

PART 1.

1. using lscpu

```
Architecture:      x86_64
CPU op-mode(s):    32-bit, 64-bit
Byte Order:        Little Endian
Address sizes:      36 bits physical, 48 bits virtual
```

```
CPU(s):            4
On-line CPU(s) list: 0-3
Thread(s) per core: 1
Core(s) per socket: 4
Socket(s):          1
```

```
L1d cache:         128 KiB
L1i cache:         128 KiB
L2 cache:           1 MiB
L3 cache:           6 MiB
```

cat /proc/meminfo

```
MemTotal:       7980624 kB
MemFree:        3158316 kB
MemAvailable:   5439944 kB
secondary memory using lsblk[know what is secondary mem], df[disk free]
FileSystem      Total      Used      Available
/dev/mapper/ubuntu--vg-ubuntu--lv 60188548 10470048 46628684 19% /
```

top

Tasks: 254 total, 1 running, 253 sleeping, 0 stopped, 0 zombie

Exercise 2:

VmRss - Virtual Machine Resident Set Scale

VmRSS in /proc/[pid]/statm is a useful data. It shows how much memory in RAM is occupied by the process. The rest extra memory has either been not used or has been swapped out. VmSize is how much virtual memory the process has in total.

memory_1.c ARRAY_SIZE = 1e6

VmSize: 6272 kB

VmRSS: 4956 kB

memory_2.c ARRAY_SIZE = 2e6

VmSize: 10180 kB

VmRSS: 8540 kB

memory_3.c assigning till ARRAY_SIZE/2

VmSize: 6272 kB

VmRSS: 4852 kB

memory_4.c assigning till ARRAY_SIZE

VmSize: 6276 kB

VmRSS: 4932 kB

Exercise 3:

running the executable using chmod +x subprocesses

./subprocesses 200050019

in another tab ps -e

total subprocesses created are 12.

54642 pts/5 00:00:00 subprocesses

54643 pts/5 00:00:00 subprocesses

```

54644 pts/5    00:00:00 subprocesses
54645 pts/5    00:00:00 subprocesses
54646 pts/5    00:00:00 subprocesses
54647 pts/5    00:00:00 subprocesses
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54649 pts/5    00:00:00 subprocesses
54650 pts/5    00:00:00 subprocesses
54651 pts/5    00:00:00 subprocesses
54652 pts/5    00:00:00 subprocesses
54653 pts/5    00:00:00 subprocesses

```

Exercise 4:

strace ./empty - gives 30 system calls

strace ./hello - gives 43 system calls

In 39th system call in hello it asks for the name.

First 29 lines are same with some difference in numerical values.

Exercise 5:

chmod +x openfiles

There are some directories also open iam including both of them.

./openfiles then in another tab lsof | grep openfiles

/home/labuser/lab1/lab1/files

/

/home/labuser/lab1/lab1/files/openfiles

usr/lib/x86_64-linux-gnu/libc-2.31.so

/usr/lib/x86_64-linux-gnu/ld-2.31.so

/dev/pts/4

dev/pts/4

/dev/pts/4

/tmp/welocme to OS

/tmp/CS333

/tmp/CS347

Exercise 6:

lsblk

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
loop0	7:0	0	55.4M	1	loop	/snap/core18/1944
loop1	7:1	0	69.9M	1	loop	/snap/lxd/19188
loop2	7:2	0	31.1M	1	loop	/snap/snapd/10707
sda	8:0	0	59.6G	0	disk	
└─sda1	8:1	0	1M	0	part	
└─sda2	8:2	0	1G	0	part	/boot
└─sda3	8:3	0	58.6G	0	part	
└─ubuntu--vg-ubuntu--lv	253:0	0	58.6G	0	lvm	/