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SE202L – Development Operations Lab

Lab 02 – Report

Part 6: Practical Exercises

Exercise 1: File Permissions Practice

```
sheikh@Ubuntu:~$ pwd
/home/sheikh
sheikh@Ubuntu:~$ mkdir permissions_lab
sheikh@Ubuntu:~$ cd permissions_lab
sheikh@Ubuntu:~/permissions_lab$ touch public.txt private.txt executable.sh
sheikh@Ubuntu:~/permissions_lab$ ls
executable.sh  private.txt  public.txt
sheikh@Ubuntu:~/permissions_lab$ ls -l
total 0
-rw-rw-r-- 1 sheikh sheikh 0 Feb 11 16:36 executable.sh
-rw-rw-r-- 1 sheikh sheikh 0 Feb 11 16:36 private.txt
-rw-rw-r-- 1 sheikh sheikh 0 Feb 11 16:36 public.txt
sheikh@Ubuntu:~/permissions_lab$ chmod 644 public.txt
sheikh@Ubuntu:~/permissions_lab$ chmod 600 private.txt
sheikh@Ubuntu:~/permissions_lab$ chmod 755 executable.sh
sheikh@Ubuntu:~/permissions_lab$ ls -l
total 0
-rwxr-xr-x 1 sheikh sheikh 0 Feb 11 16:36 executable.sh
-rw------- 1 sheikh sheikh 0 Feb 11 16:36 private.txt
-rw-r--r-- 1 sheikh sheikh 0 Feb 11 16:36 public.txt
sheikh@Ubuntu:~/permissions_lab$ touch secret.txt
sheikh@Ubuntu:~/permissions_lab$ chmod 600 secret.txt
sheikh@Ubuntu:~/permissions_lab$ ls -l secret.txt
-rw------- 1 sheikh sheikh 0 Feb 11 16:38 secret.txt
sheikh@Ubuntu:~/permissions_lab$ nano executable.sh
sheikh@Ubuntu:~/permissions_lab$ ./executable.sh
Hello DevOps
sheikh@Ubuntu:~/permissions_lab$ 
```

Exercise 2: User and Group Management

```
sheikh@Ubuntu:~$ sudo groupadd devteam
sheikh@Ubuntu:~$ getent group devteam
devteam:x:1001:
sheikh@Ubuntu:~$ sudo adduser developer1
info: Adding user `developer1' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `developer1' (1002) ...
info: Adding new user `developer1' (1002) with group `developer1 (1002)' ...
info: Creating home directory `/home/developer1' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for developer1
Enter the new value, or press ENTER for the default
        Full Name []: Developer1
        Room Number []: 37
        Work Phone []: 03168440955
        Home Phone []: 03168440955
        Other []: Nothing
Is the information correct? [Y/n] Y
info: Adding new user `developer1' to supplemental / extra groups `users' ...
info: Adding user `developer1' to group `users' ...
sheikh@Ubuntu:~$ ls /home/developer1
ls: cannot open directory '/home/developer1': Permission denied
sheikh@Ubuntu:~$ groups developer1
developer1 : developer1 users
sheikh@Ubuntu:~$ sudo usermod -aG devteam developer1
sheikh@Ubuntu:~$ sudo mkdir team_project
sheikh@Ubuntu:~$ sudo chgrp devteam team_project
sheikh@Ubuntu:~$ sudo chmod 2775 team_project
sheikh@Ubuntu:~$ ls -ld team_project
drwxrwsr-x 2 root devteam 4096 Feb 11 17:14 team_project
sheikh@Ubuntu:~$ groups developer1
developer1 : developer1 users devteam
sheikh@Ubuntu:~$ id developer1
uid=1002(developer1) gid=1002(developer1) groups=1002(developer1),100(users),1001(devteam)
sheikh@Ubuntu:~$
```

Exercise 3: Process Management

```
sheikh@Ubuntu:~$ top
```

```
Tasks: 247 total,   1 running, 246 sleeping,   0 stopped,   0 zombie
%Cpu(s):  2.4 us,  0.0 sy,  0.0 ni, 97.6 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :   5925.8 total,   2076.0 free,   2146.2 used,   1825.4 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   3779.6 avail Mem

   PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
  2179 sheikh    20   0 4957964 518812 186608 S  18.2   8.5   3:53.40 gnome-shell
  6059 sheikh    20   0   14532   5644   3416 R   9.1   0.1   0:00.01 top
     1 root      20   0   23208  14248   9504 S   0.0   0.2   0:03.64 systemd
     2 root      20   0       0      0      0 S   0.0   0.0   0:00.04 kthreadd
     3 root      20   0       0      0      0 S   0.0   0.0   0:00.00 pool_workqueue_release
     4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-rcu_gp
     5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-sync_wq
     6 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-kvfree_rcu_reclaim
     7 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-slub_flushwq
     8 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-netns
     9 root      20   0       0      0      0 I   0.0   0.0   0:01.66 kworker/0:0-events
    11 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-events_highpri
    12 root      20   0       0      0      0 I   0.0   0.0   0:00.00 kworker/u16:0-ipv6_addrconf
    13 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-mm_percpu_wq
    14 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_kthread
    15 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_rude_kthread
    16 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_trace_kthread
    17 root      20   0       0      0      0 S   0.0   0.0   0:01.04 ksoftirqd/0
    18 root      20   0       0      0      0 I   0.0   0.0   0:03.74 rcu_preempt
    19 root      20   0       0      0      0 S   0.0   0.0   0:00.00 rcu_exp_par_gp_kthread_worker/0
    20 root      20   0       0      0      0 S   0.0   0.0   0:00.22 rcu_exp_gp_kthread_worker
    21 root      rt   0       0      0      0 S   0.0   0.0   0:00.11 migration/0
    22 root     -51   0       0      0      0 S   0.0   0.0   0:00.00 idle_inject/0
    23 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/0
    24 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/1
    25 root     -51   0       0      0      0 S   0.0   0.0   0:00.00 idle_inject/1
    26 root      rt   0       0      0      0 S   0.0   0.0   0:01.27 migration/1
    27 root      20   0       0      0      0 S   0.0   0.0   0:00.28 ksoftirqd/1
    29 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/1:0H-events_highpri
    30 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/2
    31 root     -51   0       0      0      0 S   0.0   0.0   0:00.00 idle_inject/2
    32 root      rt   0       0      0      0 S   0.0   0.0   0:01.26 migration/2
sheikh@Ubuntu:~$ sleep 300 &
```

```
sheikh@Ubuntu:~$ jobs
[1]-  Running                 sleep 300 &
[2]+  Running                 sleep 300 &
sheikh@Ubuntu:~$ ps aux | grep sleep
sheikh      5906  0.0  0.0   8288  2052 pts/0    S    17:21   0:00 sleep 300
sheikh      6060  0.0  0.0   8288  2048 pts/0    S    17:23   0:00 sleep 300
sheikh      6067  0.0  0.0   9144  2268 pts/0    S+   17:23   0:00 grep --color=auto sleep
sheikh@Ubuntu:~$ kill 6060
sheikh@Ubuntu:~$ ps aux | grep sleep
sheikh      5906  0.0  0.0   8288  2052 pts/0    S    17:21   0:00 sleep 300
sheikh      6071  0.0  0.0   9144  2260 pts/0    S+   17:24   0:00 grep --color=auto sleep
[2]+  Terminated              sleep 300
sheikh@Ubuntu:~$ kill 5906
sheikh@Ubuntu:~$ sleep 200 &
[2] 6073
[1]   Terminated              sleep 300
sheikh@Ubuntu:~$ killall sleep
sheikh@Ubuntu:~$ ps aux | grep sleep
sheikh      6079  0.0  0.0   9144  2272 pts/0    S+   17:24   0:00 grep --color=auto sleep
[2]+  Terminated              sleep 200
sheikh@Ubuntu:~$ htop
Command 'htop' not found, but can be installed with:
sudo snap install htop  # version 3.4.1, or
sudo apt  install htop  # version 3.2.2-2
See 'snap info htop' for additional versions.
sheikh@Ubuntu:~$ sudo snap install htop
error: cannot perform the following tasks:
- Download snap "core24" (1349) from channel "stable" (Get "https://canonical-lgw01.cdn.snapcraftcontent.com/download-or
interactive=1&token=1770843600_b5b6f535d7fdc47ee63a4e9fa92c94f5e7dc8225": tls: failed to verify certificate: x509: certi
-lgw01.cdn.snapcraftcontent.com)
sheikh@Ubuntu:~$ htop
Command 'htop' not found, but can be installed with:
sudo snap install htop  # version 3.4.1, or
sudo apt  install htop  # version 3.2.2-2
See 'snap info htop' for additional versions.
sheikh@Ubuntu:~$ sudo apt install htop
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
```

```
Command 'htop' not found, but can be installed with:
sudo snap install htop  # version 3.4.1, or
sudo apt  install htop  # version 3.2.2-2
See 'snap info htop' for additional versions.
sheikh@Ubuntu:~$ sudo snap install htop
error: cannot perform the following tasks:
- Download snap "core24" (1349) from channel "stable" (Get "https://canonical-lgw01.cdn.snapcraftcontent.com/download-origin/canonical-lgw01/dwTAh7MZZ01zyriOZErqd1JynQLiOGvM_1349.snap?
interactive=1&token=1770843600_b5b6f535d7fdc47ee63a4e9fa92c94f5e7dc8225": tls: failed to verify certificate: x509: certificate is not valid for any names, but wanted to match canonical
-lgw01.cdn.snapcraftcontent.com)
sheikh@Ubuntu:~$ htop
Command 'htop' not found, but can be installed with:
sudo snap install htop  # version 3.4.1, or
sudo apt  install htop  # version 3.2.2-2
See 'snap info htop' for additional versions.
sheikh@Ubuntu:~$ sudo apt install htop
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Suggested packages:
  lm-sensors
The following NEW packages will be installed:
  htop
0 upgraded, 1 newly installed, 0 to remove and 158 not upgraded.
Need to get 171 kB of archives.
After this operation, 434 kB of additional disk space will be used.
Get:1 http://pk.archive.ubuntu.com/ubuntu noble/main amd64 htop amd64 3.3.0-4build1 [171 kB]
Fetched 171 kB in 7s (26.1 kB/s)
Selecting previously unselected package htop.
(Reading database ... 214311 files and directories currently installed.)
Preparing to unpack .../htop_3.3.0-4build1_amd64.deb ...
Unpacking htop (3.3.0-4build1) ...
Setting up htop (3.3.0-4build1) ...
Processing triggers for desktop-file-utils (0.27-2build1) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-1.1ubuntu3) ...
Processing triggers for man-db (2.12.0-4build2) ...
sheikh@Ubuntu:~$ htop
sheikh@Ubuntu:~$ 
```

```
  0[|||                                              3.4%]  Tasks: 134, 650 thr, 113 kthr; 1 running
  1[|||||||||||                                     11.3%]  Load average: 0.47 0.24 0.20
  2[|||||                                            6.1%]  Uptime: 00:53:33
  3[|||||                                            4.8%]
Mem[||||||||||||||||||||||||||||||||||||||||||||||||||||]  2.10G/5.79G]
Swp[                                                        0K/0K]

 Main   I/O
   PID USER      PRI  NI  VIRT   RES   SHR S  CPU% MEM%   TIME+  Command
  2179 sheikh     20   0 4848M  514M  182M S   8.2  8.7  1:21.38 /usr/bin/gnome-shell
  2220 sheikh     20   0 4848M  514M  182M S   5.5  8.7  0:44.70 /usr/bin/gnome-shell
  2218 sheikh     20   0 4848M  514M  182M S   4.8  8.7  0:39.20 /usr/bin/gnome-shell
  2219 sheikh     20   0 4848M  514M  182M S   4.8  8.7  0:41.75 /usr/bin/gnome-shell
  2217 sheikh     20   0 4848M  514M  182M S   3.4  8.7  0:37.67 /usr/bin/gnome-shell
  6609 sheikh     20   0 12200  5896  3612 R   3.4  0.1  0:00.27 htop
  5487 sheikh     20   0  688M 62388 49380 S   2.1  1.0  0:09.11 /usr/libexec/gnome-terminal-server
  1983 sheikh    -21   0  113M 15628  8988 S   1.4  0.3  0:02.19 /usr/bin/pipewire
   416 systemd-oo 20   0 17564  7620  6712 S   0.7  0.1  0:01.29 /usr/lib/systemd/systemd-oomd
   737 polkitd    20   0  381M 12304  8236 S   0.7  0.2  0:01.04 /usr/lib/polkit-1/polkitd --no-debug
  1126 root       20   0 1950M 47444 26496 S   0.7  0.8  0:00.29 /usr/lib/snapd/snapd
  2199 sheikh     20   0 4848M  514M  182M S   0.7  8.7  0:04.17 /usr/bin/gnome-shell
  2212 sheikh    -21   0 4848M  514M  182M S   0.7  8.7  0:10.12 /usr/bin/gnome-shell
  2239 sheikh     20   0 4848M  514M  182M S   0.7  8.7  0:07.38 /usr/bin/gnome-shell
  2374 sheikh     20   0  379M 12456  7112 S   0.7  0.2  0:05.38 /usr/bin/ibus-daemon --panel disable
     1 root       20   0 23208 14248  9504 S   0.0  0.2  0:03.65 /sbin/init splash
   275 root       19  -1 50860 17780 16192 S   0.0  0.3  0:01.12 /usr/lib/systemd/systemd-journald
   349 root       20   0 30604  8708  4988 S   0.0  0.1  0:00.52 /usr/lib/systemd/systemd-udevd
   424 systemd-re 20   0 22248 13828 10872 S   0.0  0.2  0:00.90 /usr/lib/systemd/systemd-resolved
   716 avahi      20   0  8668  4568  4104 S   0.0  0.1  0:00.30 avahi-daemon: running [Ubuntu.local]
   717 messagebus 20   0 12168  7416  4684 S   0.0  0.1  0:02.56 @dbus-daemon --system --address=systemd: --nofork --nopidfile --systemd-activation --syslog-only
   721 gnome-remo 20   0  500M 16544 14032 S   0.0  0.3  0:00.44 /usr/libexec/gnome-remote-desktop-daemon --system
   741 root       20   0  306M  7428  6680 S   0.0  0.1  0:00.15 /usr/libexec/power-profiles-daemon
   750 root       20   0 1950M 47444 26496 S   0.0  0.8  0:02.62 /usr/lib/snapd/snapd
   754 root       20   0  305M  7852  6936 S   0.0  0.2  0:00.22 /usr/libexec/accounts-daemon
   756 root       20   0  9424  2832  2580 S   0.0  0.0  0:00.05 /usr/sbin/cron -f -P
   758 root       20   0  302M  7100  6336 S   0.0  0.1  0:00.15 /usr/libexec/switcheroo-control
   762 root       20   0 18256  9032  7884 S   0.0  0.1  0:00.58 /usr/lib/systemd/systemd-logind
F1Help  F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice - F8Nice + F9Kill  F10Quit
```

Exercise 4: Finding and Searching Files

```
sheikh@Ubuntu:~$ pwd
/home/sheikh
sheikh@Ubuntu:~$ mkdir search_lab
sheikh@Ubuntu:~$ cd search_lab
sheikh@Ubuntu:~/search_lab$ mkdir documents scripts logs
sheikh@Ubuntu:~/search_lab$ cd documents
sheikh@Ubuntu:~/search_lab/documents$ touch report.txt notes.txt
sheikh@Ubuntu:~/search_lab/documents$ ls
notes.txt  report.txt
sheikh@Ubuntu:~/search_lab/documents$ cd ..
sheikh@Ubuntu:~/search_lab$ cd scripts
sheikh@Ubuntu:~/search_lab/scripts$ touch backup.sh
sheikh@Ubuntu:~/search_lab/scripts$ touch deploy.sh
sheikh@Ubuntu:~/search_lab/scripts$ ls
backup.sh  deploy.sh
sheikh@Ubuntu:~/search_lab/scripts$ cd ..
sheikh@Ubuntu:~/search_lab$ cd logs
sheikh@Ubuntu:~/search_lab/logs$ touch error.log access.log
sheikh@Ubuntu:~/search_lab/logs$ ls
access.log  error.log
sheikh@Ubuntu:~/search_lab/logs$ nano error.log
sheikh@Ubuntu:~/search_lab/logs$ cat error.log
ERROR
sheikh@Ubuntu:~/search_lab/logs$ nano access.log
sheikh@Ubuntu:~/search_lab/logs$ cat access.log
SUCCESS
sheikh@Ubuntu:~/search_lab/logs$ cd ..
sheikh@Ubuntu:~/search_lab$ find search_lab -name "*.log"
find: 'search_lab': No such file or directory
sheikh@Ubuntu:~/search_lab$ cd ..
sheikh@Ubuntu:~$ find search_lab -name "*.log"
search_lab/logs/error.log
search_lab/logs/access.log
sheikh@Ubuntu:~$ find search_lab -name "*.sh"
search_lab/scripts/backup.sh
search_lab/scripts/deploy.sh
sheikh@Ubuntu:~$ grep -r "ERROR" search_lab/logs/
search_lab/logs/error.log:ERROR
sheikh@Ubuntu:~$ grep -c "ERROR" search_lab/logs/error.log
1
sheikh@Ubuntu:~$
```

Exercise 5: System Monitoring

```
sheikh@Ubuntu:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs           593M  1.6M  591M   1% /run
/dev/sda2        25G  6.5G   17G  28% /
tmpfs           2.9G     0  2.9G   0% /dev/shm
tmpfs           5.0M  8.0K  5.0M   1% /run/lock
tmpfs           593M  140K  593M   1% /run/user/1000
/dev/sr0        6.0G  6.0G     0 100% /media/sheikh/Ubuntu 24.04.3 LTS amd64
sheikh@Ubuntu:~$ free -h
               total        used        free      shared  buff/cache   available
Mem:           5.8Gi       2.0Gi       2.3Gi        92Mi       1.6Gi       3.8Gi
Swap:             0B          0B          0B
sheikh@Ubuntu:~$ du -sh ~
252M    /home/sheikh
sheikh@Ubuntu:~$ du -h ~ | sort -rh | head -5
252M    /home/sheikh
225M    /home/sheikh/snap
218M    /home/sheikh/snap/firefox/common
218M    /home/sheikh/snap/firefox
157M    /home/sheikh/snap/firefox/common/.cache
sheikh@Ubuntu:~$ uptime
 18:01:53 up 21 min,  1 user,  load average: 0.30, 0.79, 0.90
sheikh@Ubuntu:~$ lscpu
Architecture:            x86_64
  CPU op-mode(s):        32-bit, 64-bit
  Address sizes:         39 bits physical, 48 bits virtual
  Byte Order:            Little Endian
CPU(s):                  4
  On-line CPU(s) list:   0-3
Vendor ID:               GenuineIntel
  Model name:            Intel(R) Core(TM) i5-8250U CPU @ 1.60GHz
    CPU family:          6
    Model:               142
    Thread(s) per core:  1
    Core(s) per socket:  4
    Socket(s):           1
    Stepping:            10
    BogoMIPS:            3599.99
    Flags:               fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx rdtscp lm constant_tsc rep_good nopl xtopol
                         ogy nonstop_tsc cpuid tsc_known_freq pni pclmulqdq ssse3 fma cx16 pcid sse4_1 sse4_2 movbe popcnt aes xsave avx f16c rdrand hypervisor lahf_lm abm 3dnowpre
                         fetch pti fsgsbase bmi1 avx2 bmi2 invpcid rdseed adx clflushopt arat md_clear flush_l1d arch_capabilities
Virtualization features:
  Hypervisor vendor:     KVM
  Virtualization type:   full
Caches (sum of all):
```

```
Caches (sum of all):
  L1d:                   128 KiB (4 instances)
  L1i:                   128 KiB (4 instances)
  L2:                    1 MiB (4 instances)
  L3:                    24 MiB (4 instances)
NUMA:
  NUMA node(s):          1
  NUMA node0 CPU(s):     0-3
Vulnerabilities:
  Gather data sampling:  Unknown: Dependent on hypervisor status
  Ghostwrite:            Not affected
  Indirect target selection: Mitigation; Aligned branch/return thunks
  Itlb multihit:         Not affected
  L1tf:                  Mitigation; PTE Inversion
  Mds:                   Mitigation; Clear CPU buffers; SMT Host state unknown
  Meltdown:              Mitigation; PTI
  Mmio stale data:       Mitigation; Clear CPU buffers; SMT Host state unknown
  Reg file data sampling: Not affected
  Retbleed:              Vulnerable
  Spec rstack overflow:  Not affected
  Spec store bypass:     Vulnerable
  Spectre v1:            Mitigation; usercopy/swapgs barriers and __user pointer sanitization
  Spectre v2:            Mitigation; Retpolines; STIBP disabled; RSB filling; PBRSB-eIBRS Not affected; BHI Retpoline
  Srbds:                 Unknown: Dependent on hypervisor status
  Tsa:                   Not affected
  Tsx async abort:       Not affected
  Vmscape:               Not affected
sheikh@Ubuntu:~$ lsblk
NAME    MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
loop0     7:0    0     4K  1 loop /snap/bare/5
loop1     7:1    0 73.9M  1 loop /snap/core22/2045
loop2     7:2    0    74M  1 loop /snap/core22/2292
loop3     7:3    0 245.1M  1 loop /snap/firefox/6565
loop4     7:4    0  11.1M  1 loop /snap/firmware-updater/167
loop5     7:5    0  18.5M  1 loop /snap/firmware-updater/210
loop6     7:6    0   516M  1 loop /snap/gnome-42-2204/202
loop7     7:7    0  91.7M  1 loop /snap/gtk-common-themes/1535
loop8     7:8    0  10.8M  1 loop /snap/snap-store/1270
loop9     7:9    0  49.3M  1 loop /snap/snapd/24792
loop10    7:10   0  48.1M  1 loop /snap/snapd/25935
loop11    7:11   0   576K  1 loop /snap/snapd-desktop-integration/315
loop12    7:12   0   576K  1 loop /snap/snapd-desktop-integration/343
sda       8:0    0    25G  0 disk
├─sda1    8:1    0     1M  0 part
└─sda2    8:2    0    25G  0 part /
```

```
loop6     7:6    0   516M  1 loop /snap/gnome-42-2204/202
loop7     7:7    0  91.7M  1 loop /snap/gtk-common-themes/1535
loop8     7:8    0  10.8M  1 loop /snap/snap-store/1270
loop9     7:9    0  49.3M  1 loop /snap/snapd/24792
loop10    7:10   0  48.1M  1 loop /snap/snapd/25935
loop11    7:11   0   576K  1 loop /snap/snapd-desktop-integration/315
loop12    7:12   0   576K  1 loop /snap/snapd-desktop-integration/343
sda       8:0    0    25G  0 disk
├─sda1    8:1    0     1M  0 part
└─sda2    8:2    0    25G  0 part /
sr0      11:0    1     6G  0 rom  /media/sheikh/Ubuntu 24.04.3 LTS amd64
sheikh@Ubuntu:~$ ps aux --sort=-%CPU | head -10
error: unknown sort specifier

Usage:
 ps [options]

 Try 'ps --help <simple|list|output|threads|misc|all>'
  or 'ps --help <s|l|o|t|m|a>'
 for additional help text.

For more details see ps(1).
sheikh@Ubuntu:~$ ps aux --sort=-%cpu | head -10
USER       PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
sheikh    5336  200  0.0  13748  4776 pts/0    R+   18:02   0:00 ps aux --sort=-%cpu
sheikh    2213 19.4  8.6 5100708 526092 ?      Ssl  17:47   2:56 /usr/bin/gnome-shell
sheikh    3238  8.4  7.9 3422944 481116 ?      Sl   17:50   1:01 /snap/firefox/6565/usr/lib/firefox/firefox
sheikh    3703  5.9  5.8 2865460 354056 ?      Sl   17:52   0:38 /snap/firefox/6565/usr/lib/firefox/firefox -contentproc -isForBrowser -prefsHandle 0:31779 -prefMapHandle 1:271718 -j
sInitHandle 2:242012 -parentBuildID 20250718161710 -sandboxReporter 3 -chrootClient 4 -ipcHandle 5 -initialChannelId {b725c827-245b-4677-94e6-f7599569210e} -parentPid 3238 -crashReport
er 6 -crashHelperPid 3463 -greomni /snap/firefox/6565/usr/lib/firefox/omni.ja -appomni /snap/firefox/6565/usr/lib/firefox/browser/omni.ja -appDir /snap/firefox/6565/usr/lib/firefox/bro
wser 5 tab
sheikh    5064  4.2  4.8 2126632 294432 ?      Sl   17:59   0:07 /usr/bin/nautilus --gapplication-service
sheikh    4858  0.9  1.0 703340 61124 ?        Ssl  17:55   0:04 /usr/libexec/gnome-terminal-server
sheikh    3653  0.6  2.4 2534144 148256 ?      Sl   17:52   0:04 /snap/firefox/6565/usr/lib/firefox/firefox -contentproc -isForBrowser -prefsHandle 0:34830 -prefMapHandle 1:271718 -j
sInitHandle 2:242012 -parentBuildID 20250718161710 -sandboxReporter 3 -chrootClient 4 -ipcHandle 5 -initialChannelId {e6fbe99b-6497-412b-8b89-7b0e364759db} -parentPid 3238 -crashReport
er 6 -crashHelperPid 3463 -greomni /snap/firefox/6565/usr/lib/firefox/omni.ja -appomni /snap/firefox/6565/usr/lib/firefox/browser/omni.ja -appDir /snap/firefox/6565/usr/lib/firefox/bro
wser 3 tab
root       874  0.6  0.6 1923904 42032 ?       Ssl  17:45   0:06 /usr/lib/snapd/snapd
sheikh    2525  0.5  0.4 421532 29716 ?        Sl   17:47   0:05 /usr/libexec/ibus-extension-gtk3
sheikh@Ubuntu:~$
```

Exercise 6: File Compression

```
sheikh@Ubuntu:~$ pwd
/home/sheikh
sheikh@Ubuntu:~$ mkdir backup_test
sheikh@Ubuntu:~$ cd backup_test
sheikh@Ubuntu:~/backup_test$ touch file1.txt file2.txt file3.txt file4.txt
sheikh@Ubuntu:~/backup_test$ ls
file1.txt  file2.txt  file3.txt  file4.txt
sheikh@Ubuntu:~/backup_test$ cd ..
sheikh@Ubuntu:~$ tar -cvf backup.tar backup_test/
backup_test/
backup_test/file3.txt
backup_test/file1.txt
backup_test/file4.txt
backup_test/file2.txt
sheikh@Ubuntu:~$ cd backup_test
sheikh@Ubuntu:~/backup_test$ ls
file1.txt  file2.txt  file3.txt  file4.txt
sheikh@Ubuntu:~/backup_test$ ls -l
total 0
-rw-rw-r-- 1 sheikh sheikh 0 Feb 11 18:09 file1.txt
-rw-rw-r-- 1 sheikh sheikh 0 Feb 11 18:09 file2.txt
-rw-rw-r-- 1 sheikh sheikh 0 Feb 11 18:09 file3.txt
-rw-rw-r-- 1 sheikh sheikh 0 Feb 11 18:09 file4.txt
sheikh@Ubuntu:~/backup_test$ cd ..
sheikh@Ubuntu:~$ tar -czvf backup.tar.gz backup_test/
backup_test/
backup_test/file3.txt
backup_test/file1.txt
backup_test/file4.txt
backup_test/file2.txt
sheikh@Ubuntu:~$ ls -lh backup.tar backup.tar.gz
-rw-rw-r-- 1 sheikh sheikh 10K Feb 11 18:09 backup.tar
-rw-rw-r-- 1 sheikh sheikh 179 Feb 11 18:10 backup.tar.gz
sheikh@Ubuntu:~$ rmdir backup_test
rmdir: failed to remove 'backup_test': Directory not empty
sheikh@Ubuntu:~$ rm -rf backup_test
sheikh@Ubuntu:~$ tar -xzvf backup.tar.gz
backup_test/
backup_test/file3.txt
backup_test/file1.txt
backup_test/file4.txt
backup_test/file2.txt
sheikh@Ubuntu:~$ ls -l backup_test/
total 0
-rw-rw-r-- 1 sheikh sheikh 0 Feb 11 18:09 file1.txt
```

```
-rw-rw-r-- 1 sheikh sheikh 0 Feb 11 18:09 file2.txt
-rw-rw-r-- 1 sheikh sheikh 0 Feb 11 18:09 file3.txt
-rw-rw-r-- 1 sheikh sheikh 0 Feb 11 18:09 file4.txt
sheikh@Ubuntu:~$ zip -r backup.zip backup_test/
  adding: backup_test/ (stored 0%)
  adding: backup_test/file3.txt (stored 0%)
  adding: backup_test/file1.txt (stored 0%)
  adding: backup_test/file4.txt (stored 0%)
  adding: backup_test/file2.txt (stored 0%)
sheikh@Ubuntu:~$ unzip -l backup.zip
Archive:  backup.zip
  Length      Date    Time    Name
---------  ---------- -----    ----
        0  2026-02-11 18:09   backup_test/
        0  2026-02-11 18:09   backup_test/file3.txt
        0  2026-02-11 18:09   backup_test/file1.txt
        0  2026-02-11 18:09   backup_test/file4.txt
        0  2026-02-11 18:09   backup_test/file2.txt
---------                     -------
        0                     5 files
sheikh@Ubuntu:~$ 
```

Lab Assessment Tasks

Task 1:

```
sheikh@Ubuntu:~$ pwd
/home/sheikh
sheikh@Ubuntu:~$ touch system_info.sh
sheikh@Ubuntu:~$ nano system_info.sh
sheikh@Ubuntu:~$ chmod +x system_info.sh
sheikh@Ubuntu:~$ ./system_info.sh
Current User: sheikh
Current Directory: /home/sheikh
Disk Usage of Home Directory:
254M    /home/sheikh
Memory Usage:
              total        used        free      shared  buff/cache   available
Mem:          5.8Gi       2.1Gi       2.2Gi        99Mi       1.6Gi       3.6Gi
Swap:            0B          0B          0B
Top 5 processes by CPU Usage:
    PID    PPID CMD                         %MEM %CPU
   2213    1977 /usr/bin/gnome-shell         9.4 13.0
   3238    2213 /snap/firefox/6565/usr/lib/  8.1  3.8
   3703    3624 /snap/firefox/6565/usr/lib/  5.5  2.8
   5064    1977 /usr/bin/nautilus --gapplic  5.6  1.0
   4858    1977 /usr/libexec/gnome-terminal  1.0  0.6
sheikh@Ubuntu:~$ ▯
```

Task 2:

```
sheikh@Ubuntu:~$ mkdir webapp
sheikh@Ubuntu:~$ cd webapp
sheikh@Ubuntu:~/webapp$ mkdir public src config logs
sheikh@Ubuntu:~/webapp$ chmod 755 public
sheikh@Ubuntu:~/webapp$ chmod 750 src
sheikh@Ubuntu:~/webapp$ chmod 700 config
sheikh@Ubuntu:~/webapp$ chmod 775 logs
sheikh@Ubuntu:~/webapp$ ls -l
total 16
drwx------ 2 sheikh sheikh 4096 Feb 11 18:26 config
drwxrwxr-x 2 sheikh sheikh 4096 Feb 11 18:26 logs
drwxr-xr-x 2 sheikh sheikh 4096 Feb 11 18:26 public
drwxr-x--- 2 sheikh sheikh 4096 Feb 11 18:26 src
sheikh@Ubuntu:~/webapp$ ▯
```

Task 3:

```
sheikh@Ubuntu:~$ pwd
/home/sheikh
sheikh@Ubuntu:~$ mkdir Task3
sheikh@Ubuntu:~$ cd Task3
sheikh@Ubuntu:~/Task3$ touch readme.txt deploy.sh secrets.conf
sheikh@Ubuntu:~/Task3$ chmod 644 readme.txt
sheikh@Ubuntu:~/Task3$ chmod 755 deploy.sh
sheikh@Ubuntu:~/Task3$ chmod 600 secrets.conf
sheikh@Ubuntu:~/Task3$ ls -l
total 0
-rwxr-xr-x 1 sheikh sheikh 0 Feb 11 18:29 deploy.sh
-rw-r--r-- 1 sheikh sheikh 0 Feb 11 18:29 readme.txt
-rw------- 1 sheikh sheikh 0 Feb 11 18:29 secrets.conf
sheikh@Ubuntu:~/Task3$ find . -maxdepth 1 -type f -executable
./deploy.sh
sheikh@Ubuntu:~/Task3$
```

Task 4:

```
sheikh@Ubuntu:~$ sleep 500 &
[1] 6439
sheikh@Ubuntu:~$ ps aux | grep sleep
sheikh      6439  0.0  0.0   8288  2052 pts/0    S    18:35   0:00 sleep 500
sheikh      6442  0.0  0.0   9144  2268 pts/0    S+   18:35   0:00 grep --color=auto sleep
sheikh@Ubuntu:~$ pgrep sleep
6439
sheikh@Ubuntu:~$ jobs
[1]+  Running                 sleep 500 &
sheikh@Ubuntu:~$ ps
   PID TTY          TIME CMD
  4865 pts/0    00:00:00 bash
  6439 pts/0    00:00:00 sleep
  6445 pts/0    00:00:00 ps
sheikh@Ubuntu:~$ kill 6439
sheikh@Ubuntu:~$ ps aux | grep sleep
sheikh      6584  0.0  0.0   9144  2268 pts/0    S+   18:38   0:00 grep --color=auto sleep
[1]+  Terminated              sleep 500
sheikh@Ubuntu:~$
```

Task 5:

```
sheikh@Ubuntu:~$ find -type f -name "*.txt" -mtime -7 > recent_files.txt
sheikh@Ubuntu:~$ cat recent_files.txt
./recent_files.txt
./backup_test/file3.txt
./backup_test/file1.txt
./backup_test/file4.txt
./backup_test/file2.txt
./search_lab/documents/notes.txt
./search_lab/documents/report.txt
././.cache/tracker3/files/last-crawl.txt
./Task3/readme.txt
sheikh@Ubuntu:~$ 
```

Task 6:

```
sheikh@Ubuntu:~$ tar -czvf ~/devops_backup_$(date +%Y%m%d).tar.gz -c ~ devops_course
tar: Removing leading `/' from member names
/home/sheikh/
/home/sheikh/devops_course/
/home/sheikh/devops_course/assignments/
/home/sheikh/devops_course/assignments/assignment1/
/home/sheikh/devops_course/assignments/assignment2/
/home/sheikh/devops_course/labs/
/home/sheikh/devops_course/labs/lab2/
/home/sheikh/devops_course/labs/lab2/notes.txt
tar: Removing leading `/' from hard link targets
/home/sheikh/devops_course/labs/lab2/devops_summary.txt
/home/sheikh/devops_course/labs/lab2/filesystem.txt
/home/sheikh/devops_course/labs/lab2/commands.txt
/home/sheikh/devops_course/labs/lab2/intro.txt
/home/sheikh/devops_course/labs/lab1/
/home/sheikh/devops_course/labs/lab1/notes.txt
/home/sheikh/devops_course/labs/lab1/summary.txt
/home/sheikh/devops_course/labs/lab1/filesystem.txt
/home/sheikh/devops_course/labs/lab1/commands.txt
/home/sheikh/devops_course/labs/lab1/intro.txt
/home/sheikh/Music/
/home/sheikh/.local/
/home/sheikh/.local/state/
/home/sheikh/.local/state/wireplumber/
/home/sheikh/.local/state/wireplumber/default-routes
/home/sheikh/.local/state/wireplumber/restore-stream
/home/sheikh/.local/share/
/home/sheikh/.local/share/gvfs-metadata/
/home/sheikh/.local/share/gvfs-metadata/root
/home/sheikh/.local/share/gvfs-metadata/root-11119a75.log
/home/sheikh/.local/share/gvfs-metadata/home
/home/sheikh/.local/share/gvfs-metadata/home-facf7b74.log
/home/sheikh/.local/share/nano/
/home/sheikh/.local/share/keyrings/
/home/sheikh/.local/share/keyrings/user.keystore
/home/sheikh/.local/share/keyrings/login.keyring
/home/sheikh/.local/share/yelp/
/home/sheikh/.local/share/yelp/storage/
/home/sheikh/.local/share/yelp/storage/salt
/home/sheikh/.local/share/yelp/mediakeys/
/home/sheikh/.local/share/yelp/mediakeys/v1/
/home/sheikh/.local/share/yelp/mediakeys/v1/salt
/home/sheikh/.local/share/yelp/hsts-storage.sqlite
```

```
/home/sheikh/snap/firefox/common/.cache/immodules/im-thai.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-ipa.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-cedilla.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-cyrillic-translit.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-ti-er.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-ti-et.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-am-et.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-fcitx.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-inuktitut.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-multipress.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-wayland.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-broadway.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-viqr.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-waylandgtk.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-ibus.so
/home/sheikh/snap/firefox/common/.cache/immodules/im-xim.so
/home/sheikh/snap/firefox/common/.cache/immodules/immodules.cache
/home/sheikh/snap/firefox/common/.cache/mesa_shader_cache/
/home/sheikh/snap/firefox/common/.cache/mesa_shader_cache/index
/home/sheikh/projects/
/home/sheikh/projects/web/
/home/sheikh/projects/web/frontend/
/home/sheikh/Templates/
devops_course/
devops_course/assignments/
devops_course/assignments/assignment1/
devops_course/assignments/assignment2/
devops_course/labs/
devops_course/labs/lab2/
devops_course/labs/lab2/notes.txt
devops_course/labs/lab2/devops_summary.txt
devops_course/labs/lab2/filesystem.txt
devops_course/labs/lab2/commands.txt
devops_course/labs/lab2/intro.txt
devops_course/labs/lab1/
devops_course/labs/lab1/notes.txt
devops_course/labs/lab1/summary.txt
devops_course/labs/lab1/filesystem.txt
devops_course/labs/lab1/commands.txt
devops_course/labs/lab1/intro.txt
sheikh@Ubuntu:~$ ls -lh ~/devops_backup_*.tar.gz
-rw-rw-r-- 1 sheikh sheikh 434M Feb 11 18:54 /home/sheikh/devops_backup_20260211.tar.gz
```

== THE END ==