150010041_lab1

Part1

1.
a) The machine has 1 socket, 4 CPUs and each CPU has 4 cores.
b) The frequency of each CPU is 3.00 GHz
c) Total Memory : 8007228 kB
d) Free Memory is 4821540 kB. Available memory is 6453284 kB. Available Memory is the part of the total memory available for use by the user, which is not occupied by the operating system. Free Memory is the part of Available Memory which is currently unoccupied.
e) 125 user level processes are running in the system outside of root.
111 root level processes are also running.
f) 42968521 context switches performed since bootup
g)

2.
a) memory_1.c -
VmSize: 8136 kB
VmRSS: 652 kB

b) memory_2.c -
VmSize: 12044 kB
VmRSS: 624 kB

c) memory_3.c -
VmSize: 8136 kB
VmRSS: 3100 kB

d) memory_4.c -
VmSize: 8136 kB
VmRSS: 4968 kB

3. Found the following processes associated with subprocess file. A total of 14 processes where 1 would be main and rest 13 subprocesses.

```
6505 pts/0    S+     0:00 ./subprocesses 150010041
6506 pts/0    S+     0:00 ./subprocesses 150010041
6507 pts/0    S+     0:00 ./subprocesses 150010041
6508 pts/0    S+     0:00 ./subprocesses 150010041
6509 pts/0    S+     0:00 ./subprocesses 150010041
6510 pts/0    S+     0:00 ./subprocesses 150010041
6511 pts/0    S+     0:00 ./subprocesses 150010041
6512 pts/0    S+     0:00 ./subprocesses 150010041
6513 pts/0    S+     0:00 ./subprocesses 150010041
6514 pts/0    S+     0:00 ./subprocesses 150010041
6515 pts/0    S+     0:00 ./subprocesses 150010041
6516 pts/0    S+     0:00 ./subprocesses 150010041
6517 pts/0    S+     0:00 ./subprocesses 150010041
6518 pts/0    S+     0:00 ./subprocesses 150010041
```

It was obtained using the command "ps ax | grep subprocesses"

4. The strace output for "empty" executable shows the basic calls for setting up the memory stack for C program. 12 different system calls function are seen which are as follows -
execve, brk, access, open, fstat, mmap, close, read, mprotect, arch_prctl, munmap, exit_group

a) First 25 lines for the initial steps are common in two strace outputs. In executable 'hello', strace output after line 25 is specifically about that program.
b) empty - execve, brk, access, open, fstat, mmap, close, read, mprotect, arch_prctl, munmap, exit_group
hello - (All the above calls from empty) and getpid, write, lseek

5. The files in use by the program are -
openfiles 5893 labuser cwd DIR 8,1 4096 795846 /home/labuser/Desktop/OS_Lab/lab1/files
openfiles 5893 labuser rtd DIR 8,1 4096 2 /
openfiles 5893 labuser txt REG 8,1 8760 795847 /home/labuser/Desktop/OS_Lab/lab1/files/openfiles
openfiles 5893 labuser mem REG 8,1 1868984 524462 /lib/x86_64-linux-gnu/libc-2.23.so
openfiles 5893 labuser mem REG 8,1 162632 524458 /lib/x86_64-linux-gnu/ld-2.23.so
openfiles 5893 labuser 0u CHR 136,0 0t0 3 /dev/pts/0
openfiles 5893 labuser 1u CHR 136,0 0t0 3 /dev/pts/0
openfiles 5893 labuser 2u CHR 136,0 0t0 3 /dev/pts/0
openfiles 5893 labuser 3w REG 8,1 0 1583846 /tmp/welocme to OS
openfiles 5893 labuser 4w REG 8,1 0 1583852 /tmp/CS333
openfiles 5893 labuser 5w REG 8,1 0 1583853 /tmp/CS347

It was obtained by using lsof command with process ID of openfiles executable.

6. The following information was obtained using the command "lsblk -f"
NAME FSTYPE LABEL UUID MOUNTPOINT
sda
|-sda1 ext4 91ae3480-736d-4c85-86c8-af2c6ab11310 /
|-sda2
`-sda5 swap deb320c4-5b12-4e1c-9598-7f84d41df8b7 [SWAP]