



Module Code & Module Title

CT5052NP Network Operating System

Assessment Type

Logbook 8

Semester

2023/24 Spring/Autumn

Student Name: Pujan Jung Thapa

London Met ID: 23057035

Assignment Due Date: 28 December 2024

Assignment Submission Date: 28 December 2024

Submitted To: Mr. Prasant Adhikari

Word Count (Where Required):

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1.Introduction

1.1 Required Tools and Concepts

Debian

The Debian project is an international volunteer effort that is used in creating and producing free operating systems - Garantizar LA Correcta et al., 2001. It is an enormous collection of software in many different packages, all based upon the Linux kernel and targeting several hardware platforms - R. Nguyen & R. Holt, 2012. The Debian package life cycle, growth, age, bugs, maintainers, and popularity are some of the concerns R. Nguyen & R. Holt, 2012 has looked at over a period of a twelve-year study. A project aims at the creation of a coherent distribution where all the programs interact smoothly with thousands of components, multiples of architectures and an array of system configurations. Debian's development involves hundreds of geographically dispersed contributors who coordinate their efforts to create robust and integrated systems. Project members have voting rights according to the Debian constitution and possess personal PGP/GPG cryptographic keys listed in the official Debian keyring (Monga, 2004).

grep

grep is a command-line utility that is used to search for patterns in text-based files. It stands for "global regular expression print", as it uses regular expressions to specify the patterns that it searches for. It has many options and features that allow you to customize its behavior, such as ignoring case, searching recursively through directories, and more grep command is a powerful tool for searching text-based files and is commonly used for tasks such as debugging, data mining, and text processing(Sakaue & Okada, 2019).

Alias

An alias is any command name or abbreviation, in other words, that represents either a string of text or a series of commands. Aliases are quite convenient in creating shortcuts or better-remembering and usage of rather complex or frequently-used commands. Aliases can be set in any shell by using the alias command, name of the alias, followed by the command or string text it is supposed to act for.

Nano

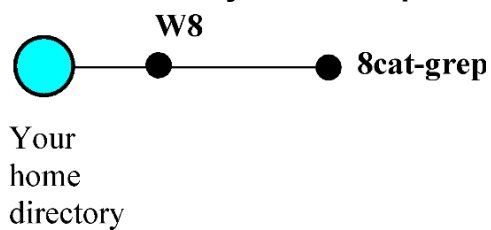
nano is a command-line text editor, which means that it is run from the terminal or command prompt and is controlled using text-based commands. It is a simple and easy-to-use text editor that is commonly used for tasks such as editing configuration files, writing scripts, and creating and editing text documents.

1.2 Objective

- Creating a directory
- Creating files within a directory
- Using grep command with varying options and arguments
- Defining an alias temporarily and permanently
- Removing an alias
- Reviewing the history of the commands used in the CLI
- Re-executing a command using varying command, options or arguments

2. Step of the logs

1. Create the directory structure presented in the figure below.

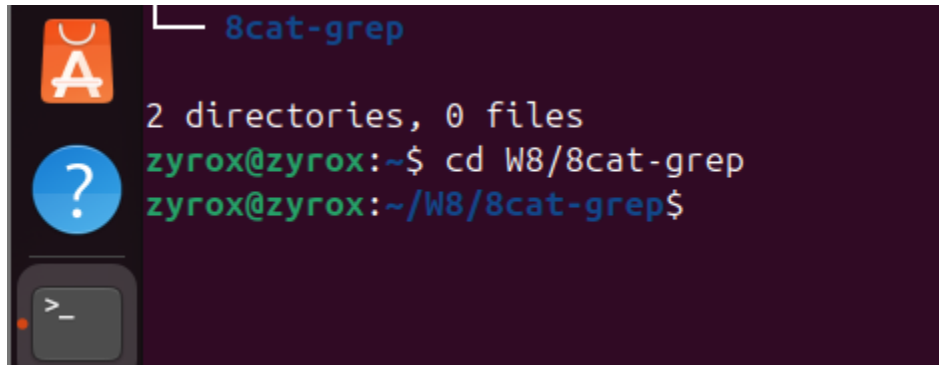


```
linux(Zyrox) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

zyrox@zyrox: ~
zyrox@zyrox:~$ mkdir -p w8/8cat-grep
zyrox@zyrox:~$ mkdir -p W8/8cat-grep
zyrox@zyrox:~$ tree W8
W8
├── 8cat-grep
2 directories, 0 files
zyrox@zyrox:~$
```

Figure 1: Create the directory structure

2. Change to the 8cat-grep directory by one step using a relative pathname.


 A terminal window with a dark purple background. On the left sidebar, there are icons for an application (orange 'A'), a help/question mark (blue circle), and a terminal (grey with a cursor). The terminal text shows the user 'zyrox' at host 'zyrox' in the directory '~'. They run 'cd W8/8cat-grep', and the prompt changes to '~ /W8/8cat-grep'. Above the prompt, it says '2 directories, 0 files'.



```

zyrox@zyrox:~$ cd W8/8cat-grep
zyrox@zyrox:~/W8/8cat-grep$
  
```

Figure 2: Change to the 8cat-grep directory

3. Using the cat utility, create two files.

File testa	File testb
Kkkll	Kkkkkk
Lllmm	Lllll
oo-oo	Mmmmmm
mmmmdd	dddd
dddkk	


 A terminal window showing the creation of two files. The user 'zyrox' is in the directory '~ /W8/8cat-grep'. They run 'cat>testa' and enter the contents of 'File testa' line by line: 'kkkll', 'oo-oo', 'lllmm', 'mmdd', 'dddkk'. Then they run 'cat>testb' and enter the contents of 'File testb' line by line: 'kkkkk', 'lllll', 'mmmmm', 'dddd'. The prompt returns to '~ /W8/8cat-grep\$'.


```

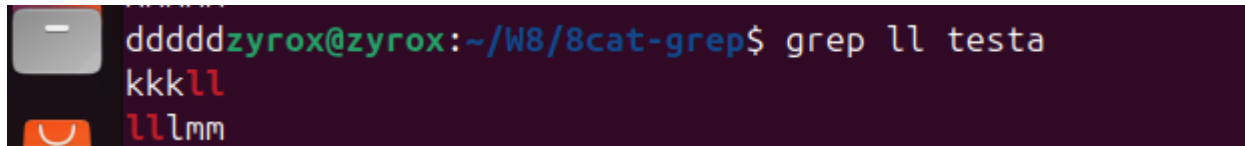
zyrox@zyrox:~/W8/8cat-grep$ cat>testa
kkkll
oo-oo
lllmm
mmdd
dddkk
zyrox@zyrox:~/W8/8cat-grep$ cat>testb
kkkkk
lllll
mmmmm
dddd
zyrox@zyrox:~/W8/8cat-grep$
  
```

Figure 3: creating two files

4. Give the following commands and explain the results for yourself

4.1 The file contents with ll in them are displayed.

`grep ll testa`



```
zyrox@zyrox:~/W8/8cat-grep$ grep ll testa
kkkll
lllmm
```

Figure 4: `grep ll testa`

4.2 The file contents, except ones with ll in them are displayed.

`grep -v ll testa`

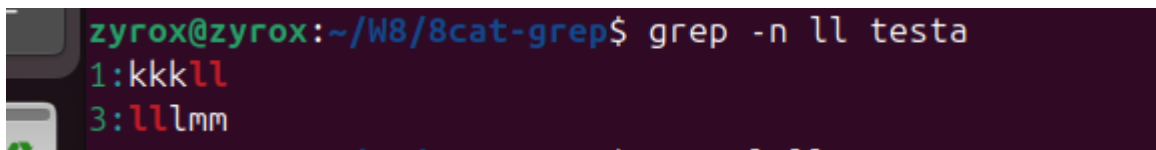


```
zyrox@zyrox:~/W8/8cat-grep$ grep -v ll testa
oo-oo
mmmdd
dddkk
```

Figure 5: `grep -v ll testa`

4.4 The file contents with ll are displayed with number labels.

`grep -n ll testa`

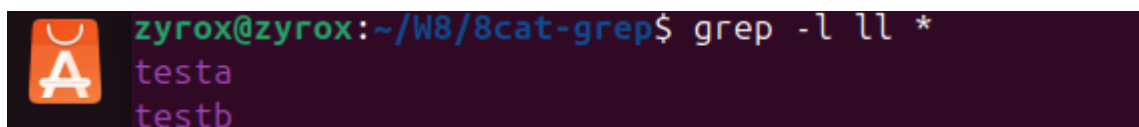


```
zyrox@zyrox:~/W8/8cat-grep$ grep -n ll testa
1:kkkll
3:lllmm
```

Figure 6: `grep -n ll testa`

4.5 The name of the file with ll among the content is displayed.

`grep -l ll *`



```
zyrox@zyrox:~/W8/8cat-grep$ grep -l ll *
testa
testb
```

Figure 7: `grep -l ll *`

4.6 The files containing ll in any form along with the specific content is displayed.

```
grep -i ll *
```

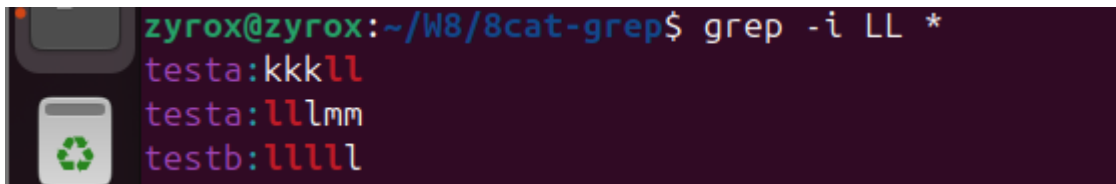


```
zyrox@zyrox:~/W8/8cat-grep$ grep -i ll *
testa:kkkll
testa:lllmm
testb:lllll
```

Figure 8: `grep -i ll *`

4.7 The files containing LLL in any form along with the specific content is displayed.

```
grep -i LL *
```

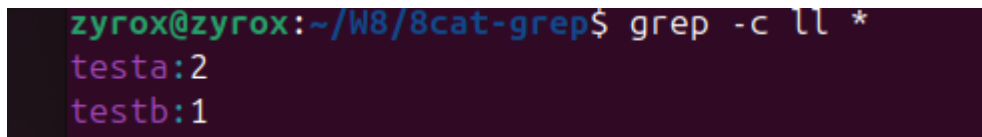


```
zyrox@zyrox:~/W8/8cat-grep$ grep -i LL *
testa:kkkll
testa:lllmm
testb:lllll
```

Figure 9: `grep -i LL *`

4.8 The number of ll contained within each file is displayed.

```
grep -c ll *
```



```
zyrox@zyrox:~/W8/8cat-grep$ grep -c ll *
testa:2
testb:1
```

Figure 10: `grep -c ll *`

4.9 grep '^k' testa testb

```
zyrox@zyrox:~/W8/8cat-grep$ grep '^k' testa testb
testa:kkkll
testb:kkkkk
zyrox@zyrox:~/W8/8cat-grep$
```

Figure 11: `grep '^k' testa testb`

4.10 grep -n '^' testa

```
zyrox@zyrox:~/W8/8cat-grep$ grep -n '^' testa
1:kkkll
2:oo-oo
3:lllmm
4:mmmdd
5:dddkk
zyrox@zyrox:~/W8/8cat-grep$
```

Figure 12: `grep -n '^' testa`

5. Define the lsal alias for ls -al command

Show that your system stores it giving the **alias** command (without arguments).

Use it in your home directory.

```

linux(Zyrox) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

zyrox@zyrox: ~/W8/8cat-grep
zyrox@zyrox:~/W8/8cat-grep$ alias lsal='ls -al'
zyrox@zyrox:~/W8/8cat-grep$ alias
alias alert='notify-send --urgency=low -i "${[ $? = 0 ]} && echo terminal || echo error" "${history|tail -n1|sed -e '\''s/^\s*[0-9]\+\s*//;s/[:;&]\s*alert$//'\`'}" ''
alias egrep='egrep --color=auto'
alias fgrep='fgrep --color=auto'
alias grep='grep --color=auto'
alias l='ls -CF'
alias la='ls -A'
alias ll='ls -alF'
alias ls='ls --color=auto'
alias lsal='ls -al'
zyrox@zyrox:~/W8/8cat-grep$

```

Figure 13: Defining the lsal alias for ls -al

```

linux(Zyrox) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

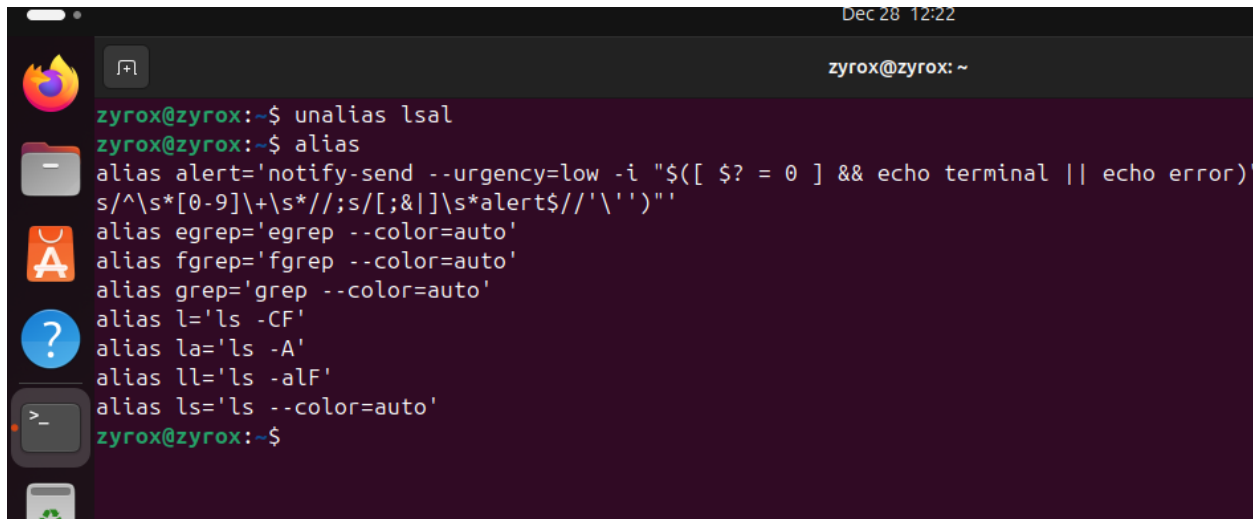
zyrox@zyrox: ~
zyrox@zyrox:~$ lsal
total 124
drwxr-x--- 20 zyrox zyrox 4096 Dec 28 11:11 .
drwxr-xr-x  3 root  root  4096 Dec  9 10:48 ..
drwxrwxr-x  4 zyrox zyrox 4096 Dec 20 13:58 1
-rw-r--r--  1 zyrox zyrox 14458 Dec  9 11:24 alscript
-rw-----  1 zyrox zyrox 1462 Dec 21 16:44 .bash_history
-rw-r--r--  1 zyrox zyrox  220 Mar 31 2024 .bash_logout
-rw-r--r--  1 zyrox zyrox 3771 Mar 31 2024 .bashrc
drwx-----  9 zyrox zyrox 4096 Dec  9 10:57 .cache
-rw-rw-r--  1 zyrox zyrox  24 Dec  9 11:15 combined_file
drwx----- 12 zyrox zyrox 4096 Dec 20 14:18 .config
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Desktop
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Documents
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Downloads
drwx-----  2 zyrox zyrox 4096 Dec 21 15:35 .gnupg
drwx-----  4 zyrox zyrox 4096 Dec  9 10:54 .local
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Music
drwxr-xr-x  3 zyrox zyrox 4096 Dec 20 14:01 Pictures
-rw-r--r--  1 zyrox zyrox  807 Mar 31 2024 .profile
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Public
drwx-----  4 zyrox zyrox 4096 Dec 20 18:22 snap
drwx-----  2 zyrox zyrox 4096 Dec  9 10:48 .ssh
-rw-r--r--  1 zyrox zyrox  0 Dec  9 11:04 .sudo_as_admin_successful
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Templates
-rw-rw-r--  1 zyrox zyrox  24 Dec  9 11:10 test1
-rw-rw-r--  1 zyrox zyrox  62 Dec  9 11:12 test2
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Videos
drwxrwxr-x  3 zyrox zyrox 4096 Dec 21 16:33 W7
drwxrwxr-x  3 zyrox zyrox 4096 Dec 28 11:09 W8
drwxrwxr-x  3 zyrox zyrox 4096 Dec 28 11:11 W8
zyrox@zyrox:~$

```

Figure 14: Checking lsal

6. Remove the alias.

Show that your system does not store it.



```

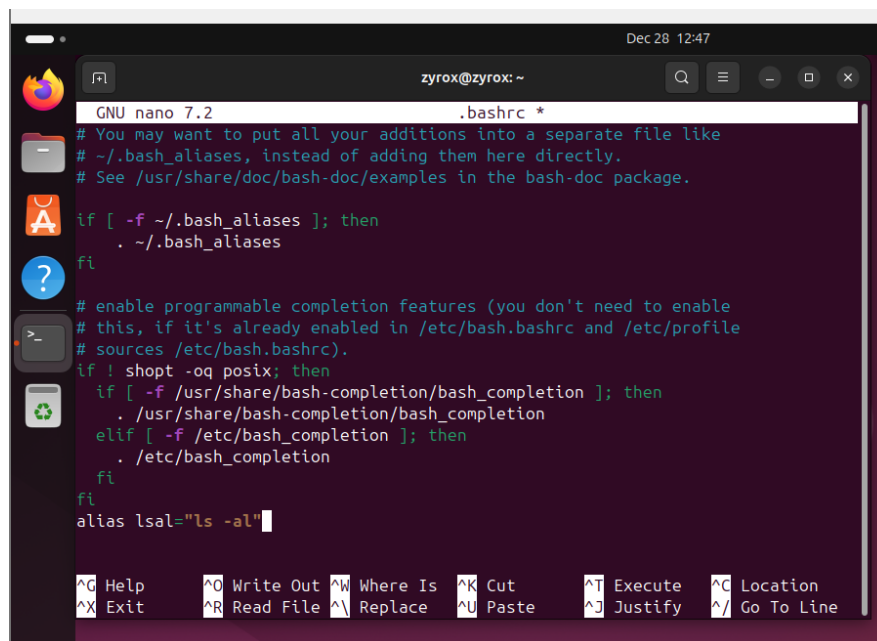
Dec 28 12:22
zyrox@zyrox: ~
zyrox@zyrox:~$ unalias lsal
zyrox@zyrox:~$ alias
alias alert='notify-send --urgency=low -i "${[ $? = 0 ] && echo terminal || echo error}"
s/^\s*[0-9]+\s*//;s/[:&|]\s*alert$//'\''"'
alias egrep='egrep --color=auto'
alias fgrep='fgrep --color=auto'
alias grep='grep --color=auto'
alias l='ls -CF'
alias la='ls -A'
alias ll='ls -alF'
alias ls='ls --color=auto'
zyrox@zyrox:~$
  
```

Figure 15: Remove the alias.

7. Define this alias again preserving it for the next session.

Enter nano .bashrc and this will come in screen

In the page alias was added then saved and exited.



```

Dec 28 12:47
zyrox@zyrox: ~
GNU nano 7.2 .bashrc *
# You may want to put all your additions into a separate file like
# ~/.bash_aliases, instead of adding them here directly.
# See /usr/share/doc/bash-doc/examples in the bash-doc package.

if [ -f ~/.bash_aliases ]; then
    . ~/.bash_aliases
fi

# enable programmable completion features (you don't need to enable
# this, if it's already enabled in /etc/bash.bashrc and /etc/profile
# sources /etc/bash.bashrc).
if ! shopt -oq posix; then
    if [ -f /usr/share/bash-completion/bash_completion ]; then
        . /usr/share/bash-completion/bash_completion
    elif [ -f /etc/bash_completion ]; then
        . /etc/bash_completion
    fi
fi
alias lsal="ls -al"
  
```

Figure 16: adding alias.

Now, After restarting the Debian app,

```

linux(Zyrox) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

Dec 28 12:52
zyrox@zyrox: ~

zyrox@zyrox:~$ lsal
total 128
drwxr-x--- 20 zyrox zyrox 4096 Dec 28 12:48 .
drwxr-xr-x  3 root  root  4096 Dec  9 10:48 ..
drwxrwxr-x  4 zyrox zyrox 4096 Dec 20 13:58 1
-rw-rw-r--  1 zyrox zyrox 14458 Dec  9 11:24 alscript
-rw-----  1 zyrox zyrox 1965 Dec 28 12:51 .bash_history
-rw-r--r--  1 zyrox zyrox  220 Mar 31 2024 .bash_logout
-rw-r--r--  1 zyrox zyrox 3791 Dec 28 12:48 .bashrc
-rw-rw-r--  1 zyrox zyrox  21 Dec 28 12:38 bashrc
drwx-----  9 zyrox zyrox 4096 Dec  9 10:57 .cache
-rw-rw-r--  1 zyrox zyrox  24 Dec  9 11:15 combined_file
drwx----- 12 zyrox zyrox 4096 Dec 20 14:18 .config
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Desktop
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Documents
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Downloads
drwx-----  2 zyrox zyrox 4096 Dec 21 15:35 .gnupg
drwx-----  4 zyrox zyrox 4096 Dec  9 10:54 .local
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Music
drwxr-xr-x  3 zyrox zyrox 4096 Dec 20 14:01 Pictures
-rw-r--r--  1 zyrox zyrox  807 Mar 31 2024 .profile
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Public
drwx-----  4 zyrox zyrox 4096 Dec 20 18:22 snap
drwx-----  2 zyrox zyrox 4096 Dec  9 10:48 .ssh
-rw-r--r--  1 zyrox zyrox   0 Dec  9 11:04 .sudo_as_admin_successful
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Templates
-rw-rw-r--  1 zyrox zyrox  24 Dec  9 11:10 test1
-rw-rw-r--  1 zyrox zyrox  62 Dec  9 11:12 test2
drwxr-xr-x  2 zyrox zyrox 4096 Dec  9 10:54 Videos
drwxrwxr-x  3 zyrox zyrox 4096 Dec 21 16:33 W7
drwxrwxr-x  3 zyrox zyrox 4096 Dec 28 11:09 w8
drwxrwxr-x  3 zyrox zyrox 4096 Dec 28 11:11 W8
zyrox@zyrox:~$

```

Figure 17: After restarting the Debian app.

8. Define the nwho alias for the number of system file at UNIX computers.

alias nwho='getent passwd|wc -l'

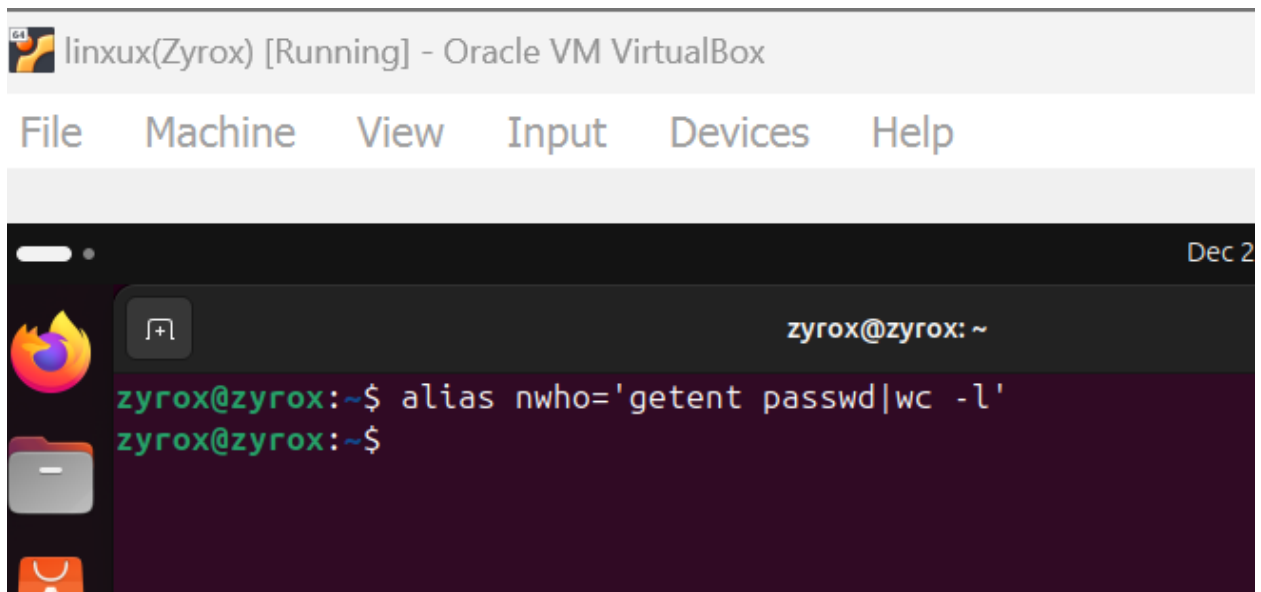


Figure 18: Defining the nwho alias.

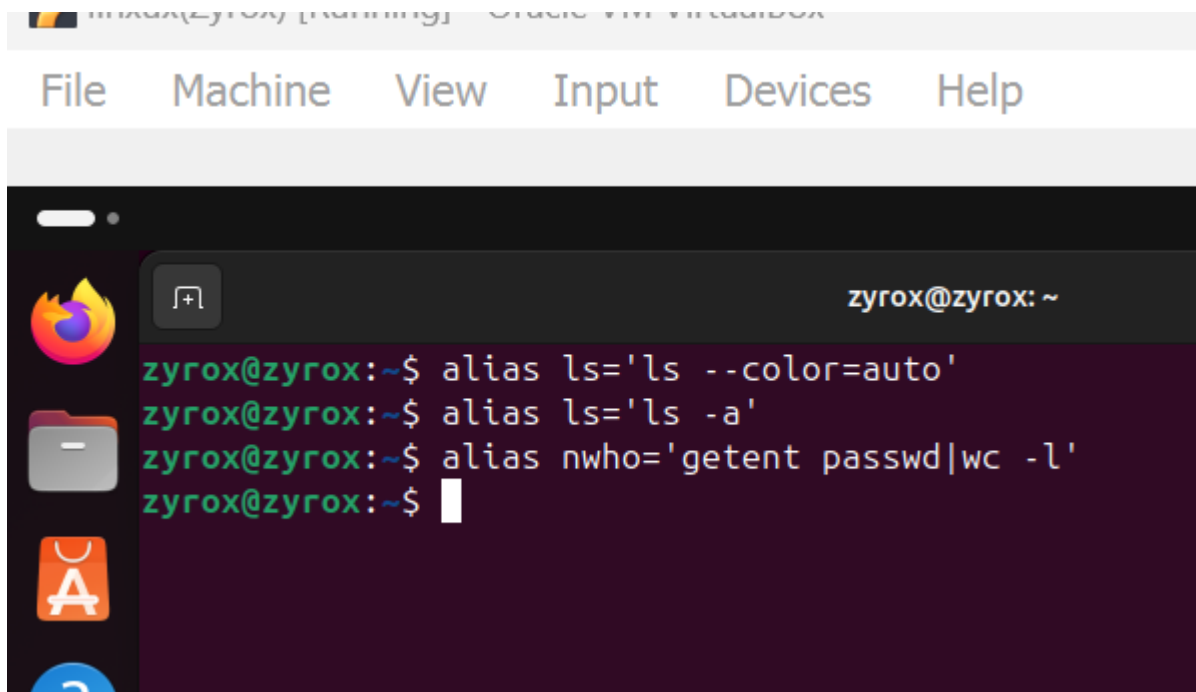
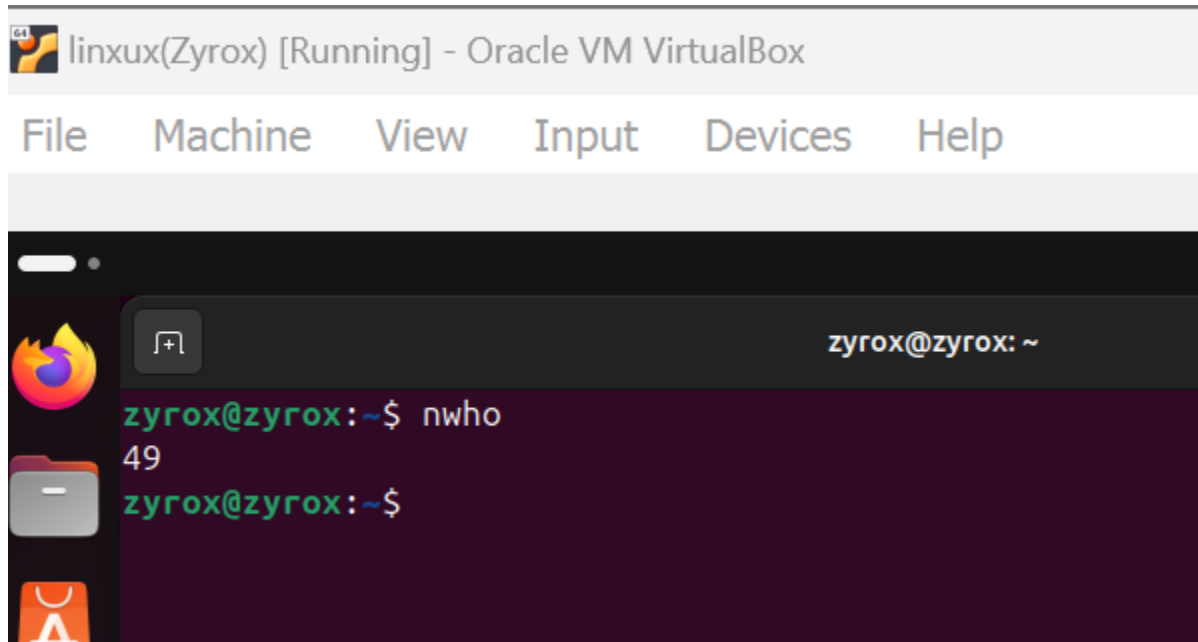


Figure 19: preserving it for the next session

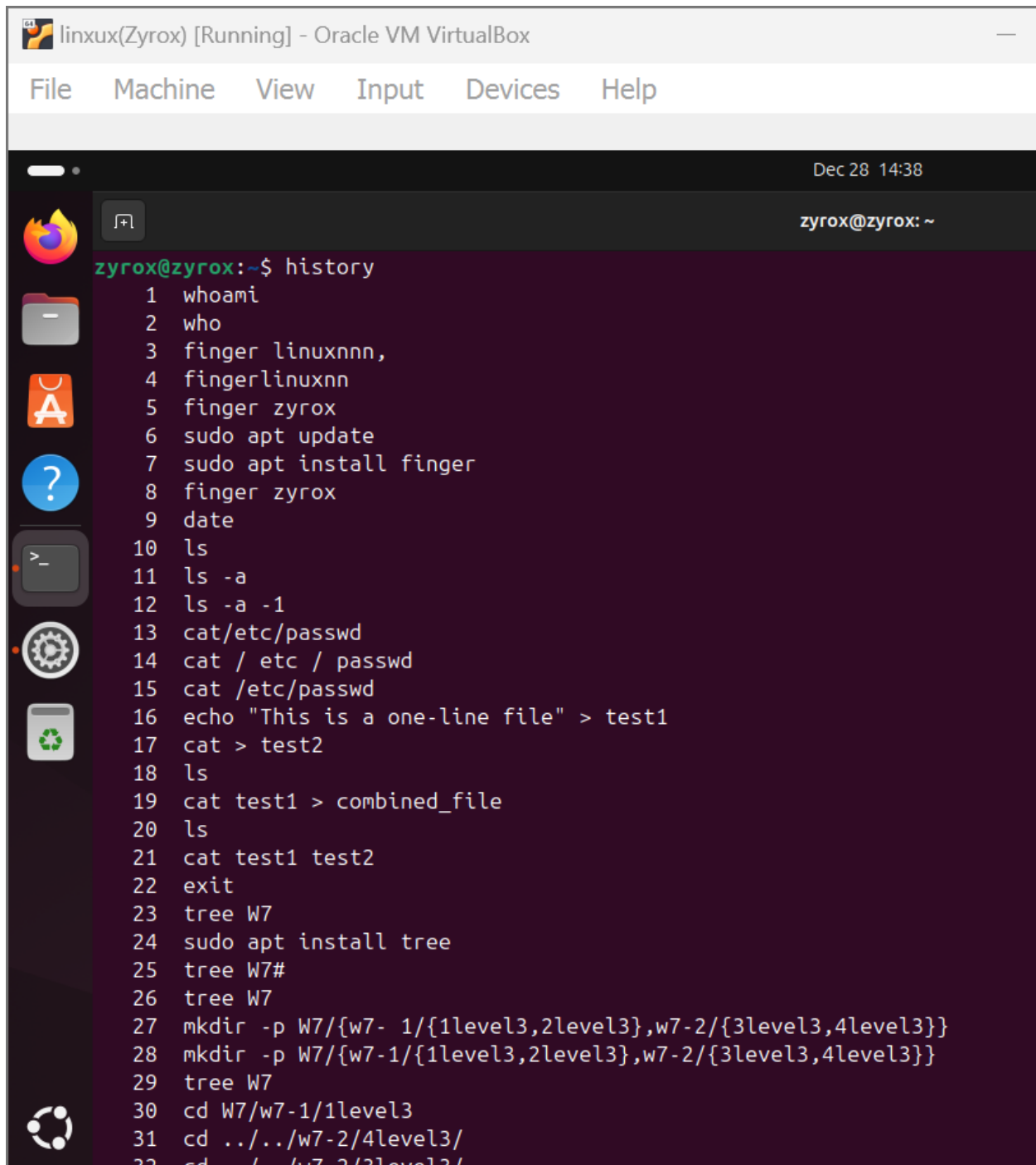
9. Give the command `nwho`. Compare the figure displayed with ones got by your UNIX-mates.



The screenshot shows a terminal window titled "linux(Zyrox) [Running] - Oracle VM VirtualBox". The terminal has a menu bar with "File", "Machine", "View", "Input", "Devices", and "Help". The terminal content shows the user "zyrox@zyrox" in the home directory. The command `nwho` is entered, and the output is "49". The prompt returns to `zyrox@zyrox:~$`.

```
linux(Zyrox) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
zyrox@zyrox: ~
zyrox@zyrox:~$ nwho
49
zyrox@zyrox:~$
```

Figure 20: Giving the command `nwho`.

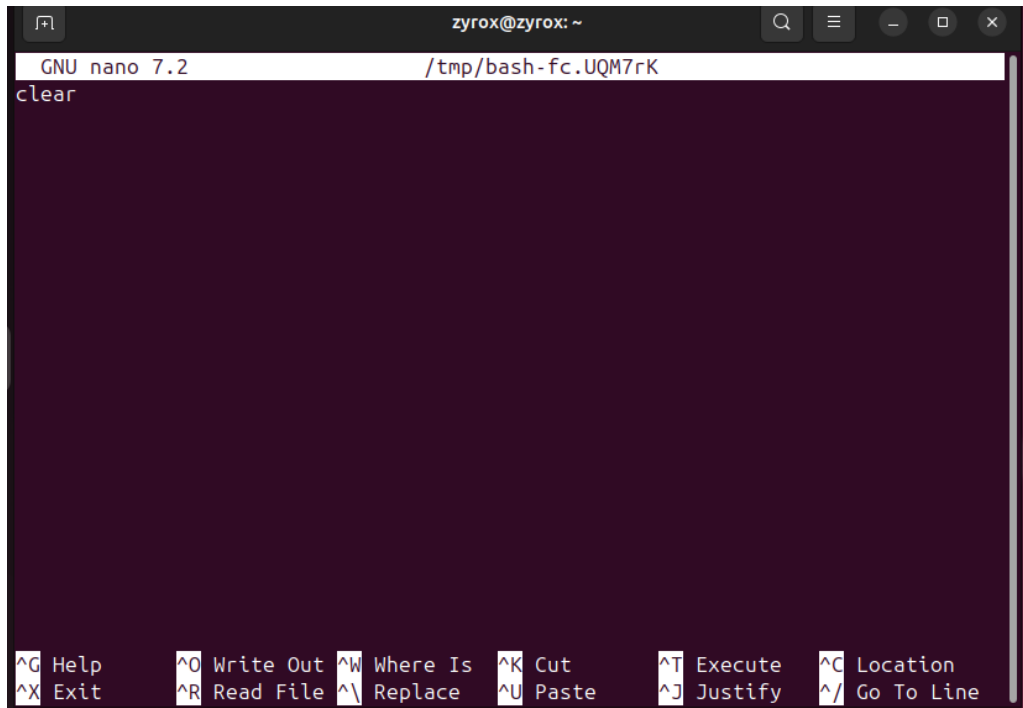
10. List your last commands executed giving the history command.

The screenshot shows a Linux terminal window titled "linux(Zyrox) [Running] - Oracle VM VirtualBox". The terminal interface includes a menu bar with "File", "Machine", "View", "Input", "Devices", and "Help". The terminal window has a dark background with a light-colored text. The prompt is "zyrox@zyrox: ~". The user has entered the command "history", which has returned a list of 32 commands, numbered 1 through 32. The commands include various system and file management operations such as "whoami", "ls", "cat", "echo", "mkdir", and "cd".

```
zyrox@zyrox:~$ history
 1  whoami
 2  who
 3  finger linuxnnn,
 4  fingerlinuxnn
 5  finger zyrox
 6  sudo apt update
 7  sudo apt install finger
 8  finger zyrox
 9  date
10  ls
11  ls -a
12  ls -a -1
13  cat/etc/passwd
14  cat / etc / passwd
15  cat /etc/passwd
16  echo "This is a one-line file" > test1
17  cat > test2
18  ls
19  cat test1 > combined_file
20  ls
21  cat test1 test2
22  exit
23  tree W7
24  sudo apt install tree
25  tree W7#
26  tree W7
27  mkdir -p W7/{w7- 1/{1level3,2level3},w7-2/{3level3,4level3}}
28  mkdir -p W7/{w7-1/{1level3,2level3},w7-2/{3level3,4level3}}
29  tree W7
30  cd W7/w7-1/1level3
31  cd ../../w7-2/4level3/
32  cd ../../w7-2/3level3/
```

Figure 21: history command.

11. Re-execute the *last but one* command using the redo (r) command and the number of the event.



```

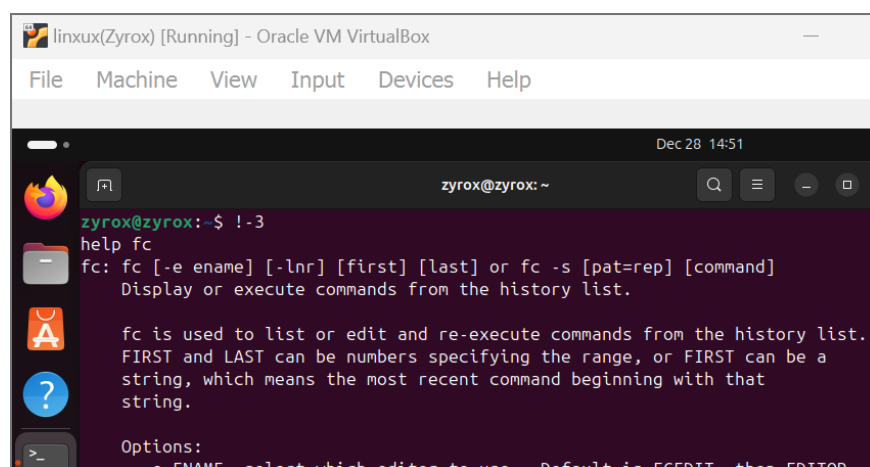
zyrox@zyrox: ~
GNU nano 7.2 /tmp/bash-fc.UQM7rK
clear
^G Help  ^O Write Out  ^W Where Is  ^K Cut  ^T Execute  ^C Location
^X Exit  ^R Read File  ^\ Replace   ^U Paste  ^J Justify  ^_ Go To Line

```

Figure 22: Re-execute the last but one command.

12. Re-execute the command given *three commands ago* using the negative integer.

!-3



```

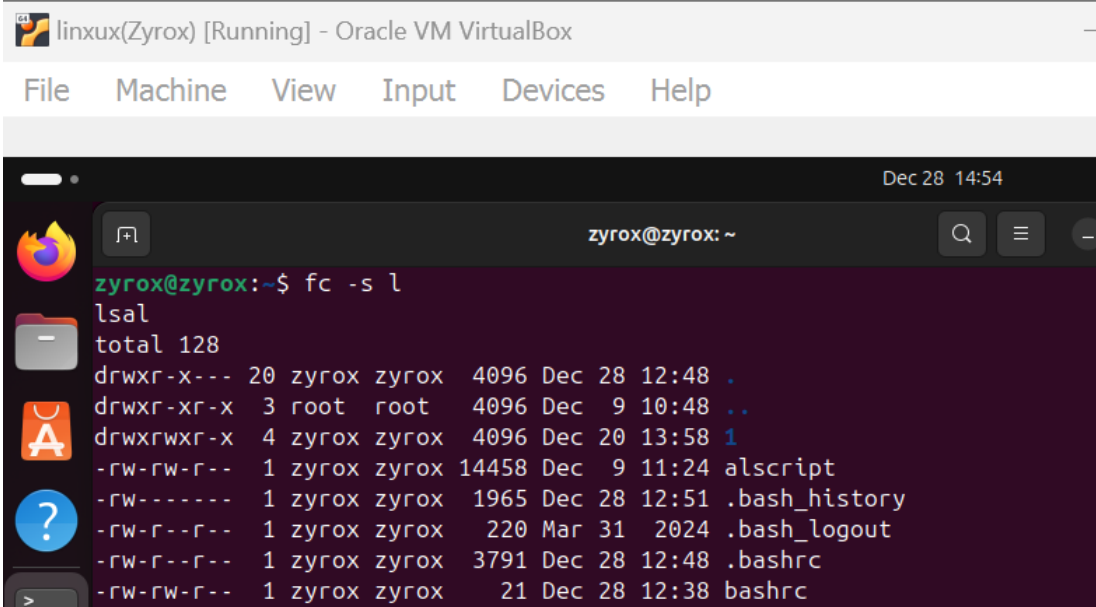
linux(Zyrox) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Dec 28 14:51
zyrox@zyrox: ~
zyrox@zyrox:~$ !-3
help fc
fc: fc [-e ename] [-lnr] [first] [last] or fc -s [pat=rep] [command]
Display or execute commands from the history list.

fc is used to list or edit and re-execute commands from the history list.
FIRST and LAST can be numbers specifying the range, or FIRST can be a
string, which means the most recent command beginning with that
string.

Options:
-e ENAME select which editor to use. Default is ECEDIT, then EDITOR

```

Figure 23: Q12 Re-execute the command given three commands ago.

13. Re-execute the last command which name begins with 'l'.***fc -e l***

The screenshot shows a terminal window titled 'linux(Zyrox) [Running] - Oracle VM VirtualBox'. The terminal prompt is 'zyrox@zyrox: ~'. The user has entered the command 'fc -s l', which lists the command history. The output shows a list of commands with their IDs and names. The command 'lsal' is the first command in the history, and it is the only one that starts with the letter 'l'. The user has then entered 'fc -e l', which re-executes the last command starting with 'l', which is 'lsal'.

```
zyrox@zyrox:~$ fc -s l
lsal
total 128
drwxr-x--- 20 zyrox zyrox 4096 Dec 28 12:48 .
drwxr-xr-x  3 root  root  4096 Dec  9 10:48 ..
drwxrwxr-x  4 zyrox zyrox 4096 Dec 20 13:58 1
-rw-rw-r--  1 zyrox zyrox 14458 Dec  9 11:24 alscrip
-rw-----  1 zyrox zyrox  1965 Dec 28 12:51 .bash_history
-rw-r--r--  1 zyrox zyrox   220 Mar 31  2024 .bash_logout
-rw-r--r--  1 zyrox zyrox  3791 Dec 28 12:48 .bashrc
-rw-rw-r--  1 zyrox zyrox    21 Dec 28 12:38 bashrc
```

Figure 24: Q13 Re-execute the last command which name begins with 'l'.

3. References

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