

RV UNIVERSITY
School of Computer Science and Engineering
Bengaluru – 560059



Linux Administration
Course Code: CS1106

II Semester SoCSE
Laboratory Record

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Academic Year	2024 - 2025

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LABORATORY CERTIFICATE

This is to certify that **Mr./Ms. Riyan Shrestha** has satisfactorily completed the course of activities in **Linux Administration (CS)** prescribed by the **School of Computer Science and Engineering** during the year **2024-25**.

Name of the Candidate: Riyan Shrestha
USN: 1RUA24BCA0075 **Semester:** 2

Marks	
Maximum	Obtained
5	

Signature of Faculty in-charge

Program Director

Date:

Vision and Mission of the School of Computer Science and Engineering

Vision

To be a pioneering school of Computer Science and Engineering committed to fostering liberal education and empowering the next generation of technologists to make a positive global socio-economic impact.

Mission

- To be a pioneer in computer science education and benchmark ourselves with the world's top computer science and engineering institutions.
- To provide state-of-the-art facilities that enable exemplary pedagogy, advanced research, innovation and entrepreneurship in emerging technologies of computer science.
- To promote a culture of cooperation and inclusiveness among students and faculty from diverse communities enabling them to take part in interdisciplinary and multidisciplinary research, contributing to institution-building.
- To foster excellence through national and international academic, industry collaborations, bringing in diverse perspectives to drive innovation.
- To nurture a talented pool of ethical, self-driven and empathetic problem solvers to achieve sustainable development goals.

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Lab 1: Basic Linux Navigation

Aim: Learn to use the command line programs to navigate and manage a linux system

Commands used:

- ls
- cd
- pwd
- touch
- mkdir
- rmdir
- rm
- mv
- cp

Usage:

1. ls – list directory contents

Syntax: ls [options] [directory]

<Insert screenshot(s) here of ls, ls -a, ls -la, etc>

```
rvu@rvu-OptiPlex-SFF-7020:~$ ls -la
total 4420
drwxr-xr-x 16 rvu rvu 4096 Apr 2 15:38 .
drwxr-xr-x 6 root root 4096 Mar 5 15:27 ..
-rw-rw-r-- 1 rvu rvu 1594 Apr 2 15:25 activity1.py
-rw-rw-r-- 1 rvu rvu 752 Apr 2 15:25 activity2.py
-rw-rw-r-- 1 rvu rvu 748 Apr 2 15:25 activity3.py
-rw-rw-r-- 1 rvu rvu 455 Apr 2 15:38 activity4.py
-rw----- 1 rvu rvu 23587 Apr 2 13:05 .bash_history
-rw-r--r-- 1 rvu rvu 220 Mar 31 2024 .bash_logout
-rw-r--r-- 1 rvu rvu 3771 Mar 31 2024 .bashrc
drwx----- 19 rvu rvu 4096 Mar 26 11:55 .cache
drwx----- 20 rvu rvu 4096 Mar 7 11:08 .config
drwxrwxr-x 3 rvu rvu 4096 Mar 27 12:52 Desktop
drwxrwxr-x 3 rvu rvu 4096 Mar 12 09:20 .dotnet
drwx----- 2 rvu rvu 4096 Apr 1 11:28 .gnupg
drwxrwxr-x 2 rvu rvu 4096 Jan 22 14:11 .gphoto
-rw----- 1 rvu rvu 20 Feb 27 10:21 .lessshst
drwx----- 4 rvu rvu 4096 Oct 1 2024 .local
-rw-r--r-- 1 rvu rvu 12288 Feb 17 15:20 .mohan21.sh.swp
drwxrwxr-x 4 rvu rvu 4096 Apr 2 09:27 .OS
drwx----- 3 rvu rvu 4096 Mar 7 10:47 .pki
-rw-r--r-- 1 rvu rvu 807 Mar 31 2024 .profile
drwxrwxr-x 3 rvu rvu 4096 Mar 12 15:19 .Python
-rw-rw-r-- 1 rvu rvu 222849 Mar 27 11:03 Python.ipynb
drwxrwxr-x 2 rvu rvu 4096 Apr 2 11:54 Screenshots
drwx----- 5 rvu rvu 4096 Apr 2 09:24 .snap
drwx----- 2 rvu rvu 4096 Sep 24 2024 .ssh
-rw-r--r-- 1 rvu rvu 0 Oct 1 2024 .sudo_as_admin_successful
-rw----- 1 rvu rvu 12288 Feb 27 10:42 .swo
-rw----- 1 rvu rvu 12288 Jan 20 15:13 .swp
-rwxrwxr-x 1 rvu rvu 16056 Dec 12 14:29 .test
-rw----- 1 rvu rvu 12288 Feb 27 11:12 .TEST_FILE.swp
-rw----- 1 rvu rvu 10665 Mar 28 10:50 .viminfo
-rw-rw-r-- 1 rvu rvu 4096000 Mar 27 10:07 VirtualDrive
drwxrwxr-x 4 rvu rvu 4096 Mar 7 10:47 .vscode
rvu@rvu-OptiPlex-SFF-7020:~$

rvu@rvu-OptiPlex-SFF-7020:~$ ls /
bin boot dev home lib64 lost+found mnt proc run sbin,usr-is-merged srv sys usr
bin,usr-is-merged cdrom etc lib lib,usr-is-merged media opt root sbin snap swap.img tmp var
```

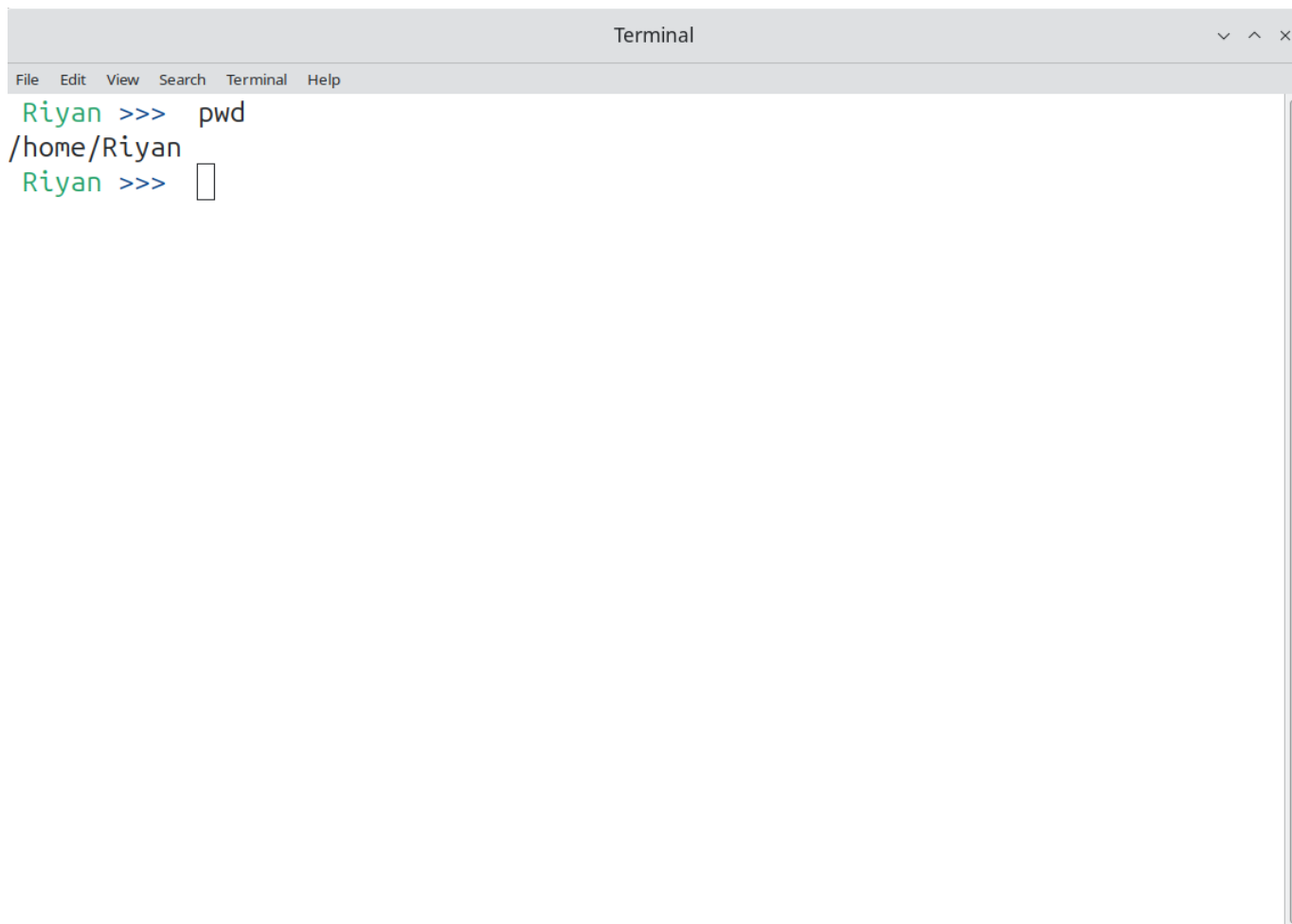
```
rvu@rvu-OptiPlex-SFF-7020:~$ ls /home
rvu
rvu@rvu-OptiPlex-SFF-7020:~$ ls /home/rvu
a           Downloads  foos        Music       snap        vinayak.txt
ARCHANA     file1.txt  harshini    Pictures    tanish7a.c  vishnu
Desktop     filename  harshini.txt 'Programming in C' Templates    yogi
Documents   foll      Jenny_Isec  Public      Videos
```

rvu@rvu-OptiPlex-SFF-7020:~\$ pwd
/home/rvu

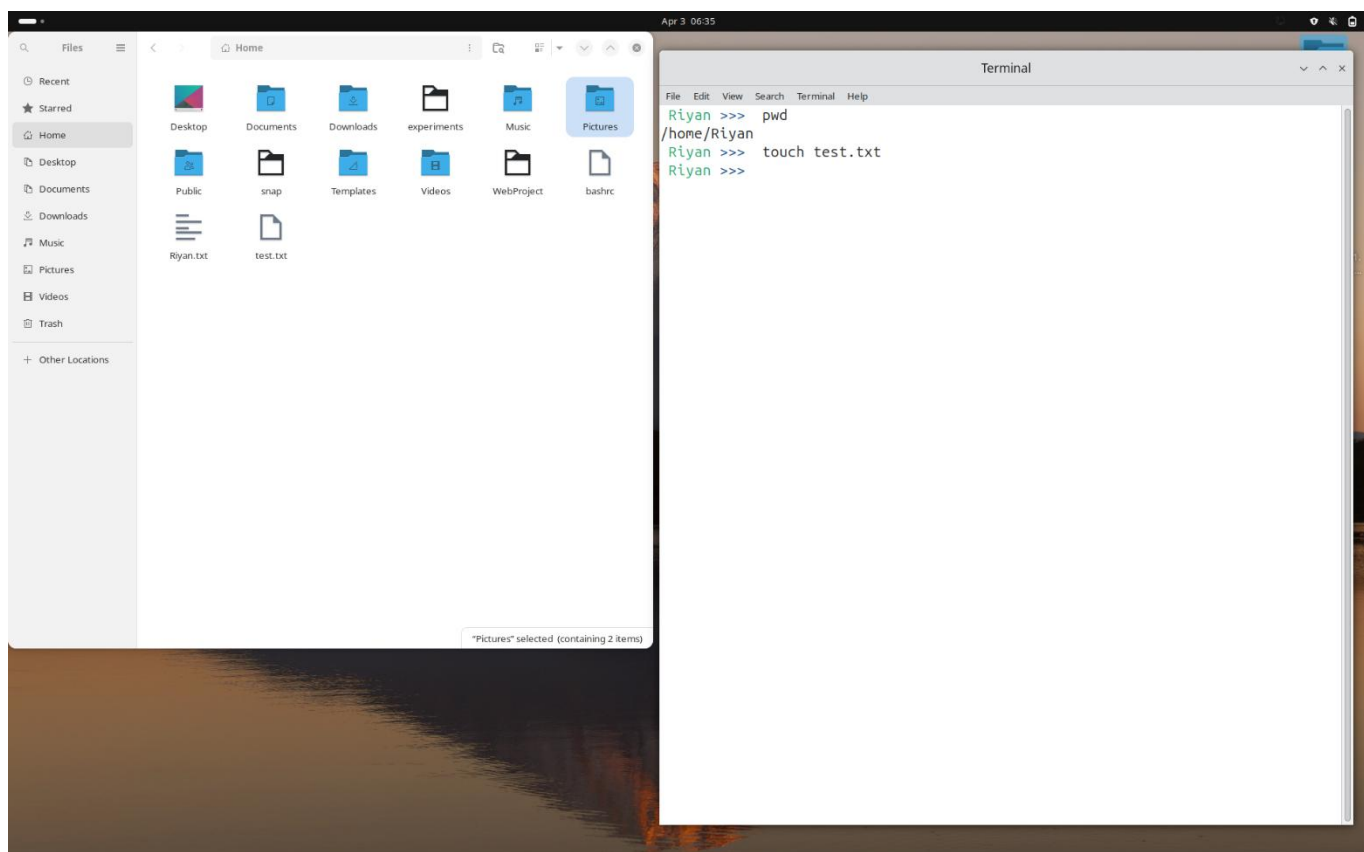
2. cd

```
rvu@rvu-OptiPlex-SFF-7020:~$ cd 123
rvu@rvu-OptiPlex-SFF-7020:~/123$ cd ..
rvu@rvu-OptiPlex-SFF-7020:~$ rmdir 123
rvu@rvu-OptiPlex-SFF-7020:~$ mkdir 456
rvu@rvu-OptiPlex-SFF-7020:~$ cd 456
rvu@rvu-OptiPlex-SFF-7020:~/456$ mkdir 123
rvu@rvu-OptiPlex-SFF-7020:~/456$ cd 123
rvu@rvu-OptiPlex-SFF-7020:~/456/123$ mkdir 789
rvu@rvu-OptiPlex-SFF-7020:~/456/123$ cd 789
rvu@rvu-OptiPlex-SFF-7020:~/456/123/789$ █
```

3. pwd



4. touch



5. mkdir

```
rvu@rvu-OptiPlex-SFF-7020:~$ cd 456
rvu@rvu-OptiPlex-SFF-7020:~/456$ mkdir 123
rvu@rvu-OptiPlex-SFF-7020:~/456$ cd ../123
rvu@rvu-OptiPlex-SFF-7020:~/123$ mkdir 789
rvu@rvu-OptiPlex-SFF-7020:~/123$ cd ..
rvu@rvu-OptiPlex-SFF-7020:~$ ls 456
123
rvu@rvu-OptiPlex-SFF-7020:~$ ls 123
789
```

6. rmdir

```
rvu@rvu-OptiPlex-SFF-7020:~$ rmdir 456/123/789
rvu@rvu-OptiPlex-SFF-7020:~$ rmdir 456/123
rvu@rvu-OptiPlex-SFF-7020:~$ rmdir 456
rvu@rvu-OptiPlex-SFF-7020:~$ cd 456
bash: cd: 456: No such file or directory
```

7. rm

```
rvu@rvu-OptiPlex-SFF-7020:~$ rm 456/123/789/test
rvu@rvu-OptiPlex-SFF-7020:~$ rmdir 456/123/789
rvu@rvu-OptiPlex-SFF-7020:~$ rmdir 456/123
rvu@rvu-OptiPlex-SFF-7020:~$ rmdir 456
rvu@rvu-OptiPlex-SFF-7020:~$ rmdir 456
```

8. mv

```
rvu@rvu-OptiPlex-SFF-7020:~$ touch 12345678
rvu@rvu-OptiPlex-SFF-7020:~$ mv 12345678 abc.txt
rvu@rvu-OptiPlex-SFF-7020:~$ cd 12345678
bash: cd: 12345678: No such file or directory
rvu@rvu-OptiPlex-SFF-7020:~$ cd abc.txt
bash: cd: abc.txt: Not a directory
rvu@rvu-OptiPlex-SFF-7020:~$ ls abc.txt
abc.txt
```

9. cp

```
rvu@rvu-OptiPlex-SFF-7020:~$ touch report.txt
rvu@rvu-OptiPlex-SFF-7020:~$ mkdir backup
mkdir: cannot create directory 'backup': File exists
rvu@rvu-OptiPlex-SFF-7020:~$ cp report.txt backup
rvu@rvu-OptiPlex-SFF-7020:~$ ls backup
file.txt  Learning.vim.txt  m.txt  myfile_copied.txt  notes.txt  report.txt
rvu@rvu-OptiPlex-SFF-7020:~$
```


Lab 2: Using the vi/vim editor

Aim: Learn to use the text-based editor vim.

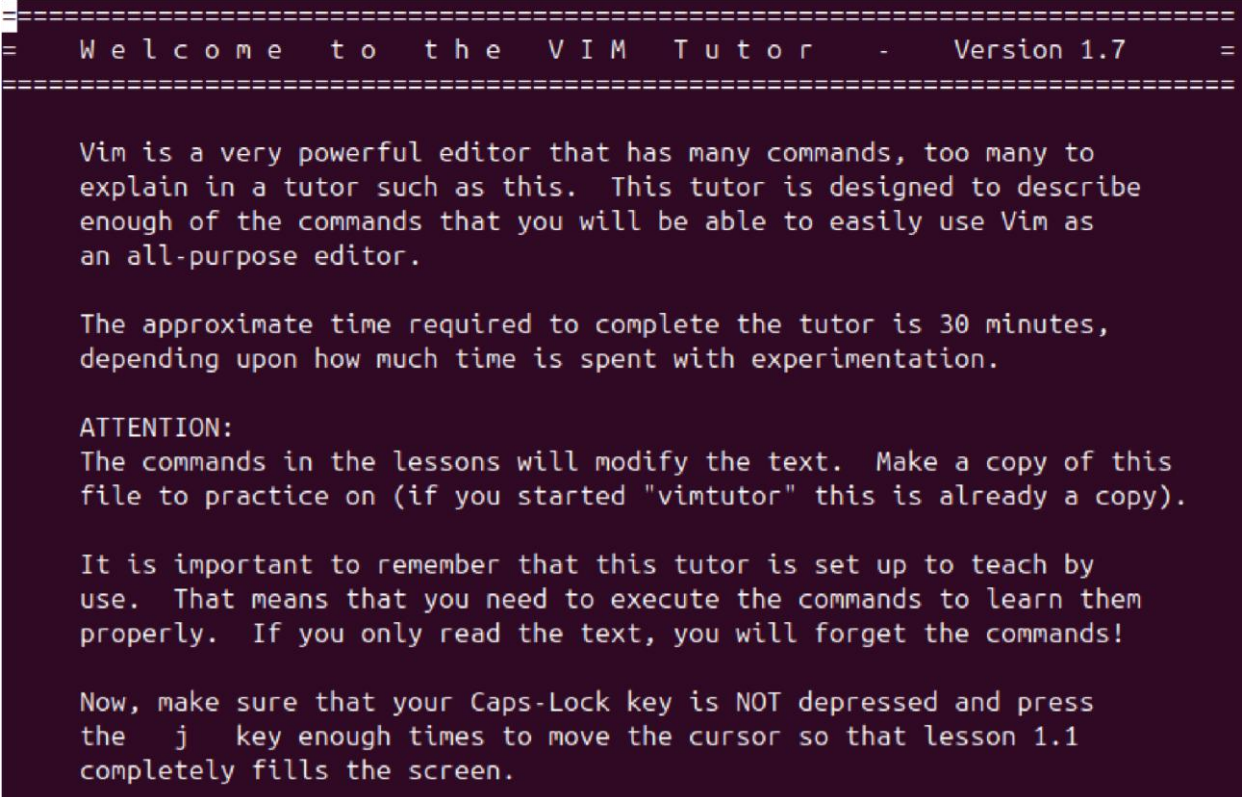
Commands used:

- vimtutor
- vim

Usage:

1. vimtutor – learn how to use the vim editor

<Insert screenshot(s) here of vimtutor>



```
=====
=  Welcome to the VIM Tutor - Version 1.7  =
=====

Vim is a very powerful editor that has many commands, too many to
explain in a tutor such as this.  This tutor is designed to describe
enough of the commands that you will be able to easily use Vim as
an all-purpose editor.

The approximate time required to complete the tutor is 30 minutes,
depending upon how much time is spent with experimentation.

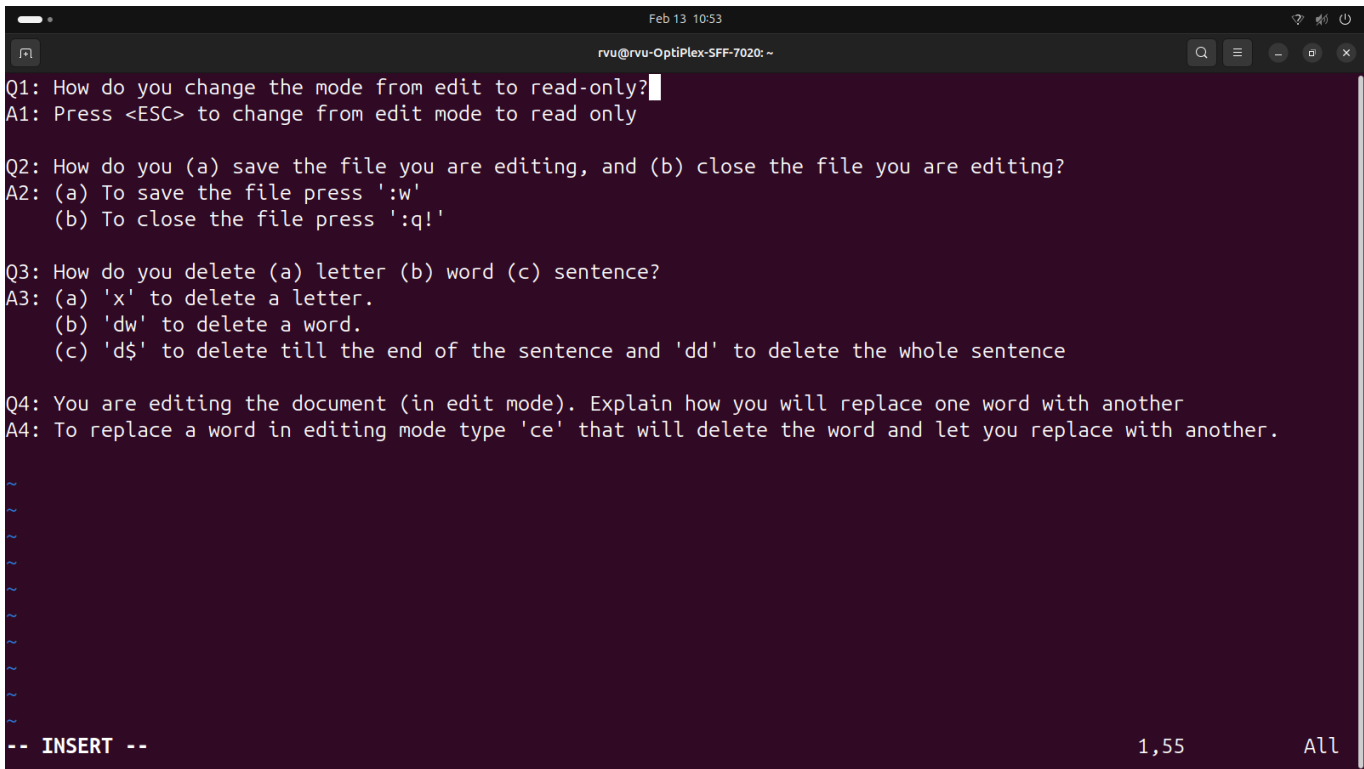
ATTENTION:
The commands in the lessons will modify the text.  Make a copy of this
file to practice on (if you started "vimtutor" this is already a copy).

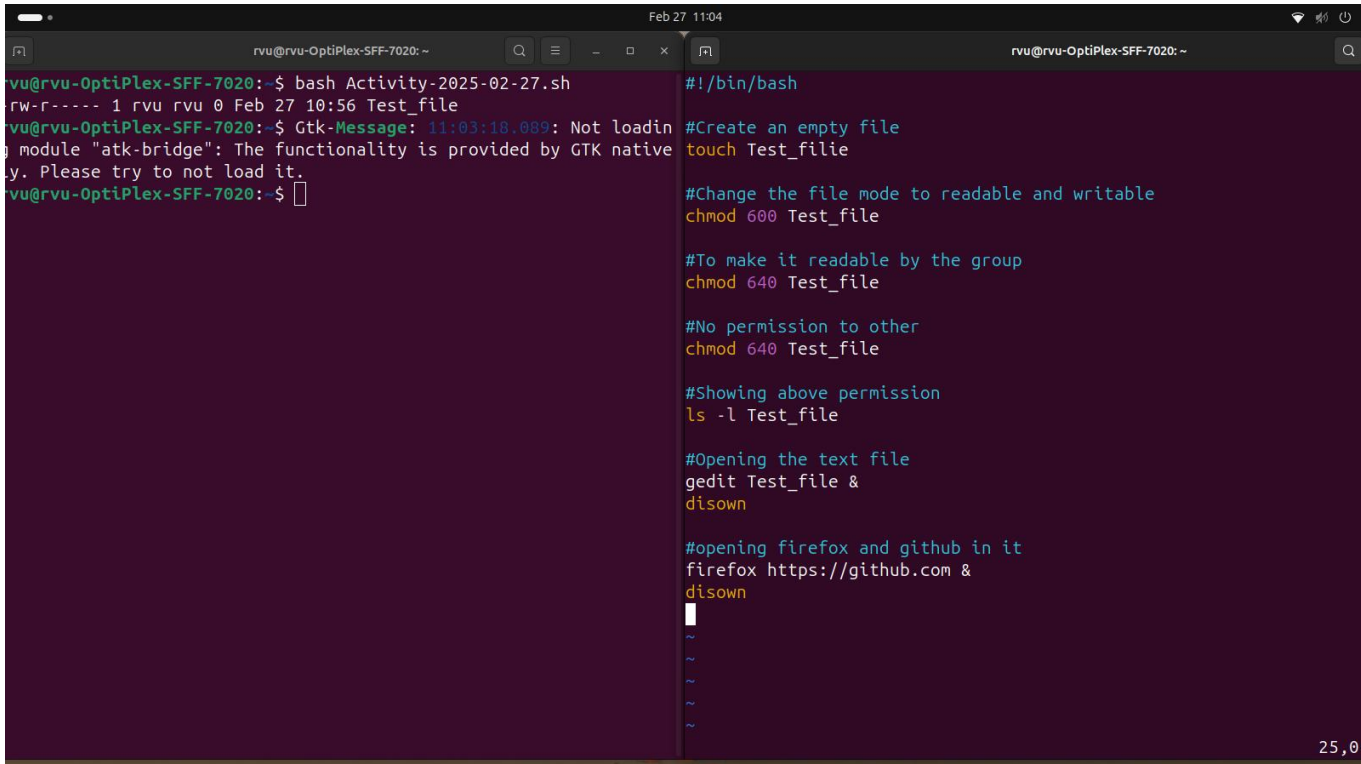
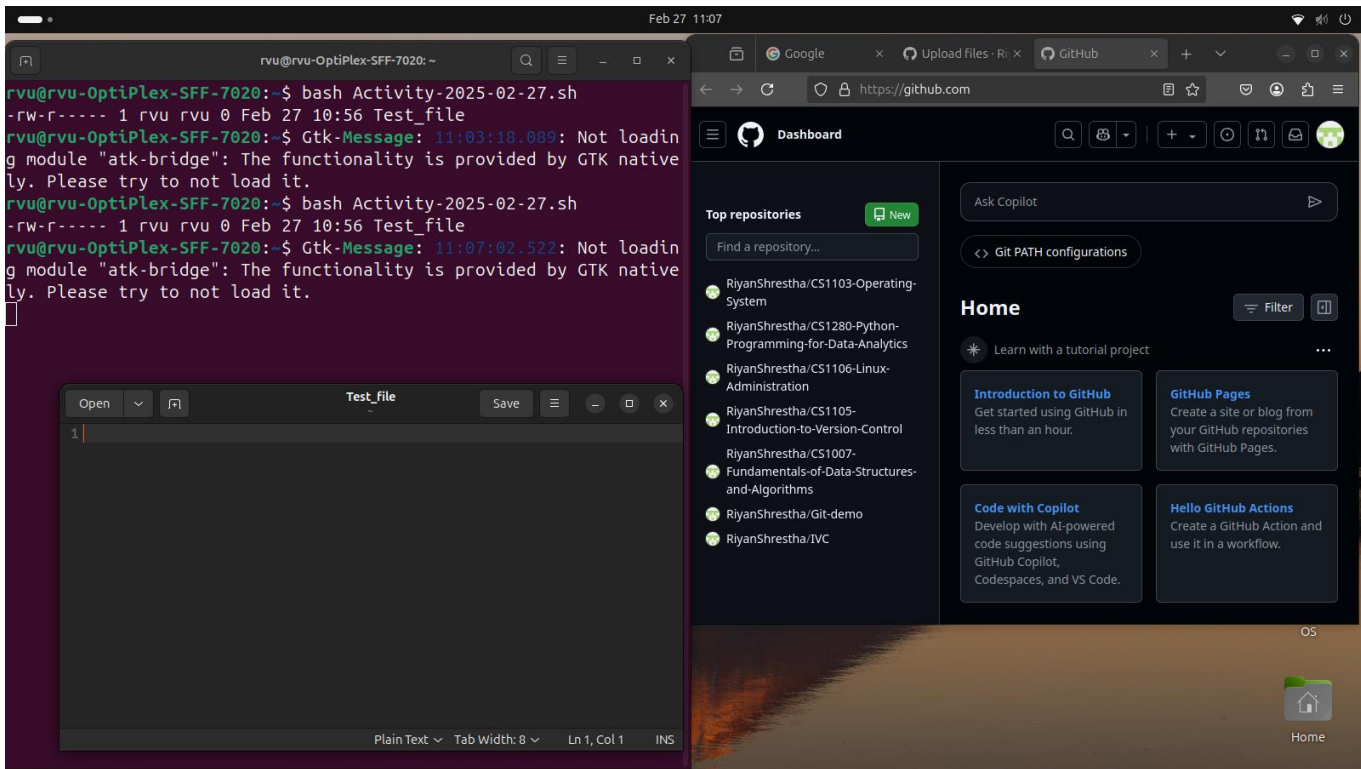
It is important to remember that this tutor is set up to teach by
use.  That means that you need to execute the commands to learn them
properly.  If you only read the text, you will forget the commands!

Now, make sure that your Caps-Lock key is NOT depressed and press
the  j  key enough times to move the cursor so that lesson 1.1
completely fills the screen.
```

2. vim

<Insert screenshot(s) here of you using vim>





```
Feb 27 10:59
rvu@rvu-OptiPlex-SFF-7020: ~
rvu@rvu-OptiPlex-SFF-7020: ~
rvu@rvu-OptiPlex-SFF-7020: ~

#!/bin/bash

#Create an empty file
touch Test_filie

#Change the file mode to readable and writable
chmod 600 Test_file

#To make it readable by the group
chmod 640 Test_file

#No permission to other
chmod 640 Test_file

#Showing above permission
ls -l Test_file

#Opening the text file
gedit Test_file &
disown

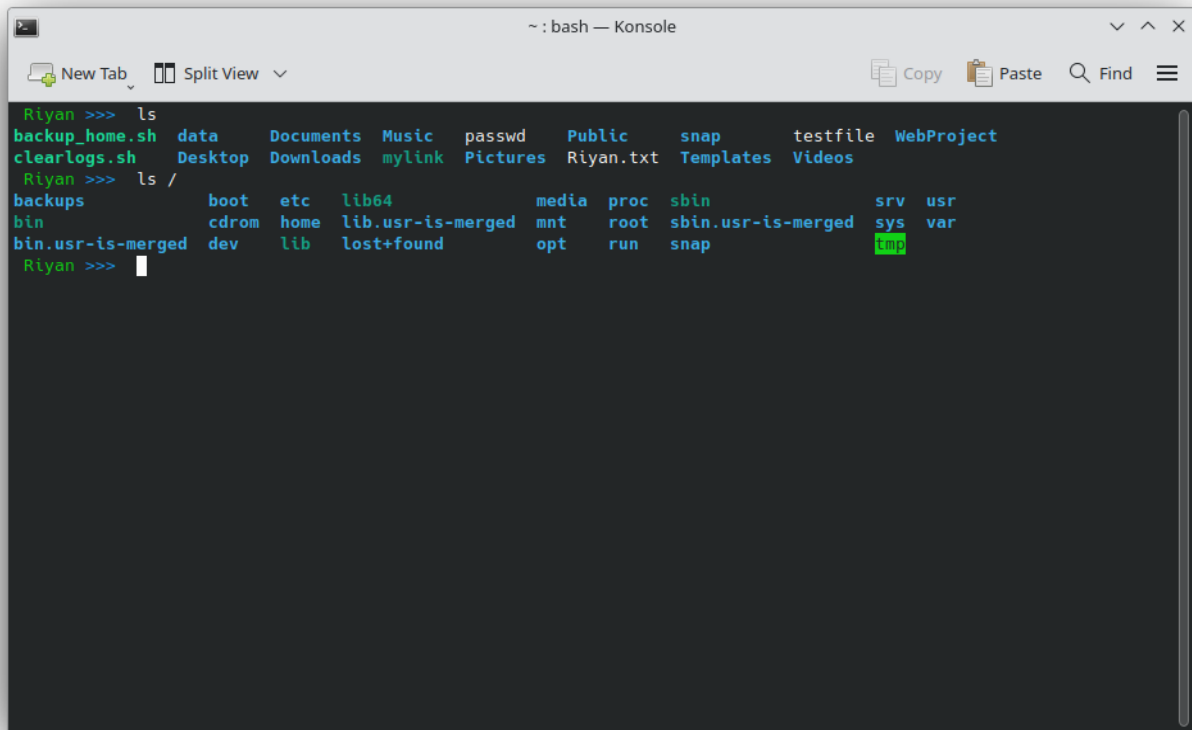
#opening firefox and github in it
firefox https://github.com &
disown

~
~
~

25,0-1 All
```

Lab 3:

Aim: Exploring the Directory Structure and File Types



A screenshot of a terminal window titled '~: bash — Konsole'. The window has a menu bar with 'New Tab', 'Split View', 'Copy', 'Paste', 'Find', and a hamburger menu. The terminal shows two 'ls' commands. The first 'ls' command lists files in the current directory: backup_home.sh, clearlogs.sh, data, Desktop, Documents, Downloads, Music, mylink, passwd, Pictures, Public, Riyan.txt, snap, Templates, testfile, Videos, and WebProject. The second 'ls /' command lists the root directory's contents: backups, bin, bin.usr-is-merged, boot, cdrom, dev, etc, home, lib, lib64, lib.usr-is-merged, lost+found, media, mnt, opt, proc, root, run, sbin, sbin.usr-is-merged, snap, srv, sys, tmp, usr, and var. The 'tmp' directory is highlighted in green in the original image.

```
Riyan >>> ls
backup_home.sh  data      Documents  Music     passwd    Public    snap      testfile  WebProject
clearlogs.sh   Desktop  Downloads  mylink    Pictures  Riyan.txt Templates Videos
Riyan >>> ls /
backups      bin      bin.usr-is-merged  boot      cdrom     dev       etc       home      lib64      lib.usr-is-merged  lost+found  media  mnt      opt      proc      root      run      sbin      sbin.usr-is-merged  srv      sys      tmp      usr      var
Riyan >>>
```

```
rvu@rvu-OptiPlex-SFF-7020:~$ cd 123
rvu@rvu-OptiPlex-SFF-7020:~/123$ cd ..
rvu@rvu-OptiPlex-SFF-7020:~$ rmdir 123
rvu@rvu-OptiPlex-SFF-7020:~$ mkdir 456
rvu@rvu-OptiPlex-SFF-7020:~$ cd 456
rvu@rvu-OptiPlex-SFF-7020:~/456$ mkdir 123
rvu@rvu-OptiPlex-SFF-7020:~/456$ cd 123
rvu@rvu-OptiPlex-SFF-7020:~/456/123$ mkdir 789
rvu@rvu-OptiPlex-SFF-7020:~/456/123$ cd 789
rvu@rvu-OptiPlex-SFF-7020:~/456/123/789$
```

```
rvu@rvu-OptiPlex-SFF-7020:~/456/123/789$ cd ..
rvu@rvu-OptiPlex-SFF-7020:~/456/123$ cd ..
rvu@rvu-OptiPlex-SFF-7020:~/456$ cd ..
rvu@rvu-OptiPlex-SFF-7020:~$ mkdir -p 456/123/789
rvu@rvu-OptiPlex-SFF-7020:~$ cd 456
rvu@rvu-OptiPlex-SFF-7020:~/456$ cd 123
rvu@rvu-OptiPlex-SFF-7020:~/456/123$ cd 789
rvu@rvu-OptiPlex-SFF-7020:~/456/123/789$ touch test
rvu@rvu-OptiPlex-SFF-7020:~/456/123/789$ ls
test
rvu@rvu-OptiPlex-SFF-7020:~/456/123/789$ ls -l
total 0
-rw-rw-r-- 1 rvu rvu 0 Jan 30 11:33 test
rvu@rvu-OptiPlex-SFF-7020:~/456/123/789$
```


Lab 4:

Aim: Creating and Managing User Accounts

Commands used:

- `sudo adduser username`
- `sudo passwd username`
- `cat /etc/passwd`
- `sudo deluser username`

Usage:

1. `sudo adduser username` -creates a new user

```
rvu@rvu-OptiPlex-SFF-7020:~$ sudo adduser rvu7
[sudo] password for rvu:
info: Adding user `rvu7' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `rvu7' (1001) ...
info: Adding new user `rvu7' (1001) with group `rvu7 (1001)' ...
info: Creating home directory `/home/rvu7' ...
info: Copying files from `/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for rvu7
Enter the new value, or press ENTER for the default
    Full Name []: Rv_university
    Room Number []: 504
    Work Phone []: 080
    Home Phone []: 12345678
    Other []: --
Is the information correct? [Y/n] y
info: Adding new user `rvu7' to supplemental / extra groups `users' ...
info: Adding user `rvu7' to group `users' ...
rvu@rvu-OptiPlex-SFF-7020:~$
```

1. `sudo passwd username` - set or change the password

```
rvu@rvu-OptiPlex-SFF-7020:~$ sudo passwd rvu7
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
rvu@rvu-OptiPlex-SFF-7020:~$
```

2. `cat /etc/passwd` –displays content of all users present on the system

```
rvu@rvu-OptiPlex-SFF-7020:~$ cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
_apt:x:42:65534::/nonexistent:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management:/:/usr/sbin/nologin
systemd-timesync:x:996:996:systemd Time Synchronization:/:/usr/sbin/nologin
dhcpcd:x:100:65534:DHCP Client Daemon,,,:/usr/lib/dhcpcd:/bin/false
messagebus:x:101:101::/nonexistent:/usr/sbin/nologin
syslog:x:102:102::/nonexistent:/usr/sbin/nologin
systemd-resolve:x:991:991:systemd Resolver:/:/usr/sbin/nologin
uidd:x:103:103::/run/uidd:/usr/sbin/nologin
usbmux:x:104:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
tss:x:105:105:TPM software stack,,,:/var/lib/tpm:/bin/false
systemd-oom:x:990:990:systemd Userspace OOM Killer:/:/usr/sbin/nologin
kernoops:x:106:65534:Kernel Oops Tracking Daemon,,,:/usr/sbin/nologin
whoopsie:x:107:109::/nonexistent:/bin/false
dnsmasq:x:999:65534:dnsmasq:/var/lib/misc:/usr/sbin/nologin
avahi:x:108:111:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin
tcpdump:x:109:112::/nonexistent:/usr/sbin/nologin
sssd:x:110:113:SSSD system user,,,:/var/lib/sss:/usr/sbin/nologin
speech-dispatcher:x:111:29:Speech Dispatcher,,,:/run/speech-dispatcher:/bin/false
cups-pk-helper:x:112:114:user for cups-pk-helper service,,,:/nonexistent:/usr/sbin/nologin
```

3. sudo deluser username –deletes the user

```
rvu@rvu-OptiPlex-SFF-7020:~$ sudo deluser rvu7
info: Removing crontab ...
info: Removing user `rvu7' ...
rvu@rvu-OptiPlex-SFF-7020:~$ ls /home/rvu7
ls: cannot open directory '/home/rvu7': Permission denied
rvu@rvu-OptiPlex-SFF-7020:~$ sudo deluser --remove-home rvu7
fatal: The user `rvu7' does not exist.
rvu@rvu-OptiPlex-SFF-7020:~$
```



```
~: bash -- Konsole
New Tab Split View
Copy Paste Find

Riyan >>> sudo adduser username
[sudo] password for Riyan:
info: Adding user 'username' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'username' (1001) ...
info: Adding new user 'username' (1001) with group 'username (1001)' ...
info: Creating home directory '/home/username' ...
info: Copying files from '/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for username
Enter the new value, or press ENTER for the default
    Full Name []: RiyanShrestha
    Room Number []: 2
    Work Phone []: 9611302767
    Home Phone []: 0000000000
    Other []: 0
Is the information correct? [Y/n] Y
info: Adding new user 'username' to supplemental / extra groups 'users' ...
info: Adding user 'username' to group 'users' ...
Riyan >>> sudo passwd username
New password:
Retype new password:
passwd: password updated successfully
Riyan >>> sudo deluser username
info: Removing crontab ...
info: Removing user 'username' ...
Riyan >>> 
```

Lab 5:

Aim: Writing Basic Shell Scripts

Commands used:

- vim script_name.sh
- nano script_name.sh

Usage:

1. vim Backup.sh –copies all .c files into a zipped Backup folder

```
#!/bin/bash

#Create a directory called "Backup" in Documents folder
mkdir ~/Documents/Backup

#Copy all .c files into the folder
cp *.c ~/Documents/Backup/

#'cd' into Documents folder
cd ~/Documents

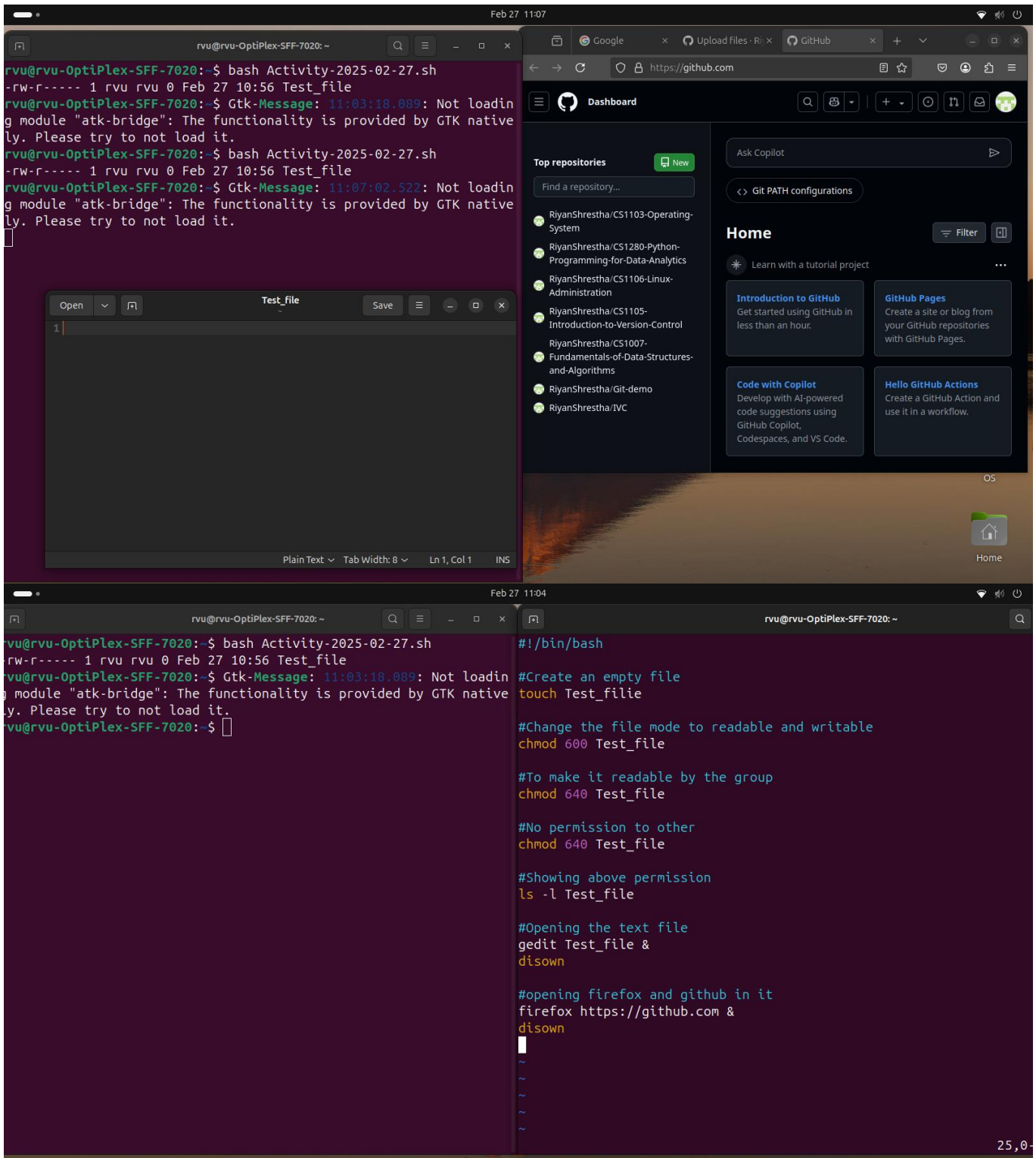
#Create a tar.gz file using tar command
tar -czf Backup.tar.gz Backup/

#Delete the "Backup" folder
rm -rf ~/Documents/Backup
```

2. nano sysinfo.sh –displays basic information

```
#!/bin/bash

date
who
uptime
free -h
```



Lab 6:

Aim: Mounting and Formatting USB Drives

```
Mar 27 09:48
rvu@rvu-OptiPlex-SFF-7020: ~
rvu@rvu-OptiPlex-SFF-7020:~$ udiskctl unmount -b /dev/sda1
Error unmounting /dev/sda1: GDBus.Error:org.freedesktop.UDisks2.Error.DeviceBusy: Error unmounting /dev/sda1: target is busy
rvu@rvu-OptiPlex-SFF-7020:~$ udiskctl unmount -b /dev/sda1
Unmounted /dev/sda1.
rvu@rvu-OptiPlex-SFF-7020:~$ udiskctl mount -b /dev/sda1
Mounted /dev/sda1 at /media/rvu/RIYAN
rvu@rvu-OptiPlex-SFF-7020:~$ udiskctl unmount -b /dev/sda1
Unmounted /dev/sda1.
rvu@rvu-OptiPlex-SFF-7020:~$ sudo mount /dev/sda1
[sudo] password for rvu:
mount: /dev/sda1: can't find in /etc/fstab.
rvu@rvu-OptiPlex-SFF-7020:~$ sudo mount /dev/sda1/mnt
mount: /dev/sda1/mnt: can't find in /etc/fstab.
rvu@rvu-OptiPlex-SFF-7020:~$ sudo mount /dev/sda1 /mnt
rvu@rvu-OptiPlex-SFF-7020:~$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
tmpfs            1605256      2296   1602960    1% /run
/dev/nvme0n1p6 153707984 17130044 128697236   12% /
tmpfs            8026276        0   8026276    0% /dev/shm
tmpfs            5120         8     5112    1% /run/lock
efivarfs         438         279     154   65% /sys/firmware/efi/efivars
/dev/nvme0n1p1  303104    178868   124236   60% /boot/efi
tmpfs            1605252     136   1605116    1% /run/user/1000
/dev/sda1       15214592     32  15214560    1% /mnt
rvu@rvu-OptiPlex-SFF-7020:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs            1.6G  2.3M  1.6G   1% /run
/dev/nvme0n1p6  147G  17G  123G  12% /
tmpfs            7.7G   0  7.7G   0% /dev/shm
tmpfs            5.0M  8.0K  5.0M   1% /run/lock
efivarfs         438K  279K  154K  65% /sys/firmware/efi/efivars
/dev/nvme0n1p1  296M  175M  122M  60% /boot/efi
tmpfs            1.6G  136K  1.6G   1% /run/user/1000
/dev/sda1        15G   32K   15G   1% /mnt
rvu@rvu-OptiPlex-SFF-7020:~$ sudo umount /dev/sda1
rvu@rvu-OptiPlex-SFF-7020:~$
```

```
Mar 27 10:09
rvu@rvu-OptiPlex-SFF-7020: ~
rvu@rvu-OptiPlex-SFF-7020:~$ touch VirtualDrive
rvu@rvu-OptiPlex-SFF-7020:~$ dd if=/dev/zero of=VirtualDrive bs=4096 count=1000
1000+0 records in
1000+0 records out
4096000 bytes (4.1 MB, 3.9 MiB) copied, 0.0140637 s, 291 MB/s
rvu@rvu-OptiPlex-SFF-7020:~$ mkfs.vfat -F 32 VirtualDrive -n Test
mkfs.fat 4.2 (2021-01-31)
mkfs.fat: Warning: lowercase labels might not work properly on some systems
WARNING: Number of clusters for 32 bit FAT is less then suggested minimum.
rvu@rvu-OptiPlex-SFF-7020:~$ ls
Desktop  'Final Lab Manual.pdf'  OS  Python  Screenshots  snap  VirtualDrive
rvu@rvu-OptiPlex-SFF-7020:~$
```

Mar 27 09:58

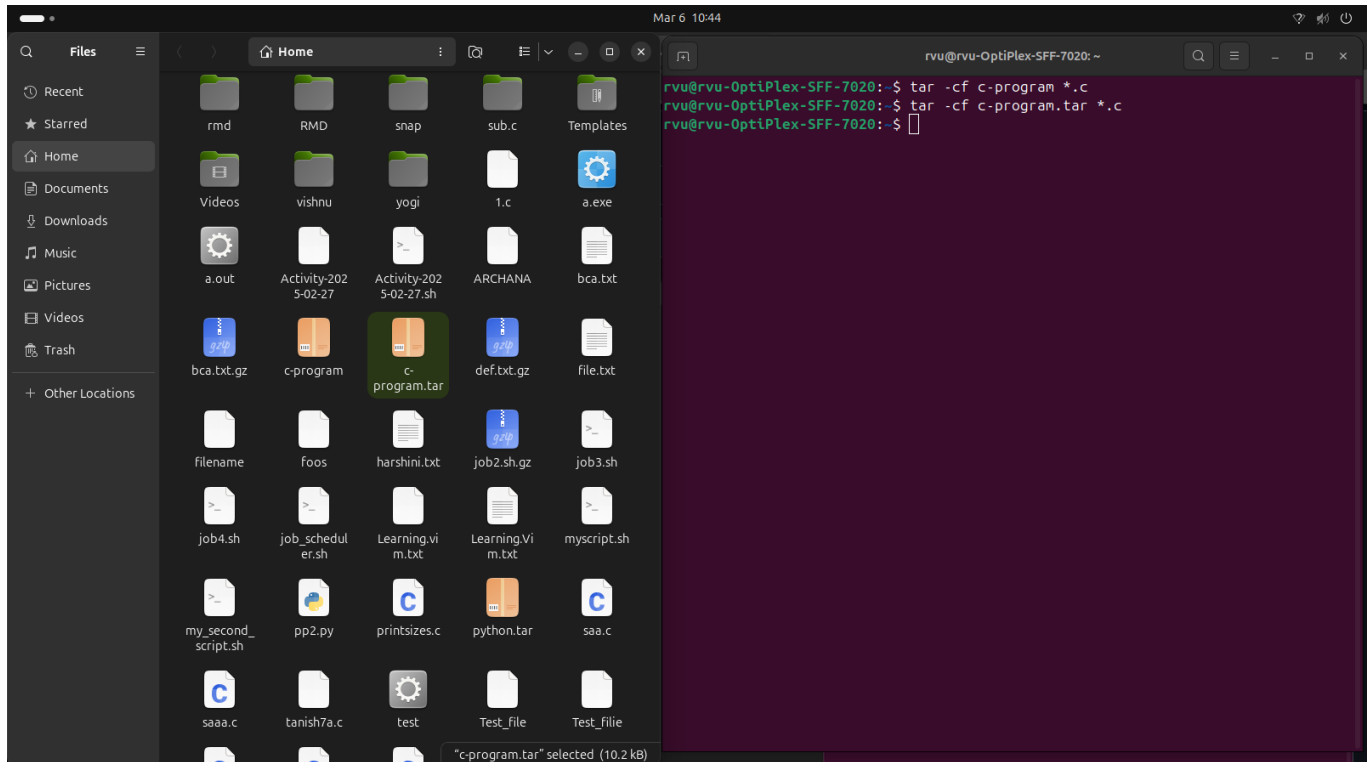
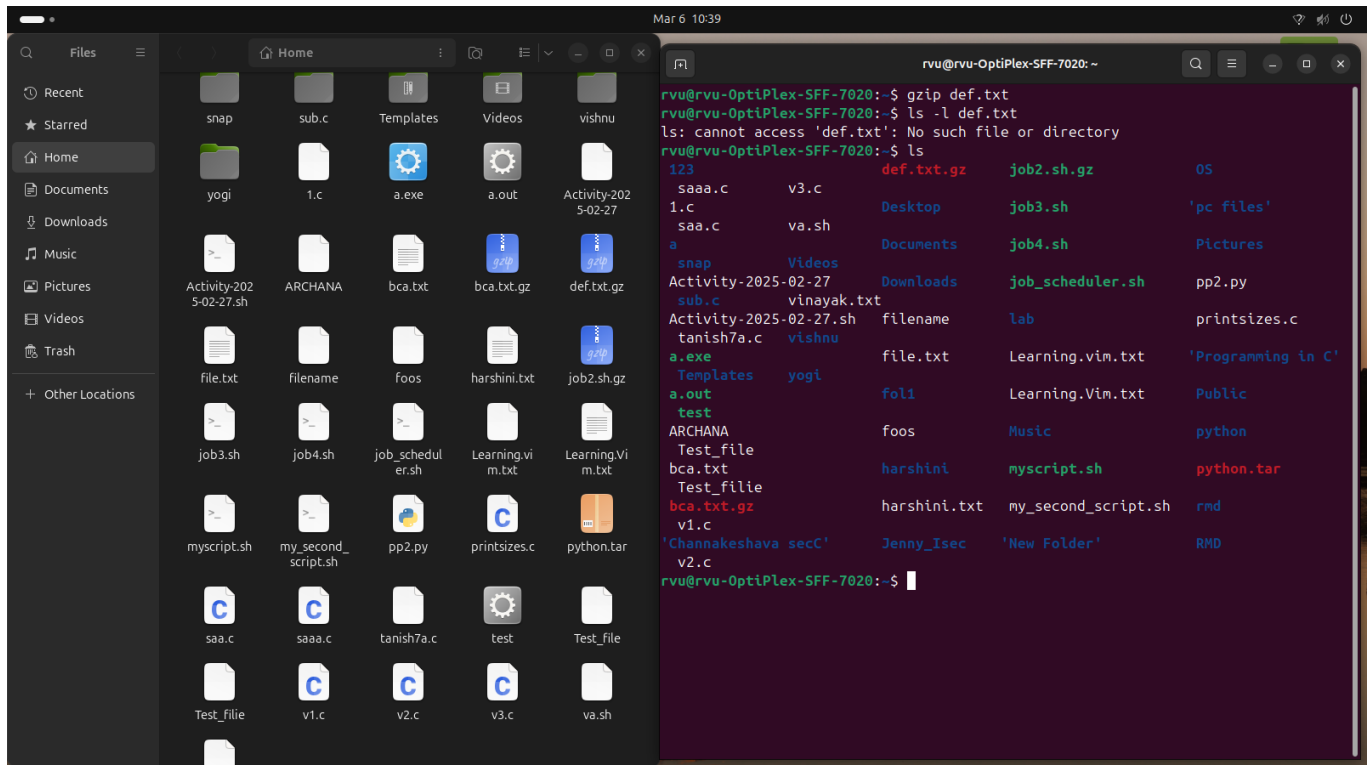


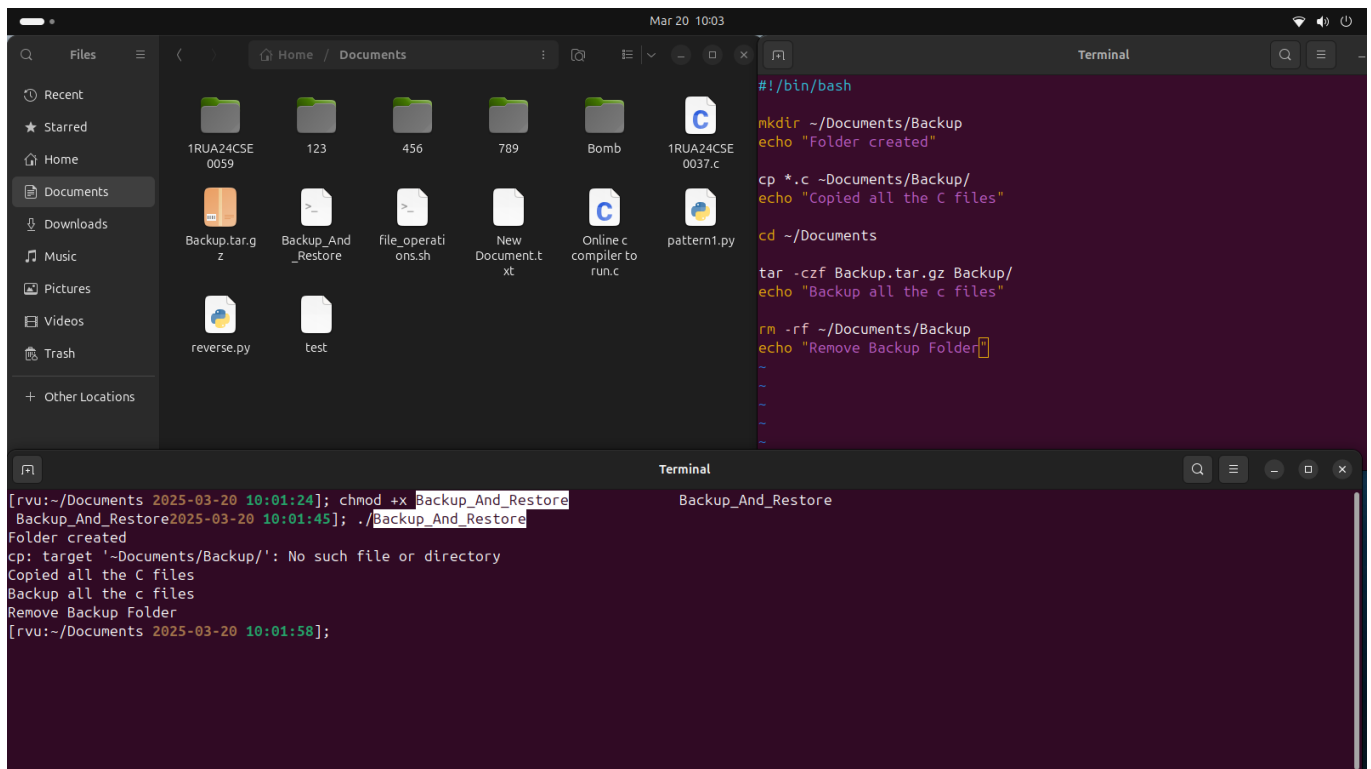
rvu@rvu-OptiPlex-SFF-7020: ~

```
rvu@rvu-OptiPlex-SFF-7020:~$ sudo mkfs.vfat -F 32 /dev/sda1 -n "Test drive"
mkfs.fat 4.2 (2021-01-31)
mkfs.fat: Warning: lowercase labels might not work properly on some systems
rvu@rvu-OptiPlex-SFF-7020:~$
```

Lab 7:

Aim: Backing Up and Compressing Files





```
1  #!/bin/bash
2
3  # Define the archive name
4  ARCHIVE_NAME="log_backup_$(date +%F).tar.gz"
5
6  # Create and compress the tar archive
7  tar -czf $ARCHIVE_NAME /var/log
8
9  # List the created archive
10 echo "Created archive:"
11 ls -lh $ARCHIVE_NAME
```

```
~: bash — Konsole
New Tab Split View
Copy Paste Find

Riyan >>> vim compress.sh
Riyan >>> chmod +x compress.sh
Riyan >>> ./compress.sh
tar: Removing leading `/' from member names
tar: /var/log/boot.log.1: Cannot open: Permission denied
tar: /var/log/speech-dispatcher: Cannot open: Permission denied
tar: /var/log/installer/curtin-install/subiquity-curthooks.conf: Cannot open: Permission denied
tar: /var/log/installer/curtin-install/subiquity-partitioning.conf: Cannot open: Permission denied
tar: /var/log/installer/curtin-install/subiquity-extract.conf: Cannot open: Permission denied
tar: /var/log/installer/curtin-install/subiquity-curtin-apt.conf: Cannot open: Permission denied
tar: /var/log/installer/curtin-install/subiquity-initial.conf: Cannot open: Permission denied
tar: /var/log/installer/installer-journal.txt: Cannot open: Permission denied
tar: /var/log/installer/autoinstall-user-data: Cannot open: Permission denied
tar: /var/log/installer/cloud-init-output.log: Cannot open: Permission denied
tar: /var/log/installer/subiquity-server-info.log.3542: Cannot open: Permission denied
tar: /var/log/installer/subiquity-server-debug.log.3542: Cannot open: Permission denied
tar: /var/log/installer/cloud-init.log: Cannot open: Permission denied
tar: /var/log/boot.log.3: Cannot open: Permission denied
tar: /var/log/gdm3: Cannot open: Permission denied
tar: /var/log/btmp: Cannot open: Permission denied
tar: /var/log/btmp.1: Cannot open: Permission denied
tar: /var/log/boot.log.4: Cannot open: Permission denied
tar: /var/log/sssd: Cannot open: Permission denied
tar: /var/log/private: Cannot open: Permission denied
tar: /var/log/boot.log: Cannot open: Permission denied
tar: /var/log/boot.log.2: Cannot open: Permission denied
tar: Exiting with failure status due to previous errors
Created archive:
-rw-rw-r-- 1 Riyan Riyan 27M Apr  3 10:10 log_backup_2025-04-03.tar.gz
```


Lab 8:

Aim: Managing User and Group Permissions and Communication Utilities

The image displays two windows from a desktop environment. The top window is a terminal with a dark purple background, showing a series of commands and their outputs. The bottom window is a web browser displaying the GitHub dashboard.

Terminal Window:

```
#!/bin/bash

#Create an empty file
touch Test_file

#Change the file mode to readable and writable
chmod 600 Test_file

#To make it readable by the group
chmod 640 Test_file

#No permission to other
chmod 640 Test_file

#Showing above permission
ls -l Test_file

#Opening the text file
gedit Test_file &
disown

#opening firefox and github in it
firefox https://github.com &
disown
```

The terminal output shows the file `Test_file` being created with permissions `-rw-r-----`. It also shows two `Gtk-Message` warnings about the `atk-bridge` module not loading.

Web Browser Window:

The browser shows the GitHub dashboard at `https://github.com`. The dashboard includes a sidebar with "Top repositories" and a main content area with "Home" and "Introduction to GitHub" sections.

```
rvu@rvu-OptiPlex-SFF-7020: ~  
rvu@rvu-OptiPlex-SFF-7020:~$ bash Activity-2025-02-27.sh  
rw-r----- 1 rvu rvu 0 Feb 27 10:56 Test_file  
rvu@rvu-OptiPlex-SFF-7020:~$ Gtk-Message: 11:03:18.089: Not loading module "atk-bridge": The functionality is provided by GTK native  
y. Please try to not load it.  
rvu@rvu-OptiPlex-SFF-7020:~$  
#!/bin/bash  
#Create an empty file  
touch Test_file  
#Change the file mode to readable and writable  
chmod 600 Test_file  
#To make it readable by the group  
chmod 640 Test_file  
#No permission to other  
chmod 640 Test_file  
#Showing above permission  
ls -l Test_file  
#Opening the text file  
gedit Test_file &  
disown  
#opening firefox and github in it  
firefox https://github.com &  
disown  
~  
~  
~  
~  
~  
25,0-
```

Lab 9:

Aim: Process Management

Commands used:

- ps aux
- top
- pidof
- pkill

Usage:

1. ps aux –displays detailed information of all running processes

```
rvu@rvu-OptiPlex-SFF-7020:~$ ps aux
```

USER	PID	%CPU	%MEM	VSZ	RSS	TTY	STAT	START	TIME	COMMAND
root	1	0.0	0.0	23548	13956	?	Ss	09:40	0:01	/sbin/init splash
root	2	0.0	0.0	0	0	?	S	09:40	0:00	[kthreadd]
root	3	0.0	0.0	0	0	?	S	09:40	0:00	[pool_workqueue_release]
root	4	0.0	0.0	0	0	?	I<	09:40	0:00	[kworker/R-rcu_gp]
root	5	0.0	0.0	0	0	?	I<	09:40	0:00	[kworker/R-sync_wq]
root	6	0.0	0.0	0	0	?	I<	09:40	0:00	[kworker/R-slub_flushwq]
root	7	0.0	0.0	0	0	?	I<	09:40	0:00	[kworker/R-netns]
root	9	0.0	0.0	0	0	?	I<	09:40	0:00	[kworker/0:0H-events_highpri]
root	10	0.0	0.0	0	0	?	I	09:40	0:00	[kworker/0:1-events]
root	12	0.0	0.0	0	0	?	I<	09:40	0:00	[kworker/R-mm_percpu_wq]
root	13	0.0	0.0	0	0	?	I	09:40	0:00	[rcu_tasks_kthread]
root	14	0.0	0.0	0	0	?	I	09:40	0:00	[rcu_tasks_rude_kthread]
root	15	0.0	0.0	0	0	?	I	09:40	0:00	[rcu_tasks_trace_kthread]
root	16	0.0	0.0	0	0	?	S	09:40	0:00	[ksoftirqd/0]
root	17	0.1	0.0	0	0	?	I	09:40	0:05	[rcu_preempt]
root	18	0.0	0.0	0	0	?	S	09:40	0:00	[rcu_exp_par_gp_kthread_worker/1]
root	19	0.0	0.0	0	0	?	S	09:40	0:00	[rcu_exp_gp_kthread_worker]
root	20	0.0	0.0	0	0	?	S	09:40	0:00	[migration/0]
root	21	0.0	0.0	0	0	?	S	09:40	0:00	[idle_inject/0]
root	22	0.0	0.0	0	0	?	S	09:40	0:00	[cpuhp/0]
root	23	0.0	0.0	0	0	?	S	09:40	0:00	[cpuhp/2]
root	24	0.0	0.0	0	0	?	S	09:40	0:00	[idle_inject/2]
root	25	0.0	0.0	0	0	?	S	09:40	0:00	[migration/2]
root	26	0.0	0.0	0	0	?	S	09:40	0:00	[ksoftirqd/2]
root	28	0.0	0.0	0	0	?	I<	09:40	0:00	[kworker/2:0H-events_highpri]
root	29	0.0	0.0	0	0	?	S	09:40	0:00	[cpuhp/4]
root	30	0.0	0.0	0	0	?	S	09:40	0:00	[idle_inject/4]
root	31	0.0	0.0	0	0	?	S	09:40	0:00	[migration/4]
root	32	0.0	0.0	0	0	?	S	09:40	0:00	[ksoftirqd/4]
root	34	0.0	0.0	0	0	?	I<	09:40	0:00	[kworker/4:0H-events_highpri]
root	35	0.0	0.0	0	0	?	S	09:40	0:00	[cpuhp/6]
root	36	0.0	0.0	0	0	?	S	09:40	0:00	[idle_inject/6]
root	37	0.0	0.0	0	0	?	S	09:40	0:00	[migration/6]
root	38	0.0	0.0	0	0	?	S	09:40	0:00	[ksoftirqd/6]
root	40	0.0	0.0	0	0	?	I<	09:40	0:00	[kworker/6:0H-events_highpri]

2. top –provides real-time, dynamic view of system's processes & resource usage


```
top - 10:45:55 up 1:04, 1 user, load average: 0.18, 0.28, 0.22
Tasks: 382 total, 1 running, 381 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.2 us, 0.2 sy, 0.0 ni, 99.6 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 15676.3 total, 10369.4 free, 3779.4 used, 2626.5 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used. 11896.9 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
864	root	-51	0	0	0	0	S	3.3	0.0	1:59.89	irq/172-rtw89_pci
2378	rvu	20	0	4993800	312952	131164	S	1.7	1.9	1:30.68	gnome-shell
967	avahi	20	0	13804	8404	3604	S	1.0	0.1	0:37.51	avahi-daemon
8461	rvu	20	0	559004	57208	45280	S	1.0	0.4	0:01.39	gnome-terminal-
5610	rvu	20	0	3268956	763192	123992	S	0.7	4.8	0:45.56	Isolated Web Co
17	root	20	0	0	0	0	I	0.3	0.0	0:05.84	rcu_preempt
1179	root	20	0	336712	18212	15812	S	0.3	0.1	0:21.79	NetworkManager
4649	rvu	20	0	12.2g	572804	279856	S	0.3	3.6	2:12.12	firefox
6333	rvu	20	0	2681272	274360	118500	S	0.3	1.7	0:20.67	Isolated Web Co
7039	root	20	0	0	0	0	I	0.3	0.0	0:01.01	kworker/u80:3-phy0
7449	rvu	20	0	2109316	165576	101484	S	0.3	1.0	0:04.87	nautilus
1	root	20	0	23548	13956	9316	S	0.0	0.1	0:01.57	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	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-slub_flushwq
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
9	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-events_highpri
10	root	20	0	0	0	0	I	0.0	0.0	0:00.39	kworker/0:1-mm_percpu_wq
12	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-mm_percpu_wq
13	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks_kthread
14	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks_rude_kthread
15	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks_trace_kthread
16	root	20	0	0	0	0	S	0.0	0.0	0:00.06	ksoftirqd/0
18	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_exp_par_gp_kthread_worker/1
19	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_exp_gp_kthread_worker
20	root	rt	0	0	0	0	S	0.0	0.0	0:00.03	migration/0
21	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/0
22	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0

3. pidof –find the process ID
pkill –kill processes by name

```
rvu@rvu-OptiPlex-SFF-7020: ~
python3
Python 3.12.3 (main, Feb 4 2025, 14:48:35) [GCC 13.3.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> Terminated
rvu@rvu-OptiPlex-SFF-7020: ~
pkill python3
rvu@rvu-OptiPlex-SFF-7020: ~
nautilus &
[1] 5202
rvu@rvu-OptiPlex-SFF-7020: ~ ** Message: 10:09:27.070: Connecting to org.freedesktop.Tracker3.Miner.Files
^C
[1]+ Done nautilus
rvu@rvu-OptiPlex-SFF-7020: ~
kill 5202
bash: kill: (5202) - No such process
rvu@rvu-OptiPlex-SFF-7020: ~
pidof nautilus
2924
rvu@rvu-OptiPlex-SFF-7020: ~
kill 2924
rvu@rvu-OptiPlex-SFF-7020: ~
```

Lab 10:

Aim: Disk Space Management

Commands used:

- `df -h`

Usage:

`df -h` –shows how much disk space is used and available

```
rvu@rvu-OptiPlex-SFF-7020:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs           1.6G  2.3M   1.6G   1% /run
/dev/nvme0n1p6  147G   15G  125G  11% /
tmpfs           7.7G    0   7.7G   0% /dev/shm
tmpfs           5.0M   8.0K   5.0M   1% /run/lock
efivarfs        438K  196K   238K  46% /sys/firmware/efi/efivars
/dev/nvme0n1p1  296M  175M  122M  60% /boot/efi
tmpfs           1.6G  132K   1.6G   1% /run/user/1000
rvu@rvu-OptiPlex-SFF-7020:~$
```