

Q1)

```
[~/sem5/os]
rzeta ➤ ls
bash.sh

[~/sem5/os]
rzeta ➤ ls -l
total 4
-rw-rw-r-- 1 rzeta rzeta 365 Aug 13 15:07 bash.sh

[~/sem5/os]
rzeta ➤ ls -la
total 12
drwxrwxr-x 2 rzeta rzeta 4096 Aug 13 15:07 .
drwxrwxr-x 3 rzeta rzeta 4096 Aug 13 14:55 ..
-rw-rw-r-- 1 rzeta rzeta 365 Aug 13 15:07 bash.sh
```

```
[~/sem5/os]
rzeta ➤ ls -lia
total 12
15078794 drwxrwxr-x 2 rzeta rzeta 4096 Aug 13 15:07 .
15078700 drwxrwxr-x 3 rzeta rzeta 4096 Aug 13 14:55 ..
15109455 -rw-rw-r-- 1 rzeta rzeta 365 Aug 13 15:07 bash.sh
```

ls == list directory contents

ls -l == long listing format of ls

ls -la == long listing format of ls , -a == all

ls -lia == long listing format of ls , -a == all , -i == inode number

Q2)

```
[~/sem5/os]
❌ rzeta ➤ cat bash.sh
#!/bin/bash

# ^ shebang

# cd = change directory
# ls = list
# ls -a
# ls -Ra

# pwd = present working directory
# mkdir = make directory
# whoami = current user
# rm = remove
# rm -rf = remove recursive forced
# cd .. = parent link
# ls -i = inode numbers
# grep = find occurrences
# man = manual
# vim = terminal based editor
# emacs = terminal based editor
```

cat – concatenate files and print them on terminal

```
[~/sem5/os]
rzeta ➤ cat bash.sh > file1.txt
```

cat <filename1> <filename2> ... > <newfile> [ > == directing operator]

less – better version of more , useful for reading larger files

```
[~/sem5/os]
rzeta ➤ less bash.sh
```

```
#!/bin/bash

# ^ shebang

# cd = change directory
# ls = list
# ls -a
# ls -Ra

# pwd = present working directory
# mkdir = make directory
# whoami = current user
# rm = remove
# rm -rf = remove recursive forced
# cd .. = parent link
# ls -i = inode numbers
# grep = find occurrences
# man = manual
# vim = terminal based editor
# emacs = terminal based editor

bash.sh (END)
```

```
[~/sem5/os]
rzeta ➤ more file2.txt
#!/bin/bash
```

more – reading through pages in terminal

```
[~/sem5/os]
rzeta ➤ more -5 bash.sh
#!/bin/bash

# ^ shebang

# cd = change directory
--More-- (13%)
```

Q3)

```
[~/sem5/os]
rzeta ➔ ls
bash.sh  file1.txt  file2.txt

[~/sem5/os]
rzeta ➔ mkdir lab1

[~/sem5/os]
rzeta ➔ cp bash.sh file1.txt file2.txt lab1

[~/sem5/os]
rzeta ➔ ls
bash.sh  file1.txt  file2.txt  lab1

[~/sem5/os]
rzeta ➔ cd lab1

[~/sem5/os/lab1]
rzeta ➔ ls
bash.sh  file1.txt  file2.txt
```

cp == copy

```
[~/sem5/os]
rzeta ➔ cp -R lab1 ~/home
```

cp -R == copy , -R = recursively

```
[~/sem5/os]
rzeta ➔ mv file1.txt ~/home
```

mv == move

```

[~/sem5/os]
rzeta ➔ ls
bash.sh  file2.txt  lab1

[~/sem5/os]
rzeta ➔ rm file2.txt

[~/sem5/os]
rzeta ➔ ls
bash.sh  lab1

```

rm == remove

rm -rf == remove , -r == recursively, -f == forcefully

```

[~/sem5/os]
rzeta ➔ mkdir lab{2..10}

[~/sem5/os]
rzeta ➔ ls
bash.sh  lab1  lab10  lab2  lab3  lab4  lab5  lab6  lab7  lab8  lab9

```

mkdir – make new directory

Q4)

```

[~/sem5/os]
✗ rzeta ➔ tar -czvf bash.sh.tar.gz bash.sh

bash.sh

[~/sem5/os]
rzeta ➔ ls
bash.sh      lab1  lab2  lab4  lab6  lab8
bash.sh.tar.gz lab10 lab3  lab5  lab7  lab9

```

tar -czvf = archiving tool , -c == compress , -v == verbose , -f == filename , -z == compress using gzip

```
[~/sem5/os]
rzeta ➤ cat bash.sh | grep 'a'
#!/bin/bash
# ^ shebang
# cd = change directory
# ls -a
# ls -Ra
# mkdir = make directory
# whoami = current user
# cd .. = parent link
# man = manual
# vim = terminal based editor
# emacs = terminal based editor
```

grep == find occurrences [ | == pipeline ]

```
[~/sem5/os]
rzeta ➤ find bash.sh
bash.sh

[~/sem5/os]
rzeta ➤ find . -name "bash.sh"
./bash.sh
./lab1/bash.sh
```

find == find files , ( . == all)

```
[~/sem5/os/lab1]
rzeta ➤ diff file1.txt file2.txt
3,21c3
< # ^ shebang
<
< # cd = change directory
< # ls = list
< # ls -a
< # ls -Ra
<
< # pwd = present working directory
< # mkdir = make directory
< # whoami = current user
< # rm = remove
< # rm -rf = remove recursive forced
< # cd .. = parent link
< # ls -i = inode numbers
< # grep = find occurrences
< # man = manual
< # vim = terminal based editor
< # emacs = terminal based editor
<
---
> echo "Hello world"
```

diff == difference between files

```
[~/sem5/os/lab1]
rzeta ➤ sort file1.txt

#!/bin/bash
# cd = change directory
# cd .. = parent link
# emacs = terminal based editor
# grep = find occurrences
# ls -a
# ls -i = inode numbers
# ls = list
# ls -Ra
# man = manual
# mkdir = make directory
# pwd = present working directory
# rm = remove
# rm -rf = remove recursive forced
# ^ shebang
# vim = terminal based editor
# whoami = current user
```

sort == sort lines in files

```
[~/sem5/os/lab1]
rzeta ➤ pwd
/home/rzeta/sem5/os/lab1
```

pwd == present working directory

```
[~/sem5/os/lab1]
rzeta ➤ gzip bash.sh

[~/sem5/os/lab1]
rzeta ➤ ls
bash.sh.gz file1.txt file2.txt
```

gzip == reduces file size using LZ77 coding (Lempel Ziv)



```
[~/sem5/os/lab1]
rzeta ➔ ps
  PID TTY          TIME CMD
 11499 pts/0        00:00:01 zsh
 14318 pts/0        00:00:00 ps
```

ps == displays processes

```
[~/sem5/os/lab1]
rzeta ➔ ps
  PID TTY          TIME CMD
 11499 pts/0        00:00:01 zsh
 14802 pts/0        00:00:00 ps

[~/sem5/os/lab1]
rzeta ➔ (sleep 100 &)

[~/sem5/os/lab1]
rzeta ➔ ps
  PID TTY          TIME CMD
 11499 pts/0        00:00:01 zsh
 14888 pts/0        00:00:00 sleep
 14903 pts/0        00:00:00 ps

[~/sem5/os/lab1]
rzeta ➔ kill 14888
```

kill == kill the process with the matching process id , (sleep 100 & ) == runs a subshell in the background

```
[~/sem5/os/lab1]
rzeta ➔ free
             total        used        free      shared  buff/cache   available
Mem:        15748128     2998420     9007792      106412     3741916    12311056
Swap:           0           0           0
```

free == shows the usage of ram in the system

Q5)

```
[~/sem5/os]
rzeta ➔ cat bash.sh
#!/bin/bash

# ^ shebang

# cd = change directory
# ls = list
# ls -a
# ls -Ra

# pwd = present working directory
# mkdir = make directory
# whoami = current user
# rm = remove
# rm -rf = remove recursive forced
# cd .. = parent link
# ls -i = inode numbers
# grep = find occurrences
# man = manual
# vim = terminal based editor
# emacs = terminal based editor

[~/sem5/os]
rzeta ➔ vim bash.sh

[~/sem5/os]
rzeta ➔ chmod +x bash.sh

[~/sem5/os]
rzeta ➔ ls
bash.sh          lab1    lab2    lab4    lab6    lab8
bash.sh.tar.gz  lab10   lab3    lab5    lab7    lab9

[~/sem5/os]
rzeta ➔ ./bash.sh
hello world
```

chmod == change file modes

```
[~/sem5/os]
rzeta ➔ ls -la
total 56
drwxrwxr-x 12 rzeta rzeta 4096 Aug 13 16:22 .
drwxrwxr-x  3 rzeta rzeta 4096 Aug 13 14:55 ..
-rwxrwxr-x  1 rzeta rzeta  383 Aug 13 16:22 bash.sh
-rw-rw-r--  1 rzeta rzeta  326 Aug 13 15:41 bash.sh.tar.gz
```

```
[~/sem5/os]
rzeta ➔ chmod 777 bash.sh

[~/sem5/os]
rzeta ➔ ls -la
total 56
DB Browser for SQLite rzeta rzeta 4096 Aug 13 16:22 .
drwxrwxr-x  3 rzeta rzeta 4096 Aug 13 14:55 ..
-rwxrwxrwx  1 rzeta rzeta  383 Aug 13 16:22 bash.sh
-rw-rw-r--  1 rzeta rzeta  326 Aug 13 15:41 bash.sh.tar.gz
```

6a)

```
[~/sem5/os/lab1]
rzeta ➔ (time who) >> myfile.txt
who  0.00s user 0.00s system 22% cpu 0.010 total

[~/sem5/os/lab1]
rzeta ➔ cat myfile.txt
rzeta  tty2          2024-08-13 14:54 (tty2)
```

time == runs programs and outputs the system resources used

who == which user is logged in

6b)

```
top - 16:29:20 up 1:35, 1 user, load average: 0.44, 0.44, 0.43
Tasks: 390 total, 2 running, 388 sleeping, 0 stopped, 0 zombie
%Cpu(s): 1.5 us, 1.1 sy, 0.0 ni, 97.4 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 15379.0 total, 8784.0 free, 2931.1 used, 3664.0 buff/cache
MiB Swap: 0.0 total, 0.0 free, 0.0 used. 12016.6 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1746	rzeta	9	-11	2547588	30328	22648	S	6.2	0.2	0:06.75	pulseaudio
1891	rzeta	20	0	5703904	350668	170880	S	6.2	2.2	4:03.37	gnome-she+
4229	rzeta	20	0	1139.1g	289760	144696	S	6.2	1.8	2:23.91	Discord
15372	root	20	0	0	0	0	I	6.2	0.0	0:00.78	kworker/u+
1	root	20	0	166880	11544	8088	S	0.0	0.1	0:01.43	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.02	kthreadd
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_par_gp
5	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	slub_flush
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	netns
11	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu+
12	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks+
13	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks+
14	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks+
15	root	20	0	0	0	0	S	0.0	0.0	0:00.33	ksoftirqd+
16	root	20	0	0	0	0	I	0.0	0.0	0:05.50	rcu_preem+
17	root	rt	0	0	0	0	S	0.0	0.0	0:00.02	migration+
18	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inje+
19	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
20	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/2
21	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inje+
22	root	rt	0	0	0	0	S	0.0	0.0	0:00.25	migration+
23	root	20	0	0	0	0	S	0.0	0.0	0:00.21	ksoftirqd+
26	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/4
27	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inje+
28	root	rt	0	0	0	0	S	0.0	0.0	0:00.25	migration+
29	root	20	0	0	0	0	S	0.0	0.0	0:00.21	ksoftirqd+
32	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/6
33	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inje+
34	root	rt	0	0	0	0	S	0.0	0.0	0:00.25	migration+
35	root	20	0	0	0	0	R	0.0	0.0	0:00.22	ksoftirqd+
38	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/8
39	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inje+
40	root	rt	0	0	0	0	S	0.0	0.0	0:00.25	migration+
41	root	20	0	0	0	0	S	0.0	0.0	0:00.48	ksoftirqd+
42	root	20	0	0	0	0	I	0.0	0.0	0:00.38	kworker/8+

top == displays the process running

```
[~/sem5/os/lab1]
rzeta ➔ ps
  PID TTY          TIME CMD
 11499 pts/0        00:00:03 zsh
 16981 pts/0        00:00:00 ps
```



ps == snapshot of current running processes

```
rzeta (Ubuntu 22.04 64bit / Linux 6.5.0-45-generic) Uptime: 1:40:13

- 1.22/4.68GHz CPU 6.6% MEM 23.1% SWAP 0.0% LOAD 16-core
CPU [ 6.6%] user 5.1% total 15.0G total 0 1 min: 0.71
MEM [ 23.1%] system 0.7% used 3.46G used 0 5 min: 0.52
SWAP [ 0.0%] iowait 1.2% free 11.6G free 0 15 min: 0.47

NETWORK Rx/s Tx/s TASKS 393 (1209 thr), 1 run, 270 slp, 122 oth
lo 0b 0b
wlp3s0 56Kb 43Kb
DefaultGateway 5ms

DISK I/O R/s W/s CPU% MEM% PID USER THR NI S
nvme0n1 0 0 0.0 1.8 4229 rzeta 43 0 S Discord --ty
nvme0n1p1 0 0 0.0 1.7 3945 rzeta 25 0 S chrome --typ
nvme0n1p2 0 0 0.0 1.6 11693 rzeta 25 0 S chrome --typ
nvme0n1p3 0 0 0.0 1.5 3610 rzeta 23 0 S chrome --typ
nvme0n1p4 0 0 0.0 1.4 4640 rzeta 27 0 S chrome --typ
nvme0n1p5 0 0 0.0 1.3 4083 rzeta 34 0 S Discord
nvme1n1 0 0 0.0 1.3 17314 rzeta 24 0 S chrome --typ
nvme1n1p1 0 0 0.0 1.2 4132 rzeta 29 0 S Discord --ty
0.0 1.0 3994 rzeta 26 0 S chrome --typ
FILE SYS Used Total CPU% MEM% PID USER THR NI S
/ 80.8G 287G 0.0 0.9 3611 rzeta 15 0 S chrome --typ
_t-hunspell 80.8G 287G 0.0 0.9 3534 rzeta 7 0 S Xwayland :0
0.0 0.8 3921 rzeta 22 0 S chrome --typ
0.0 0.8 4750 rzeta 17 0 S chrome --typ
SENSORS 0.0 0.7 17546 rzeta 11 0 S chrome --typ
acpitz 1 56C 0.0 0.6 3550 rzeta 8 0 S gsd-xsetting
Composite 29C 0.0 0.5 2162 rzeta 5 0 S snap-store -
Sensor 1 30C 0.0 0.5 2458 root 5 0 S fwupd
Sensor 2 27C 0.0 0.5 4137 rzeta 11 0 S Discord --ty
Composite 39C 0.0 0.5 3897 rzeta 8 0 S chrome --typ
Sensor 1 39C 0.0 0.5 1488 root 18 0 S dockerd -H f
Tctl 57C 0.0 0.5 2388 rzeta 12 0 S gjs /usr/sha
edge 50C 0.0 0.4 17323 rzeta 9 0 S chrome --typ
cpu_fan 0R 0.0 0.4 2090 rzeta 6 0 S evolution-al
gpu_fan 0R 0.0 0.4 11481 rzeta 4 0 S gnome-termin
Battery 69% 0.0 0.4 4270 rzeta 6 0 S Discord --ty
0.0 0.4 691 root 32 0 S warp-svc
0.0 0.4 3529 rzeta 1 0 S chrome --typ

2024-08-13 16:34:31 IST
```

glances == bird's eye view of the system

```

[~/sem5/os/lab1]
rzeta ➤ (sleep 100 &)

[~/sem5/os/lab1]
rzeta ➤ ps
    PID TTY          TIME CMD
  11499 pts/0        00:00:03 zsh
  18646 pts/0        00:00:00 sleep
  18662 pts/0        00:00:00 ps

[~/sem5/os/lab1]
rzeta ➤ kill 18646

```

kill == kills/stops the processes given the process id

```

[~/sem5/os/lab1]
rzeta ➤ (sleep 100 &)

[~/sem5/os/lab1]
rzeta ➤ ps
    PID TTY          TIME CMD
  11499 pts/0        00:00:04 zsh
  19278 pts/0        00:00:00 sleep
  19293 pts/0        00:00:00 ps

[~/sem5/os/lab1]
rzeta ➤ pkill sleep

[~/sem5/os/lab1]
rzeta ➤ ps
    PID TTY          TIME CMD
  11499 pts/0        00:00:04 zsh
  19349 pts/0        00:00:00 ps

```

pkill == kill process based on name

```
[~/sem5/os/lab1]
rzeta ➤ ps
      PID TTY          TIME CMD
    11499 pts/0        00:00:05 zsh
    19909 pts/0        00:00:00 ps

[~/sem5/os/lab1]
rzeta ➤ pgrep bash

[~/sem5/os/lab1]
✗ ➤ rzeta ➤ pgrep zsh
11499
```

pgrep == looks through the running processes and lists them out

0[     100.0%]	4[0.0%]	8[0.0%]	12[0.0%]
1[0.0%]	5[0.0%]	9[0.0%]	13[0.0%]
2[0.0%]	6[0.0%]	10[    33.3%]	14[0.0%]
3[0.0%]	7[0.0%]	11[0.0%]	15[0.0%]
Mem[     3.25G/15.0G]	Tasks: 162, 845 thr; 2 running		
Swp[0K/0K]	Load average: 0.56 0.50 0.46		
	Uptime: 01:48:29		

PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	MEM%	TIME+	Command
19729	rzeta	20	0	12644	5888	3584	R	104.	0.0	0:00.12	htop
1	root	20	0	164M	12952	8088	S	0.0	0.1	0:02.20	/sbin/init splash
352	root	19	-1	73612	38528	37632	S	0.0	0.2	0:00.82	/lib/systemd/syst
406	root	20	0	27132	6912	4736	S	0.0	0.0	0:00.33	/lib/systemd/syst
594	systemd-o	20	0	14836	6272	5504	S	0.0	0.0	0:09.64	/lib/systemd/syst
595	systemd-r	20	0	26332	14312	9600	S	0.0	0.1	0:00.86	/lib/systemd/syst
596	systemd-t	20	0	89388	7040	6272	S	0.0	0.0	0:00.12	/lib/systemd/syst
645	systemd-t	20	0	89388	7040	6272	S	0.0	0.0	0:00.02	/lib/systemd/syst
651	root	20	0	234M	7976	6952	S	0.0	0.1	0:00.24	/usr/libexec/acco
652	root	20	0	2816	1792	1792	S	0.0	0.0	0:01.30	/usr/sbin/acpid
654	avahi	20	0	12672	8320	3584	S	0.0	0.1	0:21.69	avahi-daemon: run
655	root	20	0	9816	2816	2688	S	0.0	0.0	0:00.01	/usr/sbin/cron -f
657	messagebu	20	0	11116	5504	3840	S	0.0	0.0	0:02.39	@dbus-daemon --sy
659	root	20	0	255M	18672	15856	S	0.0	0.1	0:02.45	/usr/sbin/Network
665	root	20	0	82856	3840	3584	S	0.0	0.0	0:00.93	/usr/sbin/irqbala
666	root	20	0	41404	20480	11520	S	0.0	0.1	0:00.09	/usr/bin/python3
669	root	20	0	231M	9996	6948	S	0.0	0.1	0:01.39	/usr/libexec/polk
671	root	20	0	234M	7492	6852	S	0.0	0.0	0:00.03	/usr/libexec/powe
673	syslog	20	0	217M	6016	4480	S	0.0	0.0	0:00.17	/usr/sbin/rsyslog
681	root	20	0	2299M	33172	19840	S	0.0	0.2	0:01.44	/usr/lib/snapd/sn
682	root	20	0	231M	9996	6948	S	0.0	0.1	0:00.00	/usr/libexec/polk
687	root	20	0	231M	6400	6016	S	0.0	0.0	0:00.02	/usr/libexec/swit
688	root	20	0	48248	7904	6784	S	0.0	0.1	0:00.26	/lib/systemd/syst
690	root	20	0	384M	12992	10432	S	0.0	0.1	0:00.13	/usr/libexec/udis
691	root	20	0	2255M	60288	20864	S	0.0	0.4	0:22.27	/bin/warp-svc
692	root	20	0	82856	3840	3584	S	0.0	0.0	0:00.00	/usr/sbin/irqbala
693	root	20	0	17696	11264	9600	S	0.0	0.1	0:00.10	/sbin/wpa_suppl
697	avahi	20	0	7444	1428	1152	S	0.0	0.0	0:00.00	avahi-daemon: chr
699	root	20	0	2299M	33172	19840	S	0.0	0.2	0:00.07	/usr/lib/snapd/sn
700	root	20	0	234M	7976	6952	S	0.0	0.1	0:00.18	/usr/libexec/acco
701	root	20	0	234M	7492	6852	S	0.0	0.0	0:00.00	/usr/libexec/powe
702	syslog	20	0	217M	6016	4480	S	0.0	0.0	0:00.06	/usr/sbin/rsyslog

F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice -F8Nice +F9Kill F10Quit

htop == more interactive and better version of top



7)

```
[~/sem5/os/lab1]
rzeta ➤ wget https://old.iiitdm.ac.in/img/academics/Final%20Fee%20structure%20B%20tech%20and%20DD%202024-25%2029.05.2024.pdf
--2024-08-13 16:47:57-- https://old.iiitdm.ac.in/img/academics/Final%20Fee%20structure%20B%20tech%20and%20DD%202024-25%2029.05.2024.pdf
Resolving old.iiitdm.ac.in (old.iiitdm.ac.in)... 173.236.205.207
Connecting to old.iiitdm.ac.in (old.iiitdm.ac.in)|173.236.205.207|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 606304 (592K) [application/pdf]
Saving to: 'Final Fee structure B tech and DD 2024-25 29.05.2024.pdf'

Final Fee structure 100%[=====>] 592.09K  389KB/s   in 1.5s

2024-08-13 16:47:59 (389 KB/s) - 'Final Fee structure B tech and DD 2024-25 29.05.2024.pdf' saved [606304/606304]

[~/sem5/os/lab1]
rzeta ➤ ls
bash.sh.gz  'Final Fee structure B tech and DD 2024-25 29.05.2024.pdf'
file1.txt   myfile.txt
file2.txt
```

wget == terminal based network downloader

8)

```
[~/sem5/os/lab1]
rzeta ➤ sudo useradd guest
[sudo] password for rzeta:
```

```
[~]
rzeta ➤ cat /etc/passwd | grep 'guest'
guest:x:1001:1001::/home/guest:/bin/sh
```

useradd == create and add new user

```
[~]
rzeta ➤ sudo usermod -s /bin/zsh guest
```

usermod == modify parameters of user

```
[~]
rzeta ➤ sudo userdel guest
[sudo] password for rzeta:
```

userdel == delete user

9)

```
[~/sem5/os/lab1]
rzeta ➤ cat > 9a.txt
10 20 30
20 30 40
30 40 50

[~/sem5/os/lab1]
rzeta ➤ cat 9a.txt
10 20 30
20 30 40
30 40 50

[~/sem5/os/lab1]
rzeta ➤ awk '
{
    for (i = 1; i <= NF; i++) {
        sum[i] += $i
    }
}
END {
    for (i = 1; i <= length(sum); i++) {
        printf "Sum of column %d: %d\n", i, sum[i]
    }
}
' 9a.txt

Sum of column 1: 60
Sum of column 2: 90
Sum of column 3: 120
```

9b)

```
[~/sem5/os/lab1]
rzeta ➤ cat > 9b.txt
apple red 5
banana yellow 3
cherry red 7
date brown 2

[~/sem5/os/lab1]
rzeta ➤ awk '/red/{print}' 9b.txt
apple red 5
cherry red 7
```

awk == powerful text processing tool

```
[~/sem5/os/lab1]
rzeta ➤ cat 9b.txt | grep 'red'
apple red 5
cherry red 7
```

grep == search patterns in files

```
[~/sem5/os/lab1]
rzeta ➤ cat 9b.txt | sed -n '/red/p' 9b.txt
apple red 5
cherry red 7
```

sed == stream editor , used to do basic text operations

Q4)

ssh = Open ssh login client , ssh = secured shell

Terminal – 1

```
[~/sem5/os/lab1]
❌ rzeta ➤ python3 -m http.server
Serving HTTP on 0.0.0.0 port 8000 (http://0.0.0.0:8000/) ...
```

Terminal - 2

```
[~]
❌ rzeta ➤ ssh rzeta@localhost
The authenticity of host 'localhost (127.0.0.1)' can't be established.
ED25519 key fingerprint is SHA256:SMGoPdKSzkdb4lSIzjd9h7EAd4uE4UBpWit2Ra/hL6c.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'localhost' (ED25519) to the list of known hosts.
rzeta@localhost's password:
Welcome to Ubuntu 22.04.4 LTS (GNU/Linux 6.5.0-45-generic x86_64)

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