive Tool to Monitor Remote Linux Server Over SSH  
Learn Linux Tricks & Tips  
  How to Set Limits on User Running Processes in Linux  
  How to Disable Shutdown and Reboot Commands in Linux  
https://www.tecmint.com/install-nagios-in-rocky-linux-and-almalinux/
```

- Перегляд електронної пошти в терміналі.

Mutt is probably one of the most popular text-based email clients. It supports all the common features that one would expect from an email client. Color coding, mail threading, POP3, and IMAP are all supported by Mutt. But one of its best features is it's highly configurable. Indeed, the user can easily change the keybindings, and create macros to adapt the tool to a particular workflow.

For Ubuntu, run `sudo apt-get install mutt` to install the mutt program. After installation, open a terminal and enter the mutt command. The mutt program will start and you will see your mailbox.



```
sofipxs@ubuntu: ~  
q:Quit d:Del u:Undel s:Save m:Mail r:Reply g:Group ?:Help  
  
---Mutt: (no mailbox) [Msgs:0]---(threads/date)-----all)---  
Key is not bound. Press '?' for help.
```

To send an email, press the m key. Enter the recipient's address, a subject line, and a message.

- Слухати музику через термінал.

MOC or Music on Console is a command line music player for Linux and Unix-like systems. All you have to do is install the player, select a file from a directory using the MOC menu, and all files in that directory will start playing starting from the selected file. MOC is an easy to use but powerful tool. It supports a number of audio formats such as OGG Vorbis, Mp3s, Speex, Wave, wavpack, SID, AAC, MIDI and many others.

Install MOC on Linux Ubuntu: `sudo apt install moc`

```
sofipxs@ubuntu:~$ mocc  
Running the server...  
Trying JACK...  
Trying ALSA...  
  
sofipxs@ubuntu:~$ mocc
```

```
MOC [play] - V - Rainy Days.mp3  
|-----| /home/sofipxs/Downloads |-----| Playlist |  
| .. / |  
| (G)I-DLE - Queencard.mp3 |  
| V - Rainy Days.mp3 [02:59|MP3] | | |
|---|---|---|---|
|-----| Master 05% |-----| 000:05:40 |  
| > V - Rainy Days.mp3 |  
| 01:02 01:57 [02:59] 44kHz 320kbps [STEREO] | [NEX  
T] |-----|
```

- Скачувати торенти через термінал.

There are many good CLI-based torrent clients, but few are as good as **transmission-cli**. It is the easiest to use out of all the choices out there and similar to the most-used torrent client on Linux (Transmission).

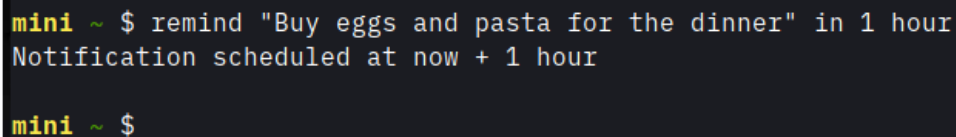
To install transmission-cli, open a terminal window and enter the following command: *sudo apt install transmission-cli*. Transmission CLI can download torrents directly from a URL by doing: *transmission-cli https://cdimage.ubuntu.com/ubuntu-mate/releases/22.04/release/ubuntu-mate-22.04.3-desktop-amd64.iso.torrent -w ~/Downloads*. This method is great if the user is in a pinch and just wants the download to happen as soon as possible.

**Aria2c** is a lightweight, and highly minimal download manager for Linux. Unlike Transmission and rTorrent, aria2c is a multi-protocol download client which means that you can also use it to download non-torrent files. You can obtain it by running the following command: *sudo apt install aria2c*.

To download a torrent with aria2c, run the program followed by the path of the ".torrent" file that you want to download. Just like in rTorrent, this could either be a local or remote path: *aria2c https://cdimage.ubuntu.com/ubuntu-mate/releases/22.04/release/ubuntu-mate-22.04.3-desktop-amd64.iso.torrent*

- Планувати дії в календарі та нагадувати про них через термінал.

remind - a sophisticated reminder service. Remind reads the supplied filename and executes the commands found in it. The commands are used to issue reminders and alarms. Each reminder or alarm can consist of a message sent to standard output, or a program to be executed.



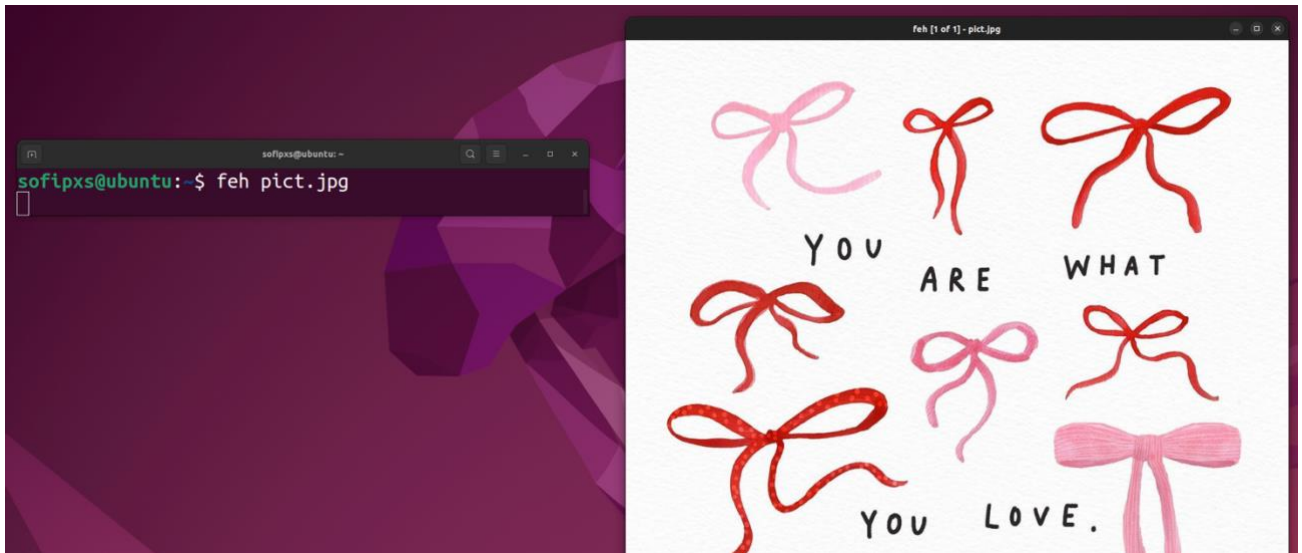
```
mini ~ $ remind "Buy eggs and pasta for the dinner" in 1 hour
Notification scheduled at now + 1 hour

mini ~ $
```

- Переглядати зображення в терміналі

feh is a light-weight, configurable and versatile image viewer. It is aimed at command line users, but can also be started from graphical file managers. Apart from viewing images, it can compile text and thumbnail listings, show (un)loadable files, set X11 backgrounds, and more. Install feh if it is not already installed on your system. You can use your package manager to install it. For example, on Ubuntu, you can run the command: *sudo apt-get install feh*.

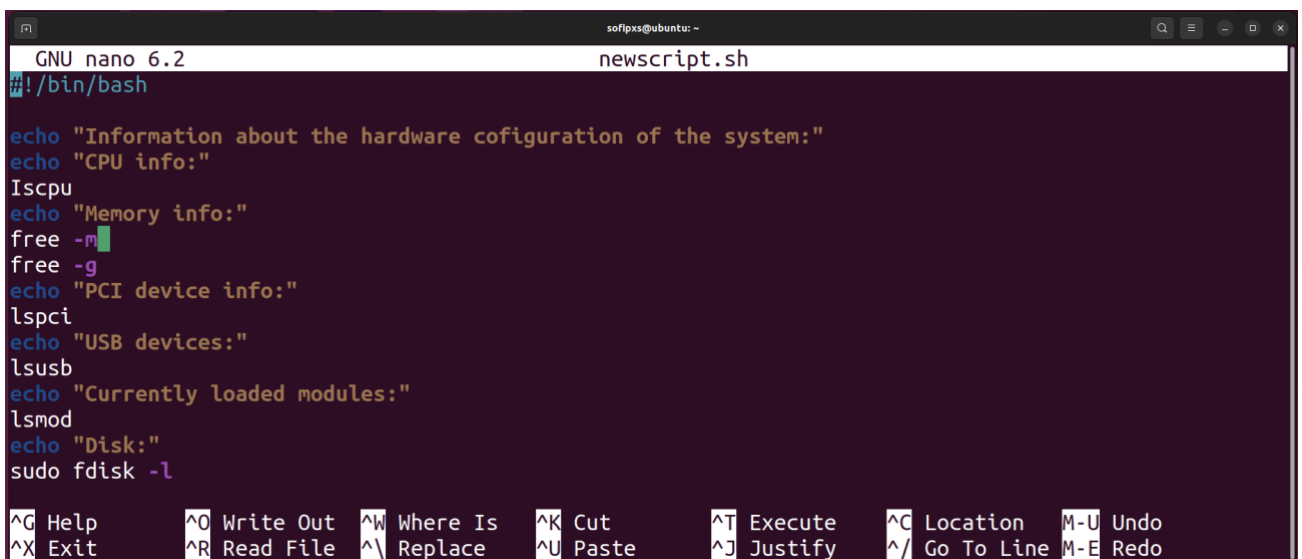




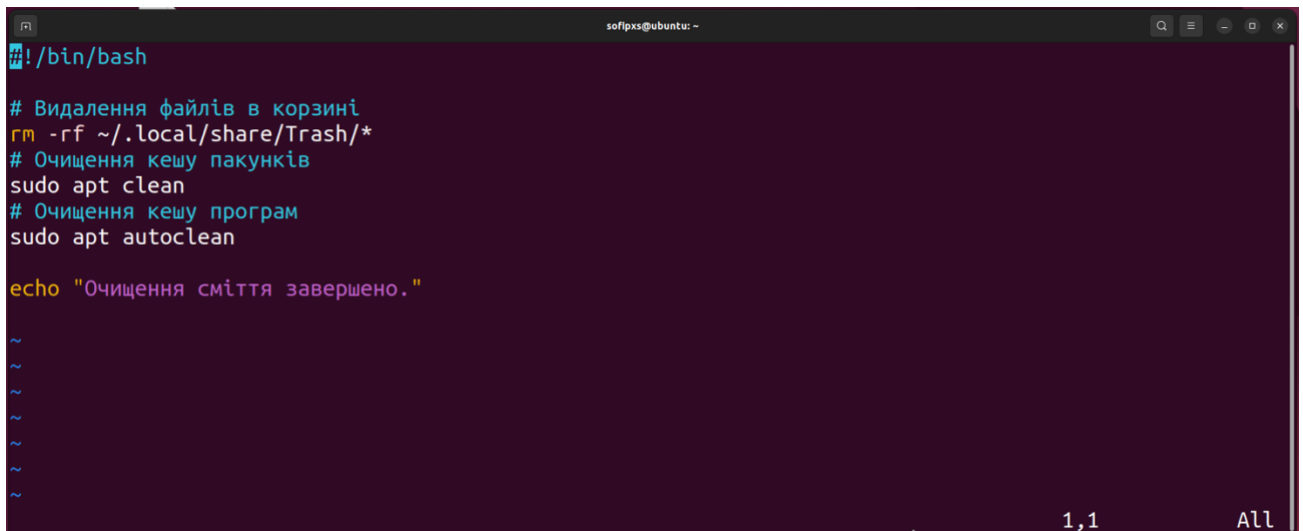
2. Існують також дії які є класичними для більшості адміністраторів та мають досить різноманітний функціонал. Опишіть різні програми (команди, пакети) та встановіть по одній на кожну дію у терміналі:

- Вводити, редагувати, видаляти текст (редактори файлів).

**Nano:** Nano is a simple and easy-to-use text editor that is available on most Linux systems. It offers a user-friendly command line interface with a list of available commands at the bottom of the screen. To open a file in Nano, use the nano <path\_to\_file> command. Make the necessary changes to the text using the various commands listed at the bottom of the editor screen. When you're done editing, press Ctrl + O to save your changes, and then Ctrl + X to exit Nano.



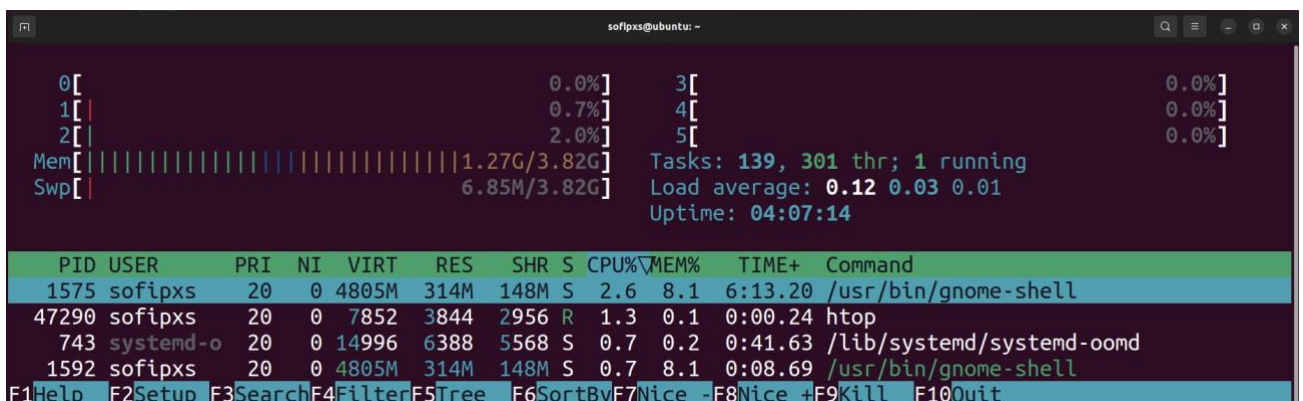
**Vim:** Vim is a powerful text editor with many features. It offers two modes of operation: input mode and command mode. In input mode, you can type, edit, and delete text. In command mode, you can execute various commands to save, delete, or move text. To open a file in Vim, use the `vim <file_path>` command. To switch to input mode, press the `i` key. After making changes, press `Esc` to return to command mode. To save your changes, type `:w` and press `Enter`. To exit Vim, type `:q` and press `Enter`.



```
sofipxs@ubuntu: ~  
#!/bin/bash  
  
# Видалення файлів в коззині  
rm -rf ~/.local/share/Trash/*  
# Очищення кешу пакунків  
sudo apt clean  
# Очищення кешу програм  
sudo apt autoclean  
  
echo "Очищення сміття завершено."  
  
~  
~  
~  
~  
~  
~  
1,1 All
```

- Здійснювати моніторинг процесів та ресурсів системи (аналог диспетчера задач або системного монітора в графічній оболонці).

**htop:** Htop is an improved version of the `top` command that provides a more user-friendly and informative interface. Install it using the package manager and run the `htop` command to open the system process and resource monitoring. Use the arrow keys and other keys to navigate and interact with htop.



```
sofipxs@ubuntu: ~  
0[ 0.0%] 3[ 0.0%]  
1[ 0.7%] 4[ 0.0%]  
2[ 2.0%] 5[ 0.0%]  
Mem[|||||||||||||||||||||||||||||1.27G/3.82G] Tasks: 139, 301 thr; 1 running  
Swp[| 6.85M/3.82G] Load average: 0.12 0.03 0.01  
Uptime: 04:07:14  
  
PID USER PRI NI VIRT RES SHR S CPU% MEM% TIME+ Command  
1575 sofipxs 20 0 4805M 314M 148M S 2.6 8.1 6:13.20 /usr/bin/gnome-shell  
47290 sofipxs 20 0 7852 3844 2956 R 1.3 0.1 0:00.24 htop  
743 systemd-o 20 0 14996 6388 5568 S 0.7 0.2 0:41.63 /lib/systemd/systemd-oomd  
1592 sofipxs 20 0 4805M 314M 148M S 0.7 8.1 0:08.69 /usr/bin/gnome-shell  
F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice - F8Nice + F9Kill F10Quit
```

**glances:** Glances is another powerful system resource monitoring tool. It provides an overview of CPU, memory, disk, network, and other system resources. Install it using the package manager and run the `glances` command to open the monitoring interface. Use the `q` key to exit Glances.

```

sofixps@ubuntu: ~
uptime
ubuntu (Ubuntu 22.04 64bit / Linux 5.15.0-105-generic)
Uptime: 3:45:52

CPU \
CPU [ 0.9%] user 0.3%
MEM [ 39.1%] system 0.3%
SWAP [ 0.2%] iowait 0.0%
MEM - 39.1% total 3.82G used 1.49G free 2.33G
SWAP - 0.2% total 3.82G used 6.85M free 3.81G
LOAD 6-core 1 min: 0.14 5 min: 0.09 15 min: 0.08

NETWORK Rx/s Tx/s TASKS 248 (547 thr), 1 run, 178 slp, 69 oth sorted automatically
enp0s1 0b 0b
lo 376b 376b
DefaultGateway 7ms

DISK I/O R/s W/s
dm-0 0 0

2024-04-29 09:49:25 UTC

```


- Якщо Ви мрієте про подорож, то термінал може Вам показати зображення парового локомотиву з вагоном (гарний натяк на дорогу).

[illegible]

Enter the telnet command `towel.blinkenlights.nl` and press Enter. You will see an animated Star Wars film in ASCII art style.

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```
sofipxs@ubuntu:~$ sudo apt install sl
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
```



The image shows a terminal window with the command 'sudo apt install sl' executed. The output shows the package lists, dependency tree, and state information. Below the text, there is an ASCII art representation of a cow and a reactor. The cow is on the left, and the reactor is on the right. The reactor has a central column with a star and a cross. To the right of the reactor, there is text that says 'They've shut down the main reactor.'

- Якщо ви любите тварин, то термінал Вам може організувати діалог з коровою.

```
sofipxs@ubuntu:~$ cowsay "Hi"
< Hi >
  ---
  \      ^__^
   (oo)\_____)
    (__)\\       )\/\
       ||----w |
       ||     ||
```

```
sofipxs@ubuntu:~$ fortune | cowsay
/ There is a great discovery still to be \
| made in Literature: that of paying   |
| literary men by the quantity they do |
\ NOT write.                          /
-----
  \      ^__^
   (oo)\_____)
    (__)\\       )\/\
       ||----w |
       ||     ||
```

```
sofipxs@ubuntu:~$ fortune | cowsay
/ Life is to you a dashing and bold \
\ adventure.                        /
-----
  \      ^__^
   (oo)\_____)
    (__)\\       )\/\
       ||----w |
       ||     ||
```

```
sofipxs@ubuntu:~$ cowsay -f ghostbusters Who you Gonna Call
```

## < Who you Gonna Call >

[illegible]

```
sofipxs@ubuntu:~$
```

- Можливо Ви знаєте якісь цікаві інтерактиви, які не знаю я, то поділіться ними зі мною :)))

Command: `sudo apt-get install cmatrix -> cmatrix -C red`

[illegible]



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[illegible]

Command: `sudo apt install oneko`. Once oneko is installed, you run the command to see a small animated cat on your screen.



A terminal window titled 'sofi1pxs@ubuntu: ~' with standard window controls. The prompt is 'sofi1pxs@ubuntu:~\$' and the command 'oneko' has been entered. A small white cat cursor is visible on the terminal background.

Command: telnet mapscii.me.

sofixps@ubuntu: ~

center: 52.512, 13.42 zoom: -0.68 mouse: -27.015, -168.83



**Висновки:**

In the course of the work case, I considered various possibilities of working with a terminal in Linux. This included viewing files and folders, browsing the web, working with e-mail, listening to music, downloading torrents, scheduling calendar events, viewing images, and installing various programs to enter, edit, and delete text, as well as to monitor system processes and resources. This web case demonstrates that a Linux terminal can be a powerful tool not only for administrative tasks, but also for entertainment and creative interaction with the system.