Name : Zuha Irfan

Roll_No : 2023-BSE-073

Subject: Cloud Computing

Semester & Section : V-B

Lab :04

Task 1 – Verify VM resources in VMware

- vm_settings.png

Ubuntu 64-bit (6)

- Power on this virtual machine
- Edit virtual machine settings

Devices

Memory	4 GB
Processors	2
Hard Disk (SCSI)	20 GB
CD/DVD (SATA)	Using file C:\Use...
Network Adapter	NAT
USB Controller	Present
Sound Card	Auto detect
Display	Auto detect

Description

Type here to enter a description of this virtual machine.

Virtual Machine Details

State: Powered off
Configuration file: E:\Ubuntu 64-bit (6).vmx
Hardware compatibility: Workstation 17.5 or later virtual machine
Primary IP address: Network information is not available

Task 2 – Start VM and log in (use your preferred host terminal method only)

- vm_login.png (optional if whoami_pwd.png provided)

```
                valid_lrt forever preferred_lrt forever
zuha@zuha:~$ ssh zuha@192.168.231.132/24
ssh: Could not resolve hostname 192.168.231.132/24: Name or service not known
zuha@zuha:~$ ssh zuha@192.168.231.132
The authenticity of host '192.168.231.132 (192.168.231.132)' can't be established.
ED25519 key fingerprint is SHA256:yYpWEhgC6pc2twYcVXW9hmvgtndybT5KkLLN8Iq4qRo.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.231.132' (ED25519) to the list of known hosts.
zuha@192.168.231.132's password:
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.8.0-71-generic x86_64)

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

 System information as of Fri Oct 24 10:05:23 AM UTC 2025

  System load:  1.45            Processes:             246
  Usage of /:   43.6% of 9.75GB Users logged in:       0
  Memory usage: 8%              IPv4 address for ens33: 192.168.231.132
  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

Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings


zuha@zuha:~$ whoami
zuha
zuha@zuha:~$ pwd
/home/zuha
```

- whoami_pwd.png (required; must show both whoami and pwd outputs)

```
zuha@zuha:~$ whoami
zuha
zuha@zuha:~$ pwd
/home/zuha
```

Task 3 – Filesystem exploration — root tree and dotfiles

- ls_root.png

```
zuha@zuha:~$ ls -la /
total 1994844
drwxr-xr-x   23 root root          4096 Oct 24  2025 .
drwxr-xr-x   23 root root          4096 Oct 24  2025 ..
lrwxrwxrwx    1 root root             7 Apr 22  2024 bin -> usr/bin
drwxr-xr-x    2 root root          4096 Feb 26  2024 bin.usr-is-merged
drwxr-xr-x    4 root root          4096 Oct 24  2025 boot
dr-xr-xr-x    2 root root          4096 Aug  5 23:53 cdrom
drwxr-xr-x   20 root root          4120 Oct 24  2025 dev
drwxr-xr-x  108 root root          4096 Oct 24  2025 etc
drwxr-xr-x    3 root root          4096 Oct 24  2025 home
lrwxrwxrwx    1 root root             7 Apr 22  2024 lib -> usr/lib
lrwxrwxrwx    1 root root             9 Apr 22  2024 lib64 -> usr/lib64
drwxr-xr-x    2 root root          4096 Feb 26  2024 lib.usr-is-merged
drwx------    2 root root         16384 Oct 24  2025 lost+found
drwxr-xr-x    2 root root          4096 Aug  5 16:54 media
drwxr-xr-x    2 root root          4096 Aug  5 16:54 mnt
drwxr-xr-x    2 root root          4096 Aug  5 16:54 opt
dr-xr-xr-x  278 root root             0 Oct 24  2025 proc
drwx------    3 root root          4096 Oct 24  2025 root
drwxr-xr-x   28 root root           840 Oct 24 05:42 run
lrwxrwxrwx    1 root root             8 Apr 22  2024 sbin -> usr/sbin
drwxr-xr-x    2 root root          4096 Dec 11  2024 sbin.usr-is-merged
drwxr-xr-x    2 root root          4096 Oct 24  2025 snap
drwxr-xr-x    2 root root          4096 Aug  5 16:54 srv
-rw-------    1 root root    2042626048 Oct 24  2025 swap.img
dr-xr-xr-x   13 root root             0 Oct 24  2025 sys
drwxrwxrwt   13 root root          4096 Oct 24  2025 tmp
drwxr-xr-x   12 root root          4096 Aug  5 16:54 usr
drwxr-xr-x   13 root root          4096 Oct 24  2025 var
```

- ls_bin.png

```
zuha@zuha:~$ ls -la /bin
lrwxrwxrwx 1 root root 7 Apr 22  2024 /bin -> usr/bin
```

- ls_sbin.png

```
zuha@zuha:~$ ls -la /sbin
lrwxrwxrwx 1 root root 8 Apr 22  2024 /sbin -> usr/sbin
```

- ls_usr.png

```
zuha@zuha:~$ ls -la /usr
total 92
drwxr-xr-x  12 root root  4096 Aug  5 16:54 .
drwxr-xr-x  23 root root  4096 Oct 24  2025 ..
drwxr-xr-x   2 root root 32768 Oct 24  2025 bin
drwxr-xr-x   2 root root  4096 Apr 22  2024 games
drwxr-xr-x  33 root root  4096 Oct 24  2025 include
drwxr-xr-x  78 root root  4096 Oct 24  2025 lib
drwxr-xr-x   2 root root  4096 Aug  5 17:01 lib64
drwxr-xr-x  11 root root  4096 Oct 24  2025 libexec
drwxr-xr-x  10 root root  4096 Aug  5 16:54 local
drwxr-xr-x   2 root root 20480 Oct 24  2025 sbin
drwxr-xr-x 124 root root  4096 Oct 24  2025 share
drwxr-xr-x   4 root root  4096 Oct 24  2025 src
```

- ls_opt.png

```
zuha@zuha:~$ ls -la /opt
total 8
drwxr-xr-x  2 root root 4096 Aug  5 16:54 .
drwxr-xr-x 23 root root 4096 Oct 24  2025 ..
```

- ls_etc.png

```
zuha@zuha:~$ ls -la /etc_
```

```
drwxr-xr-x    2 root root       4096 Aug  5 17:14 sensors.d
-rw-r--r--    1 root root      12813 Mar 27  2021 services
drwxr-xr-x    2 root root       4096 Aug  5 17:02 sgml
-rw-r-----    1 root shadow      966 Oct 24  2025 shadow
-rw-r-----    1 root shadow      966 Oct 24  2025 shadow-
-rw-r--r--    1 root root        148 Aug  5 17:14 shells
drwxr-xr-x    2 root root       4096 Aug  5 16:55 skel
drwxr-xr-x    6 root root       4096 Aug  5 17:14 sos
drwxr-xr-x    4 root root       4096 Oct 24  2025 ssh
drwxr-xr-x    4 root root       4096 Aug  5 17:02 ssl
-rw-r--r--    1 root root         18 Oct 24  2025 subgid
-rw-r--r--    1 root root          0 Aug  5 16:54 subgid-
-rw-r--r--    1 root root         18 Oct 24  2025 subuid
-rw-r--r--    1 root root          0 Aug  5 16:54 subuid-
-rw-r--r--    1 root root       4343 Jun 25 12:42 sudo.conf
-r--r-----    1 root root       1800 Jan 29  2024 sudoers
drwxr-xr-x    2 root root       4096 Aug  5 17:02 sudoers.d
-rw-r--r--    1 root root       9804 Jun 25 12:42 sudo_logsrvd.conf
drwxr-xr-x    2 root root       4096 Aug  5 17:14 supercat
-rw-r--r--    1 root root       2209 Mar 24  2024 sysctl.conf
drwxr-xr-x    2 root root       4096 Aug  5 17:02 sysctl.d
drwxr-xr-x    2 root root       4096 Aug  5 17:14 sysstat
drwxr-xr-x    6 root root       4096 Aug  5 16:49 systemd
drwxr-xr-x    2 root root       4096 Aug  5 17:00 terminfo
drwxr-xr-x    2 root root       4096 Oct 24  2025 thermald
-rw-r--r--    1 root root          8 Aug  5 17:02 timezone
drwxr-xr-x    2 root root       4096 Aug  5 17:14 tmpfiles.d
drwxr-xr-x    2 root root       4096 Aug  5 17:14 ubuntu-advantage
-rw-r--r--    1 root root       1260 Jan 27  2023 ucf.conf
drwxr-xr-x    4 root root       4096 Aug  5 17:02 udev
drwxr-xr-x    2 root root       4096 Aug  5 17:14 udisks2
drwxr-xr-x    3 root root       4096 Aug  5 17:14 ufw
-rw-r--r--    1 root root        208 Aug  5 16:54 .updated
drwxr-xr-x    3 root root       4096 Aug  5 17:02 update-manager
drwxr-xr-x    2 root root       4096 Aug  5 17:14 update-motd.d
drwxr-xr-x    2 root root       4096 Aug  5 17:14 update-notifier
drwxr-xr-x    2 root root       4096 Oct 24  2025 UPower
-rw-r--r--    1 root root       1523 Aug  5 17:14 usb_modeswitch.conf
drwxr-xr-x    2 root root       4096 Aug  5 17:14 usb_modeswitch.d
lrwxrwxrwx    1 root root         16 Aug  5 17:02 vconsole.conf -> default/keyboard
drwxr-xr-x    2 root root       4096 Aug  5 17:14 vim
drwxr-xr-x    4 root root       4096 Aug  5 17:14 vmware-tools
lrwxrwxrwx    1 root root         23 Feb 26  2024 vtrgb -> /etc/alternatives/vtrgb
-rw-r--r--    1 root root       4942 Aug  5 17:14 wgetrc
drwxr-xr-x    4 root root       4096 Aug  5 17:02 X11
-rw-r--r--    1 root root        681 Apr  8  2024 xattr.conf
drwxr-xr-x    4 root root       4096 Aug  5 17:02 xdg
drwxr-xr-x    2 root root       4096 Aug  5 17:02 xml
```

- ls_dev.png

```
zuha@zuha:~$ ls -la /dev
```

```
crw-rw----   1 root dialout    4,  92 Oct 24  2025 ttyS28
crw-rw----   1 root dialout    4,  93 Oct 24  2025 ttyS29
crw-rw----   1 root dialout    4,  67 Oct 24  2025 ttyS3
crw-rw----   1 root dialout    4,  94 Oct 24  2025 ttyS30
crw-rw----   1 root dialout    4,  95 Oct 24  2025 ttyS31
crw-rw----   1 root dialout    4,  68 Oct 24  2025 ttyS4
crw-rw----   1 root dialout    4,  69 Oct 24  2025 ttyS5
crw-rw----   1 root dialout    4,  70 Oct 24  2025 ttyS6
crw-rw----   1 root dialout    4,  71 Oct 24  2025 ttyS7
crw-rw----   1 root dialout    4,  72 Oct 24  2025 ttyS8
crw-rw----   1 root dialout    4,  73 Oct 24  2025 ttyS9
drwxr-xr-x   2 root root          60 Oct 24  2025 ubuntu-vg
crw-rw----   1 root kvm      10, 124 Oct 24  2025 udmabuf
crw-------   1 root root     10, 239 Oct 24  2025 uhid
crw-------   1 root root     10, 223 Oct 24  2025 uinput
crw-rw-rw-   1 root root      1,   9 Oct 24  2025 urandom
crw-------   1 root root     10, 126 Oct 24  2025 userfaultf
crw-------   1 root root     10, 240 Oct 24  2025 userio
crw-rw----   1 root tty       7,   0 Oct 24  2025 vcs
crw-rw----   1 root tty       7,   1 Oct 24  2025 vcs1
crw-rw----   1 root tty       7,   2 Oct 24  2025 vcs2
crw-rw----   1 root tty       7,   3 Oct 24  2025 vcs3
crw-rw----   1 root tty       7,   4 Oct 24  2025 vcs4
crw-rw----   1 root tty       7,   5 Oct 24  2025 vcs5
crw-rw----   1 root tty       7,   6 Oct 24  2025 vcs6
crw-rw----   1 root tty       7, 128 Oct 24  2025 vcsa
crw-rw----   1 root tty       7, 129 Oct 24  2025 vcsa1
crw-rw----   1 root tty       7, 130 Oct 24  2025 vcsa2
crw-rw----   1 root tty       7, 131 Oct 24  2025 vcsa3
crw-rw----   1 root tty       7, 132 Oct 24  2025 vcsa4
crw-rw----   1 root tty       7, 133 Oct 24  2025 vcsa5
crw-rw----   1 root tty       7, 134 Oct 24  2025 vcsa6
crw-rw----   1 root tty       7,  64 Oct 24  2025 vcsu
crw-rw----   1 root tty       7,  65 Oct 24  2025 vcsu1
crw-rw----   1 root tty       7,  66 Oct 24  2025 vcsu2
crw-rw----   1 root tty       7,  67 Oct 24  2025 vcsu3
crw-rw----   1 root tty       7,  68 Oct 24  2025 vcsu4
crw-rw----   1 root tty       7,  69 Oct 24  2025 vcsu5
crw-rw----   1 root tty       7,  70 Oct 24  2025 vcsu6
drwxr-xr-x   2 root root          60 Oct 24  2025 vfio
crw-------   1 root root     10, 127 Oct 24  2025 vga_arbite
crw-------   1 root root     10, 137 Oct 24  2025 vhci
crw-rw----   1 root kvm      10, 238 Oct 24  2025 vhost-net
```

- ls_var.png

```
                 1 root root      10, 249 Oct 24  2025 v13
zuha@zuha:~$ ls -la /var
total 56
drwxr-xr-x 13 root root    4096 Oct 24  2025 .
drwxr-xr-x 23 root root    4096 Oct 24  2025 ..
drwxr-xr-x  2 root root    4096 Apr 22  2024 backups
drwxr-xr-x 14 root root    4096 Oct 24  2025 cache
drwxrwsrwt  2 root root    4096 Aug  5 17:02 crash
drwxr-xr-x 44 root root    4096 Oct 24  2025 lib
drwxrwsr-x  2 root staff   4096 Apr 22  2024 local
lrwxrwxrwx  1 root root       9 Aug  5 16:54 lock -> /run/lock
drwxrwxr-x 10 root syslog  4096 Oct 24  2025 log
drwxrwsr-x  2 root mail    4096 Aug  5 16:54 mail
drwxr-xr-x  2 root root    4096 Aug  5 16:54 opt
lrwxrwxrwx  1 root root       4 Aug  5 16:54 run -> /run
drwxr-xr-x  2 root root    4096 May 21 15:46 snap
drwxr-xr-x  4 root root    4096 Aug  5 17:14 spool
drwxrwxrwt  7 root root    4096 Oct 24  2025 tmp
-rw-r--r--  1 root root     208 Aug  5 16:54 .updated
zuha@zuha:~$
```

- ls_tmp.png

```
zuha@zuha:~$ ls -la /tmp
total 52
drwxrwxrwt 13 root root 4096 Oct 24  2025 .
drwxr-xr-x 23 root root 4096 Oct 24  2025 ..
drwxrwxrwt  2 root root 4096 Oct 24  2025 .font-unix
drwxrwxrwt  2 root root 4096 Oct 24  2025 .ICE-unix
drwx------  2 root root 4096 Oct 24  2025 snap-private-tmp
drwx------  3 root root 4096 Oct 24  2025 systemd-private-3e417870f249401db1bf7a11c15dd5ab-ModemManager.service-4GkvDr
drwx------  3 root root 4096 Oct 24  2025 systemd-private-3e417870f249401db1bf7a11c15dd5ab-polkit.service-RehGHt
drwx------  3 root root 4096 Oct 24  2025 systemd-private-3e417870f249401db1bf7a11c15dd5ab-systemd-logind.service-rpVanA
drwx------  3 root root 4096 Oct 24  2025 systemd-private-3e417870f249401db1bf7a11c15dd5ab-systemd-resolved.service-sRNxlr
drwx------  3 root root 4096 Oct 24  2025 systemd-private-3e417870f249401db1bf7a11c15dd5ab-systemd-timesyncd.service-Y79Smw
drwx------  2 root root 4096 Oct 24  2025 vmware-root_845-4021653450
drwxrwxrwt  2 root root 4096 Oct 24  2025 .X11-unix
drwxrwxrwt  2 root root 4096 Oct 24  2025 .XIM-unix
```

- home_ls.png

```
zuha@zuha:~$ ls -la ~
total 28
drwxr-x--- 4 zuha zuha 4096 Oct 24  2025 .
drwxr-xr-x 3 root root 4096 Oct 24  2025 ..
-rw-r--r-- 1 zuha zuha  220 Mar 31  2024 .bash_logout
-rw-r--r-- 1 zuha zuha 3771 Mar 31  2024 .bashrc
drwx------ 2 zuha zuha 4096 Oct 24  2025 .cache
-rw-r--r-- 1 zuha zuha  807 Mar 31  2024 .profile
drwx------ 2 zuha zuha 4096 Oct 24 05:42 .ssh
-rw-r--r-- 1 zuha zuha    0 Oct 24  2025 .sudo_as_admin_successful
```

- answers_md.png

```
  GNU nano 7.2
My name is Zuha Irfan
Roll_No : 2023-BSE-073
Semester & Section : V-B
Subject : Cloud Computing
Lab_No : 04
```

```
zuha@zuha:~$ cat ~/answer.md
My name is Zuha Irfan
Roll_No : 2023-BSE-073
Semester & Section : V-B
Subject : Cloud Computing
Lab_No : 04
```

Task 4 – Essential CLI tasks — navigation and file operations

- mkdir_workspace.png

```
zuha@zuha:~$ mkdir -p ~/lab4/workspace/python_project
```

- cd_workspace.png

```
zuha@zuha:~$ cd ~/lab4/workspace/python_project
```

- pwd_workspace.png

```
zuha@zuha:~/lab4/workspace/python_project$ pwd
/home/zuha/lab4/workspace/python_project
```

- nano_readme.png

```
zuha@zuha:~/lab4/workspace/python_project$ cat README.md
Lab 04 README
```

- nano_main.png

```
zuha@zuha:~/lab4/workspace/python_project$ cat main.py
print("Hello Lab 04")
```

- nano_env.png

```
zuha@zuha:~/lab4/workspace/python_project$ cat .env
ENNV=lab04
```

- workspace_ls.png

```
zuha@zuha:~/lab4/workspace/python_project$ ls -la
total 16
drwxrwxr-x 2 zuha zuha 4096 Oct 24 06:07 .
drwxrwxr-x 3 zuha zuha 4096 Oct 24 06:03 ..
-rw-rw-r-- 1 zuha zuha   22 Oct 24 06:07 main.py
-rw-rw-r-- 1 zuha zuha   15 Oct 24 06:05 README.md
```

- cp_readme.png

```
zuha@zuha:~/lab4/workspace/python_project$ cp README.md README.copy.md
```

- mv_readme.png

```
zuha@zuha:~/lab4/workspace/python_project$ mv README.md README.copy.md
```

- rm_readme.png

```
zuha@zuha:~/lab4/workspace/python_project$ rm README.dev.md
rm: cannot remove 'README.dev.md': No such file or directory
```

- mkdir_java_app.png

```
zuha@zuha:~/lab4/workspace/python_project$ mkdir -p ~/lab4/workspace/java_app
```

- cp_recursive.png

```
zuha@zuha:~/lab4/workspace/python_project$ cp -r ~/lab4/workspace/python_project ~/lab4/workspace/java_app
```

- copy_verify.png

```
zuha@zuha:~/lab4/workspace/python_project$ ls -la ~/lab4/workspace
total 16
drwxrwxr-x 4 zuha zuha 4096 Oct 24 06:13 .
drwxrwxr-x 3 zuha zuha 4096 Oct 24 06:03 ..
drwxrwxr-x 3 zuha zuha 4096 Oct 24 06:14 java_app
drwxrwxr-x 2 zuha zuha 4096 Oct 24 06:12 python_project
```

- history.png

```
zuha@zuha:~/lab4/workspace/python_project$ history
    1  whoami
    2  pwd
    3  ls -la /
    4  ls -la /bin
    5  ls -la /sbin
    6  ls -la /usr
    7  ls -la /opt
    8  ls -la /etc
    9  ls -la /dev
   10  ls -la /var
   11  ls -la /tmp
   12  ls -la ~
   13  nano ~/answer.md
   14  cat ~/answer.md
   15  mkdir -p ~/lab4/workspace/python_project
   16  cd ~/lab4/workspace/python_project
   17  pwd
   18*
   19  cat README.md
   20  nano main.py
   21  cat main.py
   22  nao .env
   23  ls -la
   24  cp README.md README.copy.md
   25  mv README.md README.copy.md
   26  rm README.md README.copy.md
   27  rm README.dev.md
   28  rm README.md
   29  nano .env
   30  cat .env
   31  mkdir -p ~/lab4/workspace/java_app
   32  cp -r ~/lab4/workspace/python_project ~/lab4/workspace/java_app
   33  rm README.dev.md
   34  ls -la ~/lab4/workspace
   35  history
```

- tab_completion.png

Task 5 – System info, resources & processes

- uname.png

```
zuha@zuha:~/lab4/workspace/python_project$ uname -a
Linux zuha 6.8.0-71-generic #71-Ubuntu SMP PREEMPT_DYNAMIC Tue Jul 22 16:52:38 UTC 2025 x86_64 x86_64 x86_64 GNU/Linux
```

- cpuinfo.png

```
zuha@zuha:~/lab4/workspace/python_project$ cat /proc/cpuinfo
```

```
initial apicid  : 0
fpu             : yes
fpu_exception   : yes
cpuid level     : 22
wp              : yes
flags           : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ss syscall nx pdpe1gb rdtscp lm c
 arch_perfmon nopl xtopology tsc_reliable nonstop_tsc cpuid tsc_known_freq pni pclmulqdq ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe popcnt aes xs
c rdrand hypervisor lahf_lm abm 3dnowprefetch pti ssbd ibrs ibpb stibp fsgsbase tsc_adjust bmi1 avx2 smep bmi2 invpcid rdseed adx smap clflushopt xsa
c xgetbv1 xsaves arat md_clear flush_l1d arch_capabilities
bugs            : cpu_meltdown spectre_v1 spectre_v2 spec_store_bypass l1tf mds swapgs srbds mmio_stale_data retbleed gds bhi
bogomips        : 4608.01
clflush size    : 64
cache_alignment : 64
address sizes   : 45 bits physical, 48 bits virtual
power management:

processor       : 1
vendor_id       : GenuineIntel
cpu family      : 6
model           : 142
model name      : Intel(R) Core(TM) i7-10610U CPU @ 1.80GHz
stepping        : 12
microcode       : 0xffffffff
cpu MHz         : 2304.007
cache size      : 8192 KB
physical id     : 2
siblings        : 1
core id         : 0
cpu cores       : 1
apicid          : 2
initial apicid  : 2
fpu             : yes
fpu_exception   : yes
cpuid level     : 22
wp              : yes
flags           : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ss syscall nx pdpe1gb rdtscp lm c
 arch_perfmon nopl xtopology tsc_reliable nonstop_tsc cpuid tsc_known_freq pni pclmulqdq ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe popcnt aes xs
c rdrand hypervisor lahf_lm abm 3dnowprefetch pti ssbd ibrs ibpb stibp fsgsbase tsc_adjust bmi1 avx2 smep bmi2 invpcid rdseed adx smap clflushopt xsa
c xgetbv1 xsaves arat md_clear flush_l1d arch_capabilities
bugs            : cpu_meltdown spectre_v1 spectre_v2 spec_store_bypass l1tf mds swapgs srbds mmio_stale_data retbleed gds bhi
bogomips        : 4608.01
clflush size    : 64
cache_alignment : 64
address sizes   : 45 bits physical, 48 bits virtual
power management:
```

- meminfo.png

```
zuha@zuha:~/lab4/workspace/python_project$ uname -a
Linux zuha 6.8.0-71-generic #71-Ubuntu SMP PREEMPT_DYNAMIC Tue Jul 22 16:52:38 UTC 2025 x86_64 x86_64 x86_64 GNU/Linux
zuha@zuha:~/lab4/workspace/python_project$ free -h
               total        used        free      shared  buff/cache   available
Mem:           3.8Gi       490Mi       3.0Gi       1.5Mi       566Mi       3.3Gi
Swap:          1.9Gi          0B       1.9Gi
```

- diskinfo.png

```
zuha@zuha:~/lab4/workspace/python_project$ df -h
Filesystem                         Size  Used Avail Use% Mounted on
tmpfs                              387M  1.6M  386M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv  9.8G  4.4G  4.9G  48% /
tmpfs                              1.9G     0  1.9G   0% /dev/shm
tmpfs                              5.0M     0  5.0M   0% /run/lock
/dev/sda2                          1.8G  100M  1.6G   7% /boot
tmpfs                              387M   12K  387M   1% /run/user/1000
zuha@zuha:~/lab4/workspace/python_project$
```

- os-release.png

```
zuha@zuha:~/lab4/workspace/python_project$ cat /etc/os-release
PRETTY_NAME="Ubuntu 24.04.3 LTS"
NAME="Ubuntu"
VERSION_ID="24.04"
VERSION="24.04.3 LTS (Noble Numbat)"
VERSION_CODENAME=noble
ID=ubuntu
ID_LIKE=debian
HOME_URL="https://www.ubuntu.com/"
SUPPORT_URL="https://help.ubuntu.com/"
BUG_REPORT_URL="https://bugs.launchpad.net/ubuntu/"
PRIVACY_POLICY_URL="https://www.ubuntu.com/legal/terms-and-policies/privacy-policy"
UBUNTU_CODENAME=noble
LOGO=ubuntu-logo
```

- processes.png

```
zuha@zuha:~/lab4/workspace/python_project$ ps aux
```

```
root          500  0.0  0.0      0     0 ?        I    05:05   0:00 [kworker/u256:1-ext4-rsv-conversion]
root          501  0.0  0.6 354628 27392 ?        SLsl 05:05   0:01 /sbin/multipathd -d -s
root          527  0.0  0.2  30768  9256 ?        Ss   05:05   0:00 /usr/lib/systemd/systemd-udevd
root          529  0.0  0.0      0     0 ?        S    05:05   0:00 [psimon]
root          597  0.0  0.0      0     0 ?        S    05:05   0:00 [irq/57-vmw_vmci]
root          598  0.0  0.0      0     0 ?        S    05:05   0:00 [irq/58-vmw_vmci]
root          599  0.0  0.0      0     0 ?        S    05:05   0:00 [irq/59-vmw_vmci]
root          605  0.0  0.0      0     0 ?        S    05:05   0:00 [irq/16-vmwgfx]
root          606  0.0  0.0      0     0 ?        I<   05:05   0:00 [kworker/R-ttm]
root          611  0.0  0.0      0     0 ?        S    05:05   0:00 [jbd2/sda2-8]
root          612  0.0  0.0      0     0 ?        I<   05:05   0:00 [kworker/R-ext4-]
systemd+      676  0.0  0.3  21720 13056 ?        Ss   05:05   0:02 /usr/lib/systemd/systemd-resolved
systemd+      679  0.0  0.2  91024  7936 ?        Ssl  05:05   0:00 /usr/lib/systemd/systemd-timesyncd
root          844  0.0  0.2  50792 11392 ?        Ss   05:05   0:00 /usr/bin/VGAuthService
root          845  0.4  0.2 239540  9088 ?        Ssl  05:05   0:22 /usr/bin/vmtoolsd
root          965  0.0  0.0      0     0 ?        I<   05:05   0:00 [kworker/R-cfg80]
systemd+     1043  0.0  0.2  19008  9600 ?        Ss   05:05   0:00 /usr/lib/systemd/systemd-networkd
root         1084  0.0  0.0   4236  2560 ?        Ss   05:05   0:00 /usr/sbin/cron -f -P
message+     1085  0.0  0.1   9768  5376 ?        Ss   05:05   0:00 @dbus-daemon --system --address=systemd: --nofork --nopidfile --systemd-activation --syslog-o
polkitd      1089  0.0  0.2 308164  7936 ?        Ssl  05:05   0:00 /usr/lib/polkit-1/polkitd --no-debug
root         1097  0.0  0.2  17996  8704 ?        Ss   05:05   0:00 /usr/lib/systemd/systemd-logind
root         1103  0.0  0.3 468952 13568 ?        Ssl  05:05   0:00 /usr/libexec/udisks2/udisksd
syslog       1126  0.0  0.1 222508  5952 ?        Ssl  05:05   0:00 /usr/sbin/rsyslogd -n -iNONE
root         1138  0.0  0.5 107168 23680 ?        Ssl  05:05   0:00 /usr/bin/python3 /usr/share/unattended-upgrades/unattended-upgrade-shutdown --wait-for-signal
root         1160  0.0  0.3 392092 12544 ?        Ssl  05:05   0:00 /usr/sbin/ModemManager
root         1175  0.0  0.1   6944  4736 tty1     Ss   05:05   0:00 /bin/login -p --
zuha         1406  0.0  0.2  20280 11392 ?        Ss   05:05   0:00 /usr/lib/systemd/systemd --user
zuha         1407  0.0  0.0  21144  3512 ?        S    05:05   0:00 (sd-pam)
zuha         1418  0.0  0.1   8656  5504 tty1     S    05:05   0:00 -bash
root         1594  0.0  0.2  12020  7936 ?        Ss   05:22   0:00 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
root         1645  0.0  0.0      0     0 ?        I    05:22   0:01 [kworker/0:0-cgroup_destroy]
root         1732  0.0  0.0      0     0 ?        S    05:22   0:00 [psimon]
root         1747  0.0  0.2  12020  8064 ?        Ss   05:24   0:00 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
root         1776  0.0  0.0      0     0 ?        I<   05:35   0:00 [kworker/0:0H-kblockd]
root         1778  0.0  0.0      0     0 ?        I    05:35   0:00 [kworker/u257:2-events_power_efficient]
zuha         1794  0.6  0.2  14616  8576 tty1     S+   05:42   0:15 ssh zuha@192.168.231.132
root         1795  0.0  0.2  14964 10496 ?        Ss   05:42   0:00 sshd: zuha [priv]
zuha         1884  0.3  0.1  15124  6960 ?        S    05:42   0:09 sshd: zuha@pts/0
zuha         1885  0.0  0.1   8652  5504 pts/0    Ss   05:42   0:00 -bash
root         1934  0.0  0.0      0     0 ?        I    06:04   0:00 [kworker/u257:1-events_unbound]
root         1952  0.2  0.0      0     0 ?        I    06:08   0:02 [kworker/0:2-events]
root         1959  0.0  0.0      0     0 ?        I    06:10   0:00 [kworker/u257:3-events_unbound]
root         1961  0.0  0.0      0     0 ?        I    06:11   0:00 [kworker/u258:0-events_unbound]
```

Task 6 – Users and account verification (no sudo group change)

- adduser_lab4user.png

```
zuha@zuha:~/lab4/workspace/python_project$ sudo adduser lab4user
[sudo] password for zuha:
info: Adding user `lab4user' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `lab4user' (1001) ...
info: Adding new user `lab4user' (1001) with group `lab4user (1001)' ...
info: Creating home directory `/home/lab4user' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for lab4user
Enter the new value, or press ENTER for the default
        Full Name []: Zuha Irfan
        Room Number []: 1
        Work Phone []: 0343-5902786
        Home Phone []: aabdhsdaj
        Other []: sdsa
Is the information correct? [Y/n] Y
info: Adding new user `lab4user' to supplemental / extra groups `users' ...
info: Adding user `lab4user' to group `users' ...
zuha@zuha:~/lab4/workspace/python_project$
```

- lab4user_passwd.png

```
zuha@zuha:~/lab4/workspace/python_project$ getent passwd lab4user
lab4user:x:1001:1001:Zuha Irfan,1,0343-5902786,aabdhsdaj,sdsa:/home/lab4user:/bin/bash
```

- su_lab4user.png

```
zuha@zuha:~/lab4/workspace/python_project$ getent passwd lab4user
lab4user:x:1001:1001:Zuha Irfan,1,0343-5902786,aabdhsdaj,sdsa:/home/lab4user:/bin/bash
zuha@zuha:~/lab4/workspace/python_project$ su - lab4user
Password:
```

- sudo_whoami.png (You attempted the sudo command and want to show the expected failure)

```
lab4user@zuha:~$ sudo whoami
[sudo] password for lab4user:
lab4user is not in the sudoers file.
lab4user@zuha:~$
```

- exit_back.png
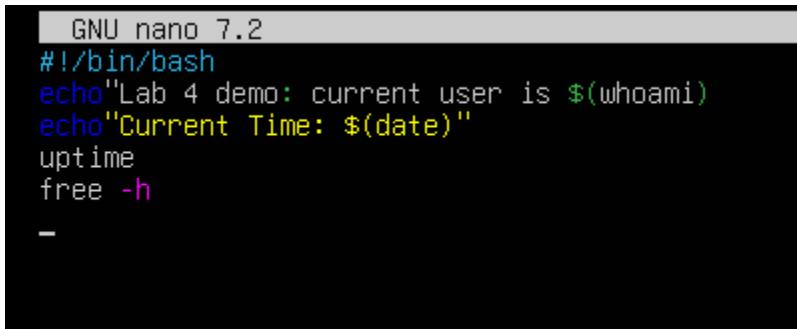
```
lab4user@zuha:~$ exit
logout
```

- (optional) deluser.png

```
logout
zuha@zuha:~/lab4/workspace/python_project$ sudo deluser --remove-home lab4user
info: Looking for files to backup/remove ...
info: Removing files ...
info: Removing crontab ...
info: Removing user `lab4user' ...
```

Bonus Task 7 – Create a small demo script using an editor and run it

- nano_run_demo.png

```
zuha@zuha:~/lab4/workspace/python_project$ nano ~/lab4/workspace/run-demo.sh
```

```
  GNU nano 7.2
#!/bin/bash
echo"Lab 4 demo: current user is $(whoami)
echo"Current Time: $(date)"
uptime
free -h

_
```

- chmod_run_demo.png

```
zuha@zuha:~/lab4/workspace/python_project$ chmod +x ~/lab4/workspace/run-demo.sh
```

- run_demo_output.png

```
zuha@zuha:~/lab4/workspace/python_project$  ~/lab4/workspace/run-demo.sh
/home/zuha/lab4/workspace/run-demo.sh: line 3: unexpected EOF while looking for matching `"'
```

- run_demo_output_sudo.png (optional)

```
zuha@zuha:~/lab4/workspace/python_project$ sudo ~/lab4/workspace/run-demo.sh
[sudo] password for zuha:
/home/zuha/lab4/workspace/run-demo.sh: line 3: unexpected EOF while looking for matching `"'
```