Module 2: Linux System

Content of course

- Discuss the three types of permissions used in the Linux Command-Line.

- Describe the three ways of adding text to file.

- Explain the different kinds of help commands used in most Linux distributions.

- Outline the examples of file display commands.

Command syntax

Commands options

- Modify the way that the command work.
- Usually consist of a hyphen or dash followed by single letter.
- Some commands accept multiple options which can usually be grouped together after a single hyphen.

Commands arguments

- Most commands are used together with one or more arguments.
- Some commands assume a default argument if none is supllied.
- Arguments are:
1. Optional for some commands
2. Required by others.

```
Embedded_Linux_VM [Running] - Oracle VM VirtualBox                    —    □    ×
File  Machine  View  Input  Devices  Help

                        Kirollos_Gerges@localhost:~

File   Edit   View   Search   Terminal   Help
[Kirollos_Gerges@localhost ~]$ whoami
Kirollos_Gerges
[Kirollos_Gerges@localhost ~]$ pwd
/home/Kirollos_Gerges
[Kirollos_Gerges@localhost ~]$ cd
[Kirollos_Gerges@localhost ~]$ pwd
/home/Kirollos_Gerges
[Kirollos_Gerges@localhost ~]$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos
[Kirollos_Gerges@localhost ~]$ ls -l
total 0
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Downloads
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Pictures
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Templates
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Videos
[Kirollos_Gerges@localhost ~]$ █
```

pwd

stands for Print Working Directory. It prints the path of the working directory, starting from the root.

pwd is shell built-in command(pwd) or an actual binary(/bin/pwd).

cd stands for "change directory" and is used to navigate the file system on a Linux computer.
When used with a specific directory path as an argument, cd will change the current working directory to that location.

Ls -l option signifies the long list format. This shows a lot more information presented to the user than the standard command.

```
[Kirollos_Gerges@localhost ~]$ ls -ltr
total 0
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Templates
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Downloads
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Videos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Pictures
[Kirollos_Gerges@localhost ~]$
```

Ls –lt :List all documents of directory by modification time .

Ls –ltr : reverse of ls -lt List all document of directory by modification time .

```
[Kirollos_Gerges@localhost ~]$ mkdir KIROLLOS
[Kirollos_Gerges@localhost ~]$ ls -ltr
total 0
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Templates
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Downloads
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Videos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Pictures
drwxrwxr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 18:08 KIROLLOS
[Kirollos_Gerges@localhost ~]$ ls -lt
total 0
drwxrwxr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 18:08 KIROLLOS
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Pictures
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Videos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Downloads
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Templates
[Kirollos_Gerges@localhost ~]$ mkdir GERGES
[Kirollos_Gerges@localhost ~]$ ls -lt
total 0
drwxrwxr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 18:14 GERGES
drwxrwxr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 18:08 KIROLLOS
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Pictures
```

Mkdir <namespace>: to add new folder on your workspace.

```
                        Kirollos_Gerges@localhost:~
File   Edit   View   Search   Terminal   Help
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Pictures
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Templates
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Videos
[Kirollos_Gerges@localhost ~]$ rm -r GERGES/
[Kirollos_Gerges@localhost ~]$ ls -l
total 0
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Downloads
drwxrwxr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 18:08 KIROLLOS
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Pictures
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Templates
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Videos
[Kirollos_Gerges@localhost ~]$ rm -r KIROLLOS/
[Kirollos_Gerges@localhost ~]$ ls -ltr
total 0
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Templates
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Downloads
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Videos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 12:13 Pictures
[Kirollos_Gerges@localhost ~]$ █
```

KIROLLOS – Dolphin   Kirollos_Gerges@localhost:~   us   06:32 PM

rm –r <namespace>/:to remove folder from workspace.

Which one of these modifies the way that commands work? Choose one correct answer.

Answer instructions

Scripts ❌

Arguments ❌

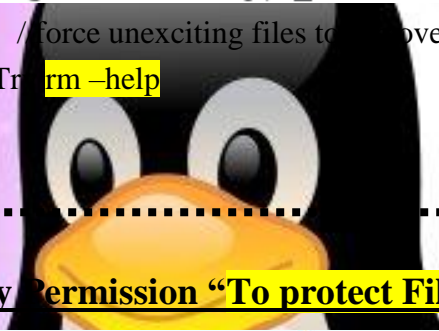Instructions ❌

Options ✅

✅ Correct.

```
Try 'rm --help' for more information.
[Kirollos_Gerges@localhost ~]$ rm -f  KIROLLOS
[Kirollos_Gerges@localhost ~]$ ▮
```

Rm –f <namespace>   // force unexciting files to remove.

For more supporting Try rm –help

man ls //manual list .

▪▪

File and Directory Permission "To protect Files"

PARAMETERS	LINUX	UNIX
Inception Year	1991	1969
Standard	Open source operating system which is freely available	Operating system can only be used by its copywriters
System type	Just the kernel	Complete Operating system
Target use	Can be used by anyone including home user and developer.	Developed mainly for servers, workstations and mainframes.
Cost	LINUX is freely available and distributed with no associated cost.	UNIX variants come as customized cost.
Security	60-100 viruses listed till date	85-120 viruses listed till date
Interface type	Primarily uses GUI with option of CLI	Primarily uses CLI
Portability	Portable	Not portable
Variants	Ubuntu, RedHat, Solaris, OpenSuse, etc.	AIS, HP-UX, BSD, etc
Source Code	The source code of Linux is available in general public.	The source code not available in general public.

https://ipwithease.com

The full form of LINUX Lovable Intellect Not Using XP. Linux was built by and named after Linus Torvalds.

Linux is an open-source operating system for servers, computers, mainframes, mobile systems, and embedded systems.

Requests from device software are handled by Linux and relayed to computer hardware.

What is the full form of UNIX?

The Full Form of UNIX (also referred to as UNICS) is UNiplexed Information Computing System.

A highly popular and multitasking Operating system, launched in 1969, UNIX is powerful.

UNIX is a multi-user system.

Every file and directory in your account can be protected from or made accessible to other users by changing its access permissions.

Every user has responsible for controlling access their files.

Permissions for a file or directory may be restricted by types.

r- Read

W- Write

X – Execute (run the program).

Each Permission (rwx) can be controlled at 3 levels.

U – User

g- Group of people same project,

O- Other, everyone the system.

```
[Kirollos_Gerges@localhost ~]$ ls -l Kirollos
total 0
drwxrwxr-x. 2 Kirollos_Gerges Kirollos_Gerges 6 Sep 22 21:55 HAM
[Kirollos_Gerges@localhost ~]$ rm -r HAM/
rm: cannot remove 'HAM/': No such file or directory
[Kirollos_Gerges@localhost ~]$ rm -f HAM/
[Kirollos_Gerges@localhost ~]$ ls -l Kirollos
total 0
[Kirollos_Gerges@localhost ~]$ █
```

Man chmod

```
CHMOD(1)                     User Commands                     CHMOD(1)

NAME
       chmod - change file mode bits

SYNOPSIS
       chmod [OPTION]... MODE[,MODE]... FILE...
       chmod [OPTION]... OCTAL-MODE FILE...
       chmod [OPTION]... --reference=RFILE FILE...

DESCRIPTION
       This manual page documents the GNU version of chmod. chmod changes the file
       mode bits of each given file according to mode, which can be either a sym-
       bolic representation of changes to make, or an octal number representing the
       bit pattern for the new mode bits.

       The format of a symbolic mode is [ugoa...][[+-=][perms...]...], where perms
       is either zero or more letters from the set rwxXst, or a single letter from
       the set ugo.  Multiple symbolic modes can be given, separated by commas.

       A combination of the letters ugoa controls which users' access to the file
       will be changed:  the user who owns it (u), other users in the file's group
       (g), other users not in the file's group (o), or all users (a).  If none of
       these are given, the effect is as if a were given, but bits that are set in
       the umask are not affected.

       The operator + causes the selected file mode bits to be added to the existing
       file mode bits of each file; - causes them to be removed; and = causes them
Manual page chmod(1) line 1 (press h for help or q to quit)
```

Scripted by: Eng/Kirollos Gerges Asaad   Embedded C Developer

Chmod g-w <namespace> //Remove group permission for this work space to write on workspace.

Chmod g-r <namespace> //Remove group permission for this work space to read from workspace

Chmod u-w <namespace> //Remove user permission for this work space to write on workspace.

Chmod u-r <namespace> //Remove user permission for this work space to read from workspace.

rm <name space>

cd <namespace>/

Chmod u+rw <namespace> //Remove user permission for this work space to read or write workspace.

Permission using Numerical Values

Assigning numerically

Chmod ugo+r FILE

Chmod 444 FILE

- The table below assigns numbers to permissions types

Number	Permission Type	Symbol
0	No Permission	---
1	Execute	--x
2	Write	-w-
3	Execute + Write	-wx
4	Read	r--
5	Read + Execute	r-x
6	Read +Write	rw-
7	Read + Write +Execute	rwx

- chmod 764 FILE

File ownership commands

Commands to change file ownership

Chowen changes the ownership of a file.

Chgrp changes the group ownership of a file.

-R: recursive ownership change option(cascade)

Su -:to said that I am the user, to access as a root with user name.

Chown root FILE: changing the root directory a

rm FILE_NAME :remove file.

cd /FILENAME: to give accessible for entering the file.

touch FILENAME

Here, the parent option in mkdir helps us to create a parent directory (unless it exists) without any error while the touch command creates a file. Generally, the touch command does put anything into the file.

How many entities can own a file or directory? Type your answer, in numeric form, into the space provided.

Type your answer in numeric form.

2 ✓

Help Commands

3 types

1. whatis command
2. command –help
3. man command

```
[Kirollos_Gerges@localhost etc]$ man cd
[Kirollos_Gerges@localhost etc]$
[Kirollos_Gerges@localhost etc]$
[Kirollos_Gerges@localhost etc]$ man pwd
[Kirollos_Gerges@localhost etc]$
[Kirollos_Gerges@localhost etc]$
```

```
[Kirollos_Gerges@localhost etc]$ whatis cd
cd (1)              - bash built-in commands, see bash(1)
cd (1p)             - change the working directory
cd (n)              - Change working directory
[Kirollos_Gerges@localhost etc]$ whatis ls
ls (1)              - list directory contents
ls (1p)             - list directory contents
[Kirollos_Gerges@localhost etc]$ whatis man
man (1)             - an interface to the on-line reference manuals
man (1p)            - display system documentation
man (7)             - macros to format man pages
[Kirollos_Gerges@localhost etc]$ whatis chmod
chmod (1)           - change file mode bits
chmod (1p)          - change the file modes
chmod (2)           - change permissions of a file
chmod (3p)          - change mode of a file
[Kirollos_Gerges@localhost etc]$ whatis pwd
pwd (1)             - print name of current/working directory
pwd (1p)            - return working directory name
pwd (n)             - Return the_absolute path of the current working directory
```

```
[Kirollos_Gerges@localhost etc]$ chmod --help
Usage: chmod [OPTION]... MODE[,MODE]... FILE...
  or:  chmod [OPTION]... OCTAL-MODE FILE...
  or:  chmod [OPTION]... --reference=RFILE FILE...
Change the mode of each FILE to MODE.
With --reference, change the mode of each FILE to that of RFILE.

  -c, --changes          like verbose but report only when a change is made
  -f, --silent, --quiet  suppress most error messages
  -v, --verbose          output a diagnostic for every file processed
      --no-preserve-root  do not treat '/' specially (the default)
      --preserve-root    fail to operate recursively on '/'
      --reference=RFILE  use RFILE's mode instead of MODE values
  -R, --recursive        change files and directories recursively
      --help     display this help and exit
      --version  output version information and exit

Each MODE is of the form '[ugoa]*([-+=]([rwxXst]*|[ugo]))+|[-+=][0-7]+'.

GNU coreutils online help: <http://www.gnu.org/software/coreutils/>
For complete documentation, run: info coreutils 'chmod invocation'
```

Tab and up Arrow

Tab and Up Arrow

TAB Completion and Up Arrow

- Hitting TAB key completes the available commands, files or directories
  - chm TAB
  - ls j<TAB>
  - cd Des<TAB>

- Hitting up arrow key on the keyboard returns the last command ran.

```
File  Edit  View  Search  Terminal  Help
G[Kirollos_Gerges@localhost ~]$ sum
diff
1
2
2
2
result

23+3
```

```
[Kirollos_Gerges@localhost ~]$ date
Sat Sep 23 17:59:56 +07 2023
```

sum command in Linux is used to find checksum and count the blocks in a file.

Basically, this command is used to show the checksum and block count for each specified file. When no file is specified then it will read the standard input. Example: It will ask for the input of the file we want to calculate the checksum.

Which key completes the available commands, files and directories? Choose one correct answer.

Answer instructions

Shift	✗
Up arrow	✗
Tab	✓
Enter	✗

Using Pipes

Used by the shell to connect the output of one command directly to the input of another command.

The symbol for a pipe is the vertical bar (|). The command syntax is:

```
command1 [arguments]  |  command2 [arguments]
```

Scripted by: Eng/Kirollos Gerges Asaad   Embedded C Developer

```
drwxr-xr-x.  2 root root          88 Sep 22 11:58 vsftpd
-rw-r--r--.  1 root root        4479 May 16  2019 wgetrc
drwxr-xr-x.  2 root root          33 Sep 22 11:51 wpa_supplicant
-rw-r--r--.  1 root root           0 Jun 10  2014 wvdial.conf
drwxr-xr-x.  6 root root         103 Sep 22 11:55 X11
drwxr-xr-x.  7 root root         131 Sep 22 11:55 xdg
drwxr-xr-x.  2 root root           6 Apr 11  2018 xinetd.d
drwxr-xr-x.  2 root root          21 Sep 22 11:44 xml
drwxr-xr-x.  6 root root         100 Sep 22 11:49 yum
-rw-r--r--.  1 root root         970 Aug  8  2019 yum.conf
drwxr-xr-x.  2 root root         187 Aug  8  2019 yum.repos.d
[Kirollos_Gerges@localhost etc]$ ls -l | tail -1
drwxr-xr-x.  2 root root         187 Aug  8  2019 yum.repos.d
```
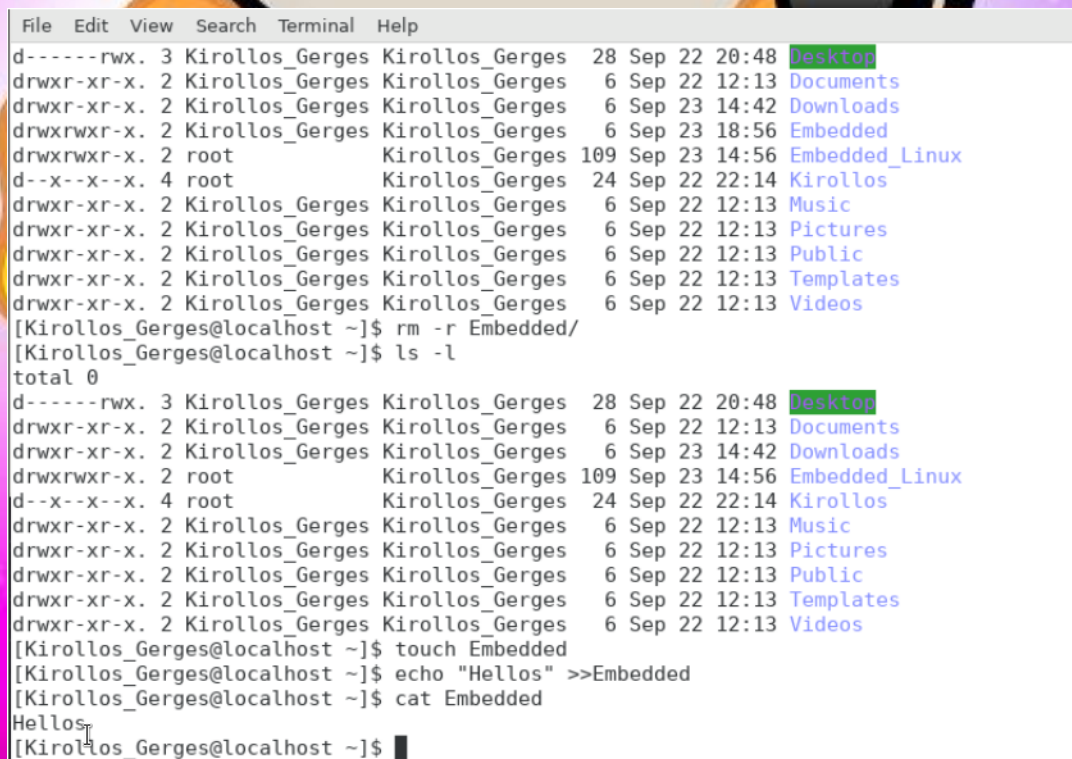
Tail give me the last line or lin

Adding text to files [Redirectives]

3 simple ways:

1. Vi "editor".
2. Redirect command output > or >>.
3. Echo > or >> and cat.

```
File  Edit  View  Search  Terminal  Help
d------rwx. 3 Kirollos_Gerges Kirollos_Gerges  28 Sep 22 20:48 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 23 14:42 Downloads
drwxrwxr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 23 18:56 Embedded
drwxrwxr-x. 2 root            Kirollos_Gerges 109 Sep 23 14:56 Embedded_Linux
d--x--x--x. 4 root            Kirollos_Gerges  24 Sep 22 22:14 Kirollos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Pictures
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Templates
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Videos
[Kirollos_Gerges@localhost ~]$ rm -r Embedded/
[Kirollos_Gerges@localhost ~]$ ls -l
total 0
d------rwx. 3 Kirollos_Gerges Kirollos_Gerges  28 Sep 22 20:48 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 23 14:42 Downloads
drwxrwxr-x. 2 root            Kirollos_Gerges 109 Sep 23 14:56 Embedded_Linux
d--x--x--x. 4 root            Kirollos_Gerges  24 Sep 22 22:14 Kirollos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Pictures
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Templates
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Videos
[Kirollos_Gerges@localhost ~]$ touch Embedded
[Kirollos_Gerges@localhost ~]$ echo "Hellos" >>Embedded
[Kirollos_Gerges@localhost ~]$ cat Embedded
Hellos
[Kirollos_Gerges@localhost ~]$
```

```
[Kirollos_Gerges@localhost ~]$ touch Embedded
[Kirollos_Gerges@localhost ~]$ echo "Hellos" >>Embedded
[Kirollos_Gerges@localhost ~]$ cat Embedded
Hellos
[Kirollos_Gerges@localhost ~]$ echo "Hellos Linux" >> Embedded
[Kirollos_Gerges@localhost ~]$ cat Embedded
Hellos
Hellos Linux
[Kirollos_Gerges@localhost ~]$ echo "Hellos Linux" > Embedded
[Kirollos_Gerges@localhost ~]$ cat Embedded
Hellos Linux
[Kirollos_Gerges@localhost ~]$ █
```

Touch Embedded: to be directory.

```
[Kirollos_Gerges@localhost ~]$ touch Embedded
[Kirollos_Gerges@localhost ~]$ ls -lt >Embedded
[Kirollos_Gerges@localhost ~]$ ls -lt
total 4
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges 801 Sep 23 22:24 Embedded
drwxrwxr-x. 2 root            Kirollos_Gerges 109 Sep 23 14:56 Embedded_Linux
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 23 14:42 Downloads
d--x--x--x. 4 root            Kirollos_Gerges  24 Sep 22 22:14 Kirollos
d------rwx. 3 Kirollos_Gerges Kirollos_Gerges  28 Sep 22 20:48 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Pictures
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Videos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Templates
[Kirollos_Gerges@localhost ~]$ cat Embedded
total 0
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges   0 Sep 23 22:24 Embedded
drwxrwxr-x. 2 root            Kirollos_Gerges 109 Sep 23 14:56 Embedded_Linux
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 23 14:42 Downloads
d--x--x--x. 4 root            Kirollos_Gerges  24 Sep 22 22:14 Kirollos
d------rwx. 3 Kirollos_Gerges Kirollos_Gerges  28 Sep 22 20:48 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Pictures
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Videos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Templates
[Kirollos_Gerges@localhost ~]$ █
```

```
[Kirollos_Gerges@localhost ~]$ ls -lt
total 4
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges 801 Sep 23 22:24 Embedded
drwxrwxr-x. 2 root            Kirollos_Gerges 109 Sep 23 14:56 Embedded_Linux
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 23 14:42 Downloads
d--x--x--x. 4 root            Kirollos_Gerges  24 Sep 22 22:14 Kirollos
d------rwx. 3 Kirollos_Gerges Kirollos_Gerges  28 Sep 22 20:48 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Pictures
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Videos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Templates
[Kirollos_Gerges@localhost ~]$ date>>Embedded
[Kirollos_Gerges@localhost ~]$ cat Embedded
total 0
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges   0 Sep 23 22:24 Embedded
drwxrwxr-x. 2 root            Kirollos_Gerges 109 Sep 23 14:56 Embedded_Linux
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 23 14:42 Downloads
d--x--x--x. 4 root            Kirollos_Gerges  24 Sep 22 22:14 Kirollos
d------rwx. 3 Kirollos_Gerges Kirollos_Gerges  28 Sep 22 20:48 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Pictures
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Videos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Templates
Sat Sep 23 22:30:58 +07 2023
[Kirollos_Gerges@localhost ~]$ █
```

File display commands

- Cat
- More
- Less
- Head
- Tail

```
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 23
d--x--x--x. 4 root            Kirollos_Gerges   24 Sep 22
d------rwx. 3 Kirollos_Gerges Kirollos_Gerges   28 Sep 22
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 22
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 22
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 22
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 22
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 22
Sat Sep 23 22:30:58 +07 2023
total 4
4 -rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges 830 Sep
0 drwxrwxr-x. 2 root            Kirollos_Gerges 109 Sep
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep
0 d--x--x--x. 4 root            Kirollos_Gerges  24 Sep
0 d------rwx. 3 Kirollos_Gerges Kirollos_Gerges  28 Sep
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep
total 4
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 2
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 2
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 2
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 2
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 2
--More--(81%)
```

```
cp -s file.txt file2.txt
```

...creates a symbolic link, **file2.txt**, which points to **file.txt**.

You can also create symbolic links from multiple source files, specifying a directory as the destination.

⚠ **Note**

To create symbolic links in another directory, **cp** needs you to specify the full pathname, including the full directory name, in your source file name(s). Relative paths will not work.

Let's say you are user **melissa** and you have a set of files, **file01.txt**, **file02.txt**, etc. in the directory **/home/melissa/myfiles**. You want to create symbolic links to these files in the existing directory **/home/melissa/myfiles2**. This command will do the trick:

```
cp -s ~/myfiles/file*.txt ~/myfiles2
```

The directory **myfiles2** now contain symbolic links to the **file*.txt** in the directory **/home/melissa/myfiles**. The **myfiles2** directory must already exist for the operation to succeed; if it doesn't exist, **cp** gives you an error message and nothing is copied.

This will work with a recursive copy, as well. So the command:

```
cp -R -s ~/myfiles ~/myfiles2
```

```
[Kirollos_Gerges@localhost ~]$ head Kirollos1
total 0
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges   0 Sep 23 22:24 Embedded
drwxrwxr-x. 2 root            Kirollos_Gerges 109 Sep 23 14:56 Embedded_Linux
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 23 14:42 Downloads
d--x--x--x. 4 root            Kirollos_Gerges  24 Sep 22 22:14 Kirollos
d------rwx. 3 Kirollos_Gerges Kirollos_Gerges  28 Sep 22 20:48 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Pictures
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Videos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Music
[Kirollos_Gerges@localhost ~]$ tail Kirollos1
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Videos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Pictures
d------rwx. 3 Kirollos_Gerges Kirollos_Gerges  28 Sep 22 20:48 Desktop
d--x--x--x. 4 root            Kirollos_Gerges  24 Sep 22 22:14 Kirollos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 23 14:42 Downloads
drwxrwxr-x. 2 root            Kirollos_Gerges 109 Sep 23 14:56 Embedded_Linux
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges 1653 Sep 23 23:04 Embedded
Sat Sep 23 23:06:52 +07 2023
[Kirollos_Gerges@localhost ~]$
```

Head and tail of Kirollos 1 File display

```
total 0
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges   0 Sep 23 22:24 Embedded
drwxrwxr-x. 2 root            Kirollos_Gerges 109 Sep 23 14:56 Embedded_Linux
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 23 14:42 Downloads
d--x--x--x. 4 root            Kirollos_Gerges  24 Sep 22 22:14 Kirollos
d------rwx. 3 Kirollos_Gerges Kirollos_Gerges  28 Sep 22 20:48 Desktop
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Pictures
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Videos
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Music
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Public
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Templates
Sat Sep 23 22:30:58 +07 2023
total 4
4 -rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges 830 Sep 23 22:30 Embedded
0 drwxrwxr-x. 2 root            Kirollos_Gerges 109 Sep 23 14:56 Embedded_Linux
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 23 14:42 Downloads
0 d--x--x--x. 4 root            Kirollos_Gerges  24 Sep 22 22:14 Kirollos
0 d------rwx. 3 Kirollos_Gerges Kirollos_Gerges  28 Sep 22 20:48 Desktop
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Pictures
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Videos
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Documents
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Music
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Public
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Templates
total 4
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Templates
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges   6 Sep 22 12:13 Public
Kirollos1
```

Less Kirollos1

Scripted by: Eng/Kirollos Gerges Asaad   Embedded C Developer

```
[Kirollos_Gerges@localhost ~]$ head -2 Kirollos1
total 0
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges   0 Sep 23 22:24 Embedded
```

Display the first 2 Lines from this file Kirollos1

```
[Kirollos_Gerges@localhost ~]$ tail -3 Kirollos1
drwxrwxr-x. 2 root            Kirollos_Gerges  109 Sep 23 14:56 Embedded_Linux
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges 1653 Sep 23 23:04 Embedded
Sat Sep 23 23:06:52 +07 2023
```

Display the last 2 Lines from this file Kirollos1

File maintenance commands

Cp: copy.

rm :remove.

Mv: move

Mkdir: make directory

rmdir || rm –r: remove directory

chgrp: change group

//Must to be become root su -

chown: change ownership of a file.

rm -Rf = will forcefully remove sub-directories and its contents as well

```
[root@localhost ~]# chown Kirollos  Puddy
chown: invalid user: 'Kirollos'
[root@localhost ~]# chown Kirollos_Gerges  Puddy
[root@localhost ~]# ls -lst
total 8
0 -rw-r--r--. 1 Kirollos_Gerges root      0 Sep 24 18:48 Puddy
0 drwxr-xr-x. 2 Kirollos_Gerges root      6 Sep 23 17:48 private
4 -rw-r--r--. 1 root            root 2273 Sep 22 12:13 initial-setup-ks.cfg
4 -rw-------. 1 root            root 2225 Sep 22 12:11 anaconda-ks.cfg
[root@localhost ~]# chgp Kirollos_Gerges  Puddy
bash: chgp: command not found...
[root@localhost ~]# chgrp Kirollos_Gerges  Puddy
[root@localhost ~]# ls -lst
total 8
0 -rw-r--r--. 1 Kirollos_Gerges Kirollos_Gerges    0 Sep 24 18:48 Puddy
0 drwxr-xr-x. 2 Kirollos_Gerges root            6 Sep 23 17:48 private
4 -rw-r--r--. 1 root            root         2273 Sep 22 12:13 initial-setup-ks.cfg
4 -rw-------. 1 root            root         2225 Sep 22 12:11 anaconda-ks.cfg
[root@localhost ~]# chgrp Kirollos_Gerges private
[root@localhost ~]# ls -lst
total 8
0 -rw-r--r--. 1 Kirollos_Gerges Kirollos_Gerges    0 Sep 24 18:48 Puddy
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 23 17:48 private
4 -rw-r--r--. 1 root            root         2273 Sep 22 12:13 initial-setup-ks.c
4 -rw-------. 1 root            root         2225 Sep 22 12:11 anaconda-ks.cfg
[root@localhost ~]#
```

Scripted by: Eng/Kirollos Gerges Asaad   Embedded C Developer

Filter and Text Processors commands

Cut

Awk: allows you to list items by their columns

grep | egrep : It searches for text and strings defined by users in a given file

sort

uniq

wc :word count

```
[Kirollos_Gerges@localhost ~]$ wc Kirollos1
  39  327 2501 Kirollos1
[Kirollos_Gerges@localhost ~]$ wc etc
0 0 0 etc
[Kirollos_Gerges@localhost ~]$ wc Embedded_Linux
wc: Embedded_Linux: Is a directory
       0        0        0 Embedded_Linux
[Kirollos_Gerges@localhost ~]$ wc kirollos
wc: kirollos: No such file or directory
[Kirollos_Gerges@localhost ~]$ wc Kirollos
wc: Kirollos: Permission denied
[Kirollos_Gerges@localhost ~]$
```

```
[Kirollos_Gerges@localhost ~]$ ls -l |wc -l
14
[Kirollos_Gerges@localhost ~]$ ls -lst
total 4
0 drwxr-xr-x. 3 Kirollos_Gerges Kirollos_Gerges   23 Sep 24 18:35 Public
0 drwxrwxr-x. 2 root            Kirollos_Gerges  125 Sep 24 18:33 Embedded_Linu
4 -rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges 2501 Sep 24 18:29 Kirollos1
0 -rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges    0 Sep 24 16:44 alsa
0 -rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges    0 Sep 24 16:42 etc
0 -rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges    0 Sep 24 16:42 Root
0 d--x--x--x. 4 root            Kirollos_Gerges   24 Sep 22 22:14 Kirollos
0 d------rwx. 3 Kirollos_Gerges Kirollos_Gerges   28 Sep 22 20:48 Desktop
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 22 12:13 Pictures
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 22 12:13 Videos
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 22 12:13 Documents
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 22 12:13 Music
0 drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 22 12:13 Templates
[Kirollos_Gerges@localhost ~]$
```

```
[Kirollos_Gerges@localhost ~]$ wc -l Kirollos1
39 Kirollos1
[Kirollos_Gerges@localhost ~]$ wc -b  Kirollos1
wc: invalid option -- 'b'
Try 'wc --help' for more information.
[Kirollos_Gerges@localhost ~]$ wc -c  Kirollos1
2501 Kirollos1
[Kirollos_Gerges@localhost ~]$ wc -w  Kirollos1
327 Kirollos1
[Kirollos_Gerges@localhost ~]$ wc -help
wc: invalid option -- 'h'
Try 'wc --help' for more information.
[Kirollos_Gerges@localhost ~]$ wc --help
Usage: wc [OPTION]... [FILE]...
  or:  wc [OPTION]... --files0-from=F
Print newline, word, and byte counts for each FILE, and a total line if
more than one FILE is specified.  With no FILE, or when FILE is -,
read standard input.  A word is a non-zero-length sequence of characters
delimited by white space.
The options below may be used to select which counts are printed, always in
the following order: newline, word, character, byte, maximum line length.
  -c, --bytes            print the byte counts
  -m, --chars            print the character counts
  -l, --lines            print the newline counts
      --files0-from=F    read input from the files specified by
                         NUL-terminated names in file F;
                         If F is - then read names from standard input
  -L, --max-line-length  print the length of the longest line
  -w, --words            print the word counts
```

What does the word count command generate? Choose three correct answers.

Answer instructions

Byte count ✔

Newline count ✔

Word count ✔

Paragraph count ✖

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Grep and egrep commands

```
-B, --before-context=NUM   print NUM lines of leading context
-A, --after-context=NUM    print NUM lines of trailing context
-C, --context=NUM          print NUM lines of output context
-NUM                       same as --context=NUM
    --group-separator=SEP  use SEP as a group separator
    --no-group-separator   use empty string as a group separator
    --color[=WHEN],
    --colour[=WHEN]        use markers to highlight the matching strings;
                           WHEN is 'always', 'never', or 'auto'
-U, --binary               do not strip CR characters at EOL (MSDOS/Windows)
-u, --unix-byte-offsets    report offsets as if CRs were not there
                           (MSDOS/Windows)

'egrep' means 'grep -E'.  'fgrep' means 'grep -F'.
Direct invocation as either 'egrep' or 'fgrep' is deprecated.
When FILE is -, read standard input.  With no FILE, read . if a command-line
-r is given, - otherwise.  If fewer than two FILEs are given, assume -h.
Exit status is 0 if any line is selected, 1 otherwise;
if any error occurs and -q is not given, the exit status is 2.

Report bugs to: bug-grep@gnu.org
GNU Grep home page: <http://www.gnu.org/software/grep/>
General help using GNU software: <http://www.gnu.org/gethelp/>
```

grep --help

```
[Kirollos_Gerges@localhost ~]$ ls -l | grep Desktop
drwxrw-r--. 3 Kirollos_Gerges Kirollos_Gerges    28 Sep 22 20:48 Desktop
[Kirollos_Gerges@localhost ~]$ ls -l | grep Kirollos
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges     0 Sep 24 16:44 alsa
drwxrw-r--. 3 Kirollos_Gerges Kirollos_Gerges    28 Sep 22 20:48 Desktop
drwxrw-r--. 2 Kirollos_Gerges Kirollos_Gerges     6 Sep 22 12:13 Documents
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges     6 Sep 24 22:03 Downloads
drwxrwxr-x. 2 root            Kirollos_Gerges   170 Sep 24 22:13 Embedded_Linux
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges     0 Sep 24 16:42 etc
d--x--x--x. 4 root            Kirollos_Gerges    24 Sep 22 22:14 Kirollos
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges  2501 Sep 24 20:56 Kirollos1
drwxrw-r--. 2 Kirollos_Gerges Kirollos_Gerges     6 Sep 22 12:13 Music
drwxrw-r--. 2 Kirollos_Gerges Kirollos_Gerges     6 Sep 22 12:13 Pictures
drwxr-xr-x. 3 Kirollos_Gerges Kirollos_Gerges    23 Sep 24 18:35 Public
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges     0 Sep 24 16:42 Root
drwxrw-r--. 2 Kirollos_Gerges Kirollos_Gerges     6 Sep 22 12:13 Templates
drwxrw-r--. 2 Kirollos_Gerges Kirollos_Gerges     6 Sep 22 12:13 Videos
```

Scripted by: Eng/Kirollos Gerges Asaad   Embedded C Developer

grep/egrep - Text Processors Commands

- What is grep?
  - The grep command which stands for "global regular expression print," processes text line by line and prints any lines which match a specified pattern

- `grep --version OR grep --help` = Check version or help
- `grep keyword file` = Search for a keyword from a file
- `grep -c keyword file` = Search for a keyword and count
- `grep -i KEYword file` = Search for a keyword ignore case-sensitive
- `grep -n keyword file` = Display the matched lines and their line numbers
- `grep -v keyword file` = Display everything but keyword
- `grep keyword file | awk '{print $1}'` = Search for a keyword and then only give the 1st field
- `ls -l | grep Desktop` = Search for a keyword and then only give the 1st field

- `egrep -i "keyword|keyword2" file` = Search for 2 keywords.

AWK command

```
[Kirollos_Gerges@localhost ~]$ ls -l | awk ' {if($9 == "alsa") print $0;}'
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges    0 Sep 24 16:44 alsa
```

```
0 drwxrw-r--. 2 Kirollos_Gerges Kirollos_Gerges    6 Sep 22 12:15 Templates
[Kirollos_Gerges@localhost ~]$ ls -l | awk '{print $1,$2,$3,$4}'
total 4
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges
drwxrw-r--. 3 Kirollos_Gerges Kirollos_Gerges
drwxrw-r--. 2 Kirollos_Gerges Kirollos_Gerges
drwxr-xr-x. 2 Kirollos_Gerges Kirollos_Gerges
drwxrwxr-x. 2 root Kirollos_Gerges
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges
d--x--x--x. 4 root Kirollos_Gerges
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges
drwxrw-r--. 2 Kirollos_Gerges Kirollos_Gerges
drwxrw-r--. 2 Kirollos_Gerges Kirollos_Gerges
drwxr-xr-x. 3 Kirollos_Gerges Kirollos_Gerges
-rw-rw-r--. 1 Kirollos_Gerges Kirollos_Gerges
drwxrw-r--. 2 Kirollos_Gerges Kirollos_Gerges
drwxrw-r--. 2 Kirollos_Gerges Kirollos_Gerges
[Kirollos_Gerges@localhost ~]$ ls -l | awk '{print $3,$4}'

Kirollos_Gerges Kirollos_Gerges
Kirollos_Gerges Kirollos_Gerges
Kirollos_Gerges Kirollos_Gerges
```

awk

- awk is a utility/language designed for data extraction. Most of the time it is used to extract fields from a file or from an output

- `awk --version` = Check version
- `awk '{print $1}' file` = List 1st field from a file
- `ls -l | awk '{print $1,$3}'` = List 1 and 3rd field of ls -l output
- `ls -l | awk '{print $NF}'` = Last field of the output
- `awk '/Jerry/ {print}' file` = Search for a specific word
- `awk -F: '{print $1}' /etc/passwd` = Ouput only 1st field of /etc/passwd
- `echo "Hello Tom" | awk '{$2="Adam"; print $0}'` = Replace words field words
- `cat file | awk '{$2="Imran"; print $0}'` = Replace words field words
- `awk 'length($0) > 15' file` = Get lines that have more than 15 byte size
- `ls -l | awk '{if($9 == "seinfeld") print $0;}'` = Get the field matching seinfeld in /home/iafzal
- `ls -l | awk '{print NF}'` = Number of fields.

Cut command

cut - Text Processors Commands

cut

- Cut is a command line utility that allows you to cut parts of lines from specified files or piped data and print the result to standard output. It can be used to cut parts of a line by delimiter, byte position, and character

• cut filename	=	Does not work
• cut --version	=	Check version
• cut -c1 filename	=	List one character
• Cut -c1,2,4	=	Pick and chose character
• cut -c1-3 filename	=	List range of characters
• cut -c1-3,6-8 filename	=	List specific range of characters
• cut -b1-3 filename	=	List by byte size
• cut -d: -f 6 /etc/passwd	=	List first 6th column separated by :
• cut -d: -f 6-7 /etc/passwd	=	List first 6 and 7th column separated by :
• ls -l | cut -c2-4	=	Only print user permissions of files/dir

```
[Kirollos_Gerges@localhost ~]$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
        inet6 fe80::45ea:a36a:d8c5:41e0  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:e0:53:2a  txqueuelen 1000  (Ethernet)
        RX packets 7918  bytes 10477953 (9.9 MiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 2184  bytes 189360 (184.9 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

virbr0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        inet 192.168.122.1  netmask 255.255.255.0  broadcast 192.168.122.255
        ether 52:54:00:b3:3b:39  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

[Kirollos_Gerges@localhost ~]$
```

<u>Compare Files</u>

<mark>Diff</mark>

<mark>cmp</mark>

```
[Kirollos_Gerges@localhost Embedded_Linux]$ cat Embedded2
Be a Linux user2 now
Be a Linux user22 now
Be a Linux user222 now
[Kirollos_Gerges@localhost Embedded_Linux]$ cat Embedded
Be a Linux user now
Be a Linux user now
Be a Linux user now
[Kirollos_Gerges@localhost Embedded_Linux]$ diff Embedded Embedded2
1,3c1,3
< Be a Linux user now
< Be a Linux user now
< Be a Linux user now
---
> Be a Linux user2 now
> Be a Linux user22 now
> Be a Linux user222 now
[Kirollos_Gerges@localhost Embedded_Linux]$ cmp Embedded Embedded2
Embedded Embedded2 differ: byte 16, line 1
```

<u>Combining and splitting file</u>

COMBINING AND SPLITTING FILES

- Multiple files can be combined into one and
- One file can be split into multiple files

    • cat file1 file2 file3 > file4
    • split file4

    • e.g. split -l 300 file.txt childfile

Split file.txt into 300 lines per file and output to childfileaa, childfileab and childfileac

Scripted by: Eng/Kirollos Gerges Asaad   Embedded C Developer

Linux vs Windows

Linux vs. Windows Commands

Command Description	Windows	Linux
Listing of a directory	dir	ls -l
Rename a file	ren	mv
Copy a file	copy	cp
Move file	move	mv
Clear screen	**cls**	clear
Delete file	del	rm
Compare contents of files	fc	diff
Search for a word/string in a file	find	grep
Display command help	**command /?**	man command
Displays your location in the file system	**chdir**	pwd
Displays the time	**time**	date

Summary

In this module you learned:

- **Command options** modify the way that command works. Some commands accept multiple options that can usually be grouped after a single hyphen.

- **Options** can modify the way a command works.

- Permissions to a file and directory can also, be assigned numerically.

- The three types of permissions are read, write and execute.

- The shell uses a pipe to connect the output of one command directly to the input of another command.

- There are three types of help commands that are used in most Linux distributions.

- The global regular expression print (grep) command processes text line by line, and it prints any lines which match a specified pattern.

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- **Awk** is a utility designed for data extraction, and it is often used to extract fields from a file or an output.

- You can combine multiple files into one, and you can also split a single file into multiple files.

- **Cut** is a command-line utility that allows you to cut parts from specified files or piped data and print the result to standard output.

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