Assignment – Memory Management

1) Setup additional swap space in the system to solve low memory issue. The swap which you added should be available post reboot.

```
ubuntu@ip-172-31-37-94:~$ sudo swapon --show
ubuntu@ip-172-31-37-94:~$ sudo swapon --show
ubuntu@ip-172-31-37-94:~$ free -h
               total        used        free      shared  buff/cache   available
Mem:           957Mi       339Mi       532Mi       920Ki       235Mi       617Mi
Swap:             0B          0B          0B
ubuntu@ip-172-31-37-94:~$ sudo fallocate -l 2G /swapfile
ubuntu@ip-172-31-37-94:~$ sudo chmod 600 /swapfile
ubuntu@ip-172-31-37-94:~$ sudo mkswap /swapfile
Setting up swapspace version 1, size = 2 GiB (2147479552 bytes)
no label, UUID=7541c1c2-9a9c-4fc0-be72-89c065b2ed85
ubuntu@ip-172-31-37-94:~$ sudo swapon /swapfile
ubuntu@ip-172-31-37-94:~$ sudo swapon --show
NAME      TYPE SIZE USED PRIO
/swapfile file   2G   0B   -2
ubuntu@ip-172-31-37-94:~$ free -h
               total        used        free      shared  buff/cache   available
Mem:           957Mi       338Mi       532Mi       920Ki       237Mi       618Mi
Swap:          2.0Gi          0B       2.0Gi
ubuntu@ip-172-31-37-94:~$  sudo vim /etc/fstab
ubuntu@ip-172-31-37-94:~$ sudo reboot
```

```
LABEL=cloudimg-rootfs   /        ext4   discard,commit=30,errors=remount-ro     0 1
LABEL=BOOT      /boot   ext4    defaults        0 2
LABEL=UEFI      /boot/efi       vfat    umask=0077      0 1
/dev/xvdb1 /Data1 ext4 defaults 0 0
/dev/xvdb2 /Data2 ext4 defaults 0 0
/dev/xvdb5 /Data3 ext4 defaults 0 0
/dev/xvdb6 /Data4 ext4 defaults 0 0
/swapfile swap swap defaults 0 0
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
:wq!
```

```
ubuntu@ip-172-31-37-94:~$ sudo reboot\
> ^C
ubuntu@ip-172-31-37-94:~$ sudo reboot

Broadcast message from root@ip-172-31-37-94 on pts/1 (Mon 2024-10-07 19:22:40 UTC):

The system will reboot now!

ubuntu@ip-172-31-37-94:~$ Connection to ec2-54-255-212-207.ap-southeast-1.compute.amazonaws.com closed by remote host.
Connection to ec2-54-255-212-207.ap-southeast-1.compute.amazonaws.com closed.

C:\Users\LENOVO\Downloads>ssh -i "window.pem" ubuntu@ec2-54-255-212-207.ap-southeast-1.compute.amazonaws.com
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-1016-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

 System information as of Mon Oct  7 19:23:04 UTC 2024

  System load:  0.23              Processes:             117
  Usage of /:   53.1% of 6.71GB   Users logged in:       0
  Memory usage: 21%               IPv4 address for enX0: 172.31.37.94
  Swap usage:   0%


Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status


The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Mon Oct  7 18:36:43 2024 from 27.7.133.127
ubuntu@ip-172-31-37-94:~$ free -h
               total        used        free      shared  buff/cache   available
Mem:           957Mi       332Mi       541Mi       936Ki       234Mi       625Mi
Swap:          2.0Gi          0B       2.0Gi
ubuntu@ip-172-31-37-94:~$
```

2) Find out the number of process is in run queue and blocking queue.

sudo apt install procps

vmstat 1 5

procs	----------memory----------				---swap--		-----io---- -		------system--		----cpu----			
r	b	swpd	free	buff	cache	si	so	bi	bo	in	cs	us	sy	id	wa
1	0	0	12720	18096	173564	0	0	16	33	43	98	3	1	95	1
0	1	0	12716	18096	173564	0	0	0	1	26	74	0	0	99	1

Alternative Using top command:

At the top of the output, you'll see:

- **Tasks: The total number of processes.**
- **Running: The number of processes in the run queue.**
- **Sleeping: The number of processes waiting (blocking).**