

CENTRALESUPÉLEC

SYSTÈMES D'EXPLOITATION

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*TP Système de fichiers sous UNIX*

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# 1 Les répertoires et les fichiers

## Question 1.1

```
~$ echo $HOME
/home/danielhuf
```

## Question 1.2

```
~$ man mkdir
```

```
MKDIR(1)                                User Commands                                MKDIR(1)

NAME
    mkdir - make directories

SYNOPSIS
    mkdir [OPTION]... DIRECTORY...

DESCRIPTION
    Create the DIRECTORY(ies), if they do not already exist.

    Mandatory arguments to long options are mandatory for short options
    too.

    -m, --mode=MODE
        set file mode (as in chmod), not a=rwx - umask

    -p, --parents
        no error if existing, make parent directories as needed

    -v, --verbose
        print a message for each created directory

    -Z
        set SELinux security context of each created directory to the
        default type

    --context[=CTX]
        like -Z, or if CTX is specified then set the SELinux or SMACK
        security context to CTX

    --help display this help and exit

    --version
        output version information and exit

AUTHOR
    Written by David MacKenzie.

REPORTING BUGS
    GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
    Report any translation bugs to <https://translationproject.org/team/>

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```

SEE ALSO

`mkdir(2)`

Full documentation <<https://www.gnu.org/software/coreutils/mkdir>>  
or available locally via: `info '(coreutils) mkdir invocation'`

GNU coreutils 8.32

February 2022

MKDIR(1)

## 2 Gestion de l'arborescence

### Question 1.3

```
~$ mkdir TOTO
```

### Question 1.4

```
~$ ls
Desktop    Downloads  Pictures   snap       TOTO
Documents  Music      Public     Templates  Videos
```

### Question 1.5

```
~$ rmdir TOTO
~$ ls
Desktop    Downloads  Pictures   snap       Videos
Documents  Music      Public     Templates
```

### Question 1.6

```
~/Documents/CS$ cd
~$
```

L'effet de taper la commande 'cd' sans argument est de me ramener à mon répertoire personnel, c'est-à-dire le répertoire '/home/danielhuf'.

### Question 1.7

```
~$ pwd
/home/danielhuf
```

### Question 1.8

```
~$ mkdir $HOME/Unix
~$ mkdir $HOME/Unix/TP1
```

### Question 1.9

```
~$ cd $HOME/Unix/TP1
~/Unix/TP1$
```

### Question 1.10

```
~/Unix/TP1$ mkdir $HOME/Unix/TP1/rep
```

### Question 1.11

```
~/Unix/TP1$ rmdir rep
```

### Question 1.12

```
~/Unix/TP1$ ls $HOME/..
danielhuf
```

## 3 Lister les Fichiers

### Question 1.13

```
~$ cd /bin
/bin$ ls | head -10
[
aa-enabled
aa-exec
aa-features-abi
aclocal
aclocal-1.16
aconnect
acpi_listen
add-apt-repository
addpart
```

**Observation** : afin de ne pas afficher tous les fichiers du répertoire /bin (qui sont des centaines), je me suis limité à afficher uniquement les 10 premiers grâce à la commande 'head -10'.

### Question 1.14

```
/bin$ ls -a | head -10
.
..
[
aa-enabled
aa-exec
aa-features-abi
aclocal
aclocal-1.16
aconnect
acpi_listen
```

### Question 1.15

```
/bin$ ls -la | head -10
total 236628
drwxr-xr-x  2 root root      40960 out  16 10:36 .
drwxr-xr-x 14 root root      4096 fev  23  2023 ..
-rwxr-xr-x  1 root root    51632 fev   7  2022 [
-rwxr-xr-x  1 root root   35344 jun  21  2022 aa-enabled
-rwxr-xr-x  1 root root   35344 jun  21  2022 aa-exec
-rwxr-xr-x  1 root root   31248 jun  21  2022 aa-features-abi
lrwxrwxrwx  1 root root        25 out  14 21:00 aclocal -> /etc/alternative
-rwxr-xr-x  1 root root   36020 mar  18  2022 aclocal-1.16
-rwxr-xr-x  1 root root   22912 jan  12  2022 aconnect
```

### Question 1.16

```
/bin$ ls -la -r | head -10
total 236628
lrwxrwxrwx  1 root root        4 ago   5 23:14 zstdmt -> zstd
-rwxr-xr-x  1 root root       30 mar 24  2022 zstdless
-rwxr-xr-x  1 root root     3869 mar 24  2022 zstdgrep
lrwxrwxrwx  1 root root        4 ago   5 23:14 zstdcat -> zstd
-rwxr-xr-x  1 root root   875096 mar 24  2022 zstd
-rwxr-xr-x  1 root root     4577 set   5  2022 znew
-rwxr-xr-x  1 root root     1842 set   5  2022 zmore
-rwxr-xr-x  1 root root     2206 set   5  2022 zless
-rwxr-xr-x  1 root root    26952 mar 20  2023 zjsdecode
```

## Question 1.17

```
/bin$ ls -la -t -r | head -10
total 236628
-rwxr-xr-x 1 root root      17143 nov 26  2006 dirsplit
-rwxr-xr-x 1 root root        273 mai 19  2016 apturl
-rwxr-xr-x 1 root root     3820 ago 12  2017 laptop-detect
-rwxr-xr-x 1 root root     1081 ago 28  2017 lspgpot
-rwxr-xr-x 1 root root     9444 fev 27  2019 dh_installxmlcatalogs
-rwxr-xr-x 1 root root     3638 ago 25  2019 lsb_release
-rwxr-xr-x 1 root root        30 jan 29  2020 rgrep
-rwxr-xr-x 1 root root     1541 mai 16  2020 dh_perl_openssl
-rwxr-xr-x 1 root root    10719 jun 16  2020 ucfr
```

## Question 1.18

### 1.18.1

```
/bin$ ls r*
ranlib      red                resolvectl      rnano          rsync-ssl
rbash       remmina            rev             routef         rtstat
rcp         remmina-file-wrapper rfcomm          routel         runcon
rctest      remmina-gnome     rgrep           rpcgen         run-mailcap
rdiffdir    rendercheck       rhythmbox       rrsync         run-parts
rdma        renice            rhythmbox-client rsh            run-with-aspell
readelf     reset             rlogin          rstart        rview
readlink    resizecons        rm              rstartd       rygel
realpath    resizepart        rmdir           rsync
```

### 1.18.2

```
/bin$ ls *e | head -10
addr2line
aggregate_profile
apt-cache
apt-ftparchive
autom4te
automake
autoupdate
avahi-browse
avahi-publish-service
avahi-resolve
```

### 1.18.3

```
/bin$ ls n*e
nautilus-autorun-software nm-online      ntfs-3g.probe  ntfstruncate
nice                    nmtui-hostname ntfsfallocate  ntfswipe
nisdomainname          nsupdate      ntfsmove
```

#### 1.18.4

```
/bin$ ls ????
```

arch	delv	gcov	gtbl	kill	make	perl	ptar	tabs	view	zcmp
bash	derb	geqn	gzip	kmod	mawk	pico	pwdx	tail	vstp	znew
bjam	diff	gold	h2ph	last	mdig	ping	rdma	test	wall	zstd
chfn	dpkg	gpgv	h2xs	less	mesg	pip3	sftp	time	wget	
chrt	echo	gpic	head	link	more	pldd	shuf	tput	xmag	
chsh	edit	grep	HEAD	look	nano	plog	size	true	xman	
chvt	eutp	grog	host	lprm	nawk	pmap	snap	tset	Xorg	
comm	expr	gsbj	i386	lshw	neqn	poff	sort	ucfq	xrdb	
cpan	file	gsdj	ibus	lsns	nice	POST	stat	ucfr	xset	
cpio	find	gslj	info	lsof	open	ppdc	stty	uniq	xwud	
dash	fold	gslp	ipcs	luit	orca	ppdi	sudo	unxz	yelp	
date	free	gsnd	join	lzma	pdb3	pphs	sync	vdir	zcat	

#### 1.18.5

```
/bin$ ls ?????* | head -10
```

- aa-enabled
- aa-exec
- aa-features-abi
- aclocal
- aclocal-1.16
- aconect
- acpi\_listen
- add-apt-repository
- addpart
- addr2line

#### 1.18.6

```
/bin$ ls *z* | head -10
```

- bunzip2
- bzcat
- bzcmp
- bzdiff
- bzegrep
- bxexe
- bzfgrep
- bzgrep
- bzip2
- bzip2recover

#### 1.18.7

```
/bin$ ls [0-9]*
```

ls: cannot access '[0-9]\*': No such file or directory



### Question 1.19

```
/bin$ sudo touch m
/bin$ sudo touch r
```

### Question 1.20

```
/bin$ sudo touch \[mr\]
/bin$ ls -la -t | head -5
total 236628
drwxr-xr-x  2 root root      40960 out 16 10:49 .
-rw-r--r--  1 root root         0 out 16 10:49 [mr]
-rw-r--r--  1 root root         0 out 16 10:49 r
-rw-r--r--  1 root root         0 out 16 10:49 m
```

### Question 1.21

```
/bin$ sudo mv \[mr\] \?
/bin$ ls ?
'?' '[' m r w X
```

## 4 Manipulation de Fichiers

### Question 1.22

```
/bin$ cd $HOME/Unix/TP1
```

### Question 1.23

```
~/Unix/TP1$ cp /etc/hosts $HOME/
```

### Question 1.24

```
~/Unix/TP1$ cp $HOME/hosts .
~/Unix/TP1$ ls
hosts
~/Unix/TP1$ rm $HOME/hosts
~/Unix/TP1$ ls $HOME/hosts
ls: cannot access '/home/danielhuf/hosts': No such file or directory
```

### Question 1.25

```
~/Unix/TP1$ touch ./-i
~/Unix/TP1$ ls
hosts -i
~/Unix/TP1$ rm ./-i
~/Unix/TP1$ ls
hosts
```

### Question 1.26

```
~/Unix/TP1$ cat hosts
127.0.0.1      localhost
127.0.1.1      danielhuf-Inspiron-7460

# The following lines are desirable for IPv6 capable hosts
::1          ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters

~/Unix/TP1$ less hosts
127.0.0.1      localhost
127.0.1.1      danielhuf-Inspiron-7460

# The following lines are desirable for IPv6 capable hosts
::1          ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
hosts (END)
```

## 5 Droit d'Accès aux Fichiers

### Question 1.27

```
~/Unix/TP1$ ls -l $HOME
total 40
drwxr-xr-x 2 danielhuf danielhuf 4096 ago  5 23:50 Desktop
drwxr-xr-x 3 danielhuf danielhuf 4096 set 26 11:51 Documents
drwxr-xr-x 2 danielhuf danielhuf 4096 out 15 03:43 Downloads
drwxr-xr-x 2 danielhuf danielhuf 4096 ago  5 23:50 Music
drwxr-xr-x 3 danielhuf danielhuf 4096 out  7 20:55 Pictures
drwxr-xr-x 2 danielhuf danielhuf 4096 ago  5 23:50 Public
drwx----- 6 danielhuf danielhuf 4096 set 26 11:36 snap
```

```
drwxr-xr-x 2 danielhuf danielhuf 4096 ago 5 23:50 Templates
drwxrwxr-x 3 danielhuf danielhuf 4096 out 16 10:55 Unix
drwxr-xr-x 2 danielhuf danielhuf 4096 ago 5 23:50 Videos
```

### Question 1.28

```
~/Unix/TP1$ cp hosts hosts.bis
~/Unix/TP1$ ls
hosts  hosts.bis
```

### Question 1.29

```
~/Unix/TP1$ chmod u-w hosts
```

### Question 1.30

```
~/Unix/TP1$ rm hosts
rm: remove write-protected regular file 'hosts'? y
~/Unix/TP1$ ls
hosts.bis
```

### Question 1.31

```
~/Unix/TP1$ ls -l hosts.bis
-rw-r--r-- 1 danielhuf danielhuf 238 out 16 10:57 hosts.bis
~/Unix/TP1$ chmod g+w hosts.bis
~/Unix/TP1$ ls -l hosts.bis
-rw-rw-r-- 1 danielhuf danielhuf 238 out 16 10:57 hosts.bis
```

## 6 Les Liens Symboliques

### Question 1.32

```
~/Unix/TP1$ cat > source
Hello World!
```

### Question 1.33

```
~/Unix/TP1$ man ln
LN(1)                                User Commands                                LN(1)

NAME
    ln - make links between files

SYNOPSIS
    ln [OPTION]... [-T] TARGET LINK_NAME
```

```
ln [OPTION]... TARGET
ln [OPTION]... TARGET... DIRECTORY
ln [OPTION]... -t DIRECTORY TARGET...
```

#### DESCRIPTION

In the 1st form, create a link to TARGET with the name LINK\_NAME. In the 2nd form, create a link to TARGET **in** the current directory. In the 3rd and 4th forms, create links to each TARGET **in** DIRECTORY. Create hard links by default, symbolic links with `--symbolic`. By default, each destination (name of new link) should not already exist. When creating hard links, each TARGET must exist. Symbolic links can hold arbitrary text; **if** later resolved, a relative link is interpreted **in** relation to its parent directory.

Mandatory arguments to long options are mandatory **for** short options too.

```
--backup[=CONTROL]
    make a backup of each existing destination file

-b
    like --backup but does not accept an argument

-d, -F, --directory
    allow the superuser to attempt to hard link directories (note:
    will probably fail due to system restrictions, even for the su-
    peruser)

-f, --force
    remove existing destination files

-i, --interactive
    prompt whether to remove destinations

-L, --logical
    dereference TARGETs that are symbolic links

-n, --no-dereference
    treat LINK_NAME as a normal file if it is a symbolic link to a
    directory

-P, --physical
    make hard links directly to symbolic links

-r, --relative
    create symbolic links relative to link location

-s, --symbolic
    make symbolic links instead of hard links

-S, --suffix=SUFFIX
    override the usual backup suffix

-t, --target-directory=DIRECTORY
    specify the DIRECTORY in which to create the links

-T, --no-target-directory
    treat LINK_NAME as a normal file always

-v, --verbose
    print name of each linked file
```

--help display this help and exit

--version  
output version information and exit

The backup suffix is '~', unless set with --suffix or SIMPLE\_BACKUP\_SUFFIX. The version control method may be selected via the --backup option or through the VERSION\_CONTROL environment variable. Here are the values:

none, off  
never make backups (even if --backup is given)

numbered, t  
make numbered backups

existing, nil  
numbered if numbered backups exist, simple otherwise

simple, never  
always make simple backups

Using -s ignores -L and -P. Otherwise, the last option specified controls behavior when a TARGET is a symbolic link, defaulting to -P.

#### AUTHOR

Written by Mike Parker and David MacKenzie.

#### REPORTING BUGS

GNU coreutils online help: <<https://www.gnu.org/software/coreutils/>>  
Report any translation bugs to <<https://translationproject.org/team/>>

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#### SEE ALSO

link(2), symlink(2)

Full documentation <<https://www.gnu.org/software/coreutils/ln>>  
or available locally via: info '(coreutils) ln invocation'

GNU coreutils 8.32

February 2022

LN(1)

## Question 1.34

```
~/Unix/TP1$ cat source
Hello World!
```

## Question 1.35

```
~/Unix/TP1$ ln -s source source.sym
```

### Question 1.36

```
~/Unix/TP1$ ls -l
total 8
-rw-rw-r-- 1 danielhuf danielhuf 238 out 16 10:57 hosts.bis
-rw-rw-r-- 1 danielhuf danielhuf  13 out 16 11:02 source
lrwxrwxrwx 1 danielhuf danielhuf   6 out 16 11:03 source.sym -> source
```

### Question 1.37

```
~/Unix/TP1$ cat source
Hello World!
~/Unix/TP1$ cat source.sym
Hello World!
```

### Question 1.38

```
~/Unix/TP1$ mv source source.bis
~/Unix/TP1$ ls
hosts.bis  source.bis  source.sym
~/Unix/TP1$ cat source.sym
cat: source.sym: No such file or directory
```

Le lien symbolique contient toujours le nom du fichier vers lequel il pointe. Donc si le fichier 'source' est renommé, le lien symbolique entre celui-ci et 'source.sym' sera cassé et 'source.sym' pointera vers un fichier invalide.