

Linux Systems

Introduction to Linux:

Basics of Linux:

Contents:

1. Introduction to Linux
2. Basic CLI Commands
3. Understanding files in Linux
4. Filters & Redirection
5. Users & Groups
6. Sudo
7. Software Management
8. Services & Processes
9. Good to Know Commands for Devops
10. Server Management

There are Basically four areas to work on Linux

01. Commands – Syntax, helps & lots of commands
02. Files – Understanding, Editing, Filtering & Security
03. Software – Management
04. Server – Management

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Open Source:

Open-Source Software is the Software with source code that anyone can inspect, modify and enhance.

Linux Origins

- **1984: The GNU Projects and the Free Software Foundations**
 - Creates open-source versions of Unix Utilities
 - Creates the General Public License
 - a. Software License enforcing open-source principles
- **1991: Linus Torvalds**
 - Creates an open-source UNIX – Like Kernel, released under the GPL
 - Ports some GNU utilities, Solicits assistance online

Today:

- Linux Kernel + GNU Utilities = Complete, Open-Source Unix Like OS
- Packaged for target audiences for Distribution

Linux Principles

- Everything is a File (Including Hardware)
- Small Single Purpose Programs
- Ability of Change the Programs for Complex Operations
- Avoid Captive User Interface
- Configuration data stored in text file

Why Linux?

- It is an open source
- Community Support
- Support Wide Variety of Hardware
- Customization
- Most of Servers run on Linux
- Automation
- Security

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Saif Panjesha
Owner

Architecture of Linux

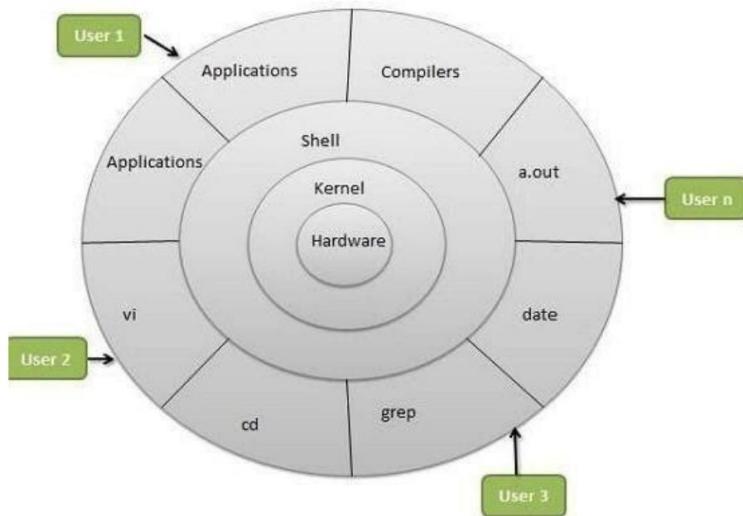


Fig. Linux Architecture

Popular Linux Distros

- **Popular Desktop Linux OS**

- Ubuntu Linux
- Linux Mint
- Arch Linux
- Fedora
- Debian
- OpenSUSE

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- **Popular Server Linux OS**

- Red Hat Enterprise Linux
- Ubuntu Server
- CentOS
- SUSE Enterprise Linux

Most used Linux distros currently in IT Industry

RPM Based: **RHEL, Oracle Linux & Centos**

Debian Based: **Ubuntu Server, Kali Server**

Some Important Directories

- **Home Directories:** /root, /home/username
- **User Executables:** /bin, /usr/bin, /usr/local/bin
- **System Executables:** /sbin, /usr/sbin, /usr/local/sbin
- **Other Mountpoint:** /media, /mnt
- **Configuration:** /etc
- **Temporary Files:** /tmp
- **Kernels & Bootloaders:** /boot
- **Server Data:** /var, /srv
- **System Information:** /proc, /sys
- **Shared Libraries:** /lib, /usr/lib, /usr/local/lib

Command and File Systems

```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ whoami
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ pwd
Administrator: PowerShell /home/saifshah_ubuntu
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ ls
Administrator: PowerShell Desktop Documents Downloads Files Music Pictures Public Templates Videos thinclient_drives
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ cat /etc/os-release
NAME="Ubuntu"
VERSION="20.04.4 LTS (Focal Fossa)"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 20.04.4 LTS"
VERSION_ID="20.04"
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"
VERSION_CODENAME=focal
UBUNTU_CODENAME=focal
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ sudo -i
[sudo] password for saifshah_ubuntu:
Welcome to Ubuntu 20.04.4 LTS (GNU/Linux 5.10.16.3-microsoft-standard-WSL2 x86_64)

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

 System information as of Tue Jun  7 18:13:13 IST 2022

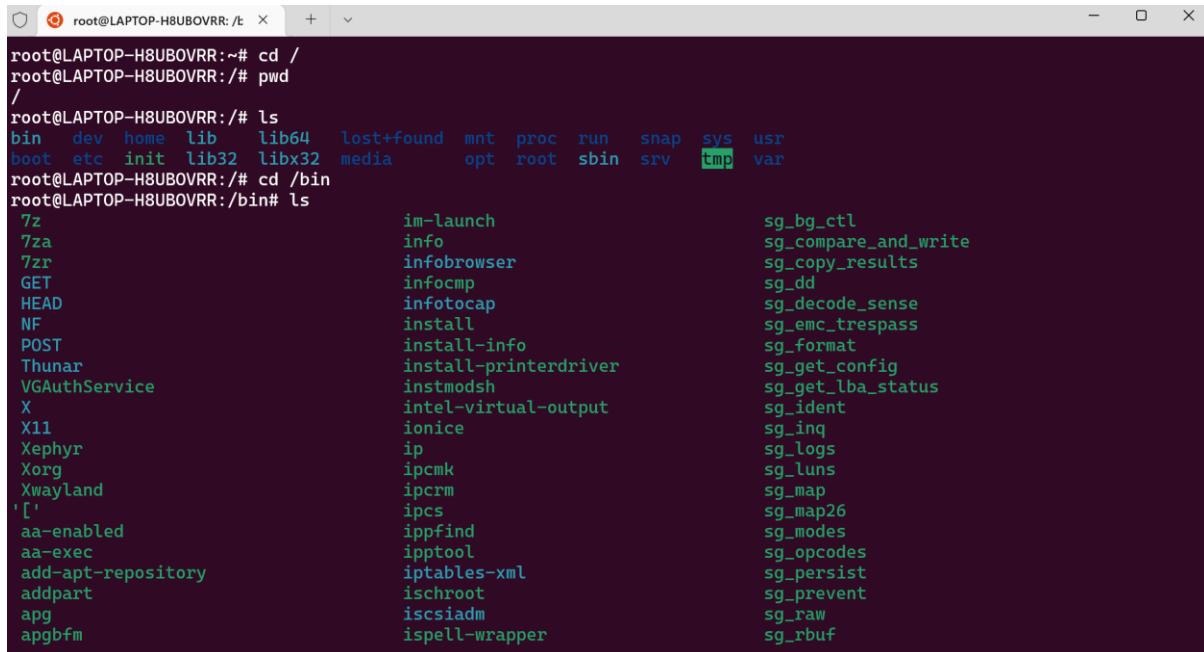
 System load: 0.0          Processes:      58
 Usage of /: 1.0% of 250.98GB   Users logged in:  0
 Memory usage: 20%           IPV4 address for eth0: 172.26.177.81
 Swap usage:  0%
 
 0 updates can be applied immediately.

 This message is shown once a day. To disable it please create the
 /root/.hushlogin file.
root@LAPTOP-H8UBOVRR:~# whoami
root@LAPTOP-H8UBOVRR:~# cd /
root@LAPTOP-H8UBOVRR:/# pwd
/
root@LAPTOP-H8UBOVRR:/# ls
bin  dev  home  lib  lib64  lost+found  mnt  proc  run  snap  sys  usr
boot etc  init  lib32  libx32  media     opt  root  sbin  srv  tmp  var
root@LAPTOP-H8UBOVRR:/#
```

Fig. Basics Commands

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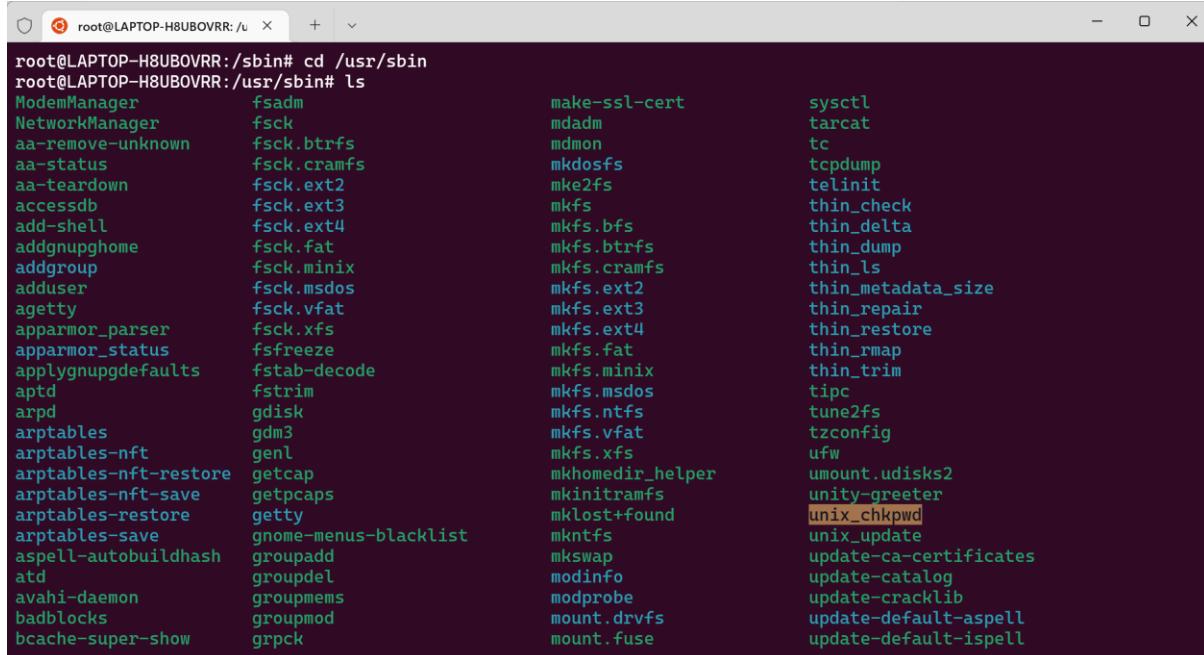
User Executables: /bin, /usr/bin, /usr/local/bin



```
root@LAPTOP-H8UBOVRR:~# cd /
root@LAPTOP-H8UBOVRR:/# pwd
/
root@LAPTOP-H8UBOVRR:/# ls
bin dev home lib lib64 lost+found mnt proc run snap sys usr
boot etc init lib32 libx32 media opt root sbin srv tmp var
root@LAPTOP-H8UBOVRR:/# cd /bin
root@LAPTOP-H8UBOVRR:/bin# ls
7z im-launch sg_bg_ctl
7za info sg_compare_and_write
7zr infobrowser sg_copy_results
GET infocmp sg_dd
HEAD infotocap sg_decode_sense
NF install sg_emc_trespass
POST install-info sg_format
Thunar install-printerdriver sg_get_config
VGAuthService instmodsh sg_get_lba_status
X intel-virtual-output sg_ident
X11 ionice sg_inq
Xephyr ip sg_logs
Xorg ipcwk sg_luns
Xwayland ipcrm sg_map
[' ipcs sg_map26
aa-enabled ippfind sg_modes
aa-exec ipptool sg_opcodes
add-apt-repository iptables-xml sg_persist
addpart ischroot sg_prevent
apg iscsiadm sg_raw
apgbfm ispell-wrapper sg_rbuf
```

Fig. User Executables

System Executables: /sbin, /usr/sbin, /usr/local/sbin



```
root@LAPTOP-H8UBOVRR:/sbin# cd /usr/sbin
root@LAPTOP-H8UBOVRR:/usr/sbin# ls
ModemManager fsadm make-ssl-cert sysctl
NetworkManager fsck mdadm tarcat
aa-remove-unknown fsck.btrfs mdmon tc
aa-status fsck.cramfs mkdosfs tcpdump
aa-teardown fsck.ext2 mke2fs telinit
accessdb fsck.ext3 mkfs thin_check
add-shell fsck.ext4 mkfs.bfs thin_delta
addgnupghome fsck.fat mkfs.btrfs thin_dump
addgroup fsck.minix mkfs.cramfs thin_ls
adduser fsck.msdos mkfs.ext2 thin_metadata_size
agetty fsck.vfat mkfs.ext3 thin_repair
apparmor_parser fsck.xfs mkfs.ext4 thin_restore
apparmor_status fsfreeze mkfs.fat thin_rmap
applygnupgdefaults fstab-decode mkfs.minix thin_trim
aptd fstrim mkfs.msdos tipc
arpd gdisk mkfs.ntfs tune2fs
arpTables gdm3 mkfs.vfat tzconfig
arpTables-nft genl mkfs.xfs ufw
arpTables-nft-restore getcap mkhomedir_helper umount.udisks2
arpTables-nft-save getcaps mkinitramfs unity-greeter
arpTables-restore getty mklost+found unix_chkpwd
arpTables-save gnome-menus-blacklist mkntfs unix_update
aspell-autobuildhash groupadd mkswap update-ca-certificates
atd groupdel modinfo update-catalog
avahi-daemon groupmems modprobe update-cracklib
badblocks groupmod mountdrvfs update-default-aspell
bcache-super-show grpck mount.fuse update-default-ispell
```

Fig. System Executables

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Configuration: /etc

```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR: ~ % cd /etc
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR: /etc$ ls
NetworkManager          fprintd.conf      lsb-release           rpc
PackageKit               fstab            ltrace.conf         rsyslog.conf
UPower                  fuse.conf        lvm                 rsyslog.d
X11                     fwupd            machine-id        rygel.conf
adduser.conf             gai.conf         magic                sane.d
alsa                    gdm3             geoclue             screenrc
alternatives            ghostscript       mailcap             security
apg.conf                ghostscript       mailcap.order      selinux
apparmor                glvnd            gnome               sensors.d
apparmor.d              gnome            group              sensors3.conf
apt                     groff            group-             services
at.deny                 grub.d           gshadow             sgml
avahi                  guest-session     gshadow-           shadow
bash.bashrc              gss              gtk-2.0            shadow-
bash_completion          gtk-3.0           guest-session     shells
bash_completion.d       host.conf         hostname           skel
bindresvport.blacklist   hosts            hosts              snmp
binfmt.d                hosts.allow       hosts.deny        sos
bluetooth               hosts            hosts.allow       ssh
byobu                   hosts.deny        hosts.deny        ssl
ca-certificates          hosts            hosts.deny        subgid
ca-certificates.conf    hosts            hosts.deny        subgid-
ca-certificates.conf.dpkg-old  hosts            hosts.deny        subuid
calendar               hosts            hosts.deny        subuid-
chatscripts            hosts            hosts.deny        sudoers
cloud                  hosts            hosts.deny        sudoers.d
cloud                  hosts.deny        hosts.deny        sysctl.conf
```

Fig. Configuration

```
saifshah_ubuntu@LAPTOP-H8UBOVRR:/etc$ cat
/etc/hostname
```

LAPTOP-H8UBOVRR

```
saifshah_ubuntu@LAPTOP-H8UBOVRR:/etc$ cd /tmp/
```

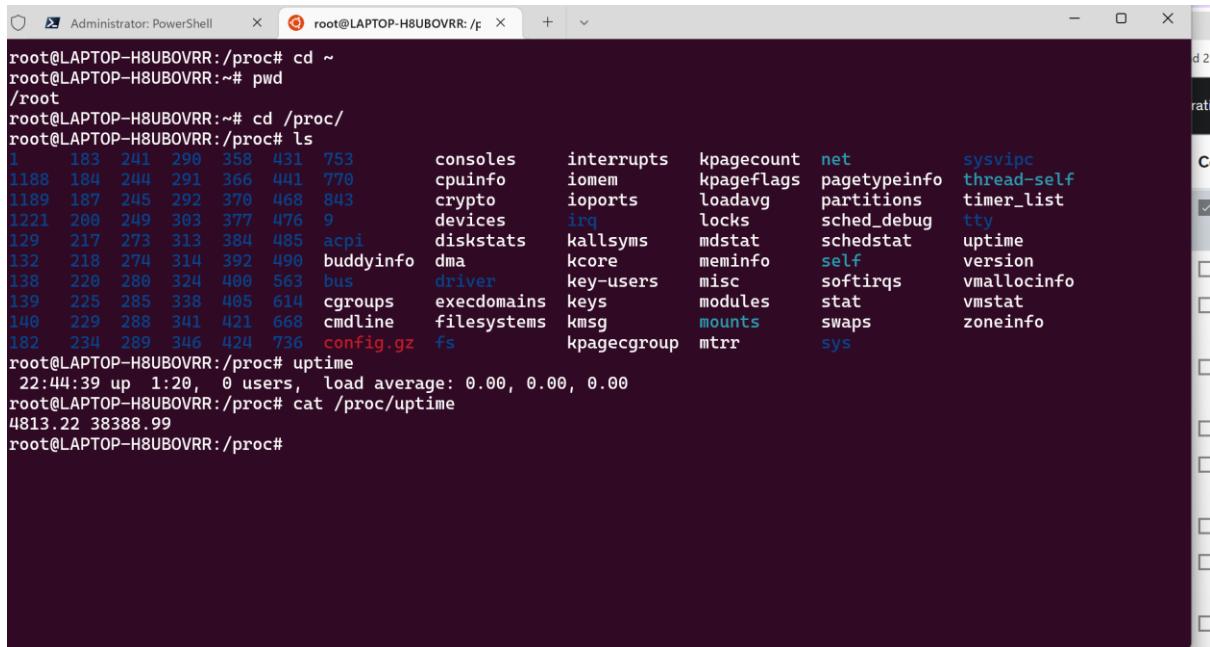
```
saifshah_ubuntu@LAPTOP-H8UBOVRR:/tmp$ ls
```

```
Temp-3e9ab343-1b3f-424b-b596-b9d0836a4786 ssh-
MLfaB9Iwy4kU ssh-Z7gY3c6CDnF7 ssh-r7C8ZJ5nt4HI
tmpoinmphoxpulse-PKdhtXMmr18n ssh-
Sr0LS7ijgWCQ ssh-fOExaGFZ42WE ssh-sW3dYgBkFVID
```

```
ssh-LTAzDJ4CwiiM          ssh-WULG7NyGwSQe ssh-
iShxOmGJWvkV tmpaddon
```

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System Information: /proc, /sys

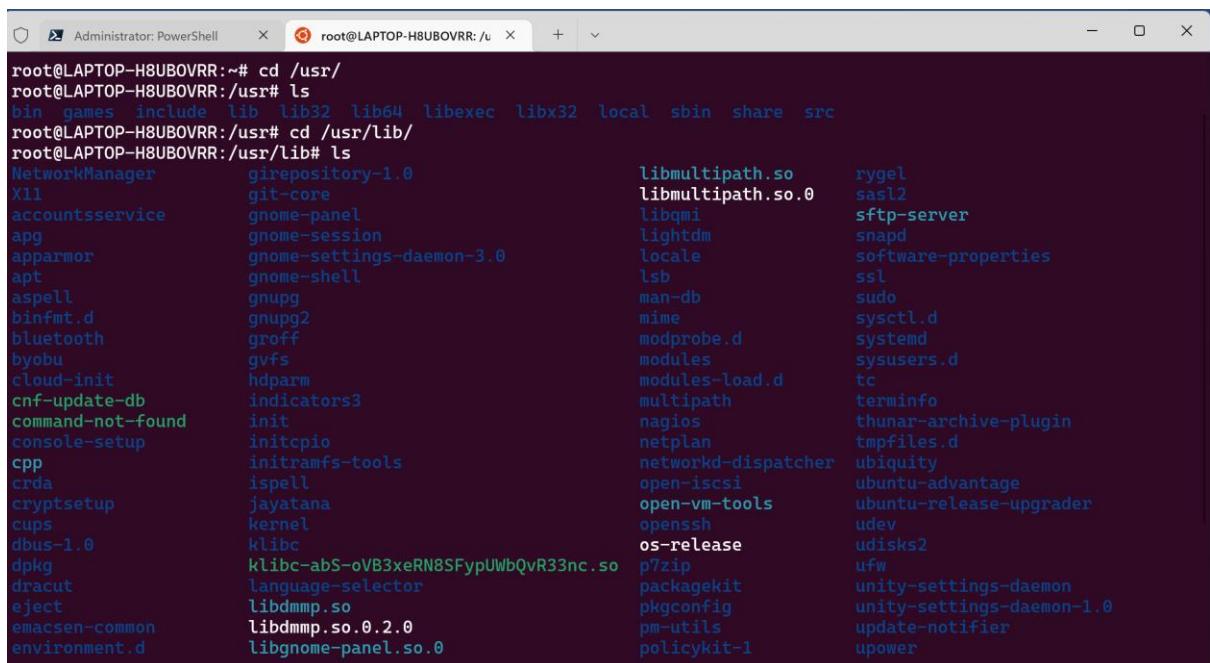


```
Administrator: PowerShell root@LAPTOP-H8UBOVRR:~# cd ~
root@LAPTOP-H8UBOVRR:~# pwd
/root
root@LAPTOP-H8UBOVRR:~# cd /proc/
root@LAPTOP-H8UBOVRR:/proc# ls
1 183 241 290 358 431 753      consoles    interrupts   kpagecount net      sysvipc
1188 184 244 291 366 441 770      cpuinfo     iomem      kpageflags pagetypeinfo thread-self
1189 187 245 292 370 468 843      crypto      ioports   loadavg    partitions timer_list
1221 200 249 303 377 476 9       devices     irq       locks      sched_debug tty
129 217 273 313 384 485 acpi    diskstats kallsyms mdstat    schedstat uptime
132 218 274 314 392 490 buddyinfo dma      kcore    meminfo   self      version
138 220 280 324 400 563 bus     driver    key-users misc     softirqs  vmallocinfo
139 225 285 338 405 614 cgroups execdomains keys     modules  stat      vmstat
140 229 288 341 421 668 cmdline filesystems kmsg     mounts  swaps    zoneinfo
182 234 289 346 424 736 config.gz fs      kpagecgrou mtrr      sys

root@LAPTOP-H8UBOVRR:/proc# uptime
22:44:39 up 1:20, 0 users, load average: 0.00, 0.00, 0.00
root@LAPTOP-H8UBOVRR:/proc# cat /proc/uptime
4813.22 38388.99
root@LAPTOP-H8UBOVRR:/proc#
```

Fig. System Information

Shared Libraries: /lib, /usr/lib, /usr/local/lib



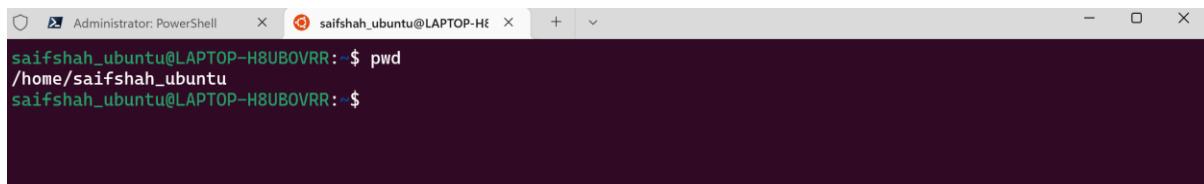
```
Administrator: PowerShell root@LAPTOP-H8UBOVRR:~# cd /usr/
root@LAPTOP-H8UBOVRR:/usr# ls
bin games include lib lib32 lib64 libexec libx32 local sbin share src
root@LAPTOP-H8UBOVRR:/usr# cd /usr/lib/
root@LAPTOP-H8UBOVRR:/usr/lib# ls
NetworkManager girepository-1.0          libmultipath.so    rygel
X11             git-core                  libmultipath.so.0  sasl2
accountsservice gnome-panel              libqmi           sftp-server
apg              gnome-session            lightdm          snapd
apparmor        gnome-settings-daemon-3.0 locale           software-properties
apt              gnome-shell               lsb              ssl
aspell           gnupg                   mime             sudo
binfmt.d        gnupg2                  modprobe.d     sysctl.d
bluetooth       groff                  modules         systemd
byobu            gvfs                   modules-load.d  sysusers.d
cloud-init     hdparm                  multipath      tc
cnf-update-db   indicators3           nagios          terminfo
command-not-found init                  netplan        thunar-archive-plugin
console-setup   initcpio                networkd-dispatcher ubiquity
cpp              initramfs-tools        open-iscsi      ubuntu-adantage
crda            ispell                 open-vm-tools  ubuntu-release-upgrader
cryptsetup     jayatana              openssh        udev
cups             kernel                os-release     udisks2
dbus-1.0        klibc-abS-oVB3xeRN8SFypUWbQvR33nc.so p7zip       ufw
dpkg             language-selector      packagekit    unity-settings-daemon
dracut          libdmmmp.so          pkgconfig      unity-settings-daemon-1.0
eject           libdmmmp.so.0.2.0      pm-utils      update-notifier
emacsen-common libgnome-panel.so.0    policykit-1   upower
```

Fig. Shared Libraries

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Basic Commands:

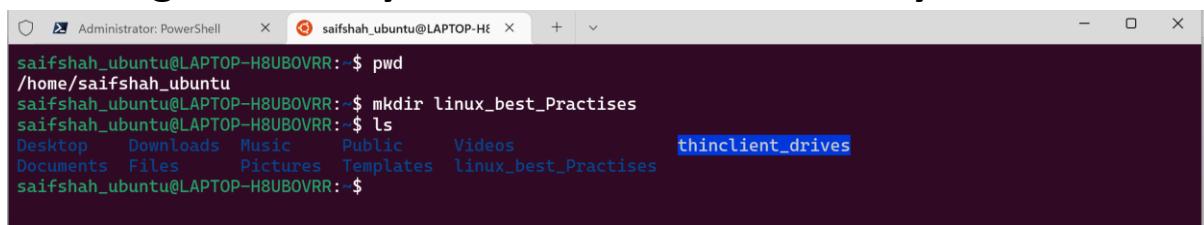
- Know where you are? Present Working Directory



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ pwd
/home/saifshah_ubuntu
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$
```

Fig. present working directory

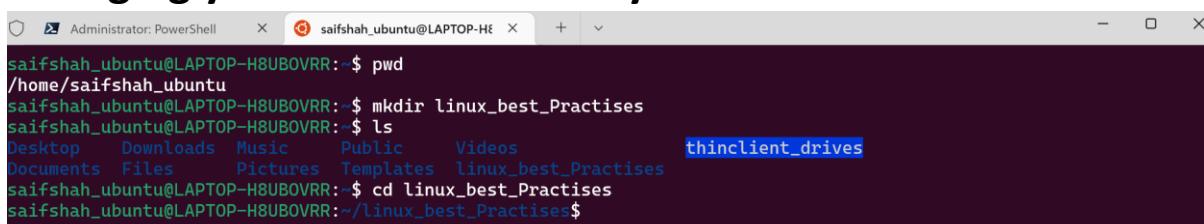
- Creating a directory Folders in Home Directory



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ pwd
/home/saifshah_ubuntu
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ mkdir linux_best_Practises
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ ls
Desktop Downloads Music Public Videos thinclient_drives
Documents Files Pictures Templates linux_best_Practises
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$
```

Fig. directory creation

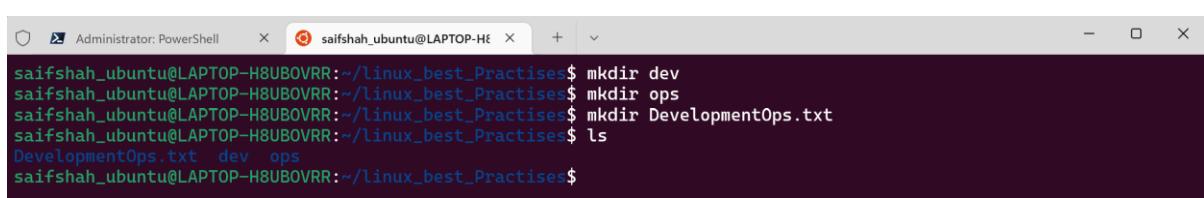
- Changing your Current directory to Linux Best Practises



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ pwd
/home/saifshah_ubuntu
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ mkdir linux_best_Practises
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ ls
Desktop Downloads Music Public Videos thinclient_drives
Documents Files Pictures Templates linux_best_Practises
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ cd linux_best_Practises
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$
```

Fig. current directory to linux best practises

- Create some more directories and list them with “ls” command

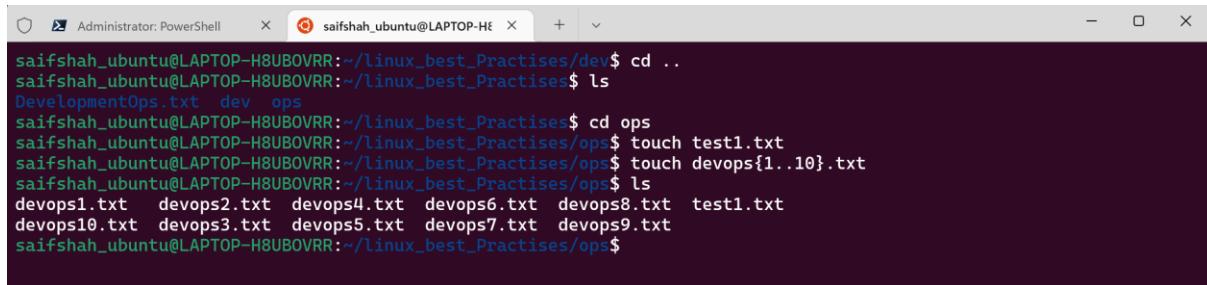


```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ mkdir dev
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ mkdir ops
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ mkdir DevelopmentOps.txt
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ ls
DevelopmentOps.txt dev ops
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$
```

Fig. Creating directory and listing with commands

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- Create some empty files with “touch” command and list them

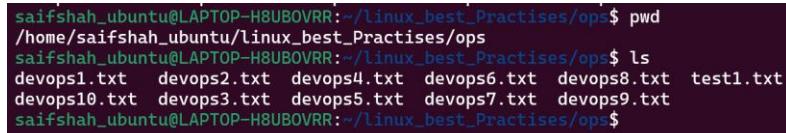


```

Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVR:~/linux_best_Practises/dev$ cd ..
saifshah_ubuntu@LAPTOP-H8UBOVR:~/linux_best_Practises$ ls
DevelopmentOps.txt dev ops
saifshah_ubuntu@LAPTOP-H8UBOVR:~/linux_best_Practises$ cd ops
saifshah_ubuntu@LAPTOP-H8UBOVR:~/linux_best_Practises/ops$ touch test1.txt
saifshah_ubuntu@LAPTOP-H8UBOVR:~/linux_best_Practises/ops$ touch devops{1..10}.txt
saifshah_ubuntu@LAPTOP-H8UBOVR:~/linux_best_Practises/ops$ ls
devops1.txt devops2.txt devops4.txt devops6.txt devops8.txt test1.txt
devops10.txt devops3.txt devops5.txt devops7.txt devops9.txt
saifshah_ubuntu@LAPTOP-H8UBOVR:~/linux_best_Practises/ops$
```

Fig. Creating some empty files with “touch” command

- Reconfirm your location in your system



```

saifshah_ubuntu@LAPTOP-H8UBOVR:~/linux_best_Practises/ops$ pwd
/home/saifshah_ubuntu/linux_best_Practises/ops
saifshah_ubuntu@LAPTOP-H8UBOVR:~/linux_best_Practises/ops$ ls
devops1.txt devops2.txt devops4.txt devops6.txt devops8.txt test1.txt
devops10.txt devops3.txt devops5.txt devops7.txt devops9.txt
saifshah_ubuntu@LAPTOP-H8UBOVR:~/linux_best_Practises/ops$
```

Fig. reconfirm your location in your system

Absolute path and Relative path

What is a path?

A path is a unique location to a file or a folder in a file system of an OS. A path to a file is a combination of / and alpha-numeric characters.

What is an absolute path?

An absolute path is defined as the specifying the location of a file or directory from the root directory(/). In other words we can say absolute path is a complete path from start of actual filesystem from / directory. Some examples of absolute path

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Some examples of absolute path:

/var/ftp/pub

/etc/samba.smb.conf

/boot/grub/grub.conf

If you see all these paths started from / directory which is a root directory for every Linux/Unix machines

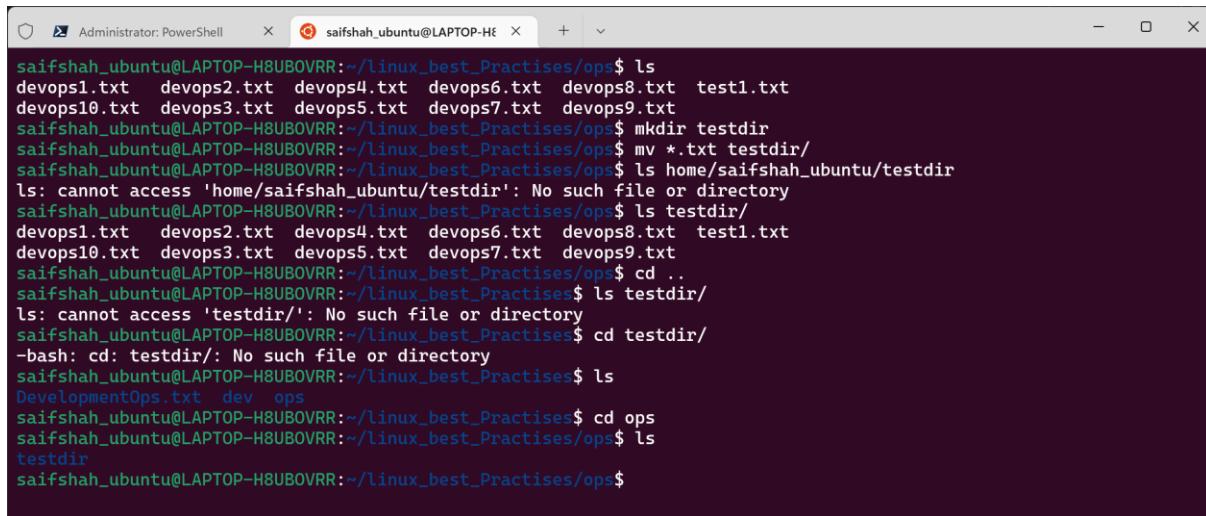
What is the relative path?

Relative path is defined as path related to the present working directory(pwd). Suppose I am located in /home/saif_shah and I want to change directory to /home/saif_shah/linux-practices. I can use relative path concept to change directory to linux-practices and also ops directory.

```
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ pwd
/home/saifshah_ubuntu
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ ls
Desktop  Downloads  Music  Public  Videos          thinclient_drives
Documents  Files    Pictures  Templates  linux_best_Practises
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ cd linux_best_Practises/
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ ls
DevelopmentOps.txt  dev  ops
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ pwd
/home/saifshah_ubuntu/linux_best_Practises
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ cd ops/
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$ ls
devops1.txt  devops2.txt  devops4.txt  devops6.txt  devops8.txt  test1.txt
devops10.txt devops3.txt  devops5.txt  devops7.txt  devops9.txt
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$ pwd
/home/saifshah_ubuntu/linux_best_Practises/ops
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$
```

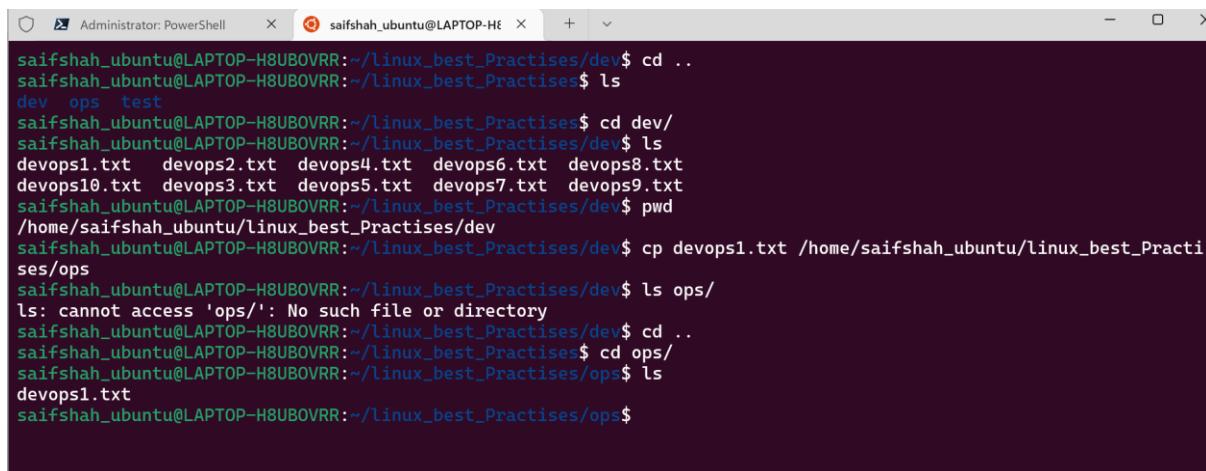
Fig. Relative Path Examples

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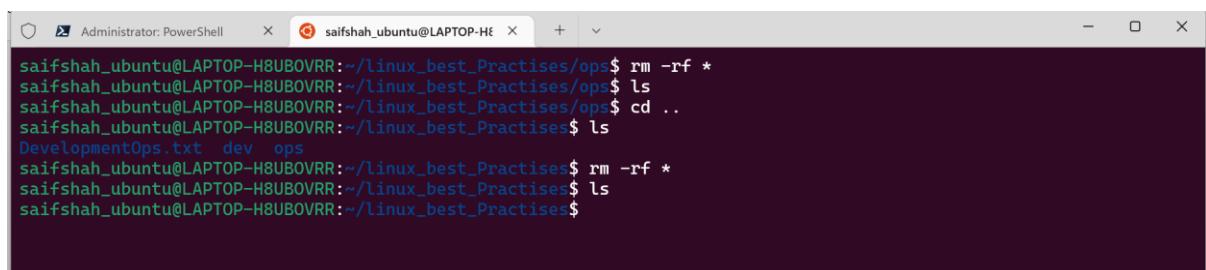
```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$ ls
devops1.txt devops2.txt devops4.txt devops6.txt devops8.txt test1.txt
devops10.txt devops3.txt devops5.txt devops7.txt devops9.txt
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$ mkdir testdir
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$ mv *.txt testdir/
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$ ls home/saifshah_ubuntu/testdir
ls: cannot access 'home/saifshah_ubuntu/testdir': No such file or directory
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$ ls testdir/
devops1.txt devops2.txt devops4.txt devops6.txt devops8.txt test1.txt
devops10.txt devops3.txt devops5.txt devops7.txt devops9.txt
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$ cd ..
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ ls testdir/
ls: cannot access 'testdir/': No such file or directory
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ cd testdir/
-bash: cd: testdir/: No such file or directory
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ ls
DevelopmentOps.txt dev ops
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ cd ops
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$ ls
testdir
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$
```

Fig. Moving files into another directory



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ cd ..
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ ls
dev ops test
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ cd dev/
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ ls
devops1.txt devops2.txt devops4.txt devops6.txt devops8.txt
devops10.txt devops3.txt devops5.txt devops7.txt devops9.txt
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ pwd
/home/saifshah_ubuntu/linux_best_Practises/dev
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ cp devops1.txt /home/saifshah_ubuntu/linux_best_Practises/ops
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ ls ops/
ls: cannot access 'ops/': No such file or directory
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ cd ..
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ cd ops/
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$ ls
devops1.txt
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$
```

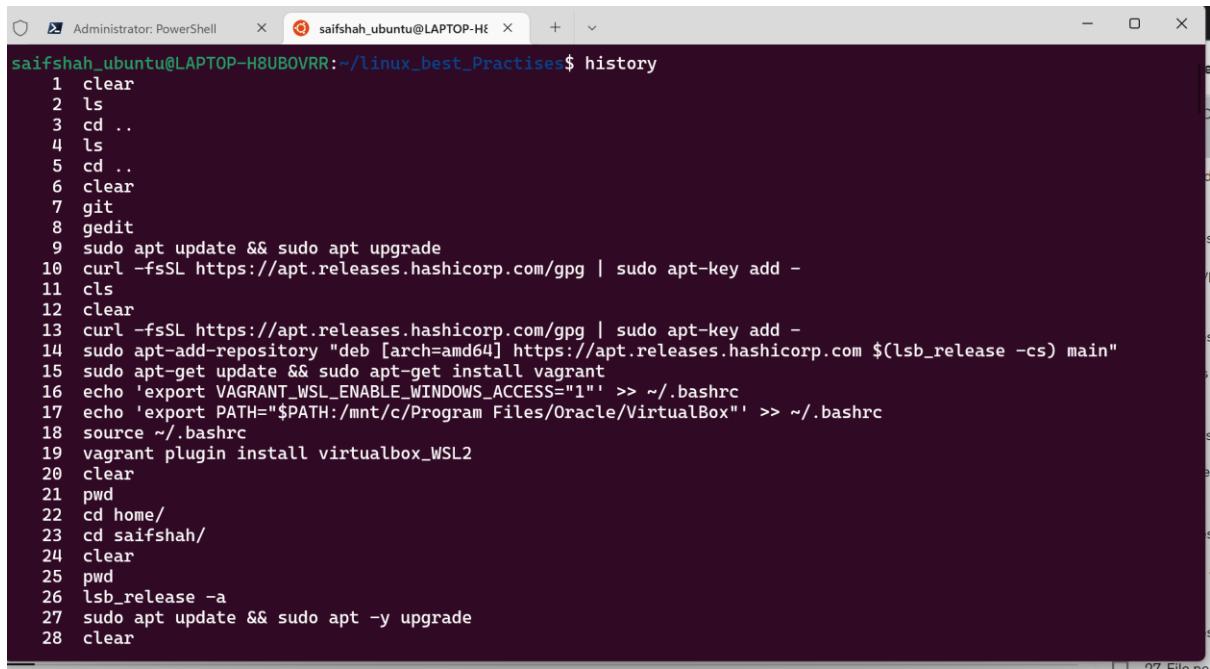
Fig. Copying the Files from one directory to another



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$ rm -rf *
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$ ls
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/ops$ cd ..
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ ls
DevelopmentOps.txt dev ops
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ rm -rf *
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ ls
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$
```

Fig. Removing Everything from Files

X



A screenshot of a Windows PowerShell window titled "Administrator: PowerShell". The title bar also shows the session name "saifshah_ubuntu@LAPTOP-H8UBOVRR" and the command "history". The main area of the window displays a numbered list of terminal commands from line 1 to 28. The commands include various Linux system calls like clear, ls, cd, curl, sudo, apt, and vagrant, along with bashrc configuration and directory navigation.

```
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ history
1 clear
2 ls
3 cd ..
4 ls
5 cd ..
6 clear
7 git
8 gedit
9 sudo apt update && sudo apt upgrade
10 curl -fsSL https://apt.releases.hashicorp.com/gpg | sudo apt-key add -
11 cls
12 clear
13 curl -fsSL https://apt.releases.hashicorp.com/gpg | sudo apt-key add -
14 sudo apt-add-repository "deb [arch=amd64] https://apt.releases.hashicorp.com $(lsb_release -cs) main"
15 sudo apt-get update && sudo apt-get install vagrant
16 echo 'export VAGRANT_WSL_ENABLE_WINDOWS_ACCESS="1"' >> ~/.bashrc
17 echo 'export PATH="$PATH:/mnt/c/Program Files/Oracle/VirtualBox"' >> ~/.bashrc
18 source ~/.bashrc
19 vagrant plugin install virtualbox_WSL2
20 clear
21 pwd
22 cd home/
23 cd saifshah/
24 clear
25 pwd
26 lsb_release -a
27 sudo apt update && sudo apt -y upgrade
28 clear
```

Fig. Shows Complete History

Vim Editor

VI Visual display editor

VIM Visual display editor improved

This is command mode editor for files.

Other editors in Linux are emacs, gedit vi editor is most popular

It has 3 modes:

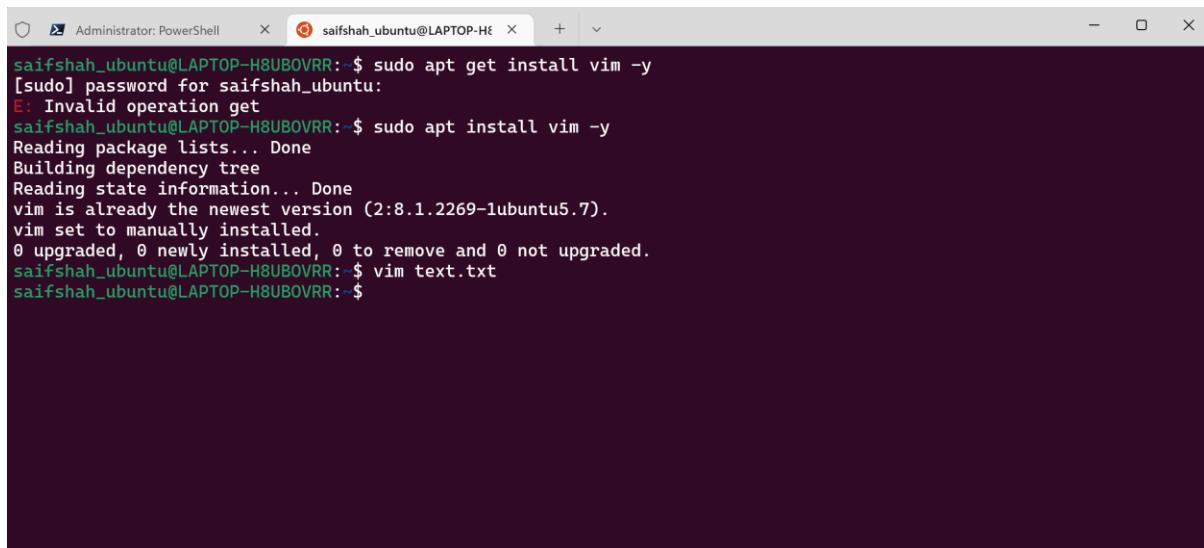
1 Command Mode

2 Insert mode (edit mode)

3 extended command mode

X

Note: When you open the vim editor, it will be in the command mode by default

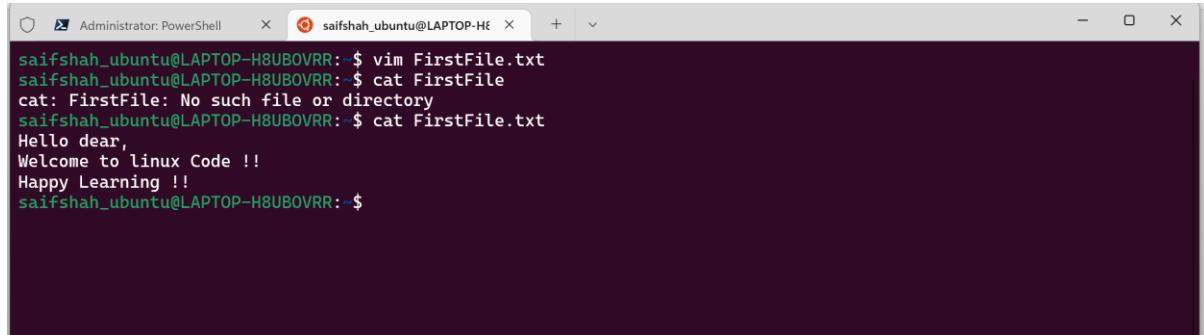


A screenshot of a terminal window titled "Administrator: PowerShell". The window shows the command line interface of a Linux system (Ubuntu). The user has run the command "sudo apt get install vim -y" to install the Vim text editor. The output indicates that Vim is already the newest version and is set to manually installed. The user then runs "vim text.txt" to open a new file named "text.txt".

```
saifshah_ubuntu@LAPTOP-H8UBOVRR: $ sudo apt get install vim -y
[sudo] password for saifshah_ubuntu:
E: Invalid operation get
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ sudo apt install vim -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
vim is already the newest version (2:8.1.2269-1ubuntu5.7).
vim set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ vim text.txt
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$
```

Fig. Vim Complete Text File Editor Installation

Creating First File of Linux:



A screenshot of a terminal window titled "Administrator: PowerShell". The user has created a new file named "FirstFile.txt" using the Vim editor. They then used the "cat" command to view the contents of the file, which display the text "Hello dear, Welcome to linux Code !! Happy Learning !!".

```
saifshah_ubuntu@LAPTOP-H8UBOVRR: $ vim FirstFile.txt
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ cat Firstfile
cat: FirstFile: No such file or directory
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ cat FirstFile.txt
Hello dear,
Welcome to linux Code !!
Happy Learning !!
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$
```

Fig. Successful Created First Linux File

X

Creating Lines with: se nu

```
Administrator: PowerShell x saifshah_ubuntu@LAPTOP-HE x + v
1 Hello dear,
2 Welcome to linux Code !!
3 Happy Learning !!
4 Its Superb Important to learn linux For Devop

:se nu 4,45 All
```

Fig. See all lines in Linux

Copying Files with: `y`

```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-HF ~ + -
```

```
1 Hello dear,  
2 Welcome to linux Code !!  
3 Happy Learning !!  
4 Happy Learning !!  
5 Its Superb Important to learn linux For Devops  
6 Its Superb Important to learn linux For Devops  
7 Happy Learning !!  
8 Its Superb Important to learn linux For Devops
```

Fig. Copying Lines (Happy Learning!!)

X

Saif Panjesha
Owner

Deleting lines with: d

```
Administrator: PowerShell x saifshah_ubuntu@LAPTOP-HE + v
1 Hello dear,
2 Welcome to linux Code !!
3 Happy Learning !!
4 Its Superb Important to learn linux For Devops

:se nu 4,1 All
```

Fig. Deleting Files (Happy Learning which is twice)

Undo Changes with: u

Fig. Undo all Commands

X

Saif Panjehsa
Owner

- Cut Paste: **d - Cut p – Paste**

A screenshot of a terminal window titled "Administrator: PowerShell". The window shows a list of numbers from 1 to 6, each followed by a line of text. The text includes "Hello dear," and "Welcome to linux Code !!". The bottom status bar indicates "1 more line; before #14 75 seconds ago". The bottom right corner shows "6,1" and "All".

```
1 Hello dear,
2 Welcome to linux Code !!
3 Happy Learning !!
4 Welcome to linux Code !!
5 Its Superb Important to learn linux For Devops
6 Welcome to linux Code !!
```

Fig. Cut paste Lines (Welcome to Linux Code)

⇒ **Searching: /**

A screenshot of a terminal window titled "Administrator: PowerShell". The window shows a list of numbers from 1 to 6, each followed by a line of text. The text includes "Hello dear," and "Welcome to linux Code !!". The bottom status bar indicates "1 more line; before #14 75 seconds ago". The bottom right corner shows "6,1" and "All". The search command "/dear" is entered at the bottom of the screen.

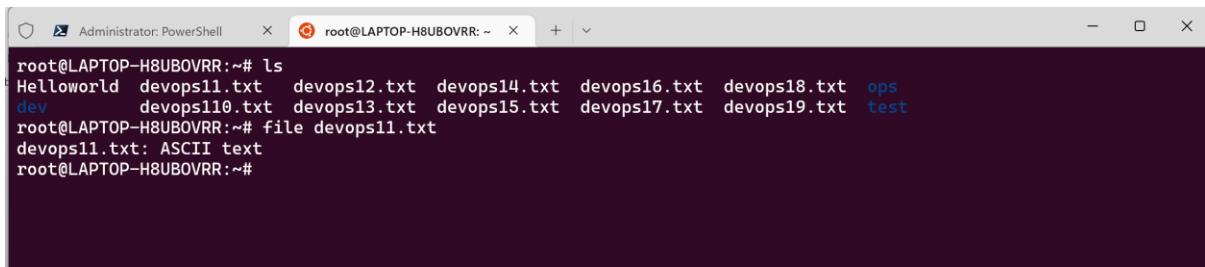
```
1 Hello dear,
2 Welcome to linux Code !!
3 Happy Learning !!
4 Welcome to linux Code !!
5 Its Superb Important to learn linux For Devops
6 Welcome to linux Code !!
```

Fig. Searching the word (dear) in Lines

X

File System in Linux

File Type	First Character in File Listing	Description
Regular file	-	Normal files such as text, data, or executable files
Directory	d	Files that are lists of other files
Link	l	A shortcut that points to the location of the actual file
Special file	c	Mechanism used for input and output, such as files in /dev
Socket	s	A special file that provides inter-process networking protected by the file system's access control
Pipe	p	A special file that allows processes to communicate with each other without using network socket semantics

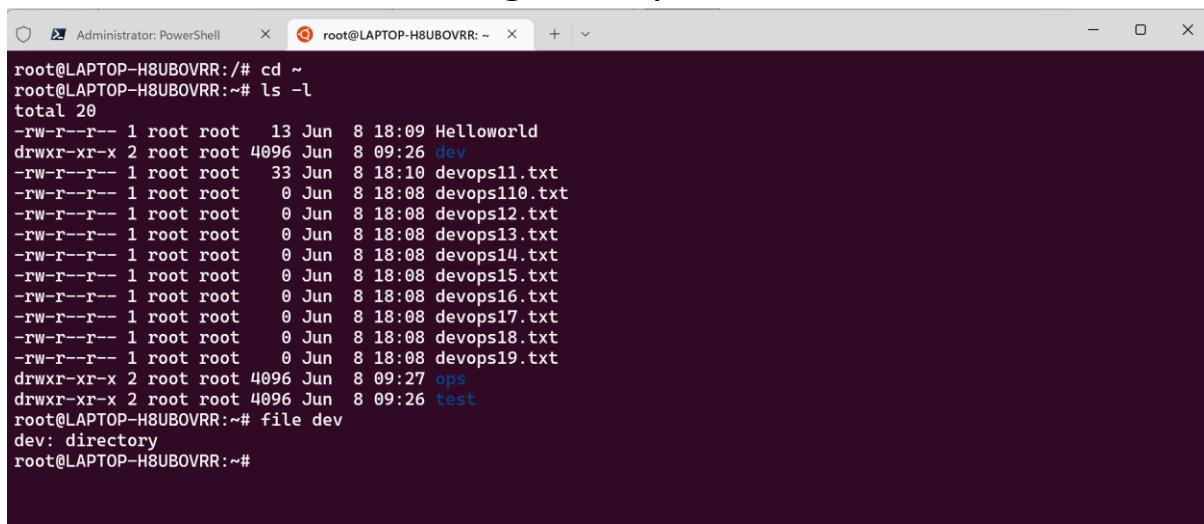


```
Administrator: PowerShell      root@LAPTOP-H8UBOVRR: ~ + - x
root@LAPTOP-H8UBOVRR:~# ls
HelloWorld devops11.txt devops12.txt devops14.txt devops16.txt devops18.txt ops
dev         devops110.txt devops13.txt devops15.txt devops17.txt devops19.txt test
root@LAPTOP-H8UBOVRR:~# file devops11.txt
devops11.txt: ASCII text
root@LAPTOP-H8UBOVRR:~#
```

Fig. regular file

```
root@LAPTOP-H8UBOVRR:/bin# file /bin/pwd
/bin/pwd: ELF 64-bit LSB shared object, x86-64, version 1 (SYSV), dynamically linked, interpreter /lib64/ld-linux-x86-64.so.2, BuildID[sha1]=6301fe1d7610374e8b9bba10cb08778c945002d6, for GNU/Linux 3.2.0, stripped
root@LAPTOP-H8UBOVRR:/bin#
```

Fig. Binary File



```
Administrator: PowerShell      root@LAPTOP-H8UBOVRR: ~ + - x
root@LAPTOP-H8UBOVRR:~# cd ~
root@LAPTOP-H8UBOVRR:~# ls -l
total 20
-rw-r--r-- 1 root root 13 Jun  8 18:09 HelloWorld
drwxr-xr-x 2 root root 4096 Jun  8 09:26 dev
-rw-r--r-- 1 root root 33 Jun  8 18:10 devops11.txt
-rw-r--r-- 1 root root  0 Jun  8 18:08 devops110.txt
-rw-r--r-- 1 root root  0 Jun  8 18:08 devops12.txt
-rw-r--r-- 1 root root  0 Jun  8 18:08 devops13.txt
-rw-r--r-- 1 root root  0 Jun  8 18:08 devops14.txt
-rw-r--r-- 1 root root  0 Jun  8 18:08 devops15.txt
-rw-r--r-- 1 root root  0 Jun  8 18:08 devops16.txt
-rw-r--r-- 1 root root  0 Jun  8 18:08 devops17.txt
-rw-r--r-- 1 root root  0 Jun  8 18:08 devops18.txt
-rw-r--r-- 1 root root  0 Jun  8 18:08 devops19.txt
drwxr-xr-x 2 root root 4096 Jun  8 09:27 ops
drwxr-xr-x 2 root root 4096 Jun  8 09:26 test
root@LAPTOP-H8UBOVRR:~# file dev
dev: directory
root@LAPTOP-H8UBOVRR:~#
```

Fig. Directory File

X

```

Administrator:PowerShell      root@LAPTOP-H8UBOVRR:~      +  -
root@LAPTOP-H8UBOVRR:~# ls -l
total 20
-rw-r--r-- 1 root root 13 Jun  8 18:09 Helloworld
drwxr-xr-x 2 root root 4096 Jun  8 09:26 dev
-rw-r--r-- 1 root root 33 Jun  8 18:10 devops11.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops110.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops12.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops13.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops14.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops15.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops16.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops17.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops18.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops19.txt
drwxr-xr-x 2 root root 4096 Jun  8 09:27 ops
drwxr-xr-x 2 root root 4096 Jun  8 09:26 test
root@LAPTOP-H8UBOVRR:~# ln -s /opt/dev/ops/devops cmd
root@LAPTOP-H8UBOVRR:~# ls -l
total 20
-rw-r--r-- 1 root root 13 Jun  8 18:09 Helloworld
lrwxrwxrwx 1 root root 19 Jun  8 18:41 cmd -> /opt/dev/ops/devops
drwxr-xr-x 2 root root 4096 Jun  8 09:26 dev
-rw-r--r-- 1 root root 33 Jun  8 18:10 devops11.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops110.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops12.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops13.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops14.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops15.txt
-rw-r--r-- 1 root root 0 Jun  8 18:08 devops16.txt

```

Fig. Creates Linking in Files

```

crw----- 1 root root 4, 57 Jun  8 18:06 tty57
crw----- 1 root root 4, 58 Jun  8 18:06 tty58
crw----- 1 root root 4, 59 Jun  8 18:06 tty59
crw----- 1 root root 4, 6 Jun  8 18:06 tty6
crw----- 1 root root 4, 60 Jun  8 18:06 tty60
crw----- 1 root root 4, 61 Jun  8 18:06 tty61
crw----- 1 root root 4, 62 Jun  8 18:06 tty62
crw----- 1 root root 4, 63 Jun  8 18:06 tty63
crw----- 1 root root 4, 7 Jun  8 18:06 tty7
crw----- 1 root root 4, 8 Jun  8 18:06 tty8
crw----- 1 root root 4, 9 Jun  8 18:06 tty9
crw----- 1 root root 4, 64 Jun  8 18:06 ttyS0
crw----- 1 root root 4, 65 Jun  8 18:06 ttyS1
crw----- 1 root root 4, 66 Jun  8 18:06 ttyS2
crw----- 1 root root 4, 67 Jun  8 18:06 ttyS3
crw-rw-rw- 1 root root 1, 9 Jun  8 18:06 urandom
crw----- 1 root root 7, 0 Jun  8 18:06 vcs
crw----- 1 root root 7, 1 Jun  8 18:06 vcs1
crw----- 1 root root 7, 128 Jun  8 18:06 vcsa
crw----- 1 root root 7, 129 Jun  8 18:06 vcsa1
crw----- 1 root root 7, 64 Jun  8 18:06 vcsu
crw----- 1 root root 7, 65 Jun  8 18:06 vcsul
drwxr-xr-x 2 root root 60 Jun  8 18:06 vfio
crw----- 1 root root 10, 238 Jun  8 18:06 vhost-net
crw----- 1 root root 10, 62 Jun  8 18:06 vsock
crw-rw-rw- 1 root root 1, 5 Jun  8 18:06 zero
root@LAPTOP-H8UBOVRR:/dev# file vcs
vcs: character special (7/0)
root@LAPTOP-H8UBOVRR:/dev#

```

Fig. Character Files in dev directory

```

root@LAPTOP-H8UBOVRR:/dev# file ram9
ram9: block special (1/9)
root@LAPTOP-H8UBOVRR:/dev#

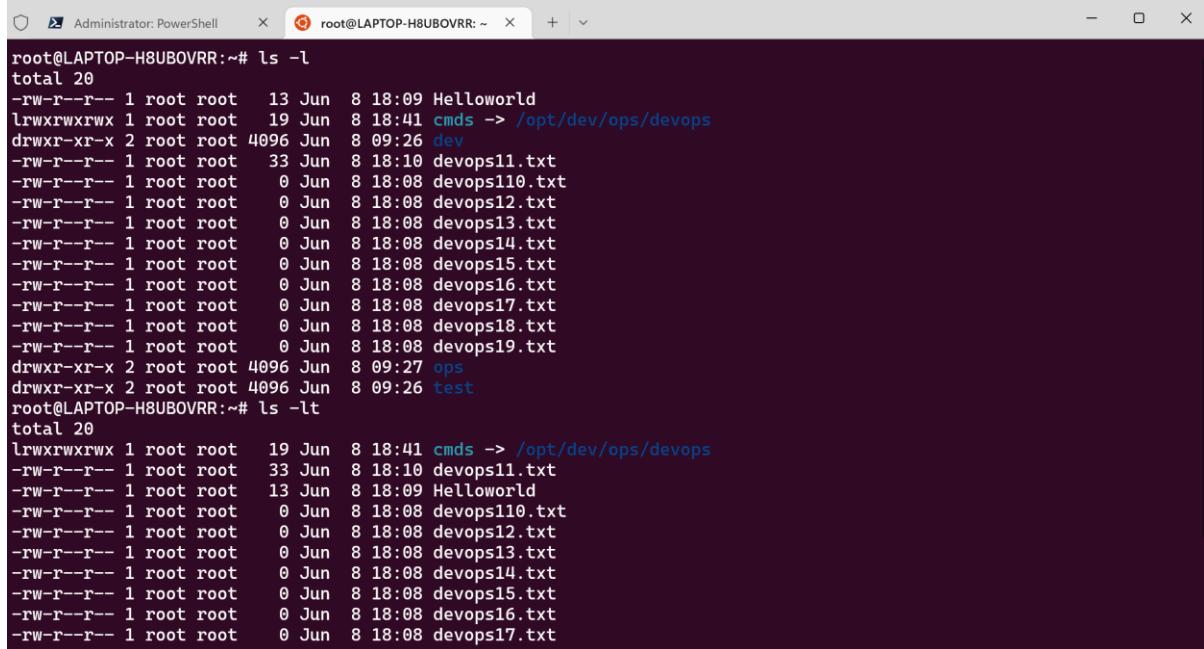
```

Fig. Block Files in dev directory

X

Saif Panjesha
Owner

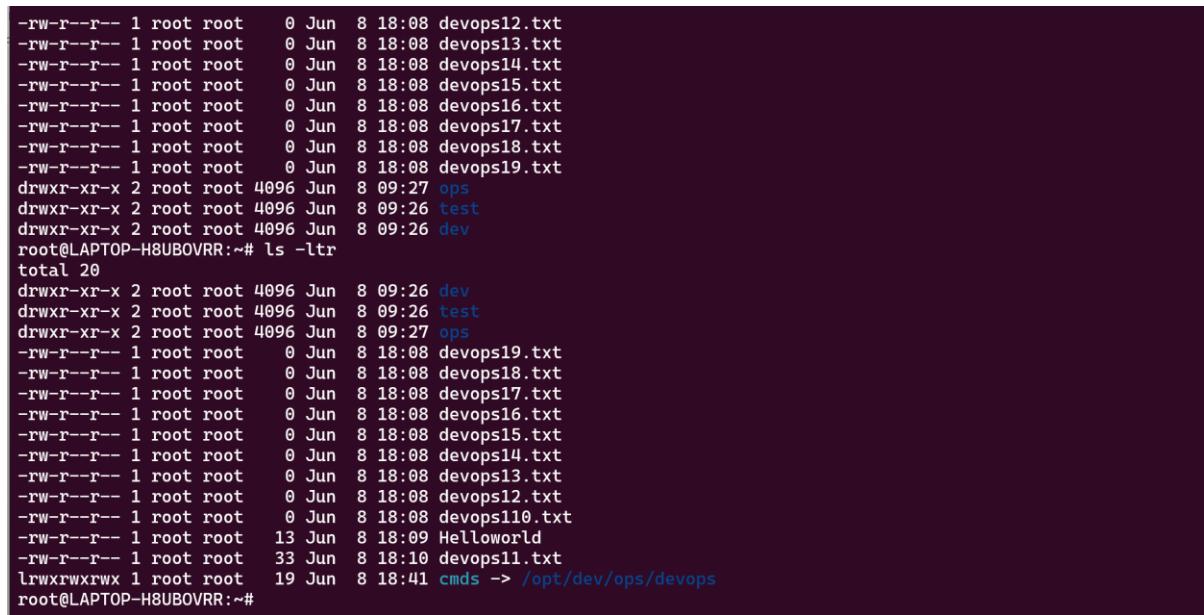
Time Stamp in File: ls -lt



```
Administrator: PowerShell      x root@LAPTOP-H8UBOVRR: ~ + | v
root@LAPTOP-H8UBOVRR:~# ls -l
total 20
-rw-r--r-- 1 root root 13 Jun 8 18:09 Helloworld
lrwxrwxrwx 1 root root 19 Jun 8 18:41 cmds -> /opt/dev/ops/devops
drwxr-xr-x 2 root root 4096 Jun 8 09:26 dev
-rw-r--r-- 1 root root 33 Jun 8 18:10 devops11.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops110.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops12.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops13.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops14.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops15.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops16.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops17.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops18.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops19.txt
drwxr-xr-x 2 root root 4096 Jun 8 09:27 ops
drwxr-xr-x 2 root root 4096 Jun 8 09:26 test
root@LAPTOP-H8UBOVRR:~# ls -lt
total 20
lrwxrwxrwx 1 root root 19 Jun 8 18:41 cmds -> /opt/dev/ops/devops
-rw-r--r-- 1 root root 33 Jun 8 18:10 devops11.txt
-rw-r--r-- 1 root root 13 Jun 8 18:09 Helloworld
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops110.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops12.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops13.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops14.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops15.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops16.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops17.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops18.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops19.txt
drwxr-xr-x 2 root root 4096 Jun 8 09:27 ops
drwxr-xr-x 2 root root 4096 Jun 8 09:26 test
drwxr-xr-x 2 root root 4096 Jun 8 09:26 dev
root@LAPTOP-H8UBOVRR:~#
```

Fig. Timestamp file at Top

Time Stamp in File Reverse ls-ltr

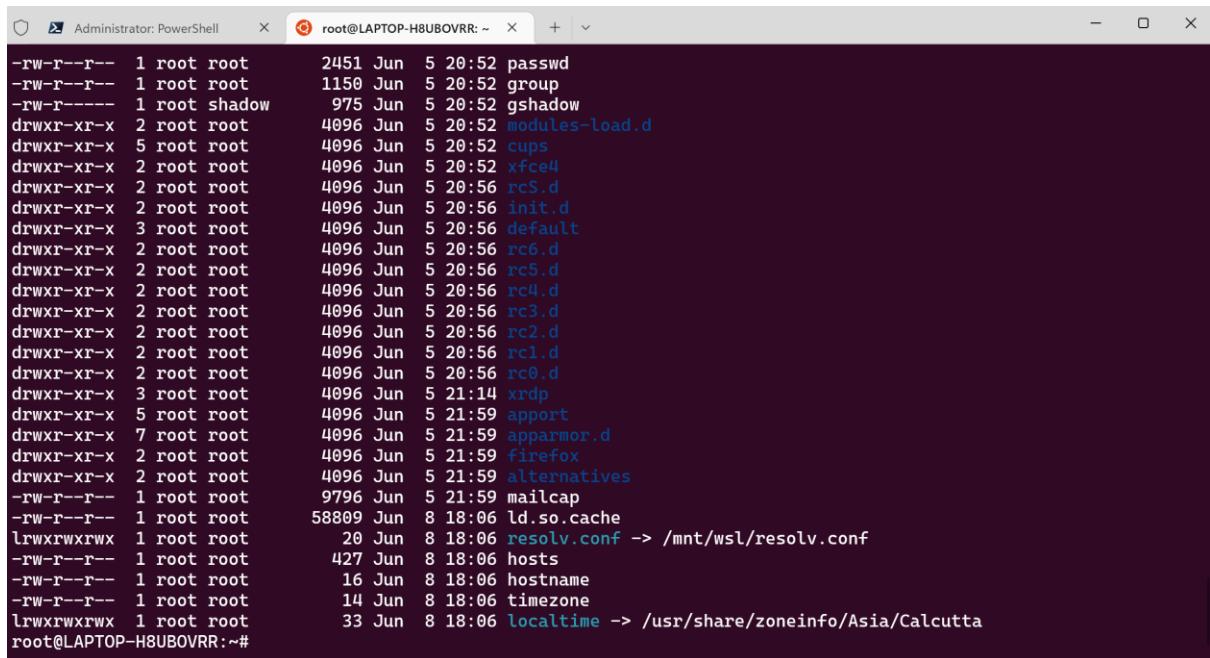


```
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops12.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops13.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops14.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops15.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops16.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops17.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops18.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops19.txt
drwxr-xr-x 2 root root 4096 Jun 8 09:27 ops
drwxr-xr-x 2 root root 4096 Jun 8 09:26 test
drwxr-xr-x 2 root root 4096 Jun 8 09:26 dev
root@LAPTOP-H8UBOVRR:~# ls -ltr
total 20
drwxr-xr-x 2 root root 4096 Jun 8 09:26 dev
drwxr-xr-x 2 root root 4096 Jun 8 09:26 test
drwxr-xr-x 2 root root 4096 Jun 8 09:27 ops
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops19.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops18.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops17.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops16.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops15.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops14.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops13.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops12.txt
-rw-r--r-- 1 root root 0 Jun 8 18:08 devops110.txt
-rw-r--r-- 1 root root 13 Jun 8 18:09 Helloworld
-rw-r--r-- 1 root root 33 Jun 8 18:10 devops11.txt
lrwxrwxrwx 1 root root 19 Jun 8 18:41 cmds -> /opt/dev/ops/devops
root@LAPTOP-H8UBOVRR:~#
```

Fig. Timestamp file at Bottom

X

Saif Panjesha
Owner



```
-rw-r--r-- 1 root root      2451 Jun  5 20:52 passwd
-rw-r--r-- 1 root root     1150 Jun  5 20:52 group
-rw-r----- 1 root shadow    975 Jun  5 20:52 gshadow
drwxr-xr-x  2 root root    4096 Jun  5 20:52 modules-load.d
drwxr-xr-x  5 root root    4096 Jun  5 20:52 cups
drwxr-xr-x  2 root root    4096 Jun  5 20:52 xfce4
drwxr-xr-x  2 root root    4096 Jun  5 20:56 rcS.d
drwxr-xr-x  2 root root    4096 Jun  5 20:56 init.d
drwxr-xr-x  3 root root    4096 Jun  5 20:56 default
drwxr-xr-x  2 root root    4096 Jun  5 20:56 rc6.d
drwxr-xr-x  2 root root    4096 Jun  5 20:56 rc5.d
drwxr-xr-x  2 root root    4096 Jun  5 20:56 rc4.d
drwxr-xr-x  2 root root    4096 Jun  5 20:56 rc3.d
drwxr-xr-x  2 root root    4096 Jun  5 20:56 rc2.d
drwxr-xr-x  2 root root    4096 Jun  5 20:56 rc1.d
drwxr-xr-x  2 root root    4096 Jun  5 20:56 rc0.d
drwxr-xr-x  3 root root    4096 Jun  5 21:14 xrdp
drwxr-xr-x  5 root root    4096 Jun  5 21:59 apport
drwxr-xr-x  7 root root    4096 Jun  5 21:59 apparmor.d
drwxr-xr-x  2 root root    4096 Jun  5 21:59 firefox
drwxr-xr-x  2 root root    4096 Jun  5 21:59 alternatives
-rw-r--r--  1 root root    9796 Jun  5 21:59 mailcap
-rw-r--r--  1 root root   58809 Jun  8 18:06 ld.so.cache
lrwxrwxrwx  1 root root      20 Jun  8 18:06 resolv.conf -> /mnt/wsl/resolv.conf
-rw-r--r--  1 root root     427 Jun  8 18:06 hosts
-rw-r--r--  1 root root      16 Jun  8 18:06 hostname
-rw-r--r--  1 root root     14 Jun  8 18:06 timezone
lrwxrwxrwx  1 root root     33 Jun  8 18:06 localtime -> /usr/share/zoneinfo/Asia/Calcutta
root@LAPTOP-H8UBOVRR:~#
```

Fig: ls -ltr /etc/ Timestamp file at Bottom

Changing the Host Name:

```
root@LAPTOP-H8UBOVRR:~# vim /etc/hostname
root@LAPTOP-H8UBOVRR:~# vim /etc/hostname
root@LAPTOP-H8UBOVRR:~# cat /etc/hostname
SAIF-PANJESHAH
root@LAPTOP-H8UBOVRR:~#
```

Fig. Host Name Changes

X

Quiz:

 Good job!

Question 1:

What command is used to find file type

type <filepath>

check <filepath>

file <filepath>

filetype <filepath>

 Good job!

Question 2:

In -s <originalFilePath> <LinkFilePath> command is used to create soft link.

True

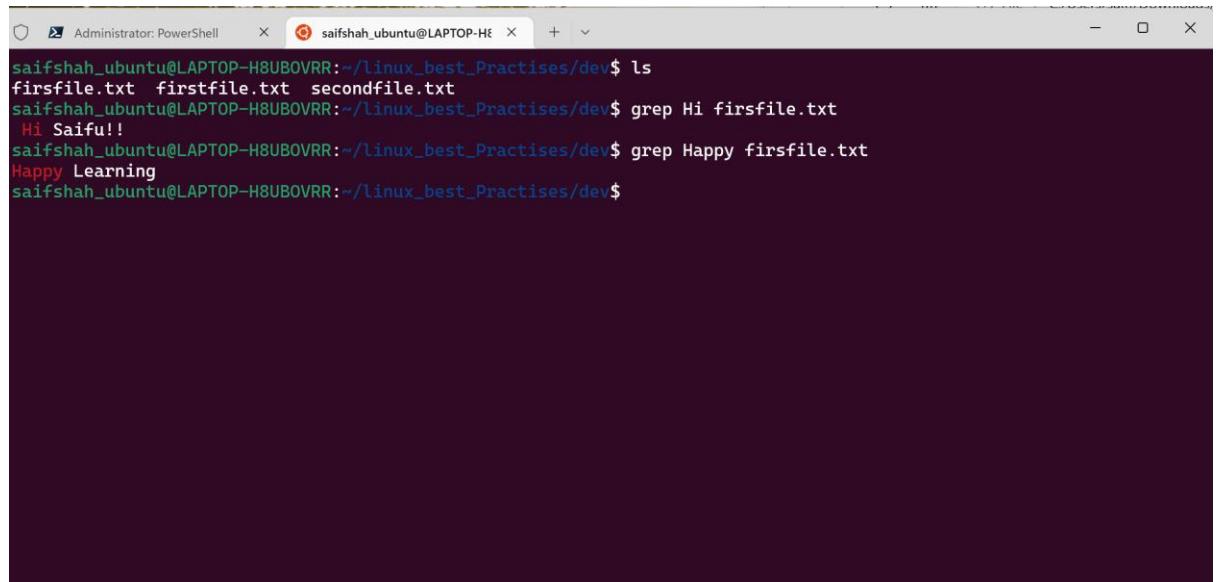
False

X

Filters & IO redirections command

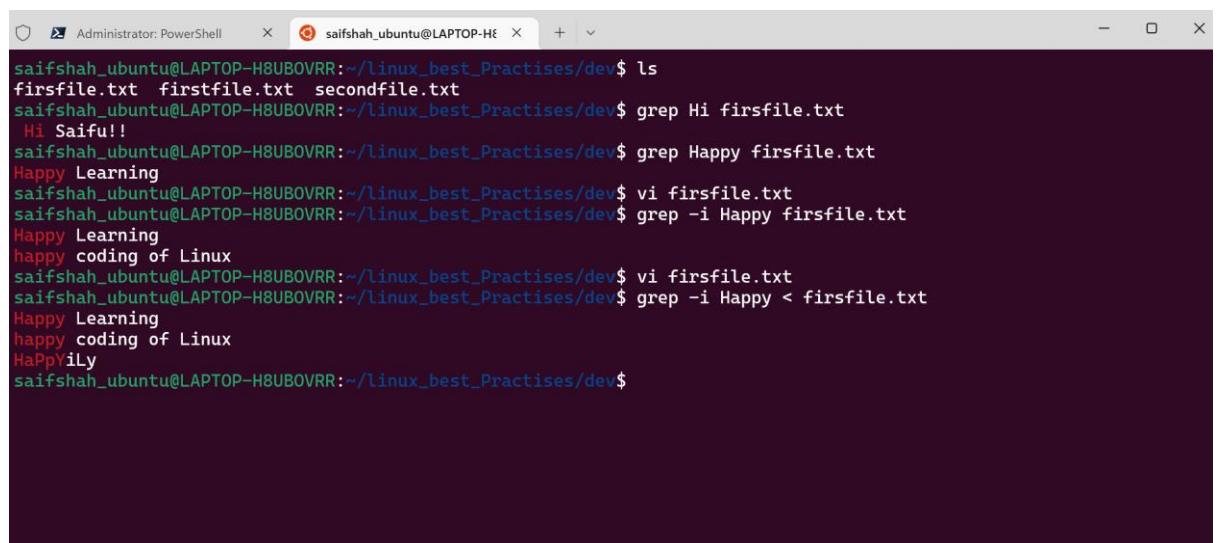
Grep:

- Grep command is used to find texts from any text input



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ ls firsfile.txt firstfile.txt secondfile.txt saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ grep Hi firsfile.txt Hi Saiful! saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ grep Happy firsfile.txt Happy Learning saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$
```

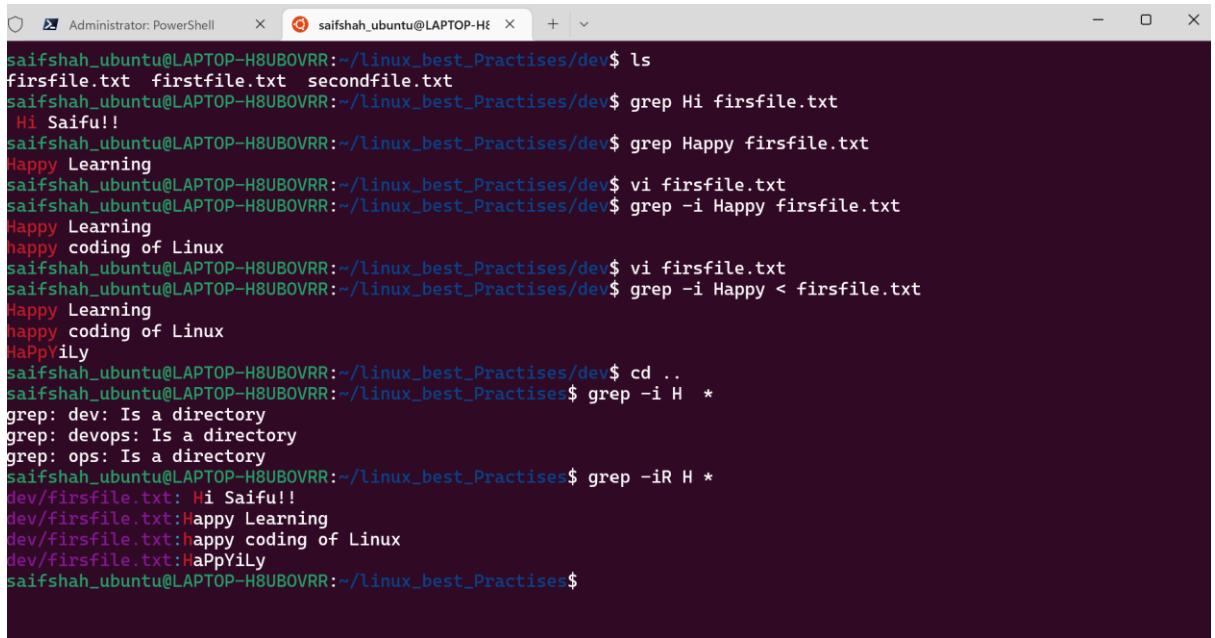
Fig. grep commands for finding text from any text input



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ ls firsfile.txt firstfile.txt secondfile.txt saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ grep Hi firsfile.txt Hi Saiful! saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ grep Happy firsfile.txt Happy Learning saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ vi firsfile.txt saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ grep -i Happy < firsfile.txt Happy Learning happy coding of Linux saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ vi firsfile.txt saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ grep -i Happy < firsfile.txt Happy Learning happy coding of Linux HaPpYiLy saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$
```

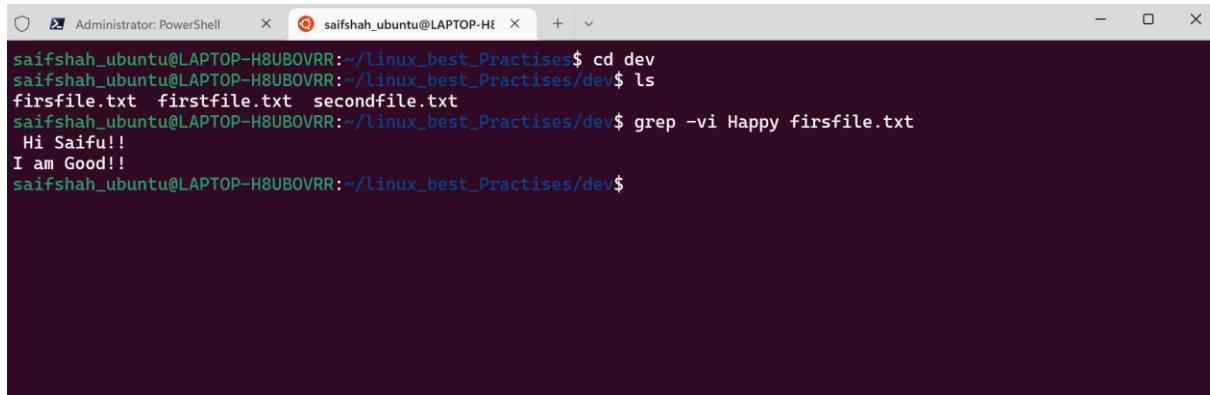
Fig. To ignores case sensitive in grep commands

X



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ ls
firsfile.txt firstfile.txt secondfile.txt
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ grep Hi firsfile.txt
Hi Saifu!!
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ grep Happy firsfile.txt
Happy Learning
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ vi firsfile.txt
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ grep -i Happy firsfile.txt
Happy Learning
happy coding of Linux
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ vi firsfile.txt
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ grep -i Happy < firsfile.txt
Happy Learning
happy coding of Linux
HaPpYily
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ cd ..
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises$ grep -i H *
grep: dev: Is a directory
grep: devops: Is a directory
grep: ops: Is a directory
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises$ grep -iR H *
dev/firsfile.txt: Hi Saifu!!
dev/firsfile.txt:Happy Learning
dev/firsfile.txt:happy coding of Linux
dev/firsfile.txt:HaPpYiLy
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises$
```

Fig. grep searching in the directory -iR commands



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises$ cd dev
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ ls
firsfile.txt firstfile.txt secondfile.txt
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ grep -vi Happy firsfile.txt
Hi Saifu!!
I am Good!!
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$
```

Fig. Reverse Searching with -vi commands

X

Reading the Content:

saifshah_ubuntu@LAPTOPH8UBOVRR:~/linux_best_Practices/dev\$ less firstfile.txt

Fig. Reading the Content and Searching for (Good)

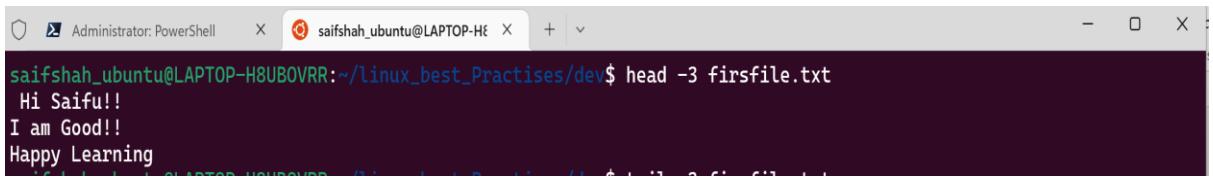
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux best Practises/dev\$ more firsfile.txt

```
Administrator: PowerShell x saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ less firsfile.txt
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ ^C
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ less firsfile.txt
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practises/dev$ more firsfile.txt
Hi Saifu!!
I am Good!!
Happy Learning
happy coding of Linux
HaPpYiLy
```

Fig. Reading the content with more command

head

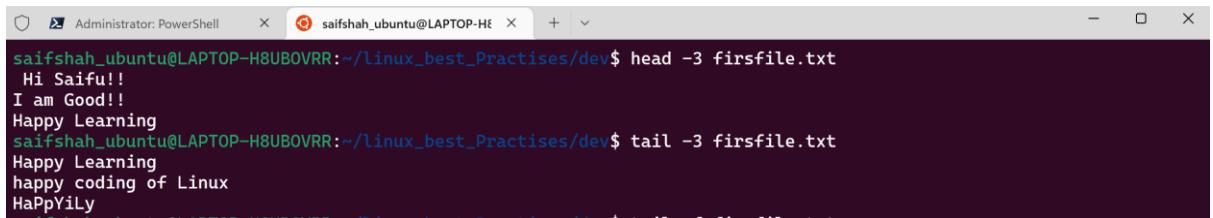
- **Head:** It's Used to display top 10 lines of files



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ head -3 firsfile.txt
Hi Saifu!!
I am Good!!
Happy Learning
```

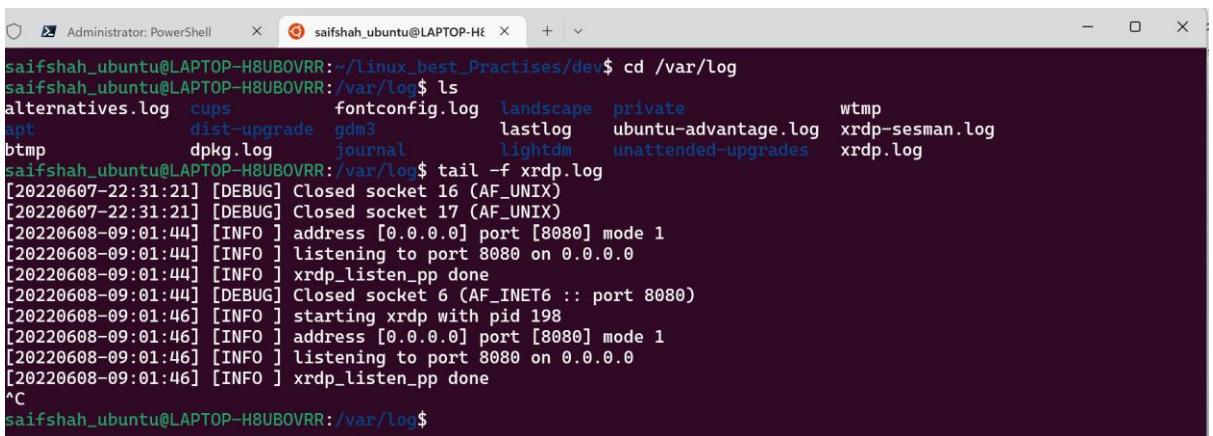
Fig. head to display first 3 lines from files

- **Tail:** It's Used to display last 10 lines of files



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ head -3 firsfile.txt
Hi Saifu!!
I am Good!!
Happy Learning
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ tail -3 firsfile.txt
Happy Learning
happy coding of Linux
HaPpYiLy
```

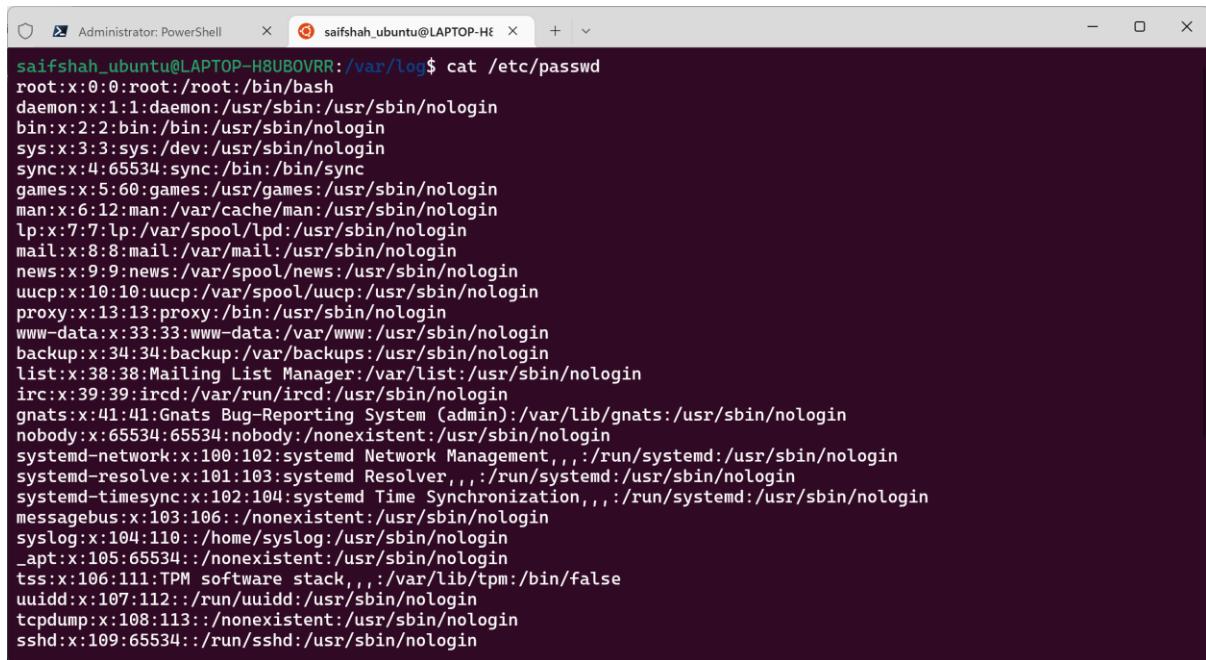
Fig. tail to display last 3 lines from files



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/dev$ cd /var/log
saifshah_ubuntu@LAPTOP-H8UBOVRR:/var/log$ ls
alternatives.log    cups          fontconfig.log   landscape    private           wtmp
apt                 dist-upgrade  gdm3          lastlog      ubuntu-advantage.log  xrdp-sesman.log
btmp                dpkg.log     journal        lightdm     unattended-upgrades  xrdp.log
saifshah_ubuntu@LAPTOP-H8UBOVRR:/var/log$ tail -f xrdp.log
[20220607-22:31:21] [DEBUG] Closed socket 16 (AF_UNIX)
[20220607-22:31:21] [DEBUG] Closed socket 17 (AF_UNIX)
[20220608-09:01:44] [INFO ] address [0.0.0.0] port [8080] mode 1
[20220608-09:01:44] [INFO ] listening to port 8080 on 0.0.0.0
[20220608-09:01:44] [INFO ] xrdp_listen_pp done
[20220608-09:01:44] [DEBUG] Closed socket 6 (AF_INET6 :: port 8080)
[20220608-09:01:46] [INFO ] starting xrdp with pid 198
[20220608-09:01:46] [INFO ] address [0.0.0.0] port [8080] mode 1
[20220608-09:01:46] [INFO ] listening to port 8080 on 0.0.0.0
[20220608-09:01:46] [INFO ] xrdp_listen_pp done
^C
saifshah_ubuntu@LAPTOP-H8UBOVRR:/var/log$
```

Fig. tail to check **-f** for newly added code in logs file

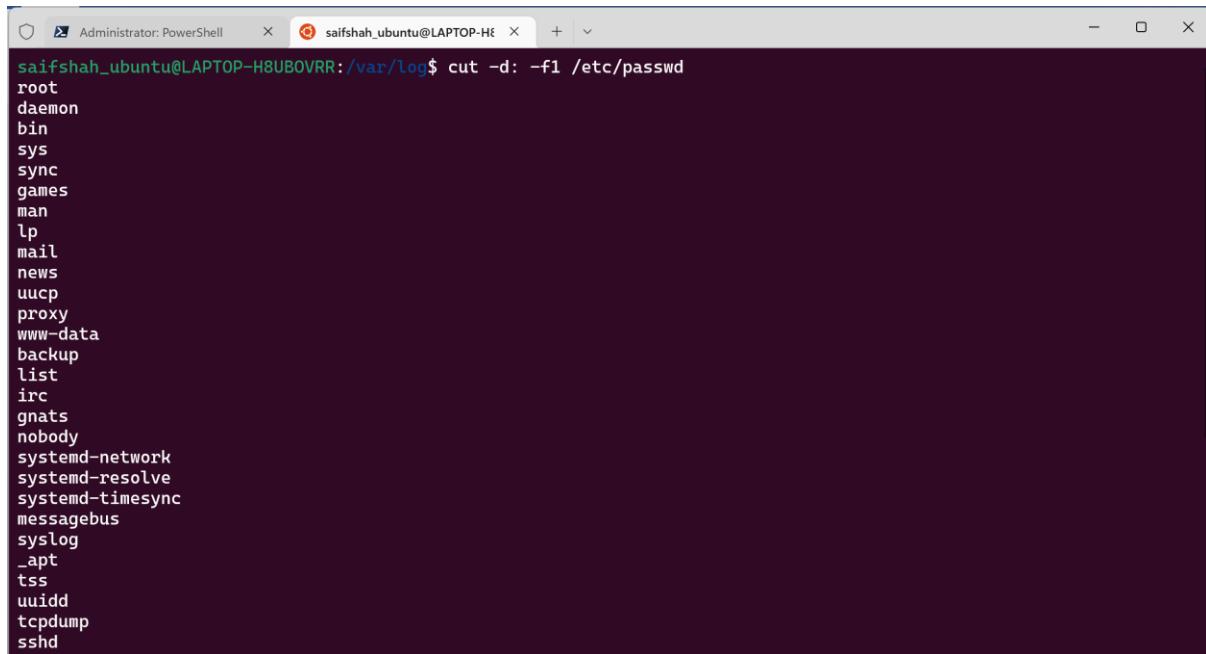
X



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:/var/log$ 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:/usr/sbin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin:/nologin
sync:x:4:65534:sync:/bin:/sync
games:x:5:60:games:/usr/sbin:/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:/var/run/ircd:/usr/sbin:/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin:/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin:/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin:/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin:/nologin
systemd-timesync:x:102:104:systemd Time Synchronization,,,:/run/systemd:/usr/sbin:/nologin
messagebus:x:103:106:/nonexistent:/usr/sbin:/nologin
syslog:x:104:110:/home/syslog:/usr/sbin:/nologin
_apt:x:105:65534:/nonexistent:/usr/sbin:/nologin
tss:x:106:111:TPM software stack,,,:/var/lib/tpm:/bin/false
uuidd:x:107:112:/run/uuidd:/usr/sbin:/nologin
tcpdump:x:108:113:/nonexistent:/usr/sbin:/nologin
sshd:x:109:65534:/run/sshd:/usr/sbin:/nologin
```

Fig. Shows full information of passwd file

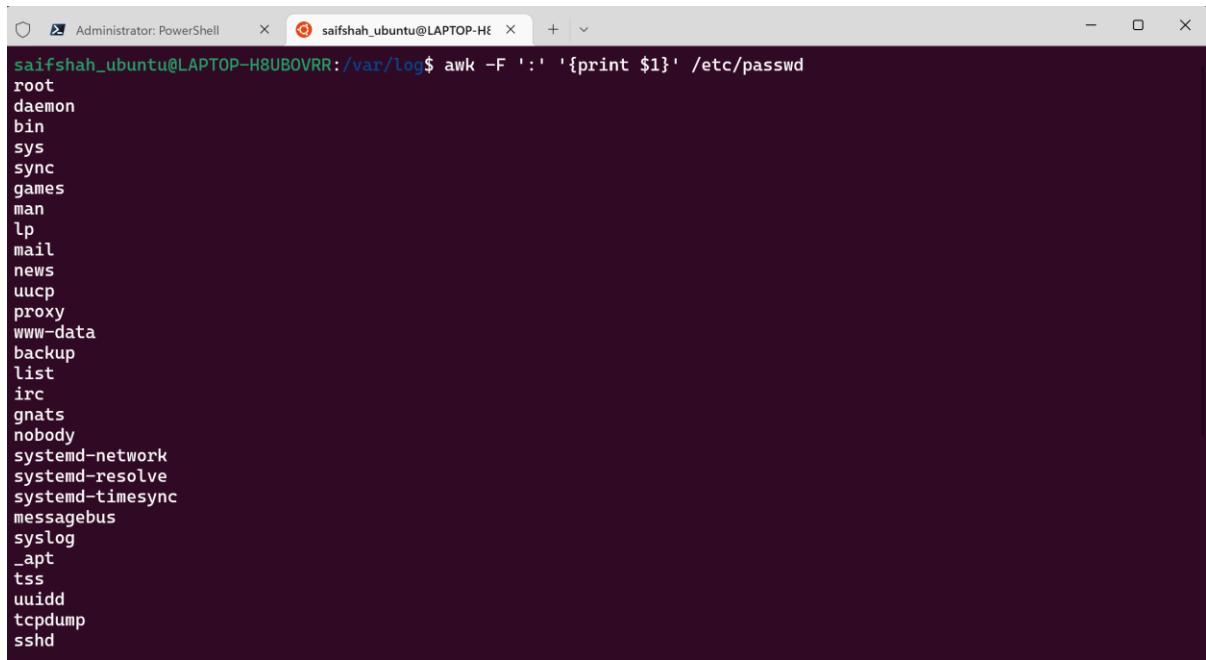
**saifshah_ubuntu@LAPTOP-H8UBOVRR:/var/log\$ cut -d: -f1
/etc/passwd**



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:/var/log$ cut -d: -f1 /etc/passwd
root
daemon
bin
sys
sync
games
man
lp
mail
news
uucp
proxy
www-data
backup
list
irc
gnats
nobody
systemd-network
systemd-resolve
systemd-timesync
messagebus
syslog
_apt
tss
uuidd
tcpdump
sshd
```

Fig. Shows first column of passwd file

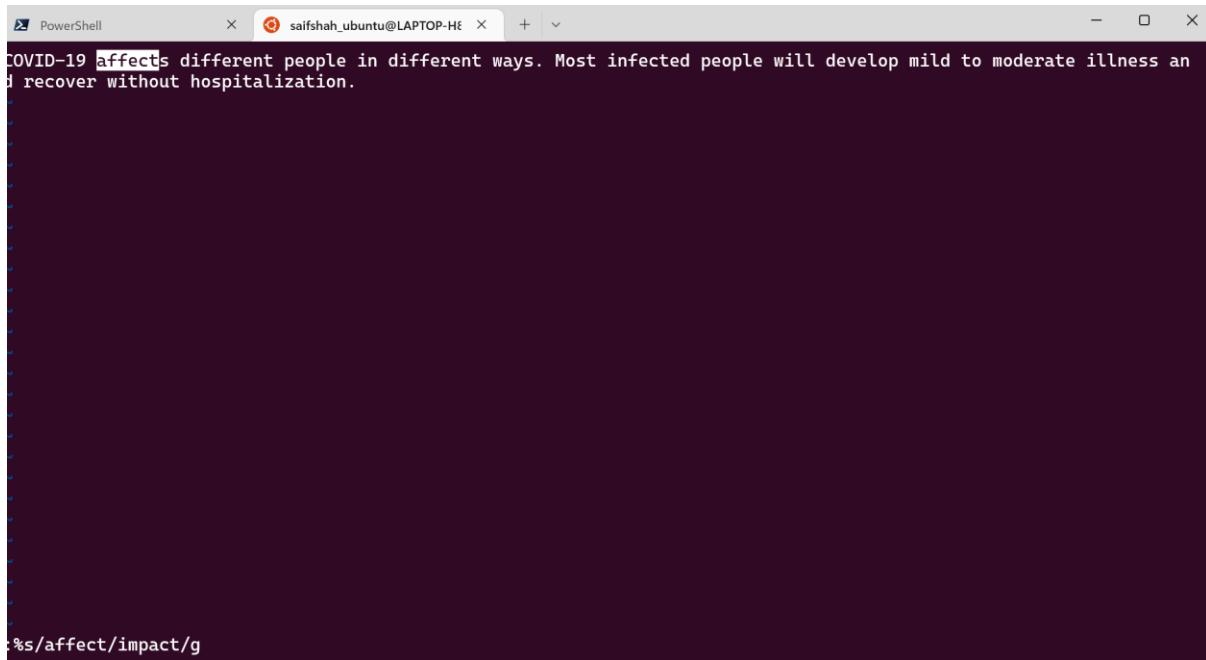
X



```
saifshah_ubuntu@LAPTOP-H8UB0VRR:/var/log$ awk -F ':' '{print $1}' /etc/passwd
root
daemon
bin
sys
sync
games
man
lp
mail
news
uucp
proxy
www-data
backup
list
irc
gnats
nobody
systemd-network
systemd-resolve
systemd-timesync
messagebus
syslog
_apt
tss
uuid
tcpdump
sshd
```

Fig. awk is useful when there is no separator in file

Searching and Replacing File:



```
saifshah_ubuntu@LAPTOP-H8UB0VRR:~ % sed -i 's/affect/impact/g' file.txt
COVID-19 affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization.
```

Fig. Searching the file

X

Fig. Replacing with enter

- **Sed:** It's stands for stream editor, which is used to search a word in the file & replace it with word required to be in the output

```
PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices/dev$ cat Sample.txt
COVID-19 affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization.
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices/dev$ sed 's/COVID-19/Coronavirus/g' Sample.txt
Coronavirus affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization.
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices/dev$ cat Sample.txt
COVID-19 affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization.
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices/dev$ sed -i 's/COVID-19/Coronavirus/g' Sample.txt
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices/dev$ cat Sample.txt
Coronavirus affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization.
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices/dev$ sed -i 's/Coronavirus//g' Sample.txt
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices/dev$ cat Sample.txt
    affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization.
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices/dev$
```

Fig. Stream Editor with all operations

Quiz:



Good job!

Question 1:

`grep <text> * -R` command will search for the text in all the file, in all the subdirectories.

true

false



Good job!

Question 2:

What is the command to find last 20 lines of the file

head 20 <filepath>

tail <filepath>

tail twenty <filepath>

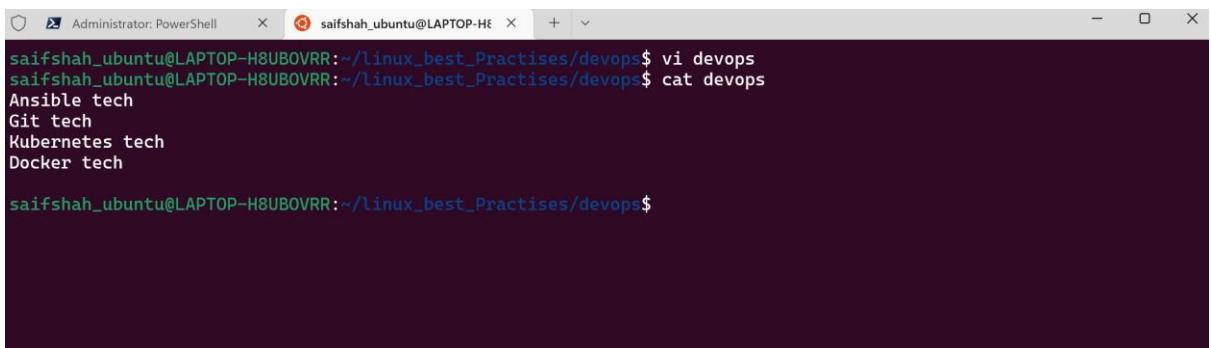
tail 20 <filepath>

X

IO redirections command

Redirection is a process where we can copy the output of any command(s), file(s) into a new file. There are two ways of redirecting the output into a file. Using **>** or **>>** filename after the command, and

⇒ Create a File name called devops tools with content

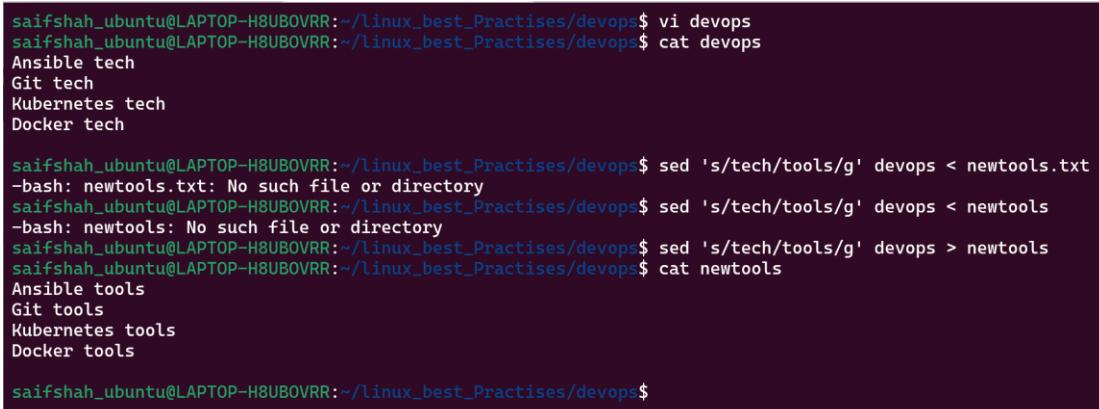


```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ vi devops
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ cat devops
Ansible tech
Git tech
Kubernetes tech
Docker tech

saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$
```

Fig. Creating devops tool with content

⇒ Search for text “tech” replace it with “tools” and redirect the output into a new file



```
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ vi devops
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ cat devops
Ansible tech
Git tech
Kubernetes tech
Docker tech

saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ sed 's/tech/tools/g' devops < newtools.txt
-bash: newtools.txt: No such file or directory
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ sed 's/tech/tools/g' devops < newtools
-bash: newtools: No such file or directory
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ sed 's/tech/tools/g' devops > newtools
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ cat newtools
Ansible tools
Git tools
Kubernetes tools
Docker tools

saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$
```

Fig. Searching and replacing with IO redirection

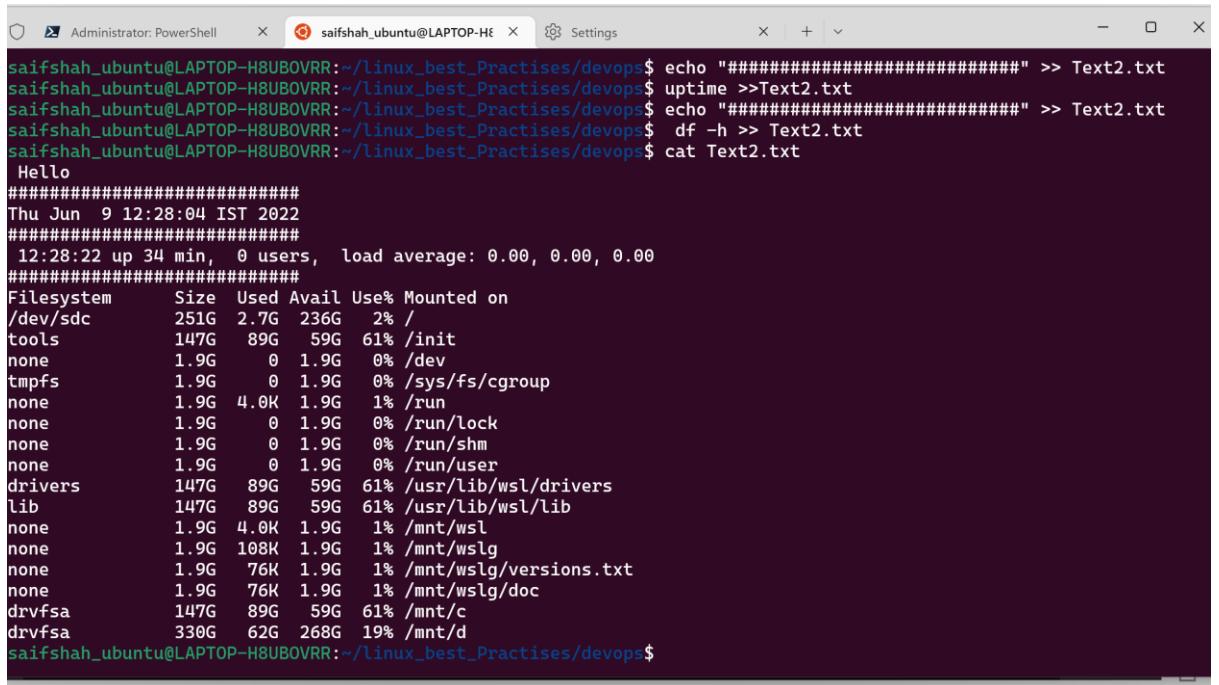
Note: if the given file is not available a new file will be created automatically. If file already exists then it will overwrite contents of that file.

⇒ Appending another output in same file with “>>”.

```
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ tail -4 /etc/passwd
saned:x:120:129::/var/lib/saned:/usr/sbin/noLogin
colord:x:121:130:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
gdm:x:122:131:Gnome Display Manager:/var/lib/gdm3:/bin/false
lightdm:x:123:132:Light Display Manager:/var/lib/lightdm:/bin/false
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ tail -4 /etc/passwd >> newtools
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ cat newtools
Ansible tools
Git tools
Kubernetes tools
Docker tools

saned:x:120:129::/var/lib/saned:/usr/sbin/nologin
colord:x:121:130:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
gdm:x:122:131:Gnome Display Manager:/var/lib/gdm3:/bin/false
lightdm:x:123:132:Light Display Manager:/var/lib/lightdm:/bin/false
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$
```

Fig. Appending another output in same file



The screenshot shows a Windows PowerShell window titled "Administrator: PowerShell". It contains a series of Linux commands run on an Ubuntu system via WSL:

```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ echo "#####" >> Text2.txt
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ uptime >>Text2.txt
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ echo "#####" >> Text2.txt
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ df -h >> Text2.txt
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ cat Text2.txt
Hello
#####
Thu Jun  9 12:28:04 IST 2022
#####
12:28:22 up 34 min,  0 users,  load average:  0.00,  0.00,  0.00
#####
Filesystem      Size  Used Avail Use% Mounted on
/dev/sdc        251G  2.7G  236G  2% /
tools           147G  89G   59G  61% /init
none            1.9G   0    1.9G  0% /dev
tmpfs           1.9G   0    1.9G  0% /sys/fs/cgroup
none            1.9G  4.0K   1.9G  1% /run
none            1.9G   0    1.9G  0% /run/lock
none            1.9G   0    1.9G  0% /run/shm
none            1.9G   0    1.9G  0% /run/user
drivers         147G  89G   59G  61% /usr/lib/wsl/drivers
lib             147G  89G   59G  61% /usr/lib/wsl/lib
none            1.9G  4.0K   1.9G  1% /mnt/wsl
none            1.9G  108K   1.9G  1% /mnt/wslg
none            1.9G  76K   1.9G  1% /mnt/wslg/versions.txt
none            1.9G  76K   1.9G  1% /mnt/wslg/doc
drvfsa          147G  89G   59G  61% /mnt/c
drvfsa          330G  62G   268G 19% /mnt/d
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$
```

Fig. Basic Commands of Linux redirected



⇒ Redirecting only error to a file “2>>”.

```
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ uptimer 2>> Text3.txt
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ cat Text3.txt

Command 'uptimer' not found, did you mean:

  command 'uptime' from deb procps (2:3.3.16-1ubuntu2.3)
  command 'uptimed' from deb uptimed (1:0.4.2-1)

Try: sudo apt install <deb name>
```

Fig. redirecting only errors

⇒ Redirecting all the output to a file “&>>”.

```
saifshah_ubuntu@LAPTOP-
H8UBOVRR:~/linux_best_Practises/devops$ freee -m &>>
Text3.txt
```

```
Administrator: PowerShell X saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ free -m &>> Text3.txt
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises/devops$ cat Text3.txt

Command 'uptimer' not found, did you mean:

  command 'uptime' from deb procps (2:3.3.16-1ubuntu2.3)
  command 'uptimed' from deb uptimed (1:0.4.2-1)

Try: sudo apt install <deb name>

Command 'freee' not found, did you mean:

  command 'free' from deb procps (2:3.3.16-1ubuntu2.3)

Try: sudo apt install <deb name>

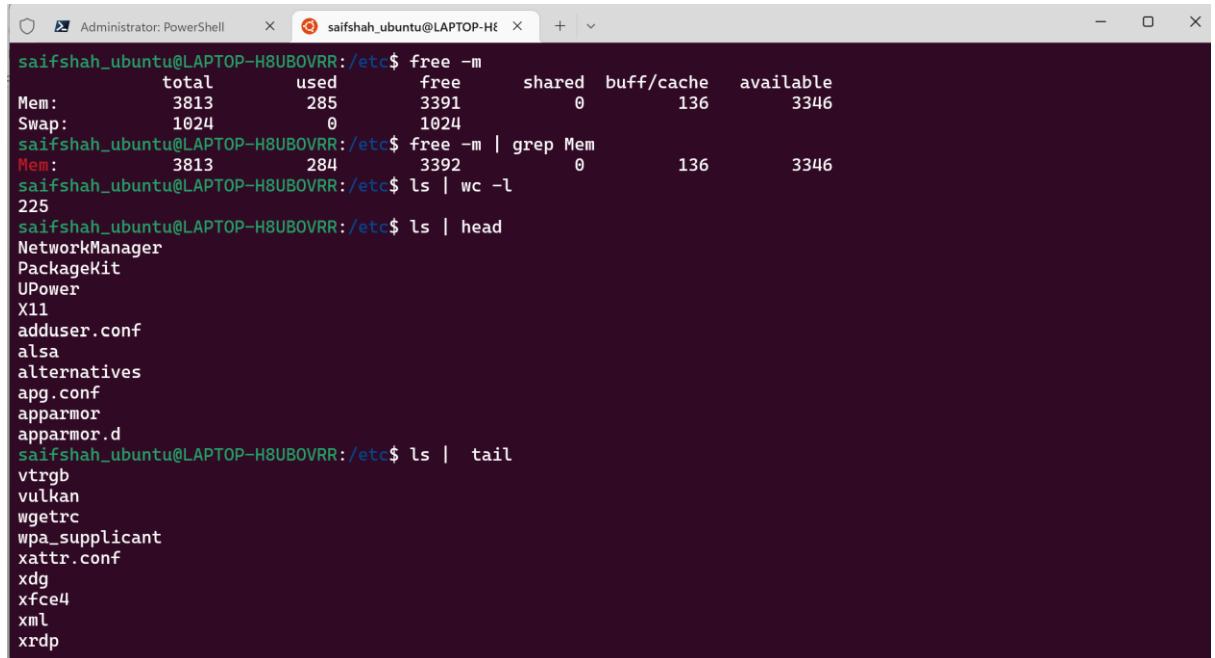
          total        used         free       shared  buff/cache   available
Mem:      3813         292        3384           0         135        3339
Swap:     1024           0        1024
```

Fig. redirecting all output to the file

X

Piping:

So far, we've dealt with sending data to and from files. Now we'll take a look at a mechanism for sending data from one program to another. It's called piping and the operator we use is (|). What this operator does is feed the output from the program on the left as input to the program on the right.

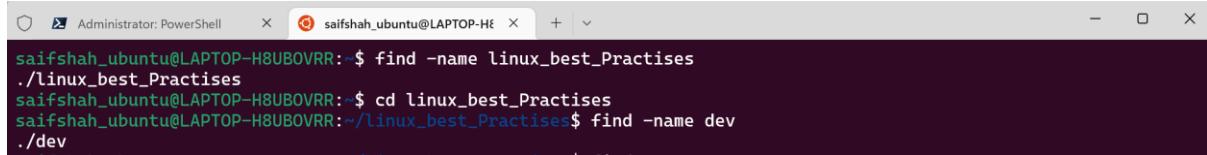


The screenshot shows a Windows PowerShell window with the title 'Administrator: PowerShell'. The command history is as follows:

```
saifshah_ubuntu@LAPTOP-H8UBOVRR:/etc$ free -m
Mem:      total        used        free      shared  buff/cache   available
Swap:      1024          0       1024
saifshah_ubuntu@LAPTOP-H8UBOVRR:/etc$ free -m | grep Mem
Mem:      total        used        free      shared  buff/cache   available
Swap:      1024          0       1024
saifshah_ubuntu@LAPTOP-H8UBOVRR:/etc$ ls | wc -l
225
saifshah_ubuntu@LAPTOP-H8UBOVRR:/etc$ ls | head
NetworkManager
PackageKit
UPower
X11
adduser.conf
alsa
alternatives
apg.conf
apparmor
apparmor.d
saifshah_ubuntu@LAPTOP-H8UBOVRR:/etc$ ls | tail
vtrgb
vulkan
wgetrc
wpa_supplicant
xattr.conf
xdg
xfce4
xml
xrpd
```

Fig. Piping with all commands

Find: find command is used to find the files or directory's path, it is exactly the find option in windows where you can search for a file.



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UB0VRR:~$ find -name linux_best_Practices
./linux_best_Practices
saifshah_ubuntu@LAPTOP-H8UB0VRR:~$ cd linux_best_Practices
saifshah_ubuntu@LAPTOP-H8UB0VRR:~/linux_best_Practices$ find -name dev
./dev
```

Fig. find command

Options that can be used with find command:

Option	Usage
-name	For searching a file with its name
-inum	For searching a file with particular inode number
-type	For searching a particular type of file
-user	For files whose owner is a particular user
-group	For files belonging to particular group

Quiz:



Good job!

2>> is to append standard ERROR not Output

Question 4:

2>> is to append standard Output to a file.

True

False

X



Good job!

Question 1:

Output redirection symbol is ____

>

<

=>

<=



Good job!

Question 2:

Input Redirection symbol is ____

>

<

<=

=>

X

Saif Panjesha

Owner

Users and Groups

Users

Some Important Points related to Users:

- Users and groups are used to control access to files and resources
- Users login to the system by supplying their username and password
- Every file on the system is owned by a user and associated with a group
- Every process has an owner and group affiliation, and can only access the resources its owner or group can access
- Every user of the system is assigned a unique UserID number (the UID)
- Users name and UID are stored in **/etc/passwd**
- Users password is stored in **/etc/shadow** in encrypted form.
- Users are assigned a home directory and a program that is run when they login (**Usually a shell**)
- Users cannot read, write or execute each other's without permission.

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Type of User

TYPE	EXAMPLE	USER ID(ID)	GROUP ID(ID)	HOME DIR	SHELL
ROOT	root	0	0	/root	/bin/bash
REGULAR	Saifshah, ubuntu	1000 to 60000	1000 to 60000	/home/username	/bin/bash
SERVICE	ftp, ssh, apache	1 to 999	1 to 999	/var/ftp etc	/sbin/nologin

In Linux there are three types of users.

1. Super user or root user

Super user or root user is the most powerful user. He is the administrator user.

2. System User

System users are the users created by the software or applications. For Example, if we install Apache, it will create a user apache. These kinds of users are also known as system users.

3. Normal User

Normal users are the users created by the root user. They are normal users like saif, Sandeep, Amar, etc..

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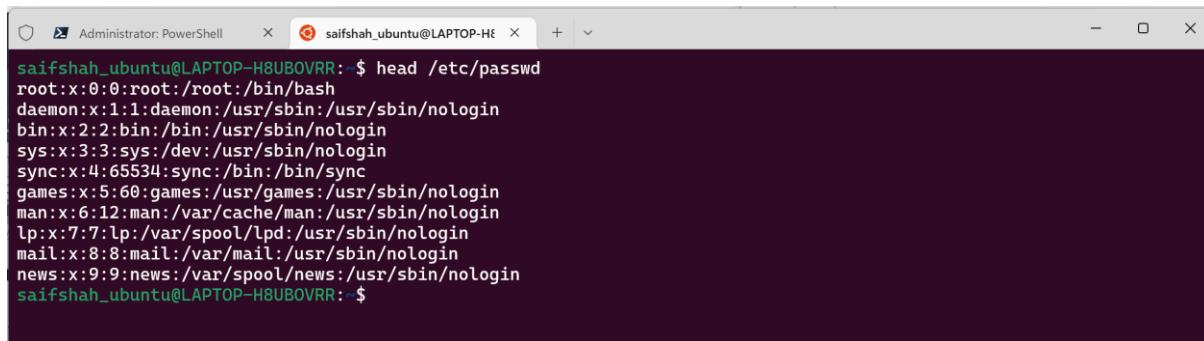
Saif Panjesha
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Whenever a user is created in Linux things created by default:

- A home directory is created(home/username)
- A mail box is created(var/spool/mail)
- Unique UID & GID are given to user

Passwd file

1. /etc/passwd



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR ~$ head /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:/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
saifshah_ubuntu@LAPTOP-H8UBOVRR ~$
```

The above fields are

- root = name
- x = link to the password file i.e. /etc/shadow
- **0 or 1** = UID (user id)
- **0 or 1** = GID (group id)
- **root or daemon** = comments (brief information about user)
- **/root or /usr** = home directory of the user
- **/bin/bash or /sbin/nologin** = shell

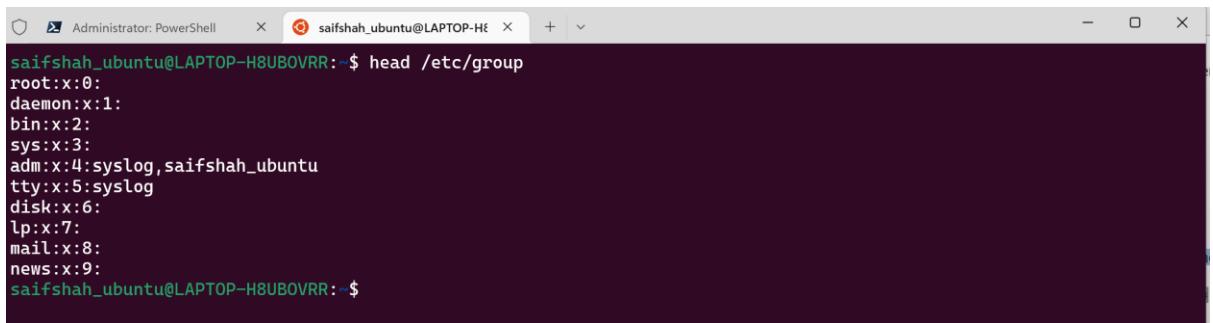
X

Group file

2. /etc/group

The file /etc/group stores group information. Each line in this file stores one group entry.

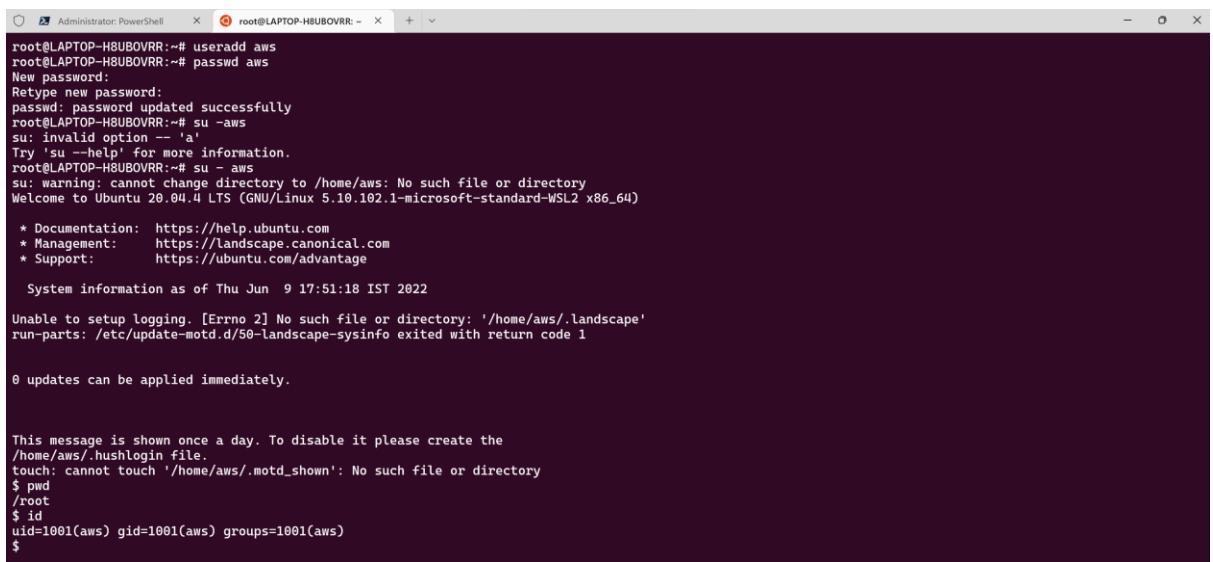
Group name, group password, GID, group member



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~$ head /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,saifshah_ubuntu
tty:x:5:syslog
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
saifshah_ubuntu@LAPTOP-H8UBOVRR:~$
```

Fig. Group head

ADD USER, SET PASSWORD & SWITCH TO USER



```
Administrator: PowerShell root@LAPTOP-H8UBOVRR:~# useradd aws
root@LAPTOP-H8UBOVRR:~# passwd aws
New password:
Retype new password:
passwd: password updated successfully
root@LAPTOP-H8UBOVRR:~# su -aws
su: invalid option -- 'a'
Try 'su --help' for more information.
root@LAPTOP-H8UBOVRR:~# su -aws
su: warning: cannot change directory to /home/aws: No such file or directory
Welcome to Ubuntu 20.04.4 LTS (GNU/Linux 5.10.102.1-microsoft-standard-WSL2 x86_64)

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

 System information as of Thu Jun  9 17:51:18 IST 2022

Unable to setup logging. [Errno 2] No such file or directory: '/home/aws/.landscape'
run-parts: /etc/update-motd.d/50-landscape-sysinfo exited with return code 1

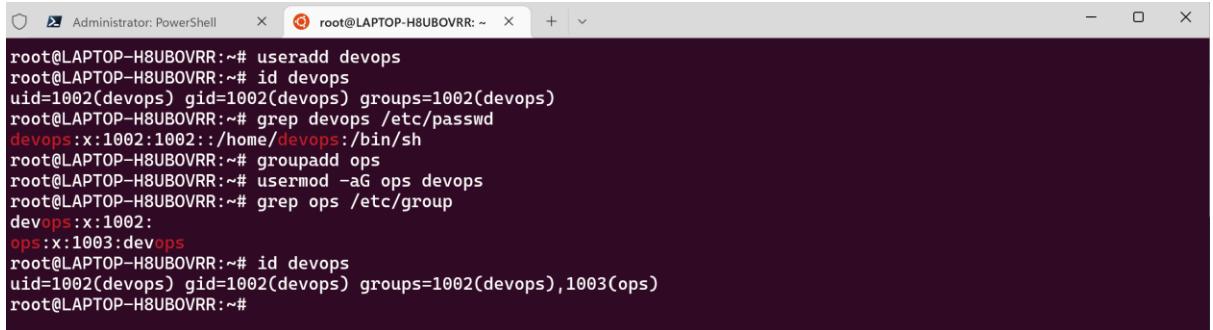
0 updates can be applied immediately.

This message is shown once a day. To disable it please create the
/home/aws/.hushlogin file.
touch: cannot touch '/home/aws/.motd_shown': No such file or directory
$ pwd
/root
$ id
uid=1001(aws) gid=1001(aws) groups=1001(aws)
$
```

Fig. adding user, password setting and switch to user

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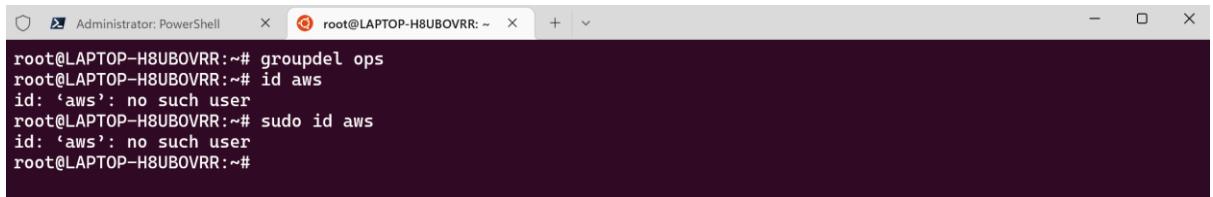
ADD USER, GROUP & USER INTO GROUP



```
Administrator: PowerShell root@LAPTOP-H8UBOVRR:~# useradd devops
root@LAPTOP-H8UBOVRR:~# id devops
uid=1002(devops) gid=1002(devops) groups=1002(devops)
root@LAPTOP-H8UBOVRR:~# grep devops /etc/passwd
devops:x:1002:1002::/home/devops:/bin/sh
root@LAPTOP-H8UBOVRR:~# groupadd ops
root@LAPTOP-H8UBOVRR:~# usermod -aG ops devops
root@LAPTOP-H8UBOVRR:~# grep ops /etc/group
devops:x:1002:
ops:x:1003:devops
root@LAPTOP-H8UBOVRR:~# id devops
uid=1002(devops) gid=1002(devops) groups=1002(devops),1003(ops)
root@LAPTOP-H8UBOVRR:~#
```

Fig. all commands check

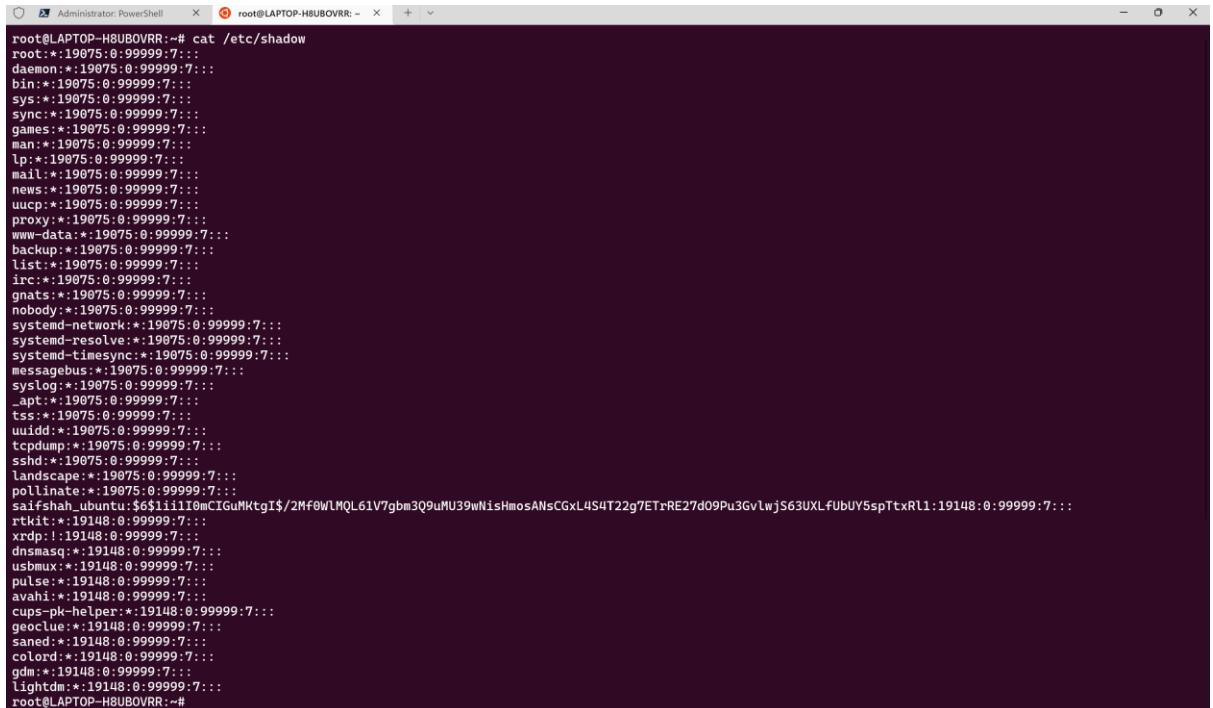
DELETE USER and GROUP



```
Administrator: PowerShell root@LAPTOP-H8UBOVRR:~# groupdel ops
root@LAPTOP-H8UBOVRR:~# id aws
id: 'aws': no such user
root@LAPTOP-H8UBOVRR:~# sudo id aws
id: 'aws': no such user
root@LAPTOP-H8UBOVRR:~#
```

Fig. deleted users and groups

cat /etc/shadow



```
Administrator: PowerShell root@LAPTOP-H8UBOVRR:~# cat /etc/shadow
root::19075:0:99999:7:::
daemon::19075:0:99999:7:::
bin::19075:0:99999:7:::
sys::19075:0:99999:7:::
sync::19075:0:99999:7:::
games::19075:0:99999:7:::
man::19075:0:99999:7:::
lp::19075:0:99999:7:::
mail::19075:0:99999:7:::
news::19075:0:99999:7:::
uucp::19075:0:99999:7:::
proxy::19075:0:99999:7:::
www-data::19075:0:99999:7:::
backup::19075:0:99999:7:::
list::19075:0:99999:7:::
irc::19075:0:99999:7:::
gnats::19075:0:99999:7:::
nobody::19075:0:99999:7:::
systemd-network::19075:0:99999:7:::
systemd-resolve::19075:0:99999:7:::
systemd-timesync::19075:0:99999:7:::
messagebus::19075:0:99999:7:::
syslog::19075:0:99999:7:::
_apt::19075:0:99999:7:::
tss::19075:0:99999:7:::
uuid::19075:0:99999:7:::
tcpdump::19075:0:99999:7:::
sshd::19075:0:99999:7:::
landscape::19075:0:99999:7:::
pollinate::19075:0:99999:7:::
saifshah:ubuntu:$6$1ii110mCIGuMKtgI$/2Mf0wLMQL61V7gbm3Q9uMU39wNisHmosAnSGxL4S4T22g7ETrRE27d09Pu3GvLwjS63UXLfUbUY5spTtxRl1:19148:0:99999:7:::
rtkit::19148:0:99999:7:::
xdp::19148:0:99999:7:::
dnsmasq::19148:0:99999:7:::
usbmux::19148:0:99999:7:::
pulse::19148:0:99999:7:::
avahi::19148:0:99999:7:::
cups-pk-helper::19148:0:99999:7:::
geoclue::19148:0:99999:7:::
saned::19148:0:99999:7:::
colord::19148:0:99999:7:::
gdm::19148:0:99999:7:::
lightdm::19148:0:99999:7:::
root@LAPTOP-H8UBOVRR:~#
```

X

Users and Group cheat sheet

COMMANDS	DESCRIPTION
useradd	Creates user in RedHat
adduser	Creates user in ubuntu
id	Shows user info
groupadd	Creates group
usermod -G grpnam username	Adds user to group
passwd	set/reset password
userdel -r	removes user with home dir
groupdel	removes group
last	shows last login in system
who	who is logged into system
whoami	username
lsof -u user	List files opened by user

Fig. Users and Group cheat sheet

X

Saif Panjesha
Owner

Quiz:



Good job!

User info file is /etc/passwd and Group info file is /etc/group

Question 1:

User info file is /etc/group and Group info file is /etc/passwd



True



False



Good job!

Question 2:

lsof -u username will list files opened by user



True



False



Good job!

Question 3:

How to reset password of a user ?



Any User can reset any users password by using `passwd username` command



Only user can reset its own password by using `passwd username` command



root user can reset any users password by using `passwd username` command, also user can reset its own password by running just `passwd` command.

X



Good job!

Question 4:

How to switch between users in Linux cli?



su - username



sudo - username



sudo -i



Good job!

Question 5:

Users password is stored(encrypted) in /etc/shadows file.



True

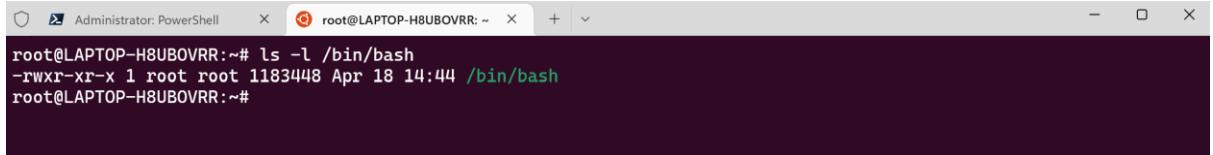


False

X

File Permissions

Viewing Permission from command – Line: ls -l



```
Administrator: PowerShell      root@LAPTOP-H8UBOVRR:~      +  ▾
root@LAPTOP-H8UBOVRR:~# ls -l /bin/bash
-rwxr-xr-x 1 root root 1183448 Apr 18 14:44 /bin/bash
root@LAPTOP-H8UBOVRR:~#
```

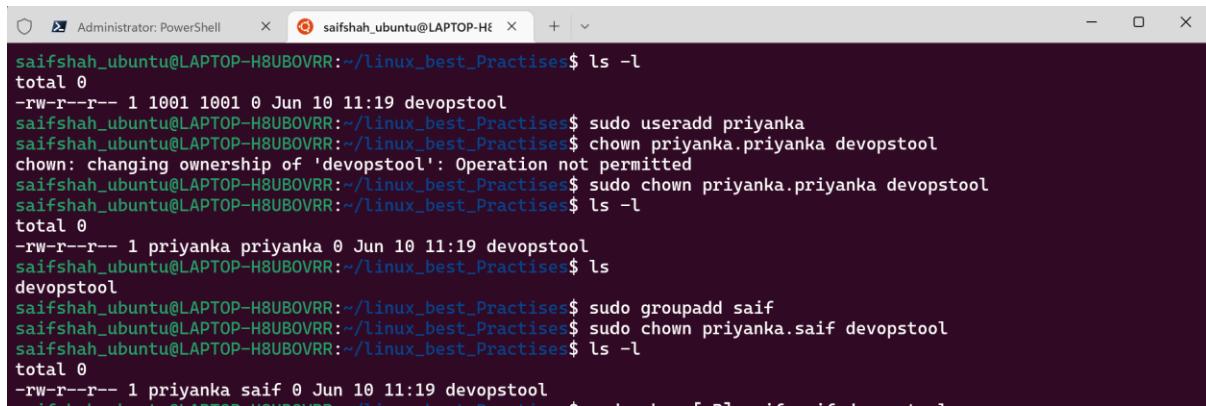
Fig. view permission

- Four Symbol are used when display permissions
 - : Type of file directory, links, characters, etc
 - r :Permission to read a file or list's the directory content
 - w : Permission to write a file or creates & remove file from directory
 - x : Permission to execute a program and changing the directory and do a long listing to a directory
 - : no permission in place of (r, w and x)

Changing the File Ownership

- Only root can change the file's owner
- Only root or the owner can change a file's group
- Ownership is changed with **chown**
Chown[-R] user_name File | directory...
- Group-ownership is changed with **chgrp**
Chgrp[-R] group_name File |directory...

X



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/Linux_best_Practices$ ls -l
total 0
-rw-r--r-- 1 1001 1001 0 Jun 10 11:19 devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/Linux_best_Practices$ sudo useradd priyanka
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/Linux_best_Practices$ chown priyanka.priyanka devopstool
chown: changing ownership of 'devopstool': Operation not permitted
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/Linux_best_Practices$ sudo chown priyanka.priyanka devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/Linux_best_Practices$ ls -l
total 0
-rw-r--r-- 1 priyanka priyanka 0 Jun 10 11:19 devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/Linux_best_Practices$ ls
devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/Linux_best_Practices$ sudo groupadd saif
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/Linux_best_Practices$ sudo chown priyanka.saif devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/Linux_best_Practices$ ls -l
total 0
-rw-r--r-- 1 priyanka saif 0 Jun 10 11:19 devopstool
```

Fig. Changing File Permission

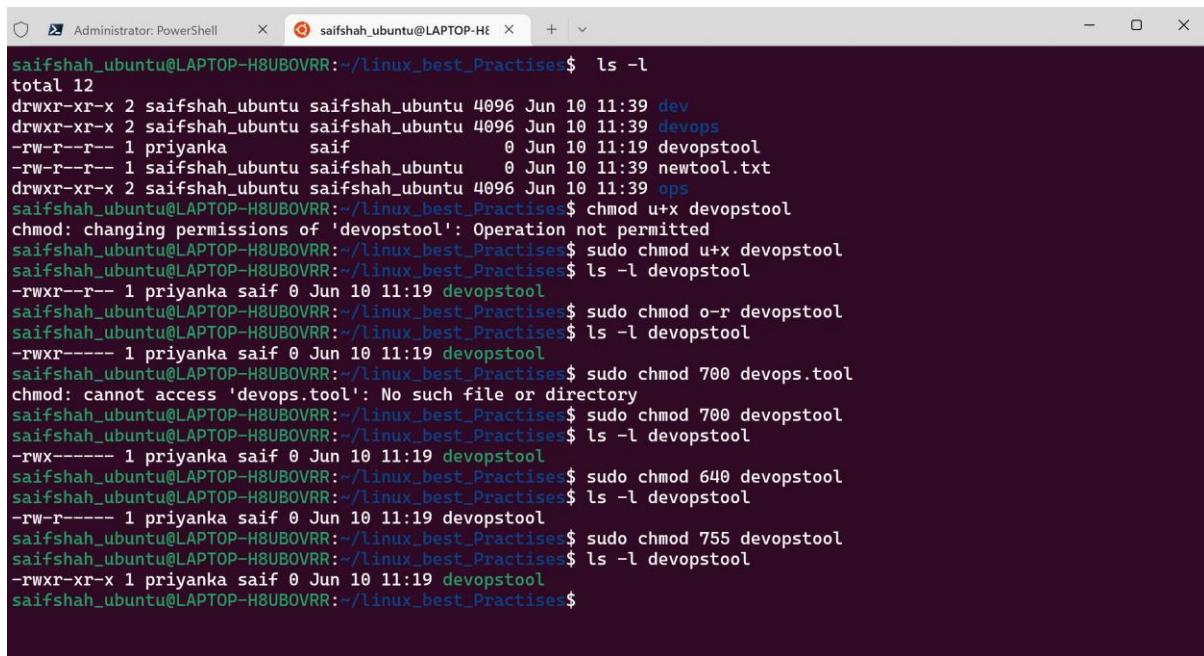
Changing Permissions - Symbolic Method

- To change access modes:
 - **chmod [-OPTION] ... mode[,mode] file directory ...**
- *mode* includes:
 - **u,g or o** for user, group and other
 - **+- or =** for grant, deny or set
 - **r, w or x** for read, write and execute
- Options include:
 - **-R Recursive**
 - **-v Verbose**
 - **--reference** Reference another file for its mode
- Examples:
 - **chmod ugo+r file:** Grant read access to all for *file*
 - **chmod o-wx dir:** Deny write and execute to others for *dir*

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Changing Permissions - Numeric Method

- Uses a three-digit mode number
 - first digit specifies owner's permissions
 - second digit specifies group permissions
 - third digit represents others' permissions
- Permissions are calculated by adding:
 - 4 (for read)
 - 2 (for write)
 - 1 (for execute)
- Example:
 - **chmod 640 myfile**



The screenshot shows a terminal window titled "Administrator: PowerShell" running on a Linux system. The user, saifshah_ubuntu, is demonstrating how to change file permissions. They start by listing files with "ls -l", then attempt to change the permissions of a file named "devopstool" using "chmod u+x". This fails with the message "Operation not permitted". They then use "sudo" to run the command successfully. Finally, they show how to use numeric permissions (640) and symbolic permissions (o+r) to achieve the same result.

```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$ ls -l
total 12
drwxr-xr-x 2 saifshah_ubuntu saifshah_ubuntu 4096 Jun 10 11:39 dev
drwxr-xr-x 2 saifshah_ubuntu saifshah_ubuntu 4096 Jun 10 11:39 devops
-rw-r--r-- 1 priyanka saif 0 Jun 10 11:19 devopstool
-rw-r--r-- 1 saifshah_ubuntu saifshah_ubuntu 0 Jun 10 11:39 newtool.txt
drwxr-xr-x 2 saifshah_ubuntu saifshah_ubuntu 4096 Jun 10 11:39 ops
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$ chmod u+x devopstool
chmod: changing permissions of 'devopstool': Operation not permitted
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$ sudo chmod u+x devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$ ls -l devopstool
-rw-r--r-- 1 priyanka saif 0 Jun 10 11:19 devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$ sudo chmod o-r devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$ ls -l devopstool
-rwxr----- 1 priyanka saif 0 Jun 10 11:19 devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$ sudo chmod 700 devops.tool
chmod: cannot access 'devops.tool': No such file or directory
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$ sudo chmod 700 devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$ ls -l devopstool
-rwxr----- 1 priyanka saif 0 Jun 10 11:19 devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$ sudo chmod 640 devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$ ls -l devopstool
-rw-r----- 1 priyanka saif 0 Jun 10 11:19 devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$ sudo chmod 755 devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$ ls -l devopstool
-rwxr-xr-x 1 priyanka saif 0 Jun 10 11:19 devopstool
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practices$
```

Fig. Changing permission Symbolic & Numeric Method

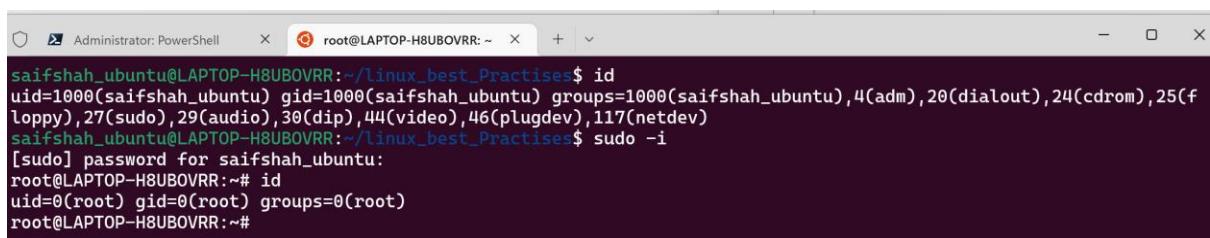
X

Sudo

Sudo gives power to a normal user to execute commands which is owned by root user.

If a user has already full sudoers privileges, it can become a root user anytime.

⇒ **sudo -i changes from normal user to root user**

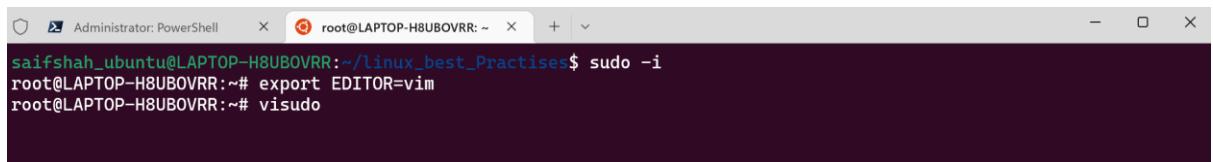


```
Administrator: PowerShell saifshah@LAPTOP-H8UBOVRR:~/linux_best_Practices$ id
uid=1000(saifshah_ubuntu) gid=1000(saifshah_ubuntu) groups=1000(saifshah_ubuntu),4(adm),20(dialout),24(cdrom),25(floppy),27(sudo),29(audio),30(dip),40(video),46(plugdev),117(netdev)
saifshah@LAPTOP-H8UBOVRR:~/linux_best_Practices$ sudo -i
[sudo] password for saifshah_ubuntu:
root@LAPTOP-H8UBOVRR:~# id
uid=0(root) gid=0(root) groups=0(root)
root@LAPTOP-H8UBOVRR:~#
```

Fig. Sudo Commands to switch from normal to root user

Note: User saifshah was already a sudo user with full privilege

⇒ **Adding a user pari in sudoers list**



```
Administrator: PowerShell saifshah@LAPTOP-H8UBOVRR:~/linux_best_Practices$ sudo -i
root@LAPTOP-H8UBOVRR:~# export EDITOR=vim
root@LAPTOP-H8UBOVRR:~# visudo
```

```
# This file MUST be edited with the 'visudo' command as root.
#
# Please consider adding local content in /etc/sudoers.d/ instead of
# directly modifying this file.
#
# See the man page for details on how to write a sudoers file.
#
Defaults      env_reset
Defaults      mail_badpass
Defaults      secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/snap/bin"

# Host alias specification

# User alias specification

# Cmnd alias specification

# User privilege specification
root    ALL=(ALL:ALL) ALL
pari   ALL=(ALL:ALL) ALL
# Members of the admin group may gain root privileges
%admin  ALL=(ALL) ALL

# Allow members of group sudo to execute any command
%sudo   ALL=(ALL:ALL) ALL

# See sudoers(5) for more information on "#include" directives:
```

24,0-1 50%

Fig. adding user in sudoers list

⇒ Like a user a group can also be added into sudoers list.

```
# This file MUST be edited with the 'visudo' command as root.
#
# Please consider adding local content in /etc/sudoers.d/ instead of
# directly modifying this file.
#
# See the man page for details on how to write a sudoers file.
#
Defaults      env_reset
Defaults      mail_badpass
Defaults      secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/snap/bin"

# Host alias specification

# User alias specification

# Cmnd alias specification

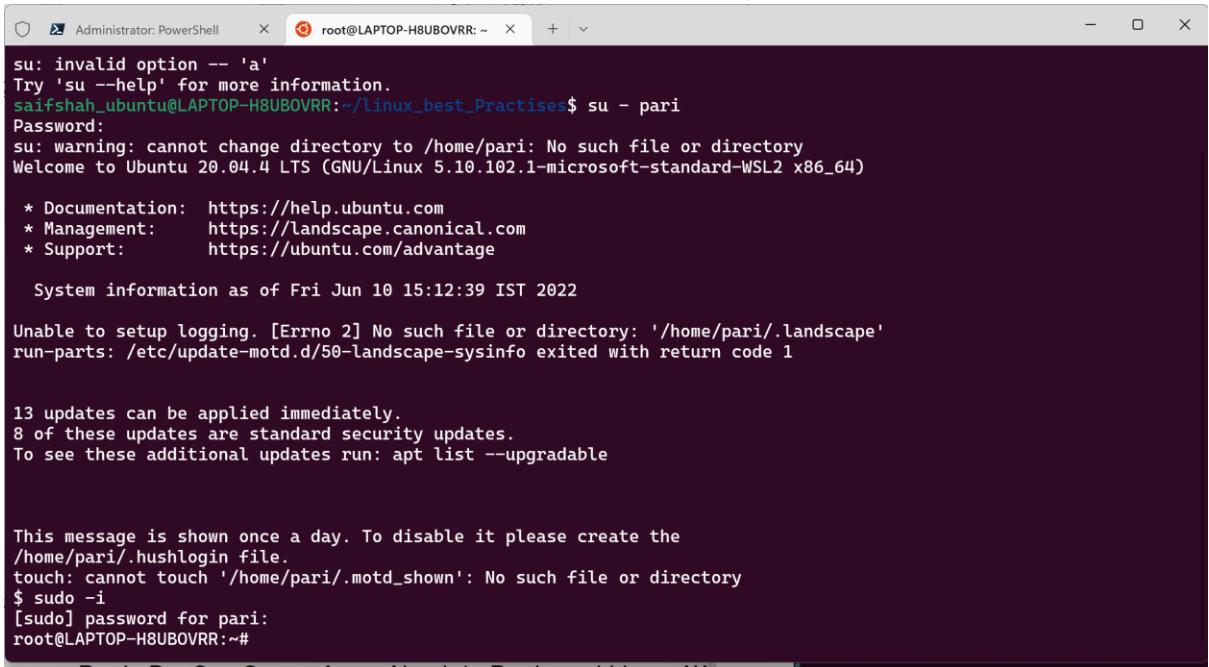
# User privilege specification
root    ALL=(ALL:ALL) ALL
pari   ALL=(ALL:ALL) ALL
# Members of the admin group may gain root privileges
%admin  ALL=(ALL) ALL
%saif  ALL=(ALL) ALL
# Allow members of group sudo to execute any command
%sudo   ALL=(ALL:ALL) ALL

# See sudoers(5) for more information on "#include" directives:
```

-- INSERT -- 24,21 50%

Fig. adding groups in sudoers list

X



```
Administrator: PowerShell      root@LAPTOP-H8UBOVRR: ~ + | 
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ su - pari
Password:
su: warning: cannot change directory to /home/pari: No such file or directory
Welcome to Ubuntu 20.04.4 LTS (GNU/Linux 5.10.102.1-microsoft-standard-WSL2 x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://Landscape.canonical.com
 * Support: https://ubuntu.com/advantage

 System information as of Fri Jun 10 15:12:39 IST 2022

Unable to setup logging. [Errno 2] No such file or directory: '/home/pari/.landscape'
run-parts: /etc/update-motd.d/50-landscape-sysinfo exited with return code 1

13 updates can be applied immediately.
8 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

This message is shown once a day. To disable it please create the
/home/pari/.hushlogin file.
touch: cannot touch '/home/pari/.motd_shown': No such file or directory
$ sudo -i
[sudo] password for pari:
root@LAPTOP-H8UBOVRR:~#
```

Fig. login with sudoers users

⇒ Every time you enter sudo command it asks your own password. To turn that off use NOPASSWD in sudoers file.

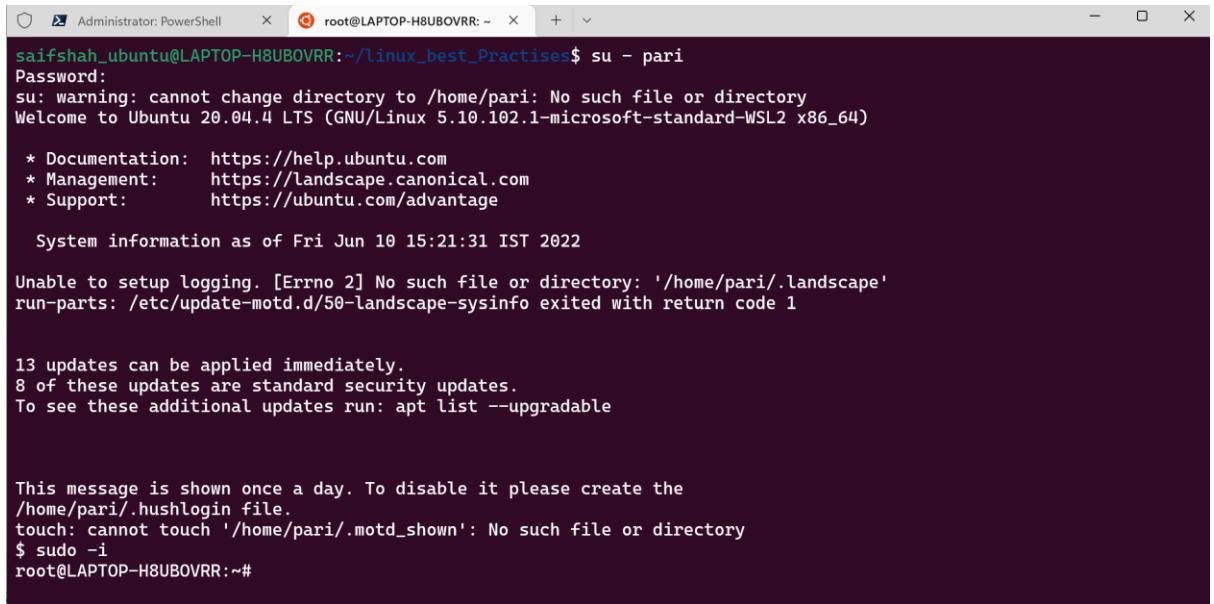
```
# User privilege specification
root    ALL=(ALL:ALL) ALL
pari    ALL=(ALL:ALL) NOPASSWD: ALL
```

Fig. setting NOPASSWD in sudoers file

X

⇒ **Changing to any other users with “su- “command.**

⇒ **Become a root user from pari user login**



```
Administrator: PowerShell      X  root@LAPTOP-H8UBOVRR: ~ + 
saifshah_ubuntu@LAPTOP-H8UBOVRR:~/linux_best_Practises$ su - pari
Password:
su: warning: cannot change directory to /home/pari: No such file or directory
Welcome to Ubuntu 20.04.4 LTS (GNU/Linux 5.10.102.1-microsoft-standard-WSL2 x86_64)

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

 System information as of Fri Jun 10 15:21:31 IST 2022

Unable to setup logging. [Errno 2] No such file or directory: '/home/pari/.landscape'
run-parts: /etc/update-motd.d/50-landscape-sysinfo exited with return code 1

13 updates can be applied immediately.
8 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

This message is shown once a day. To disable it please create the
/home/pari/.hushlogin file.
touch: cannot touch '/home/pari/.motd_shown': No such file or directory
$ sudo -i
root@LAPTOP-H8UBOVRR:~#
```

Fig. Changing to other users with su – command & become a root user from pari user login

Quiz:



Good job!

Only user in /etc/sudoers file or /etc/sudoers.d dir can use sudo -i command to switch to root user as mentioned below

Question 1:

sudo -i command can be used by any user to switch to root user



True



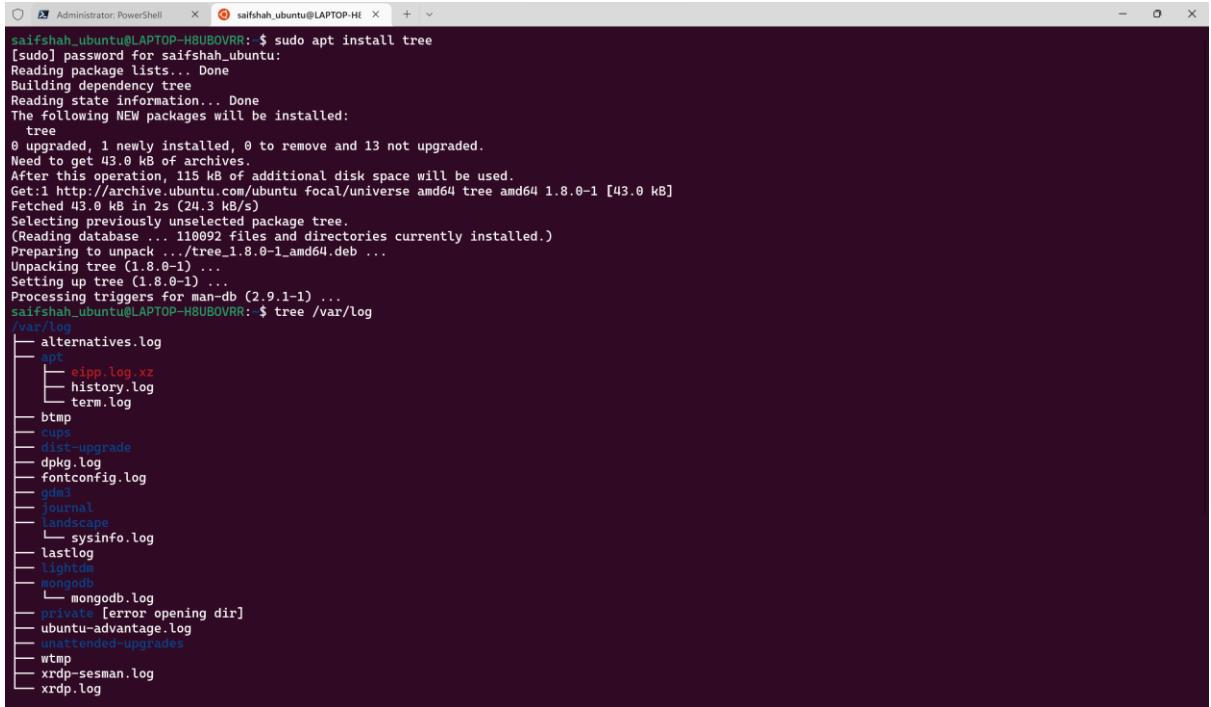
False

X

Package Management

⇒ Download Packages from Internet

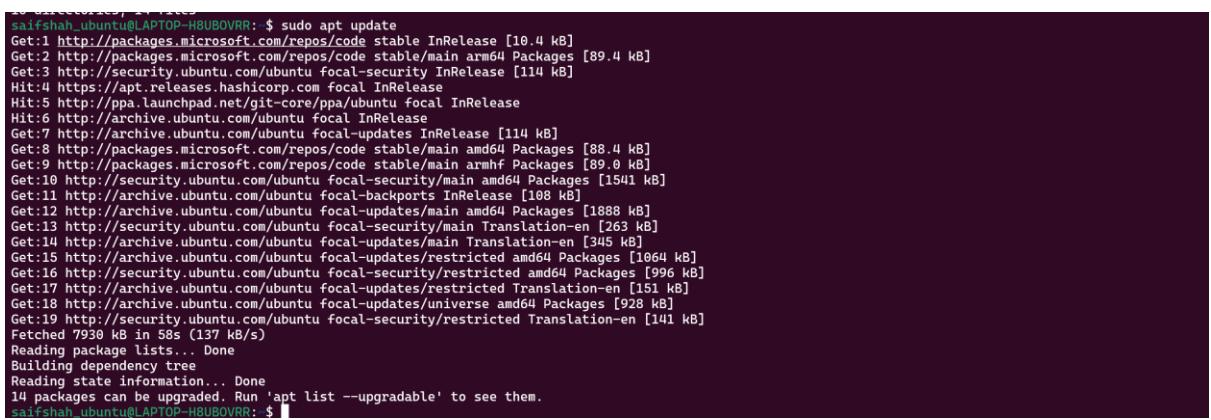
Install Tree



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-H8UBOVRR: $ sudo apt install tree
[sudo] password for saifshah_ubuntu:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  tree
0 upgraded, 1 newly installed, 0 to remove and 13 not upgraded.
Need to get 43.0 kB of archives.
After this operation, 115 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/universe amd64 tree amd64 1.8.0-1 [43.0 kB]
Fetched 43.0 kB in 2s (24.3 kB/s)
Selecting previously unselected package tree.
(Reading database ... 110092 files and directories currently installed.)
Preparing to unpack .../tree_1.8.0-1_amd64.deb ...
Unpacking tree (1.8.0-1) ...
Setting up tree (1.8.0-1) ...
Processing triggers for man-db (2.9.1-1) ...
saifshah_ubuntu@LAPTOP-H8UBOVRR: $ tree /var/log
/var/log
├── alternatives.log
├── apt
│   ├── eipp.log.xz
│   ├── history.log
│   └── term.log
├── btmp
├── cups
├── dist-upgrade
├── dpkg.log
├── fontconfig.log
├── gda3
├── journal
│   └── landscape
│       └── sysinfo.log
└── lastlog
    └── lightdm
        └── mongod
            └── private [error opening dir]
    └── ubuntu-advantage.log
    └── unattended-upgrades
└── wtmp
└── xrdp-sesman.log
└── xrdp.log
```

Fig. tree successful Installation

To Update all your packages

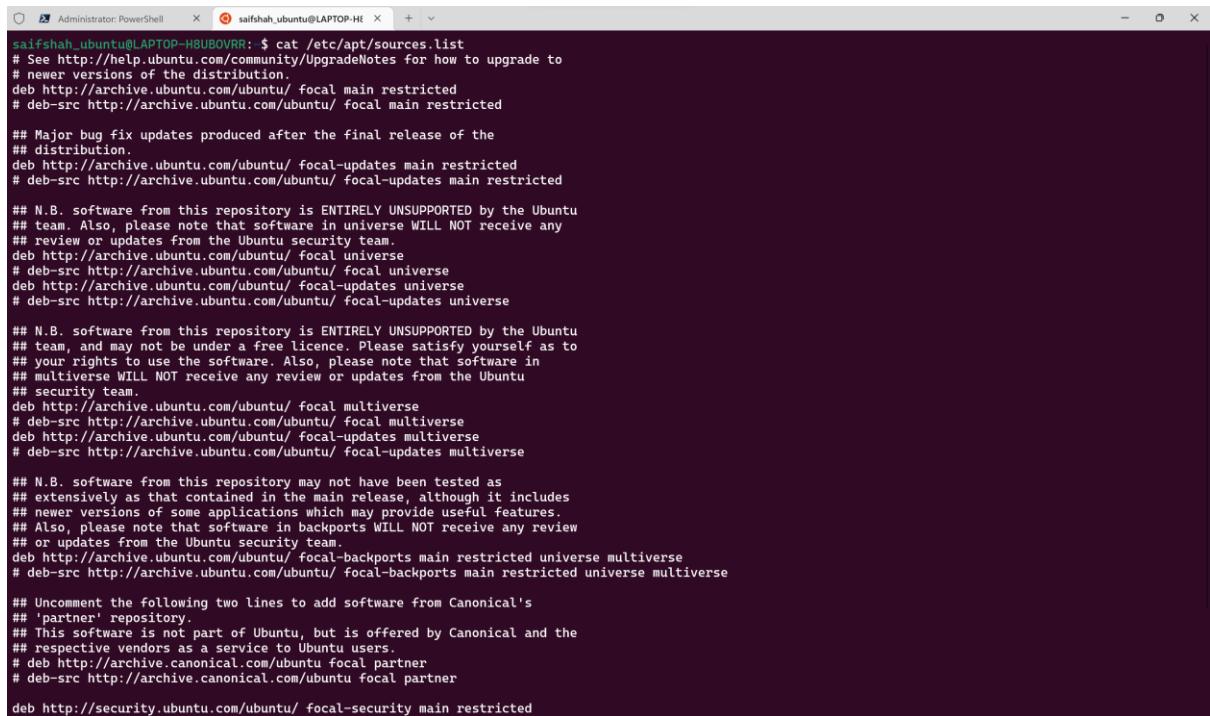


```
10 directories, 117 files
saifshah_ubuntu@LAPTOP-H8UBOVRR: ~$ sudo apt update
Get:1 http://packages.microsoft.com/repos/code stable InRelease [10.4 kB]
Get:2 http://packages.microsoft.com/repos/code stable/main arm64 Packages [89.4 kB]
Get:3 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Hit:4 https://apt.releases.hashicorp.com focal InRelease
Hit:5 http://ppa.launchpad.net/git-core/ppa/ubuntu focal InRelease
Hit:6 http://archive.ubuntu.com/ubuntu focal InRelease
Get:7 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:8 http://packages.microsoft.com/repos/code stable/main amd64 Packages [88.4 kB]
Get:9 http://packages.microsoft.com/repos/code stable/main armhf Packages [89.0 kB]
Get:10 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [1541 kB]
Get:11 http://archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:12 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [1888 kB]
Get:13 http://security.ubuntu.com/ubuntu focal-security/main Translation-en [263 kB]
Get:14 http://archive.ubuntu.com/ubuntu focal-updates/main Translation-en [345 kB]
Get:15 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [1064 kB]
Get:16 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [996 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal-updates/restricted Translation-en [151 kB]
Get:18 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [928 kB]
Get:19 http://security.ubuntu.com/ubuntu focal-security/restricted Translation-en [141 kB]
Fetched 7930 kB in 58s (137 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
14 packages can be upgraded. Run 'apt list --upgradable' to see them.
saifshah_ubuntu@LAPTOP-H8UBOVRR: ~$
```

Fig. Update Packages

X

The **sources.list** file is a key factor in adding or upgrading applications to your Ubuntu installation. This is also used by your system for system updates. The file is basically the roadmap for your system to know where it may download programs for installation or upgrade.



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-HBUBOVRR: $ cat /etc/apt/sources.list
# See http://help.ubuntu.com/community/UpgradeNotes for how to upgrade to
# newer versions of the distribution.
deb http://archive.ubuntu.com/ubuntu/ focal main restricted
# deb-src http://archive.ubuntu.com/ubuntu/ focal main restricted

## Major bug fix updates produced after the final release of the
## distribution.
deb http://archive.ubuntu.com/ubuntu/ focal-updates main restricted
# deb-src http://archive.ubuntu.com/ubuntu/ focal-updates main restricted

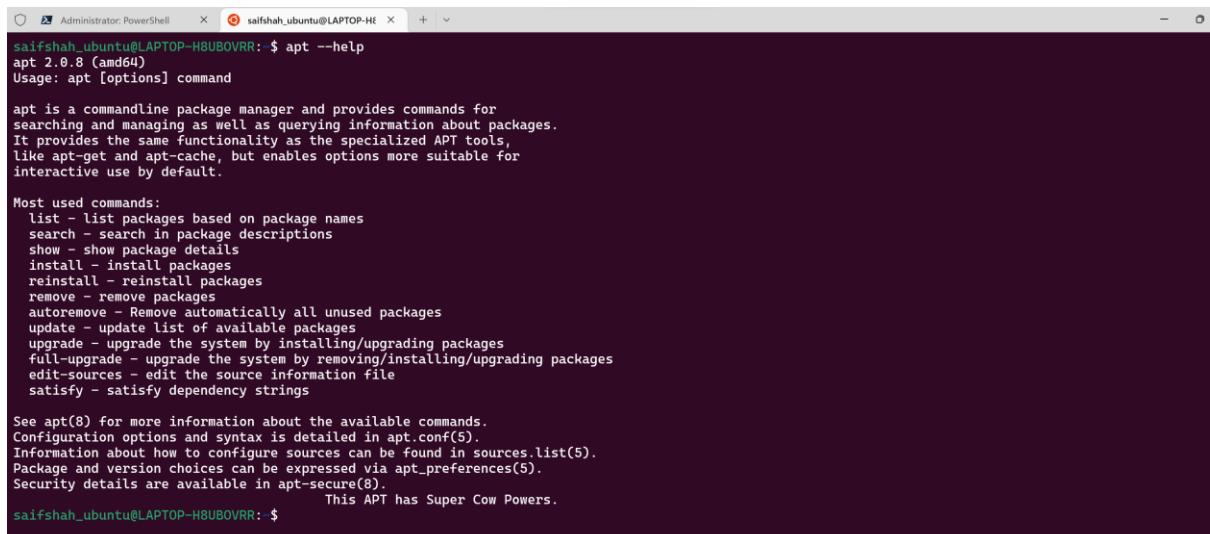
## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu
## team. Also, please note that software in universe WILL NOT receive any
## review or updates from the Ubuntu security team.
deb http://archive.ubuntu.com/ubuntu/ focal universe
# deb-src http://archive.ubuntu.com/ubuntu/ focal universe
deb http://archive.ubuntu.com/ubuntu/ focal-updates universe
# deb-src http://archive.ubuntu.com/ubuntu/ focal-updates universe

## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu
## team, and may not be under a free licence. Please satisfy yourself as to
## your rights to use the software. Also, please note that software in
## multiverse WILL NOT receive any review or updates from the Ubuntu
## security team.
deb http://archive.ubuntu.com/ubuntu/ focal multiverse
# deb-src http://archive.ubuntu.com/ubuntu/ focal multiverse
deb http://archive.ubuntu.com/ubuntu/ focal-updates multiverse
# deb-src http://archive.ubuntu.com/ubuntu/ focal-updates multiverse

## N.B. software from this repository may not have been tested as
## extensively as that contained in the main release, although it includes
## newer versions of some applications which may provide useful features.
## Also, please note that software in backports WILL NOT receive any review
## or updates from the Ubuntu security team.
deb http://archive.ubuntu.com/ubuntu/ focal-backports main restricted universe multiverse
# deb-src http://archive.ubuntu.com/ubuntu/ focal-backports main restricted universe multiverse

## Uncomment the following two lines to add software from Canonical's
## 'partner' repository.
## This software is not part of Ubuntu, but is offered by Canonical and the
## respective vendors as a service to Ubuntu users.
# deb http://archive.canonical.com/ubuntu focal partner
# deb-src http://archive.canonical.com/ubuntu focal partner

deb http://security.ubuntu.com/ubuntu/ focal-security main restricted
```



```
Administrator: PowerShell saifshah_ubuntu@LAPTOP-HBUBOVRR: $ apt --help
apt 2.0.8 (amd64)
Usage: apt [options] command

apt is a commandline package manager and provides commands for
searching and managing as well as querying information about packages.
It provides the same functionality as the specialized APT tools,
like apt-get and apt-cache, but enables options more suitable for
interactive use by default.

Most used commands:
  list - list packages based on package names
  search - search in package descriptions
  show - show package details
  install - install packages
  reinstall - reinstall packages
  remove - remove packages
  autoremove - Remove automatically all unused packages
  update - update list of available packages
  upgrade - upgrade the system by installing/upgrading packages
  full-upgrade - upgrade the system by removing/installing/upgrading packages
  edit-sources - edit the source information file
  satisfy - satisfy dependency strings

See apt(8) for more information about the available commands.
Configuration options and syntax is detailed in apt.conf(5).
Information about how to configure sources can be found in sources.list(5).
Package and version choices can be expressed via apt_preferences(5).
Security details are available in apt-secure(8).

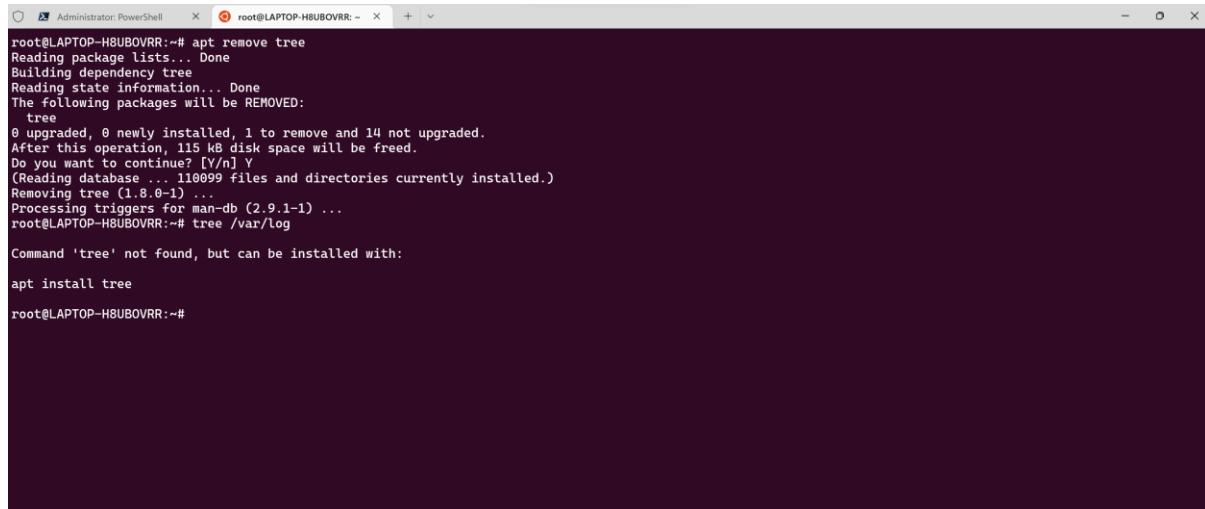
This APT has Super Cow Powers.

saifshah_ubuntu@LAPTOP-HBUBOVRR: ~$
```

X

To remove tree

```
root@LAPTOP-H8UBOVRR:~# apt remove tree
```



The screenshot shows a terminal window titled "Administrator: PowerShell" with the command "root@LAPTOP-H8UBOVRR:~# apt remove tree" entered. The output shows the package tree being removed, with 1 package to be removed and 14 not upgraded. It asks for confirmation and then removes the package. Finally, it suggests installing the 'tree' command via apt.

```
root@LAPTOP-H8UBOVRR:~# apt remove tree
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages will be REMOVED:
  tree
0 upgraded, 0 newly installed, 1 to remove and 14 not upgraded.
After this operation, 115 kB disk space will be freed.
Do you want to continue? [Y/n] Y
(Reading database ... 110099 files and directories currently installed.)
Removing tree (1.8.0-1) ...
Processing triggers for man-db (2.9.1-1) ...
root@LAPTOP-H8UBOVRR:~# tree /var/log
Command 'tree' not found, but can be installed with:
apt install tree
root@LAPTOP-H8UBOVRR:~#
```

Fig. Removing packages

Ubuntu20 Commands		
apt commands cheatsheet	https://itsfoss.com/apt-command-guide/	
apt search PACKAGE	search from available repositories	
apt install PACKAGE -y	To Install Packages	
apt install apache2 -y	To Install apache2	
apt reinstall PACKAGE	To reinstall PACKAGE	
apt remove PACKAGE	To remove PACKAGE	
apt update	update all packages	
apt update PACKAGE	update only a package	

X

apt grouplist	List all available Group Packages	
apt groupinstall "GROUPNAME"	Installs all the packages in a group.	
apt repolist	List Enabled apt Repositories	
apt clean all	Clean apt Cache	
apt history	View History of apt	
apt show package name	Shows the information of package like version, size, source, repository etc	

X

Saif Panjesha
Owner

Services:

\$ sudo systemctl start apache2	# Starts apache2 on ubuntu
\$ sudo systemctl stop apache2	# Stops apache2 on ubuntu
\$ sudo systemctl restart apache2	# Restart service
\$ sudo systemctl reload apache2	# Reload conf
\$ sudo systemctl enable apache2	# starts apache2 at boot time
\$ sudo systemctl disable apache2	# stops apache2 at boot time
\$ sudo systemctl is-active apache2	# Shows whether the service is active or not
\$ sudo systemctl is-enabled apache2	# Shows whether the service is enabled or not

Fig. Services in Ubuntu20

X

Process Related or Compression / Archives

```
$ tar cf home.tar home # Create tar named home.tar containing  
home/ (11 tar examples)  
  
$ tar xf file.tar file # Extract the files  
from  
  
$ tar czf file.tar.gz file # Create a tar with  
compression gzip  
  
$ gzip file to file.gz (untar gzip  
file) # Compress file and renames  
it
```

```
$ processes (many parameters to  
lsarn) # Display your currently  
active  
  
$ ps aux | grep 'telnet' telnet  
process # Find all process id related  
to  
  
$ pmap (kernel,user memory  
etc) # Memory map of  
process  
  
$ top (30  
examples) # Display all running  
processes  
  
$ kill pid pid id (types of  
signals) # Kill process with  
mentioned  
  
$ killall proc # Kill all processes named  
proc  
  
$ pkill processname its  
name # Send signal to a process  
with  
  
$ # Resumes suspended jobs  
bringing them to foreground (bg and fg  
command)  
  
$ fg foregrou  
nd # Brings the most recent job  
to  
  
$ fg n # Brings job n to the  
foreground
```

X

Saif Panjesha
Owner

Quiz:



Good job!

Question 1:

Difference between CentOS & Ubuntu Linux

Both are same just different name, different packaging.

CentOS is for Server and Ubuntu is for Desktop

The biggest difference between the two Linux distributions is that Ubuntu is based on the Debian architecture while CentOS is forked from Red Hat Enterprise Linux



Good job!

Question 2:

apt command in ubuntu and yum in centos to manage packages

True

False

X