Question no. 1

Find out where these commands are from your UNIX terminal. For each of the commands. Do the following:

- Use the which command to find out where the command is. If these commands don't exist, say "these commands don't exist"
- Try 1 option for each command. And explain what the option does. If a command does not have an option, say "this command does not support an option"
- ls:

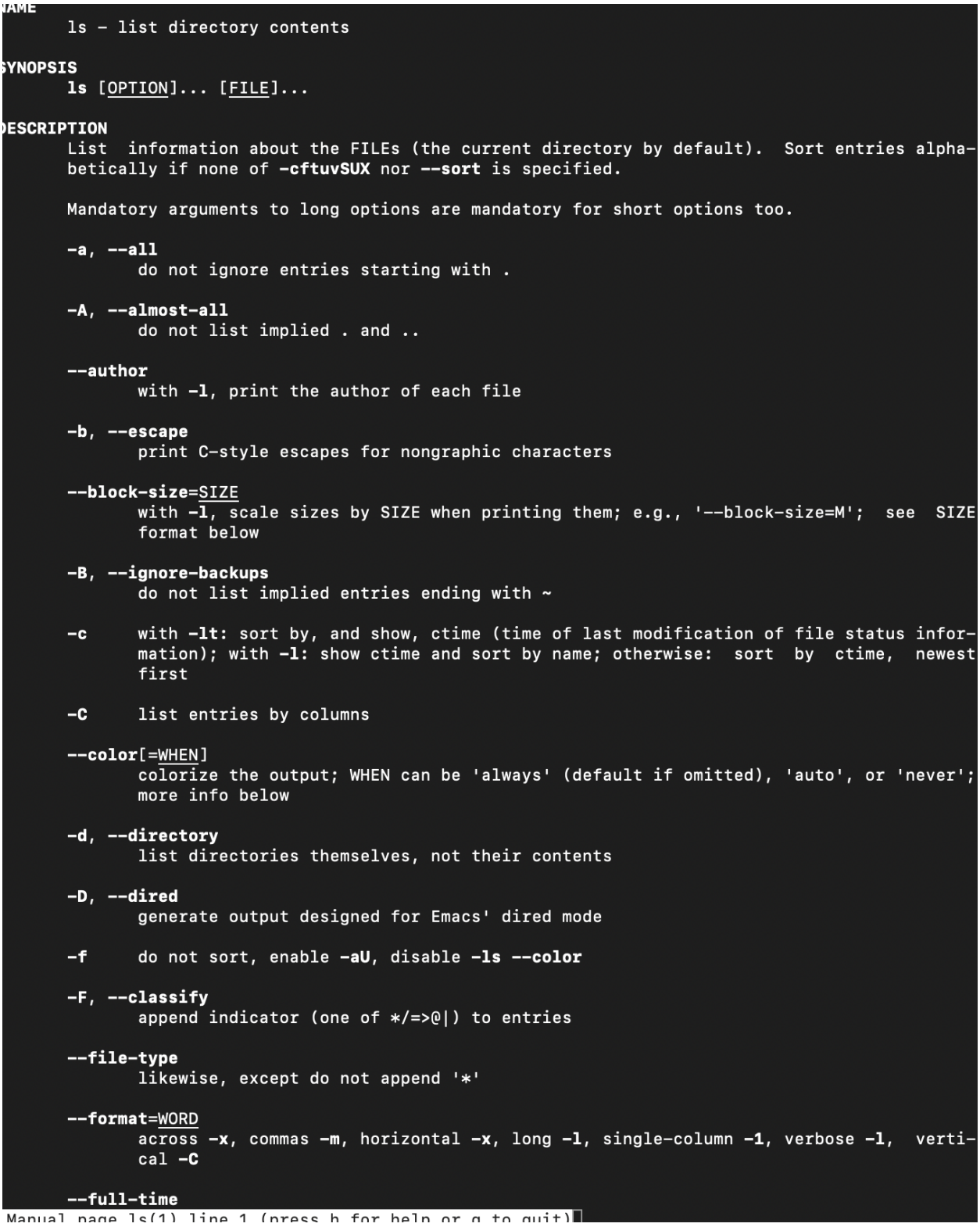
  ➔ The command exists in the Unix terminal, and it is located in the bin. It is used to list the files and directories.

```
*** System restart required ***
Last login: Fri Jan 27 22:15:16 2023 from 67.170.198.143
[19706@ip-172-26-2-101:~$ ls
A  B  B1  B2  C  C1  D  file1  file2  file4
[19706@ip-172-26-2-101:~$ who ls
[19706@ip-172-26-2-101:~$ which ls
/usr/bin/ls
```

  It has options like :

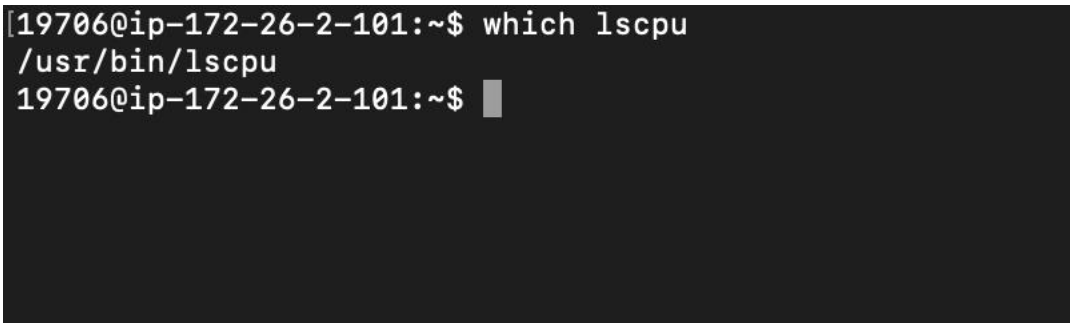
  -l: It helps us to list the long listing information about the file and directory.

  -lt: It helps to sort the file names displayed in the order of the last modification time


NAME
ls - list directory contents
SYNOPSIS
ls [OPTION]... [FILE]...
DESCRIPTION
List information about the FILEs (the current directory by default). Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.
Mandatory arguments to long options are mandatory for short options too.
-a, --all
do not ignore entries starting with .
-A, --almost-all
do not list implied . and ..
--author
with -l, print the author of each file
-b, --escape
print C-style escapes for nongraphic characters
--block-size=SIZE
with -l, scale sizes by SIZE when printing them; e.g., '--block-size=M'; see SIZE format below
-B, --ignore-backups
do not list implied entries ending with ~
-c with -lt: sort by, and show, ctime (time of last modification of file status information); with -l: show ctime and sort by name; otherwise: sort by ctime, newest first
-C list entries by columns
--color[=WHEN]
colorize the output; WHEN can be 'always' (default if omitted), 'auto', or 'never'; more info below
-d, --directory
list directories themselves, not their contents
-D, --dired
generate output designed for Emacs' dired mode
-f do not sort, enable -aU, disable -ls --color
-F, --classify
append indicator (one of */=>@|) to entries
--file-type
likewise, except do not append '*'
--format=WORD
across -x, commas -m, horizontal -x, long -l, single-column -1, verbose -l, vertical -C
--full-time
Manual page ls(1) line 1 (press h for help or q to quit)

- lscpu:

The command exists in the Unix terminal, and it is located in the bin.



It has options like :
-a, -all which includes the lines for online and offline CPUs in the output where this function may be only specified together with -e or -p.
-V, --version is used for the display version information and exit.
--output-all gives an output of available columns. This option must be combined with either –extended, --parse, or --caches.

OPTIONS

-a, **--all**
Include lines for online and offline CPUs in the output (default for **-e**). This option may only be specified together with option **-e** or **-p**.

-B, **--bytes**
Print the sizes in bytes rather than in a human-readable format.

-b, **--online**
Limit the output to online CPUs (default for **-p**). This option may only be specified together with option **-e** or **-p**.

-C, **--caches**[=*list*]
Display details about CPU caches. For details about available information see **--help** output.

If the *list* argument is omitted, all columns for which data is available are included in the command output.

When specifying the *list* argument, the string of option, equal sign (=), and *list* must not contain any blanks or other whitespace. Examples: '**-C=NAME,ONE-SIZE**' or '**--caches=NAME,ONE-SIZE**'.

-c, **--offline**
Limit the output to offline CPUs. This option may only be specified together with option **-e** or **-p**.

-e, **--extended**[=*list*]
Display the CPU information in human-readable format.

If the *list* argument is omitted, all columns for which data is available are included in the command output.

When specifying the *list* argument, the string of option, equal sign (=), and *list* must not contain any blanks or other whitespace. Examples: '**-e=cpu,node**' or '**--extended=cpu,node**'.

-h, **--help**
Display help text and exit.

-J, **--json**
Use JSON output format for the default summary or extended output (see **--extended**).

-p, **--parse**[=*list*]
Optimize the command output for easy parsing.

If the *list* argument is omitted, the command output is compatible with earlier versions of **lscpu**. In this compatible format, two commas are used to separate CPU cache columns. If no CPU caches are identified the cache column is omitted. If the *list* argument is used, cache columns are separated with a colon (:).

When specifying the *list* argument, the string of option, equal sign (=), and *list* must not contain any blanks or other whitespace. Examples: '**-p=cpu,node**' or '**--parse=cpu,node**'.

-s, **--sysroot** *directory*
Gather CPU data for a Linux instance other than the instance from which the **lscpu** command is issued. The specified *directory* is the system root of the Linux instance to be inspected.

-x, **--hex**
Use hexadecimal masks for CPU sets (for example "ff"). The default is to print the

- cd: this command does not exist.

```
19706@ip-172-26-2-101:~$ which cd
19706@ip-172-26-2-101:~$ man cd
No manual entry for cd
19706@ip-172-26-2-101:~$
```

- time: The command exists in the Unix terminal, and it is located in the bin.

```
19706@ip-172-26-2-101:~$ which time
/usr/bin/time
19706@ip-172-26-2-101:~$
```

This command has options like ：
--quiet help does not report the status of the program even if it is different from zero.
-V, --version helps to print the version number of time and exit.

```
OPTIONS
       -o FILE, --output=FILE
              Write the resource use statistics to FILE instead of to the standard error stream.
              By default, this overwrites the file, destroying the file's previous contents.
              This option is useful for collecting information on interactive programs and
              programs that produce output on the standard error stream.

       -a, --append
              Append the resource use information to the output file instead of overwriting it.
              This option is only useful with the `-o' or `--output' option.

       -f FORMAT, --format FORMAT
              Use FORMAT as the format string that controls the output of time.  See the below
              more information.

       --help Print a summary of the command line options and exit.

       -p, --portability
              Use the following format string, for conformance with POSIX standard 1003.2:
                        real %e
                        user %U
                        sys %S

       -v, --verbose
              Use the built-in verbose format, which displays each available piece of information
              on the program's resource use on its own line, with an English description of its
              meaning.

       --quiet
              Do not report the status of the program even if it is different from zero.

       -V, --version
              Print the version number of time and exit.
```

- lp : This command does not exist.

```
[19706@ip-172-26-2-101:~$ which lp
[19706@ip-172-26-2-101:~$ man lp
[19706@ip-172-26-2-101:~$ which lp
 19706@ip-172-26-2-101:~$
```

But this command information is given by the manual command, and it does not have an option.

NAME

lp − line printer devices

SYNOPSIS

#include <linux/lp.h>

CONFIGURATION

lp[0−2] are character devices for the parallel line printers; they have major number 6 an minor number 0−2. The minor numbers correspond to the printer port base addresses 0x03bc 0x0378 and 0x0278. Usually they have mode 220 and are owned by root and group lp. Yo can use printer ports either with polling or with interrupts. Interrupts are recommende when high traffic is expected, for example, for laser printers. For typical dot matri printers, polling will usually be enough. The default is polling.

DESCRIPTION

The following **ioctl**(2) calls are supported:

int ioctl(int fd**, LPTIME, int** arg**)**
Sets the amount of time that the driver sleeps before rechecking the printer whe the printer's buffer appears to be filled to arg. If you have a fast printer, de crease this number; if you have a slow printer, then increase it. This is in hun dredths of a second, the default 2 being 0.02 seconds. It influences only th polling driver.

int ioctl(int fd**, LPCHAR, int** arg**)**
Sets the maximum number of busy−wait iterations which the polling driver does whil waiting for the printer to get ready for receiving a character to arg. If printin is too slow, increase this number; if the system gets too slow, decrease this num ber. The default is 1000. It influences only the polling driver.

int ioctl(int fd**, LPABORT, int** arg**)**
If arg is 0, the printer driver will retry on errors, otherwise it will abort. Th default is 0.

int ioctl(int fd**, LPABORTOPEN, int** arg**)**
If arg is 0, **open**(2) will be aborted on error, otherwise error will be ignored The default is to ignore it.

int ioctl(int fd**, LPCAREFUL, int** arg**)**
If arg is 0, then the out−of−paper, offline, and error signals are required to b false on all writes, otherwise they are ignored. The default is to ignore them.

int ioctl(int fd**, LPWAIT, int** arg**)**
Sets the number of busy waiting iterations to wait before strobing the printer t accept a just−written character, and the number of iterations to wait before turn ing the strobe off again, to arg. The specification says this time should be 0. microseconds, but experience has shown the delay caused by the code is alread enough. For that reason, the default value is 0. This is used for both th polling and the interrupt driver.

int ioctl(int fd**, LPSETIRQ, int** arg**)**
This **ioctl**(2) requires superuser privileges. It takes an int containing the ne IRQ as argument. As a side effect, the printer will be reset. When arg is 0, th polling driver will be used, which is also default.

int ioctl(int fd**, LPGETIRQ, int ***arg**)**
Stores the currently used IRQ in arg.

int ioctl(int fd**, LPGETSTATUS, int ***arg**)**
Stores the value of the status port in arg. The bits have the following meaning:

- rmdir: The command exists in the Unix terminal, and it is located in the bin.

```
19706@ip-172-26-2-101:~$ which rmdir
/usr/bin/rmdir
19706@ip-172-26-2-101:~$
```

This command has options like :
-p: it helps to remove all the directory arguments which are treated as a pathname, if they are already empty, starting from the last component.
-v, –verbose: It displays verbose information for every directory being processed.

```
--ignore-fail-on-non-empty

      ignore each failure that is solely because a directory

      is non-empty

-p, --parents
      remove  DIRECTORY  and  its  ancestors; e.g., 'rmdir -p a/b/c' is similar to 'rmdir
      a/b/c a/b a'

-v, --verbose
      output a diagnostic for every directory processed

--help display this help and exit

--version
      output version information and exit
```

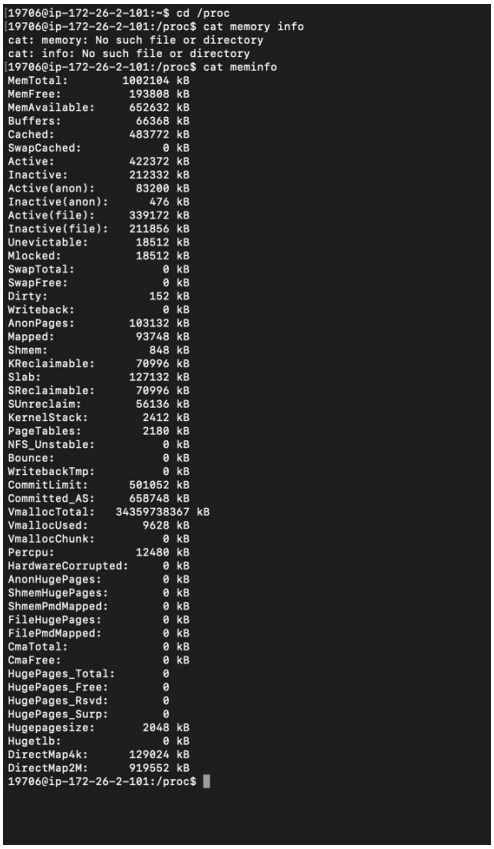
- unnamed: This command does not exist, and it does not have an option.

```
19706@ip-172-26-2-101:~$ which unnamed
19706@ip-172-26-2-101:~$ man unnamed
No manual entry for unnamed
19706@ip-172-26-2-101:~$
```

Question no.2

Go to the /proc directory from your UNIX system and find out more info about the system such as

- memory info : It displays detailed information about memory usage and availability on your system.



- CPU info: It displays the CPU information such as vendor, model name, clock speed, cache size, and many other

details.

```
[19706@ip-172-26-2-101:/proc$ cat cpuinfo                                                                    ]
processor       : 0
vendor_id       : GenuineIntel
cpu family      : 6
model           : 63
model name      : Intel(R) Xeon(R) CPU E5-2676 v3 @ 2.40GHz
stepping        : 2
microcode       : 0x49
cpu MHz         : 2399.823
cache size      : 30720 KB
physical id     : 0
siblings        : 1
core id         : 0
cpu cores       : 1
apicid          : 0
initial apicid  : 0
fpu             : yes
fpu_exception   : yes
cpuid level     : 13
wp              : yes
flags           : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mm
x fxsr sse sse2 ht syscall nx rdtscp lm constant_tsc rep_good nopl xtopology cpuid pni pclmulqdq sss
e3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand hype
rvisor lahf_lm abm cpuid_fault invpcid_single pti fsgsbase bmi1 avx2 smep bmi2 erms invpcid xsaveopt
bugs            : cpu_meltdown spectre_v1 spectre_v2 spec_store_bypass l1tf mds swapgs itlb_multihit
bogomips        : 4800.00
clflush size    : 64
cache_alignment : 64
address sizes   : 46 bits physical, 48 bits virtual
power management:
```

- file system: The file system can be displayed using the "df" command. This command shows the amount of disk space available on the file system, as well as the usage and mounted file systems

```
[19706@ip-172-26-2-101:/proc$ df
Filesystem     1K-blocks    Used Available Use% Mounted on
/dev/root       40593612 2321468  38255760   6% /
devtmpfs          496940       0    496940   0% /dev
tmpfs             501052       0    501052   0% /dev/shm
tmpfs             100212     828     99384   1% /run
tmpfs               5120       0      5120   0% /run/lock
tmpfs             501052       0    501052   0% /sys/fs/cgroup
/dev/loop1         56320   56320         0 100% /snap/core18/1880
/dev/loop2         73088   73088         0 100% /snap/lxd/16100
/dev/loop3         28800   28800         0 100% /snap/amazon-ssm-agent/2012
/dev/loop4         56960   56960         0 100% /snap/core18/2667
/dev/loop5        119552  119552         0 100% /snap/core/14447
/dev/loop6         64896   64896         0 100% /snap/core20/1778
/dev/loop7         25088   25088         0 100% /snap/amazon-ssm-agent/6312
/dev/loop8        147712  147712         0 100% /snap/lxd/24323
19706@ip-172-26-2-101:/proc$
```