

OS LAB 2

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ridhima@DESKTOP-CTMUG20:~\$ more /proc/cpuinfo

```
processor      : 0
vendor_id     : GenuineIntel
cpu family    : 6
model         : 142
model name    : Intel(R) Core(TM) i5-8250U CPU @ 1.60GHz
stepping      : 10
microcode     : 0xffffffff
cpu MHz       : 1800.000
cache size    : 256 KB
physical id    : 0
siblings      : 8
core id       : 0
cpu cores     : 4
apicid        : 0
initial apicid : 0
fpu           : yes
fpu_exception : yes
cpuid level   : 6
wp            : yes
flags         : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx
                pdpe1gb rdtscp lm pni pclmulqdq dtes64 monitor ds_cpl vmx est tm2 ssse3 fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_time
                r aes xsave osxsave avx f16c rdrand lahf_lm abm 3dnowprefetch fsgsbase tsc_adjust bmi1 avx2 smep bmi2 erms invpcid mpx rdseed adx smap clflushopt in
                tel_pt ibrs ibpb stibp ssbd
bogomips      : 3600.00
clflush size   : 64
cache_alignment : 64
address sizes  : 36 bits physical, 48 bits virtual
power management:

processor      : 1
vendor_id     : GenuineIntel
cpu family    : 6
model         : 142
```

Part I

Q1

On typing more proc/cpuinfo , the information displayed was as given in the next slide

(a) Run command `more /proc/cpuinfo` and explain the following terms: processor and cores. **Processor is an electronic circuit which performs operations and handles instructions while cores are processing units which receive instructions and perform actions. Cores are present inside processor.**

```
ridhima@DESKTOP-CTMUG20:~$ grep -c ^processor more /proc/cpuinfo
grep: more: No such file or directory
/proc/cpuinfo:8
```

(b) How many cores does your machine have? **4**

(c) How many processors does your machine have? **8**

(d) What is the frequency of each processor? **1800.00**

(e) How much physical memory does your system have? **8295652kB**

(f) How much of this memory is free? **3887620kB**

(g) What is the total number of number of forks since the boot in the system? **26**

(h) How many context switches has the system performed since bootup? **494453**

```
ridhima@DESKTOP-CTMUG20:~$ more /proc/meminfo
MemTotal:      8295652 kB
MemFree:       3887620 kB
```

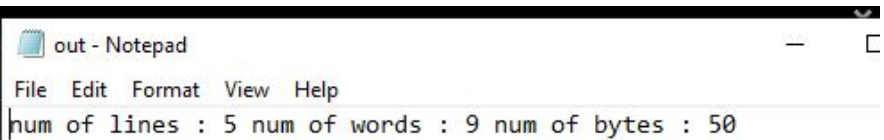
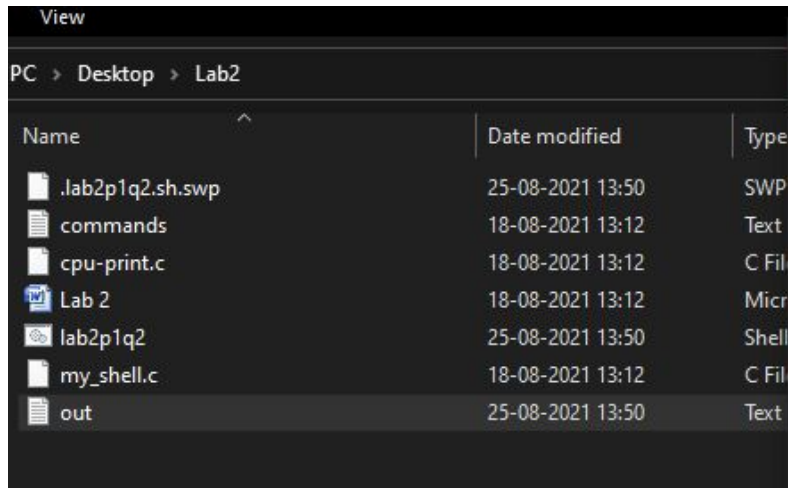
```

ctxt 494453
btime 1629798773
processes 26
```

2. Write a shell script for counting the number of lines in a given text file. Your program should additionally report the number of bytes and the number of words as well. All these outputs to be written into another text file. Example shell script for adding two numbers as arguments:

```
#!/bin/bash
echo "Part 1 Q2"
file="commands.txt"
linescount=$(wc --lines<$file)
wordscount=$(wc --word<$file)
bytecount=$(wc --c<$file)
outputfile=out.txt

finalOut="num of lines : $linescount num of words : $wordscount num of bytes : $bytecount"
echo $finalOut>$outputfile
```



Part Two

How to run ?

Type : `gcc shell.c -lreadline`

Followed by `./a.out`

Dependencies needed :

- Gcc compiler
- Libreadline which can be installed using the following command

```
sudo apt-get install libreadline-dev
```

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shell.c file is a simple executable shell which has been built C language and relevant libraries.

Features / Commands added (internal commands)

- help : display commands list
- hello : greets
- history : history of commands
- env : environment information
- Ls : lists directories present in current directory
- exit : exists
- mkdir : create a new directory
- rmdir: delete an existing directory
- cd : change directory
- pwd : current directory
- clear: clears
- Colored outputs - escape sequences have been used to produce colored outputs

Exception Handling

- cd : If directory is not present , no action is performed
- mkdir : If directory already exists no action is performed and the exception displays message that file is already present
- rmdir : If directory is not present , the exception returns message that directory cannot be removed

Special feature : Coloring

In order to make outputs attractive , colors have been added using escape sequences

Execution status :

Returns 0 on pass and 1 on error

Outputs after
executing the
commands

****Welcome****

<<---(° v °)--->>

USER is: @ridhima

/mnt/c/USERS/LENOVO/Desktop/Lab2\$ help

Welcome message

help

```
/mnt/c/USERS/LENOVO/Desktop/Lab2$ help

***>>>>          Help Section  <<<<***
Commands :
>hello
>history
>env
>help
>ls
>exit
>mkdir
>rmdir
>cd
>pwd
>clear
```

hello

```
/mnt/c/USERS/LENOVO/Desktop/Lab2$ hello

Hello ridhima.
I am the shell. Please type the required command.
Type help to see list of commands
/mnt/c/USERS/LENOVO/Desktop/Lab2$
```

cd

```
ridhima@DESKTOP-CTMUG20: /mnt/c/USERS/LENOVO/Desktop/Lab2
/mnt/c/USERS/LENOVO/Desktop/Lab2$ cd f2
/mnt/c/USERS/LENOVO/Desktop/Lab2/f2$ cd ..
/mnt/c/USERS/LENOVO/Desktop/Lab2$
```

env

```
/mnt/c/USERS/LENOVO/Desktop/Lab2$ env
LESSOPEN=| /usr/bin/lesspipe %s
USER=ridhima
SHLVL=1
HOME=/home/ridhima
OLDPWD=/mnt/c/USERS/LENOVO/Desktop
WSL_DISTRO_NAME=Ubuntu
LOGNAME=ridhima
NAME=DESKTOP-CTMUG20
_=./a.out
TERM=xterm-256color
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/
.UbuntuonWindows_2004.2021.222.0_x64__79rhkp1fndgsc:/mnt/c/Python39
System32/Wbem:/mnt/c/Windows/System32/WindowsPowerShell/v1.0/;/mnt/
s/nodejs/;/mnt/c/Program Files/Git/cmd:/mnt/c/MinGW/bin:/mnt/c/User
ograms/Microsoft VS Code/bin:/mnt/c/Users/LENOVO/AppData/Roaming/np
LANG=C.UTF-8
LS_COLORS=rs=0:di=01;34:ln=01;36:mh=00:pi=40;33:so=01;35:do=01;35:b
4;42:st=37;44:ex=01;32:*.tar=01;31:*.tgz=01;31:*.arc=01;31:*.arj=01
z=01;31:*.tzo=01;31:*.t7z=01;31:*.zip=01;31:*.z=01;31:*.dz=01;31:*.
.bz2=01;31:*.bz=01;31:*.tbz=01;31:*.tbz2=01;31:*.tz=01;31:*.deb=01;
01;31:*.ace=01;31:*.zoo=01;31:*.cpio=01;31:*.7z=01;31:*.rz=01;31:*.
5:*.mjpg=01;35:*.mjpeg=01;35:*.gif=01;35:*.bmp=01;35:*.pbm=01;35:*.
5:*.png=01;35:*.svg=01;35:*.svgz=01;35:*.mng=01;35:*.pcx=01;35:*.m
:*.mp4=01;35:*.m4v=01;35:*.mp4v=01;35:*.vob=01;35:*.qt=01;35:*.nuv=
li=01;35:*.flv=01;35:*.gl=01;35:*.dl=01;35:*.xcf=01;35:*.xwd=01;35:
```

Is

```

ridhima@DESKTOP-CTMUG20: /mnt/c/USERS/LENOVO/Desktop/Lab2
/mnt/c/USERS/LENOVO/Desktop/Lab2$ ls
/mnt/c/USERS/LENOVO/Desktop/Lab2$ 'Lab 2.docx'    a.out    commands.txt
2.docx'

```

pwd

```
ridhima@DESKTOP-CTMUG2O: /mnt/c/USERS/LENOVO/Desktop/Lab2
/mnt/c/USERS/LENOVO/Desktop/Lab2$ pwd
/mnt/c/USERS/LENOVO/Desktop/Lab2
/mnt/c/USERS/LENOVO/Desktop/Lab2$
```

mkdir

```
>exit
>mkdir
>rmdir
>cd
>pwd
>clear
/mnt/c/USERS/LENOVO/Desktop/Lab2$ mkdir f1
Directory created !
/mnt/c/USERS/LENOVO/Desktop/Lab2$ mkdir f1
Can't create directory :( There might be another file with the same name .
/mnt/c/USERS/LENOVO/Desktop/Lab2$ rmdir
```



rmdir

```
>ls
>exit
>mkdir
>rmdir
>cd
>pwd
>clear
/mnt/c/USERS/LENOVO/Desktop/Lab2$ mkdir f1
Directory created !
/mnt/c/USERS/LENOVO/Desktop/Lab2$ mkdir f1
Can't create directory :( There might be another file with the same name .
/mnt/c/USERS/LENOVO/Desktop/Lab2$ rmdir f1
Directory Deleted !
/mnt/c/USERS/LENOVO/Desktop/Lab2$ rmdir f1
Can't delete directory :(
/mnt/c/USERS/LENOVO/Desktop/Lab2$
```

