

Laborator 1

```
liveuser@localhost-live:~/Documents/S0/lab1$ sudo su -
root@localhost-live:~# exit
logout
liveuser@localhost-live:~/Documents/S0/lab1$
```

Intrare si iesire din modul root(cel mai privilegiat user din system)

```
liveuser@localhost-live:~/Documents/S0/lab1$ sudo dnf update
Updating and loading repositories:
Repositories loaded.
Package                                Arch    Version
----                                -
Upgrading:
ImageMagick                           x86_64  1:7.1.1
.43-1.fc41 updat  88.4 KiB
replacing ImageMagick
.38-1.fc41 anaco  88.4 KiB
ImageMagick-libs                       x86_64  1:7.1.1
.43-1.fc41 updat  9.1 MiB
replacing ImageMagick-libs
.38-1.fc41 anaco  9.1 MiB
NetworkManager                         x86_64  1:1.50.
2-1.fc41 updat  5.7 MiB
replacing NetworkManager
0-1.fc41 anaco  5.7 MiB
NetworkManager-adsl                   x86_64  1:1.50.
2-1.fc41 updat  40.0 KiB
replacing NetworkManager-adsl
0-1.fc41 anaco  40.0 KiB
NetworkManager-bluetooth              x86_64  1:1.50.
2-1.fc41 updat  105.2 KiB
replacing NetworkManager-bluetooth
0-1.fc41 anaco  105.2 KiB
NetworkManager-config-connectivity-fedora noarch  1:1.50.
```

Update sistemului

```
liveuser@localhost-live:~/Documents/S0/lab1$ sudo rpm -q kernel-core
kernel-core-6.11.4-301.fc41.x86_64
```

(nu am alte versiuni pe care le pot sterge cu comanda: sudo dnf remove `version`)

Task 1: ierarhia de directoare (pornesc din root)

```
liveuser@localhost-live:~/Documents/S0/lab1$ man hier
```



```
hier(7) Miscellaneous Information Manual             hier(7)
NAME
  hier - description of the filesystem hierarchy
DESCRIPTION
  A typical Linux system has, among others, the following
  directories:
  /
    This is the root directory. This is where the
    whole tree starts.
  /bin
    This directory contains executable programs which
    are needed in single user mode and to bring the
    system up or repair it.
  /boot
    Contains static files for the boot loader. This
    directory holds only the files which are needed
    during the boot process. The wpa installer and
    configuration files should go to /libwpa and /etc.
    The operating system kernel (initrd for example)
    must be located in either / or /boot.
  /dev
    Special or device files, which refer to physical
    devices. See mknod(1).
Manual page hier(7) line 1 (press h for help or q to quit)
```

```
liveuser@localhost-live:~$ cd Documents
liveuser@localhost-live:~/Documents$ cd SO
liveuser@localhost-live:~/Documents/SO$ ls -l lab1
total 0
-rw-r--r--. 1 liveuser liveuser 0 Feb 19 04:36 file1.txt
```

Afisare sub forma de lista a fisierelor din directorul /Documents/SO/Lab1

Se observa un fisier cu permisiuni: owner – read and write; group – read; others – read

```
liveuser@localhost-live:~$ ls -l /dev/* | grep ^b
brw-rw----. 1 root    disk      7,     0 Feb 19 09:01 /dev/loop0
brw-rw----. 1 root    disk      8,     0 Feb 19 09:01 /dev/sda
brw-rw----+ 1 root    cdrom     11,    0 Feb 19 09:01 /dev/sr0
brw-rw----. 1 root    disk     252,    0 Feb 19 09:01 /dev/zram0
```

Toate fisierele din dev cu proprietatea ca sunt fisiere asociate unui I/O de tip block (b)

Grep – gaseste cele care incep cu “b” – grep este metoda de cautare

“*” – filtreaza fisiere cu orice nume din folderul specificat

Piping – pentru a lega comanda ls de grep

Task 2:

```
Anchoring
The caret ^ and the dollar sign $ are meta-characters that
respectively match the empty string at the beginning and end of
a line.

The Backslash Character and Special Expressions
The symbols \< and \> respectively match the empty string at
the beginning and end of a word. The symbol \b matches the
empty string at the edge of a word, and \B matches the empty
string provided it's not at the edge of a word. The symbol \w
is a synonym for [_[:alnum:]] and \W is a synonym for
[^_[:alnum:]].

Repetition
A regular expression may be followed by one of several
repetition operators:
? The preceding item is optional and matched at most once.
* The preceding item will be matched zero or more times.
+ The preceding item will be matched one or more times.
{n} The preceding item is matched exactly n times.
{n,} The preceding item is matched n or more times.
{,m} The preceding item is matched at most m times. This is
a GNU extension.
{n,m} The preceding item is matched at least n times, but not
more than m times.

Manual page grep(1) line 422 (press h for help or q to quit)
```

Manualul pentru comanda grep -> /anchoring in manual

```
liveuser@localhost-live:~/Documents/S0/lab1$ touch file1.txt
liveuser@localhost-live:~/Documents/S0/lab1$ ls -al file1.txt
-rw-r--r--. 1 liveuser liveuser 0 Feb 19 10:55 file1.txt
liveuser@localhost-live:~/Documents/S0/lab1$ chmod 400 file1.txt
```

```
liveuser@localhost-live:~/Documents/S0/lab1$ ls -al file1.txt
-r-----. 1 liveuser liveuser 0 Feb 19 10:55 file1.txt
```

Fisier nou -> schimbam modul in 4(read only) pentru owner si nici o alta permisiune pentru group si others

```
liveuser@localhost-live:~/Documents/S0/lab1$ mkdir temp
liveuser@localhost-live:~/Documents/S0/lab1$ touch temp/file2.txt
liveuser@localhost-live:~/Documents/S0/lab1$ ls -al temp/
total 0
drwxr-xr-x. 2 liveuser liveuser 60 Feb 19 10:58 .
drwxr-xr-x. 3 liveuser liveuser 80 Feb 19 10:58 ..
-rw-r--r--. 1 liveuser liveuser 0 Feb 19 10:58 file2.txt
```

```
liveuser@localhost-live:~/Documents/S0/lab1$ chmod 100 temp
liveuser@localhost-live:~/Documents/S0/lab1$ ls -al temp/
ls: cannot open directory 'temp/': Permission denied
```

Similar, schimbam modul unui director in execute only pentru owner, si nu se mai poate citii, dar putem accesa fisierele (daca era in schimb 400, le puteam citii, dar nu afisa)

```
liveuser@localhost-live:~/Documents/S0/lab1$ chmod 500 temp/
liveuser@localhost-live:~/Documents/S0/lab1$ ls -l temp/
total 0
-rw-r--r--. 1 liveuser liveuser 0 Feb 19 10:58 file2.txt
liveuser@localhost-live:~/Documents/S0/lab1$ touch temp/file3.txt
touch: cannot touch 'temp/file3.txt': Permission denied
liveuser@localhost-live:~/Documents/S0/lab1$ chmod +w temp/
liveuser@localhost-live:~/Documents/S0/lab1$ ls -l temp/
total 0
-rw-r--r--. 1 liveuser liveuser 0 Feb 19 10:58 file2.txt
liveuser@localhost-live:~/Documents/S0/lab1$ rm temp/file2.txt
liveuser@localhost-live:~/Documents/S0/lab1$ ls -l temp/
total 0
liveuser@localhost-live:~/Documents/S0/lab1$ rm temp/
rm: cannot remove 'temp/': Is a directory
liveuser@localhost-live:~/Documents/S0/lab1$ rm temp/
rm: cannot remove 'temp/': Is a directory
liveuser@localhost-live:~/Documents/S0/lab1$ rm -r temp/
```

In modul read and execute (5) nu se poate scrie sau sterge din director/fisier

Pentru a sterge un director ne trebuie “-r” dupa rm

```
liveuser@localhost-live:~$ echo $PATH
/home/liveuser/.local/bin:/home/liveuser/bin:/usr/local/bin:/usr/local/sbin:/usr/bin:/usr/sbin
liveuser@localhost-live:~$ export PATH=$PATH:/home/user/comenzi
liveuser@localhost-live:~$ echo $PATH
/home/liveuser/.local/bin:/home/liveuser/bin:/usr/local/bin:/usr/local/sbin:/usr/bin:/usr/sbin:/home/user/comenzi
```

Includere calea comenzi in directorul home

```
liveuser@localhost-live:~$ sudo dnf -y install nano
Updating and loading repositories:
Fedora 41 - x86_64 - Updates      100% | 1.7 MiB/s | 10.8 MiB | 00m06s
Fedora 41 openh264 (From Cisco) - x 100% | 5.0 KiB/s | 4.8 KiB | 00m01s
Fedora 41 - x86_64              100% | 2.9 MiB/s | 35.5 MiB | 00m12s
Repositories loaded.
Package "nano-8.1-1.fc41.x86_64" is already installed.

Nothing to do.
liveuser@localhost-live:~$ nano ~/.bashrc
```



```
GNU nano 8.1 /home/liveuser/.bashrc
# Source global definitions
if [ -f /etc/bashrc ]; then
    . /etc/bashrc
fi

# User specific environment
if [ [ "$PATH" =~ "$HOME/.local/bin:$HOME/bin:" ] ]; then
    PATH="$HOME/.local/bin:$HOME/bin:$PATH"
fi
export PATH

# Uncomment the following line if you don't like systemctl's auto-paging feature
# export SYSTEMD_PAGER=

# User specific aliases and functions
if [ -d ~/.bashrc.d ]; then
    for rc in ~/.bashrc.d/*; do
        if [ -f "$rc" ]; then
            . "$rc"
        fi
    done
fi
unset rc
```

Pentru a salva calea adaugata trebuie schimbat fisierul .bashrc (se executa la pornire)

(~ - in home/user; nano – editor de text)

```
liveuser@localhost-live:~$ cat > file.txt
un text scurt
liveuser@localhost-live:~$ wc < file.txt
1 3 14
liveuser@localhost-live:~$ od -t x1a file.txt
00000000 75 6e 20 74 65 78 74 20 73 63 75 72 74 0a
          u n s p t e x t s p s c u r t n l
00000016
```

Simbolul “>” – redirectarea output; “<” – redirectare input; “|” – preia si da mai departe

“wc” – word count; “od” – octal dump -> pentru reprezentare in hexazecimal;

X – hexazecimal; 1 – 1 byte; a – ascii

```
liveuser@localhost-live:~$ find / -name nano > results
find: '/boot/efi': Permission denied
find: '/boot/grub2': Permission denied
find: '/boot/loader/entries': Permission denied
find: '/etc/audit': Permission denied
find: '/etc/credstore': Permission denied
find: '/etc/credstore.encrypted': Permission denied
find: '/etc/cups/ssl': Permission denied
find: '/etc/dhcp': Permission denied
find: '/etc/firewalld': Permission denied
find: '/etc/grub.d': Permission denied
find: '/etc/libvirt': Permission denied
find: '/etc/lvm/archive': Permission denied
find: '/etc/lvm/backup': Permission denied
```

```
liveuser@localhost-live:~$ cat results
/run/rootfsbase/usr/bin/nano
/run/rootfsbase/usr/share/doc/nano
/run/rootfsbase/usr/share/licenses/nano
/run/rootfsbase/usr/share/nano
/usr/bin/nano
/usr/share/doc/nano
/usr/share/licenses/nano
/usr/share/nano
```

“find” caută în root și creează fișierul results unde stochează tot ce a găsit

```
liveuser@localhost-live:~$ cat /etc/passwd
root:x:0:0:Super User:/root:/bin/bash
bin:x:1:1:bin:/bin:/usr/sbin/nologin
daemon:x:2:2:daemon:/sbin:/usr/sbin/nologin
adm:x:3:4:adm:/var/adm:/usr/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/usr/sbin/nologin
sync:x:5:0:sync:/sbin:/bin/sync
shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
halt:x:7:0:halt:/sbin:/sbin/halt
mail:x:8:12:mail:/var/spool/mail:/usr/sbin/nologin
operator:x:11:0:operator:/root:/usr/sbin/nologin
games:x:12:100:games:/usr/games:/usr/sbin/nologin
ftp:x:14:50:FTP User:/var/ftp:/usr/sbin/nologin
nobody:x:65534:65534:Nobody:/usr/sbin/nologin
```

Cautăm tot ce este în /etc/passwd

```
liveuser@localhost-live:~$ cat /etc/passwd | cut -d : -f 1,7
root:/bin/bash
bin:/usr/sbin/nologin
daemon:/usr/sbin/nologin
adm:/usr/sbin/nologin
lp:/usr/sbin/nologin
sync:/bin/sync
shutdown:/sbin/shutdown
halt:/sbin/halt
```

Filtrăm doar coloanele (despartite prin “:”) afișând doar coloanele 1 și 7

EXERCITIU 1:

```
liveuser@localhost-live:~$ ls -l /dev/tty* | grep ^c
crw-rw-rw-. 1 root   tty    5,  0 Feb 26  2025 /dev/tty
crw--w----. 1 root   tty    4,  0 Feb 26  2025 /dev/tty0
crw--w----. 1 root   tty    4,  1 Feb 26  2025 /dev/tty1
crw--w----. 1 root   tty    4, 10 Feb 26  2025 /dev/tty10
crw--w----. 1 root   tty    4, 11 Feb 26  2025 /dev/tty11
crw--w----. 1 root   tty    4, 12 Feb 26  2025 /dev/tty12
crw--w----. 1 root   tty    4, 13 Feb 26  2025 /dev/tty13
crw--w----. 1 root   tty    4, 14 Feb 26  2025 /dev/tty14
crw--w----. 1 root   tty    4, 15 Feb 26  2025 /dev/tty15
crw--w----. 1 root   tty    4, 16 Feb 26  2025 /dev/tty16
crw--w----. 1 root   tty    4, 17 Feb 26  2025 /dev/tty17
crw--w----. 1 root   tty    4, 18 Feb 26  2025 /dev/tty18
crw--w----. 1 root   tty    4, 19 Feb 26  2025 /dev/tty19
crw--w----. 1 liveuser tty    4,  2 Feb 26  03:04 /dev/tty2
crw--w----. 1 root   tty    4, 20 Feb 26  2025 /dev/tty20
crw--w----. 1 root   tty    4, 21 Feb 26  2025 /dev/tty21
crw--w----. 1 root   tty    4, 22 Feb 26  2025 /dev/tty22
crw--w----. 1 root   tty    4, 23 Feb 26  2025 /dev/tty23
crw--w----. 1 root   tty    4, 24 Feb 26  2025 /dev/tty24
crw--w----. 1 root   tty    4, 25 Feb 26  2025 /dev/tty25
crw--w----. 1 root   tty    4, 26 Feb 26  2025 /dev/tty26
crw--w----. 1 root   tty    4, 27 Feb 26  2025 /dev/tty27
```

EXERCITIUL 2:

```
liveuser@localhost-live:~$ nano --show-previous-error /usr/share/doc/nano/nano.1.gz
" Copyright (C) 1999-2011, 2013-2024 Free Software Foundation, Inc.
"
" This document is dual-licensed. You may distribute and/or modify it
" under the terms of either of the following licenses:
"
" * The GNU General Public License, as published by the Free Software
"   Foundation, version 3 or (at your option) any later version. You
"   should have received a copy of the GNU General Public License
"   along with this program. If not, see
"   <https://www.gnu.org/licenses/>.
"
" * The GNU Free Documentation License, as published by the Free
"   Software Foundation, version 1.2 or (at your option) any later
"   version, with no Invariant Sections, no Front-Cover Texts, and no
"   Back-Cover Texts. You should have received a copy of the GNU Free
"   Documentation License along with this program. If not, see
"   <https://www.gnu.org/licenses/>.
"
TH NANO 1 "version 8.1" "July 2024"

SH NAME
nano - Nano's ANOther text editor, inspired by Pico

SH SYNOPSIS
B nano
RT [ options ] [[\fB+ line [\fB, column ]]] " file ]...
```

Fisierele nano... din manual

```
liveuser@localhost-live:~$ zless `find / -name nano* | grep "/man/"`
find: '/boot/efi': Permission denied
find: '/boot/grub2': Permission denied
find: '/boot/loader/entries': Permission denied
find: '/etc/audit': Permission denied
find: '/etc/credstore': Permission denied
find: '/etc/credstore.encrypted': Permission denied
find: '/etc/cups/ssl': Permission denied
find: '/etc/dhcp': Permission denied
find: '/etc/firewalld': Permission denied
find: '/etc/grub.d': Permission denied
find: '/etc/libvirt': Permission denied
find: '/etc/lvm/archive': Permission denied
find: '/etc/lvm/backup': Permission denied
find: '/etc/lvm/cache': Permission denied
find: '/etc/lvm/devices': Permission denied
find: '/etc/nftables': Permission denied
find: '/etc/openvpn/client': Permission denied
find: '/etc/openvpn/server': Permission denied
```

Zless - filtru care permite examinarea fişierelor comprimate sau text simplu câte un ecran pe un terminal de copie software

Apostroful – de la ` la ` terminalul trateaza ca o singura chestie

EXERCITIUL 3:

```
liveuser@localhost-live:~$ mkdir dir_inv
liveuser@localhost-live:~$ touch dir_inv/file_inv.txt
liveuser@localhost-live:~$ chmod 111 dir_inv
liveuser@localhost-live:~$ cut -d : -f3 /etc/passwd > dir_inv/file_inv.txt
liveuser@localhost-live:~$ chmod 444 dir_inv/file_inv.txt
liveuser@localhost-live:~$ ls dir_inv
ls: cannot open directory 'dir_inv': Permission denied
liveuser@localhost-live:~$ cat dir_inv/file_inv.txt
0
1
2
3
4
5
6
7
8
```

mkdir: Creează un director

touch: Creează un fișier gol sau actualizează timpul de modificare al unui fișier existent.

chmod: Schimbă permisiunile unui fișier sau director

cut: Cauta in /etc/passwd, unde coloanele sunt despartite prin : si returneaza doar coloana a 3a(userID urile), iar cu > adauga in fisier

ls: pentru incercarea listarii fisierelor din director

cat: pentru afisarea fisierului

EXERCITIUL 4:

```
liveuser@localhost-live:~$ which nano
/usr/bin/nano
liveuser@localhost-live:~$ od -t x1a /usr/bin/nano | less
```

od - folosește **octal dump** pentru afișarea conținutului binar

-t x1a - afișează fiecare **byte** în două formate:

x1 - hexazecimal (câte un octet pe rând)

a - ASCII, dacă caracterul este imprimabil

| less - permite navigarea rezultatelor

```
liveuser@localhost: ~ - ssh - 172.17.0.1/24
00000000 7f 45 4c 46 02 01 01 00 00 00 00 00 00 00 00 00
del E L F stx soh nul nul nul nul nul nul nul
00000020 03 00 3e 00 01 00 00 00 50 80 00 00 00 00 00 00
etx nul > nul soh nul nul nul P vt nul nul nul nul
00000040 40 00 00 00 00 00 00 00 70 5f 04 00 00 00 00 00
q nul nul nul nul nul nul nul p _ eot nul nul nul nul
00000060 00 00 00 00 40 00 38 00 0d 00 40 00 21 00 20 00
nul nul nul nul q nul 8 nul cr nul q nul ! nul sp nul
00000080 06 00 00 00 04 00 00 00 40 00 00 00 00 00 00 00
ack nul nul nul eot nul nul nul q nul nul nul nul nul
000000a0 40 00 00 00 00 00 00 00 40 00 00 00 00 00 00 00
q nul nul nul nul nul nul nul q nul nul nul nul nul
000000c0 d5 02 00 00 00 00 00 00 d5 02 00 00 00 00 00
X stx nul nul nul nul nul X stx nul nul nul nul nul
000000e0 08 00 00 00 00 00 00 00 03 00 00 00 04 00 00 00
bs nul nul nul nul nul nul nul etx nul nul eot nul nul
00000100 18 03 00 00 00 00 00 00 18 03 00 00 00 00 00 00
can etx nul nul nul nul nul can etx nul nul nul nul nul
00000120 18 03 00 00 00 00 00 00 1c 00 00 00 00 00 00 00
can etx nul nul nul nul nul fs nul nul nul nul nul nul
00000140 1c 00 00 00 00 00 00 00 01 00 00 00 00 00 00 00
fs nul nul nul nul nul nul nul soh nul nul nul nul nul
00000160 01 00 00 00 04 00 00 00 00 00 00 00 00 00 00 00
soh nul nul eot nul nul nul nul nul nul nul nul nul
00000180 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
nul nul nul nul nul nul nul nul nul nul nul nul nul
000001a0 50 34 00 00 00 00 00 00 50 34 00 00 00 00 00 00
X 4 nul nul nul nul nul X 4 nul nul nul nul nul nul
000001c0 00 10 00 00 00 00 00 00 01 00 00 00 05 00 00 00
nul die nul nul nul nul nul soh nul nul enq nul nul nul
000001e0 00 40 00 00 00 00 00 00 00 40 00 00 00 00 00 00
nul q nul nul nul nul nul nul q nul nul nul nul nul
00000200 00 40 00 00 00 00 00 00 75 34 03 00 00 00 00 00
```

```
liveuser@localhost-live:~$ hexdump -C -s 1205360 /usr/bin/nano
000467b0
```

-C - afișează ieșirea într-un format ușor de citit (hex + ASCII).

-s 1205360 - **offset** de la care începe afișarea.

EXERCITIUL 5:

```
liveuser@localhost-live:~$ ls /etc | grep '[0-9]'
dbus-1
grub2.cfg
grub2-efi.cfg
ImageMagick-7
kde4rc
krb5.conf
krb5.conf.d
mke2fs.conf
opensc-x86_64.conf
pkcs11
polkit-1
rc0.d
rc1.d
rc2.d
rc3.d
rc4.d
rc5.d
rc6.d
sasl2
tpm2-tss
udisks2
x11
```

Grep '[0-9]' – cele care au in nume un numar din acest interval