K. J. Somaiya College of Engineering, Mumbai-77
(A Constituent College of Somaiya Vidyavihar University)
Department of Computer Engineering

Batch: B2	**Roll No.: 16010121194**
Experiment No. 01	
Grade: AA / AB / BB / BC / CC / CD /DD	
Signature of the Staff In-charge with date	

TITLE: Exploring basic Commands of UNIX: Shell, Processes, Files

---

AIM: To Explore basic commands for handling File system under Unix/Linux using shell scripts.(Creating groups, chown , chmod , directory name, tty , diff, umask).

Expected Outcome of Experiment:

CO 1. To introduce basic concepts and functions of operating systems.

Books/ Journals/ Websites referred:

1. **Silberschatz A., Galvin P., Gagne G. "Operating Systems Principles", Willey Eight edition.**
2. **Achyut S. Godbole , Atul Kahate "Operating Systems", McGraw Hill Third Edition.**
3. **Sumitabha Das " UNIX Concepts & Applications", McGraw Hill Second Edition.**

Pre Lab/ Prior Concepts:

An operating system (OS) is a resource manager. It takes the form of a set of software routines that allow users and application programs to access system resources (e.g. the CPU, memory, disks, modems, printers network cards etc.) in safe efficient and abstract way.

- The operating system kernel is in direct control of the underlying hardware. The kernel provides low-level device, memory and processor management functions (e.g. dealing with interrupts from hardware devices, sharing the processor among multiple programs, allocating memory for programs etc.)
- Basic hardware-independent kernel services are exposed to higher-level programs through a library of system calls (e.g. services to create a file, begin execution of a program, or open a logical network connection to another computer).
- Application programs (e.g. word processors, spreadsheets) and system utility programs (simple but useful application programs that come with the operating system, e.g. programs which find text inside a group of files) make use of system calls. Applications and system utilities are launched using a shell (a textual command line interface) or a graphical user interface that provides direct user interaction.

Operating systems can be distinguished from one another by the system calls, system utilities and user interface they provide, as well as by the resource scheduling policies implemented by the kernel.

UNIX has been a popular OS for more than two decades because of its multi-user, multi-tasking environment, stability, portability and powerful networking capabilities.

Linux is a free open source UNIX OS for PCs.

Linux has all of the components of a typical OS :

- **Kernel**

  The Linux kernel includes device driver support for a large number of PC hardware devices (graphics cards, network cards, hard disks etc.), advanced processor and memory management features, and support for many different types of file systems. In terms of the services that it provides to application programs and system utilities, the kernel implements most BSD and SYSV system calls, as well as the system calls described in the POSIX.1 specification.

  The kernel (in raw binary form that is loaded directly into memory at system startup time) is typically found in the file /boot/vmlinuz, while the source files can usually be found in /usr/src/linux.

- **Shells and GUIs**

  Linux supports two forms of command input: through textual command line shells similar to those found on most UNIX systems (e.g. sh - the Bourne shell,

bash - the Bourne again shell and csh - the C shell) and through graphical interfaces (GUIs) such as the KDE and GNOME window managers.

- **System Utilities**

  Virtually every system utility that you would expect to find on standard implementations of UNIX has been ported to Linux. This includes commands such as ls, cp, grep, awk, sed, bc, wc, more, and so on. These system utilities are designed to be powerful tools that do a single task extremely well (e.g. grep finds text inside files while wc counts the number of words, lines and bytes inside a file). Users can often solve problems by interconnecting these tools instead of writing a large monolithic application program.

- **Application programs**

  Linux distributions typically come with several useful application programs as standard. Examples include the emacseditor, xv (an image viewer), gcc (a C compiler), g++ (a C++ compiler), xfig (a drawing package), latex (a powerful typesetting language) and soffice (StarOffice, which is an MS-Office style clone that can read and write Word, Excel and PowerPoint files).

Description of Commands and options:

DOS commands: Attrib, dir, at, chkdsk, shutdown, tree, create a batch file, output and input redirection

Windows utilities: msconfig, defragmenter, performance monitor, task manager, registry editor, event viewer, process explorer

Unix Commands:

---

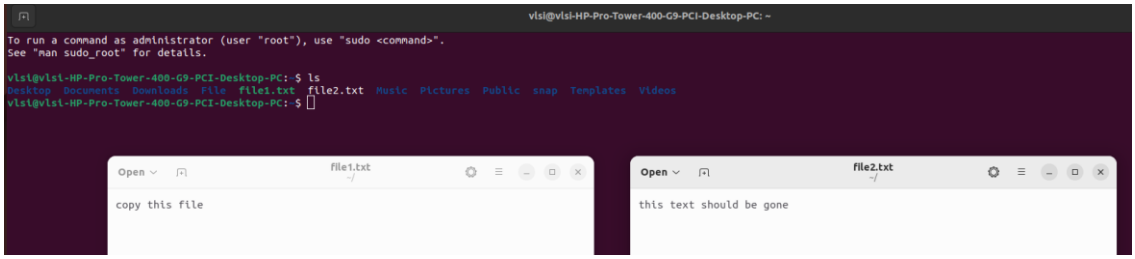
1) Unix file operations: ls, cp, rm , mv, chmod, chown ,chgrp
2) Text file operations in Unix : cat , more , less , head, tail , grep
3) Unix directory management commands : cd, pwd , ln, mkdir, rmdir
4) Unix system status commands: hostname, w, uname ,utime
5) Process management: ps, top, kill,nice
6) Unix users commands: whoami , id, groups, passwd , who, last

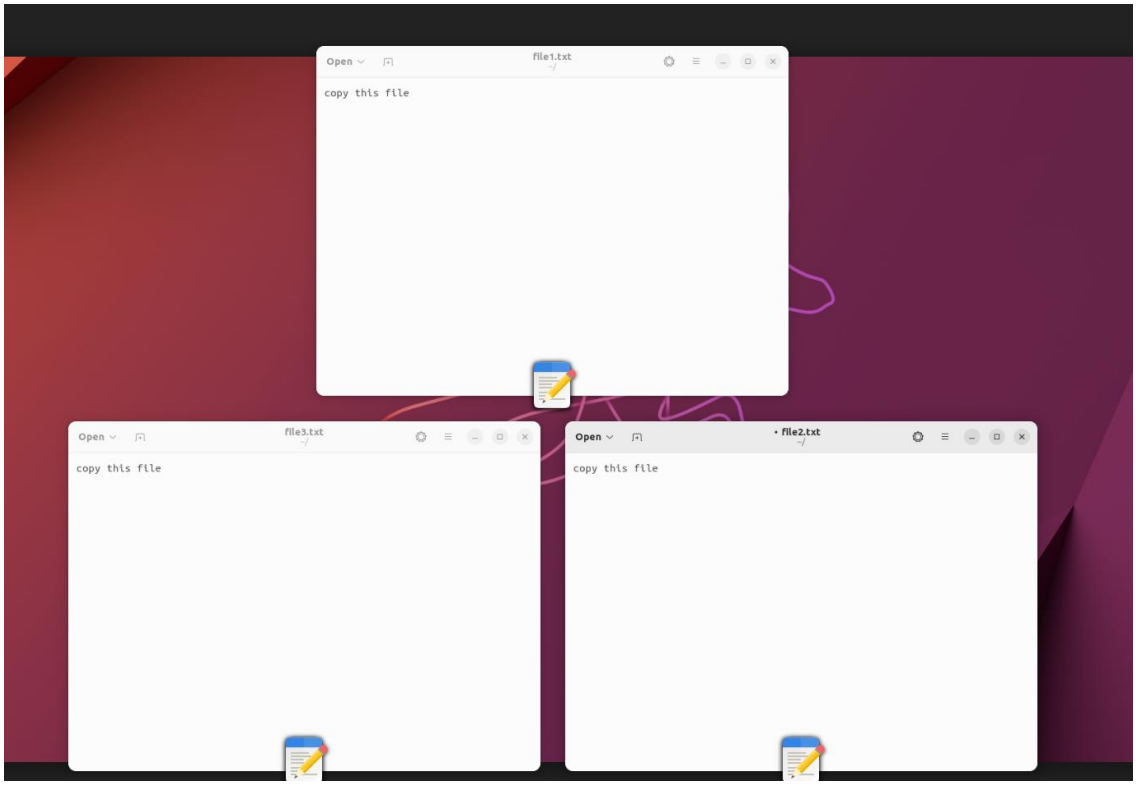
---

Implementation details:

Ubuntu

cp command:






```
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls
Desktop  Documents  Downloads  File  file1.txt  file2.txt  Music  Pictures  Public  snap  Templates  Videos
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp file1.txt file2.txt
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp file1.txt file3.txt
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls
Desktop  Documents  Downloads  File  file1.txt  file2.txt  file3.txt  Music  Pictures  Public  snap  Templates  Videos
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp file1.txt file2.txt dir1
cp: cannot stat 'file1.txt': No such file or directory
cp: cannot stat 'file2.txt': No such file or directory
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ file2.txt file3.txt dir1
file2.txt: command not found
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp file2.txt file3.txt dir1
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls dir1
file2.txt  file3.txt
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$
```

```
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls
Desktop  Documents  Downloads  File  file1.txt  file2.txt  Music  Pictures  Public  snap  Templates  Videos
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp file1.txt file2.txt
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp file1.txt file3.txt
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls
Desktop  Documents  Downloads  File  file1.txt  file2.txt  file3.txt  Music  Pictures  Public  snap  Templates  Videos
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp file1.txt file2.txt dir1
cp: cannot stat 'file1.txt': No such file or directory
cp: cannot stat 'file2.txt': No such file or directory
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ file2.txt file3.txt dir1
file2.txt: command not found
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp file2.txt file3.txt dir1
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls dir1
file2.txt  file3.txt
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ mkdir dir2
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls dir2
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp dir1 dir2
cp: -r not specified; omitting directory 'dir1'
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp -r  dir1 dir2
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls dir2
dir1
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$
```

```
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls
Desktop  Documents  Downloads  File  file1.txt  file2.txt  Music  Pictures  Public  snap  Templates  Videos
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp file1.txt file2.txt
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp file1.txt file3.txt
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls
Desktop  Documents  Downloads  File  file1.txt  file2.txt  file3.txt  Music  Pictures  Public  snap  Templates  Videos
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp file1.txt file2.txt dir1
cp: cannot stat 'file1.txt': No such file or directory
cp: cannot stat 'file2.txt': No such file or directory
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ file2.txt file3.txt dir1
file2.txt: command not found
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp file2.txt file3.txt dir1
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls dir1
file2.txt  file3.txt
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ mkdir dir2
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls dir2
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp dir1 dir2
cp: -r not specified; omitting directory 'dir1'
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp -r  dir1 dir2
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls dir2
dir1
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp -r  dir1 dir3
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ ls dir3
file2.txt  file3.txt
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$
```

```
dir4  file2.txt  file3.txt
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp -i file1.txt file2.txt
cp: overwrite 'file2.txt'? y
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$
```

cat command:

```
dir4   file2.txt   file3.txt
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cp -i file1.txt file2.txt
cp: overwrite 'file2.txt'? y
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$
```

User commands:

```
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ group
Command 'group' not found, did you mean:
  command 'groups' from deb coreutils (8.32-4.1ubuntu1)
  command 'grop' from deb grop (2:0.10-1.2)
Try: sudo apt install <deb name>
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ groups
vlsi adm cdrom sudo dip plugdev lpadmin lxd sambashare
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ whoami
vlsi
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ id
uid=1000(vlsi) gid=1000(vlsi) groups=1000(vlsi),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),122(lpadmin),134(lxd),135(sambashare)
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ who
vlsi     tty2         2023-07-28 14:19 (tty2)
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ last
vlsi     tty2         tty2             Fri Jul 28 14:19   still logged in
reboot   system boot  5.19.0-21-generi Fri Jul 28 14:19   still running
vlsi     tty2         tty2             Wed Jul 26 17:09 - down   (-1:13)
reboot   system boot  5.19.0-21-generi Wed Jul 26 17:08 - 15:55  (-1:13)
vlsi     tty2         tty2             Tue Dec  6 00:57 - down   (00:00)
reboot   system boot  5.19.0-21-generi Tue Dec  6 00:54 - 00:57  (00:02)
reboot   system boot  5.19.0-21-generi Tue Dec  6 00:43 - 00:48  (00:05)
reboot   system boot  5.19.0-21-generi Tue Dec  6 00:36 - 00:37  (00:00)

wtmp begins Tue Dec  6 00:36:23 2022
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$
```

Text file operations:

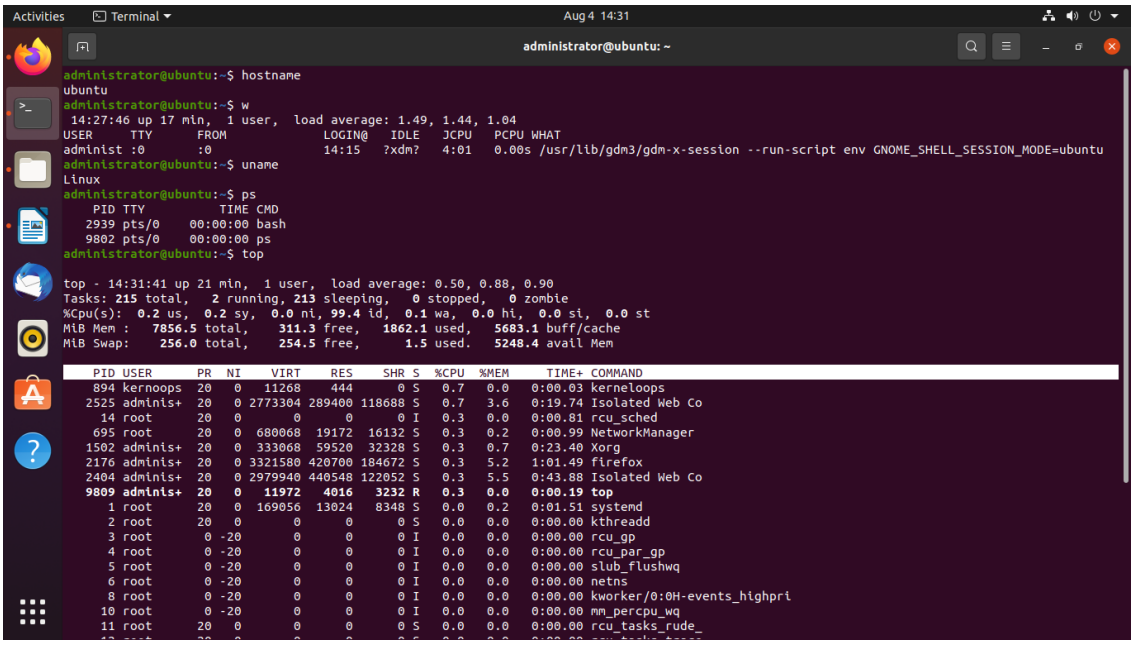
K. J. Somaiya College of Engineering, Mumbai-77
(A Constituent College of Somaiya Vidyavihar University)
Department of Computer Engineering

```
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cat file6.txt
this is line 1
this is line 2
this is line 3
this is line 4
this is line 5
this is line 6
this is line 7
this is line 8
this is line 9
this is line 10
this is line 11
this is line 12
this is line 13
this is line 14
this is line 15
this is line 16
this is line 17
this is line 18
this is line 19
this is line 20
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ head file6.txt
this is line 1
this is line 2
this is line 3
this is line 4
this is line 5
this is line 6
this is line 7
this is line 8
this is line 9
this is line 10
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ tail file6.txt
this is line 11
this is line 12
this is line 13
this is line 14
this is line 15
this is line 16
this is line 17
this is line 18
this is line 19
this is line 20
```

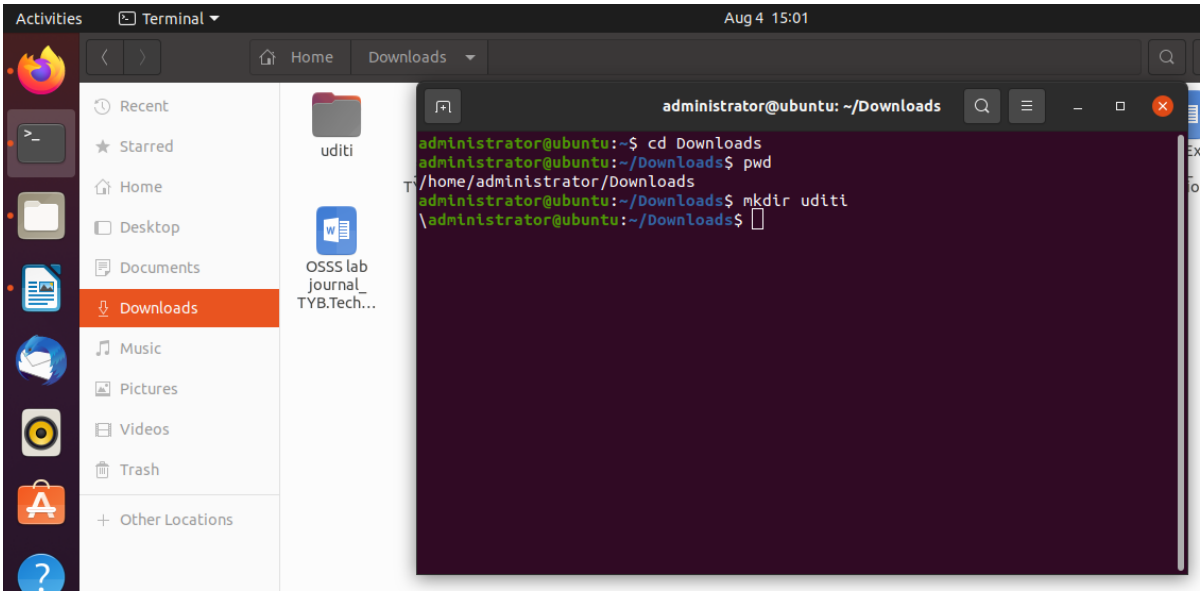
K. J. Somaiya College of Engineering, Mumbai-77
(A Constituent College of Somaiya Vidyavihar University)
Department of Computer Engineering

```
this is line 20
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ grep -n "file" file6.txt
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ grep -n "grep" file6.txt
21:is grep working?
22:grep should work
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ grep -v "grep" file6.txt
this is line 1
this is line 2
this is line 3
this is line 4
this is line 5
this is line 6
this is line 7
this is line 8
this is line 9
this is line 10
this is line 11
this is line 12
this is line 13
this is line 14
this is line 15
this is line 16
this is line 17
this is line 18
this is line 19
this is line 20
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$ cat file6.txt
this is line 1
this is line 2
this is line 3
this is line 4
this is line 5
this is line 6
this is line 7
this is line 8
this is line 9
this is line 10
this is line 11
this is line 12
this is line 13
this is line 14
this is line 15
this is line 16
this is line 17
this is line 18
this is line 19
this is line 20
is grep working?
grep should work
vlsi@vlsi-HP-Pro-Tower-400-G9-PCI-Desktop-PC:~$
```

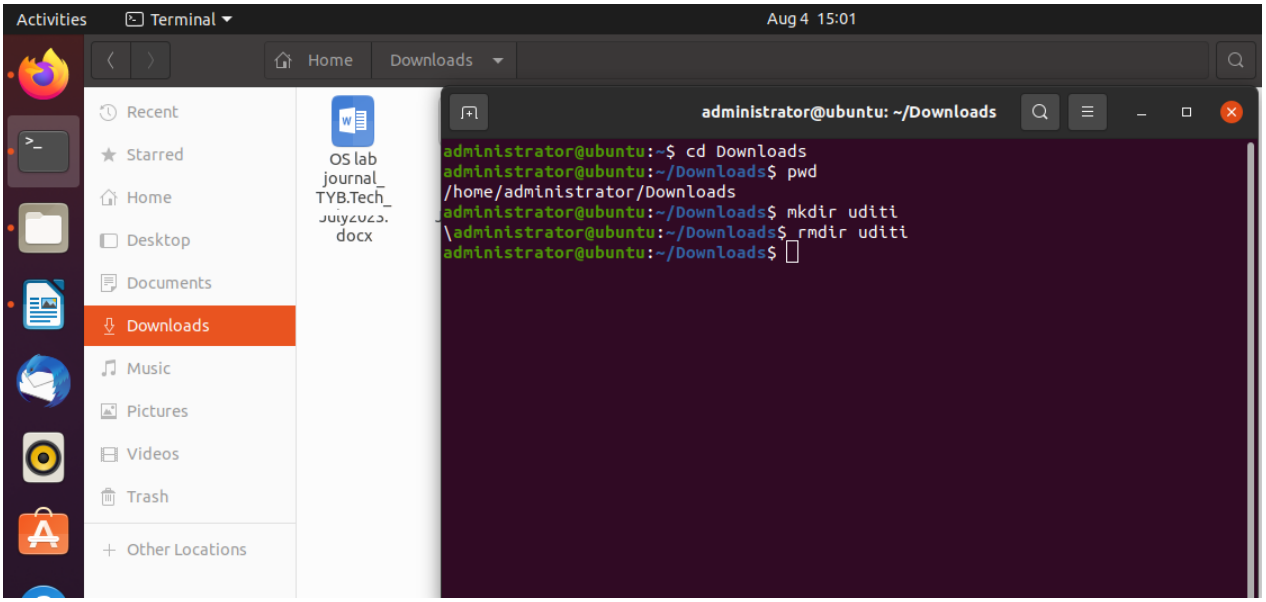
System status and process management commands:



Unix directory management commands:



K. J. Somaiya College of Engineering, Mumbai-77
(A Constituent College of Somaiya Vidyavihar University)
Department of Computer Engineering



2. DOS commands: Attrib, dir, at, chkdsk, shutdown, tree, create a batch file, output and input redirection

- attrib

```
D:\D_downloads>attrib
A                   D:\D_downloads\cat.png
A                   D:\D_downloads\cd pwd rm.png
A                   D:\D_downloads\chmod.png
A                   D:\D_downloads\chmod2.png
A                   D:\D_downloads\chown.png
A                   D:\D_downloads\cp.png
A                   D:\D_downloads\damn.mp4
A                   D:\D_downloads\grep.png
A                   D:\D_downloads\HitFilm_2023.2.msi
A                   D:\D_downloads\id,last, hostname,uname.png
A                   D:\D_downloads\JFLAP7.1.jar
A                   D:\D_downloads\kali-linux-2023.2a-installer-amd64.iso
A                   D:\D_downloads\ls.png
A                   D:\D_downloads\more,less,head,tail-.png
A                   D:\D_downloads\msys2-x86_64-20230526.exe
A                   D:\D_downloads\mv.png
A                   D:\D_downloads\National Anthem before movies_ No more_ #shorts #india.mp4
A                   D:\D_downloads\nationalanthem.hfp
A                   D:\D_downloads\neerja.hfp
A                   D:\D_downloads\neerjabhanot.mp4
A                   D:\D_downloads\ps.png
A                   D:\D_downloads\pw.txt
A                   D:\D_downloads\R-4.2.2-win.exe
A                   D:\D_downloads\rm.png
A                   D:\D_downloads\rm2.png
A                   D:\D_downloads\RStudio-2022.12.0-353.exe
A                   D:\D_downloads\short.mp4
A                   D:\D_downloads\torbrowser-install-win64-12.0.7_ALL.exe
A                   D:\D_downloads\tut_5.jff
A                   D:\D_downloads\ubuntu-22.04.2-desktop-amd64.iso
A                   D:\D_downloads\un.txt
A                   D:\D_downloads\whoami,who,passwd,groups.png
```

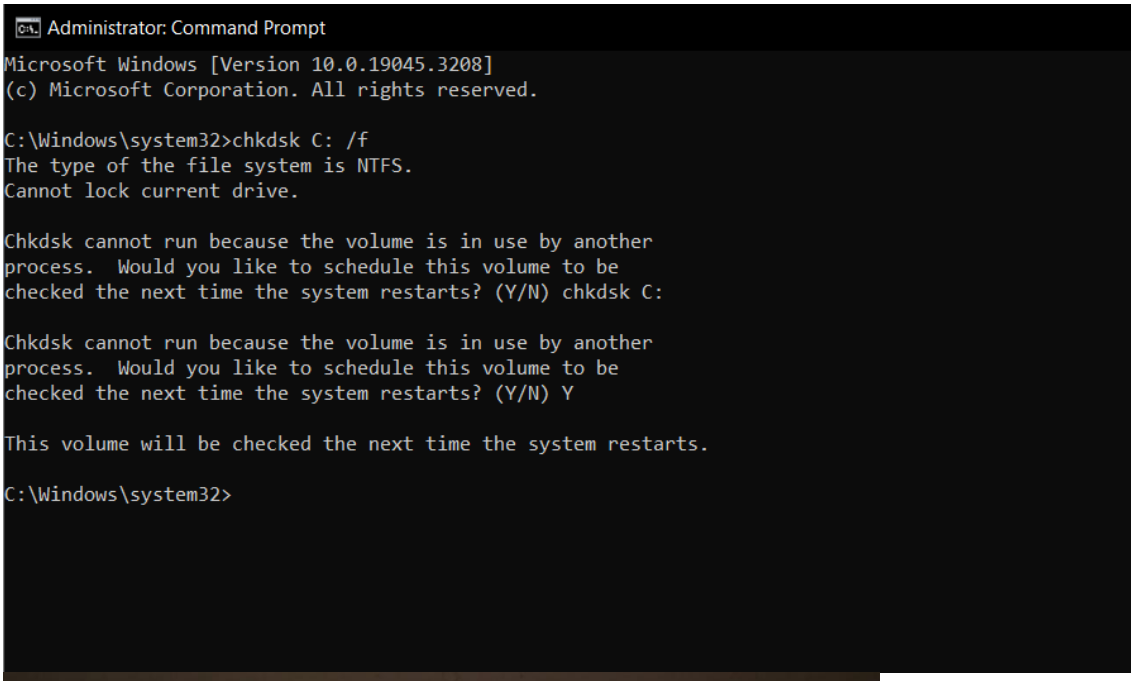
- dir

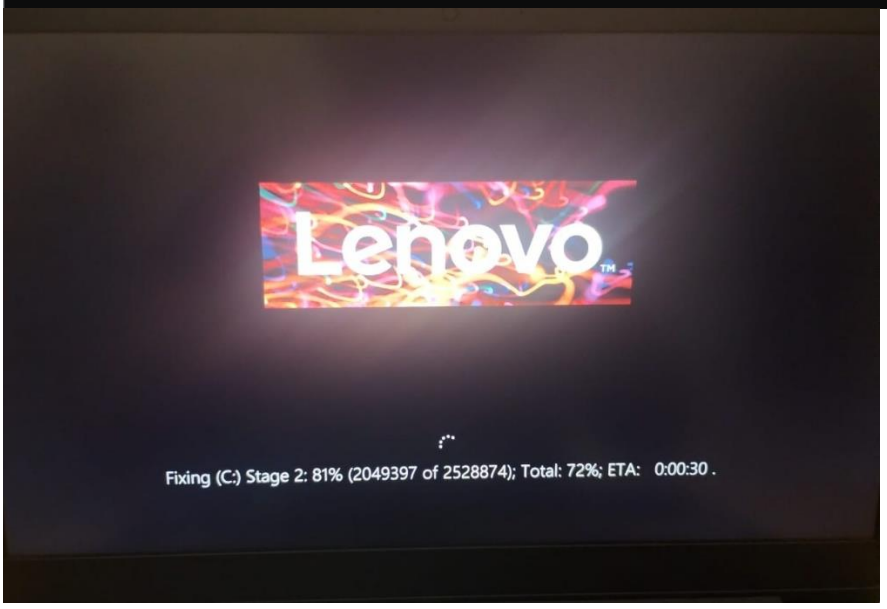
```
D:\>dir
 Volume in drive D is New Volume
 Volume Serial Number is 1E68-0A7C

 Directory of D:\

20-07-2023  12:49    <DIR>          All sems
27-07-2023  12:12    <DIR>          coding and miscellaneous
02-01-2023  13:46    <DIR>          colez
07-08-2023  12:38    <DIR>          D_downloads
30-07-2023  23:42    <DIR>          GATE
04-07-2023  11:13    <DIR>          internship
02-01-2023  13:58    <DIR>          ip
25-03-2023  16:02             8,191 jan_2017.qgz
02-01-2023  14:28    <DIR>          java cmd
04-08-2023  12:03    <DIR>          my cv
21-03-2023  21:19    <DIR>          PENDRIVE
25-03-2023  18:04    <DIR>          SIH
               1 File(s)          8,191 bytes
              11 Dir(s)  282,903,478,272 bytes free
```

- at

```
D:\>at
The AT command has been deprecated. Please use schtasks.exe instead.

The request is not supported.

D:\>schtasks.exe

Folder: \
TaskName                                 Next Run Time          Status
======================================== ====================== ===============
iTop Christmas Task (One-Time)           N/A                    Ready
LenovoUtility Startup                    N/A                    Ready
NvBatteryBoostCheckOnLogon_{B2FE1952-018 N/A                    Ready
NvDriverUpdateCheckDaily_{B2FE1952-0186- 09-08-2023 12:25:45    Ready
NVIDIA GeForce Experience SelfUpdate_{B2 N/A                    Ready
NvNodeLauncher_{B2FE1952-0186-46C3-BAEC- N/A                    Ready
NvProfileUpdaterDaily_{B2FE1952-0186-46C 09-08-2023 12:25:40    Ready
NvProfileUpdaterOnLogon_{B2FE1952-0186-4 N/A                    Ready
NvTmRep_CrashReport1_{B2FE1952-0186-46C3 09-08-2023 12:25:45    Ready
NvTmRep_CrashReport2_{B2FE1952-0186-46C3 09-08-2023 18:25:45    Ready
NvTmRep_CrashReport3_{B2FE1952-0186-46C3 09-08-2023 00:25:45    Ready
NvTmRep_CrashReport4_{B2FE1952-0186-46C3 09-08-2023 06:25:45    Ready
Opera scheduled Autoupdate 1647145733    09-08-2023 09:58:58    Ready
User_Feed_Synchronization-{7BD15413-F262 09-08-2023 02:16:55    Ready

Folder: \Agent Activation Runtime
TaskName                                 Next Run Time          Status
======================================== ====================== ===============
S-1-5-21-1488395711-590132417-1197517173 N/A                    Disabled

Folder: \Lenovo
TaskName                                 Next Run Time          Status
======================================== ====================== ===============
INFO: There are no scheduled tasks presently available at your access level.

Folder: \Lenovo\ImController
TaskName                                 Next Run Time          Status
======================================== ====================== ===============
INFO: There are no scheduled tasks presently available at your access level.

Folder: \Lenovo\UDC
TaskName                                 Next Run Time          Status
======================================== ====================== ===============
Lenovo UDC Idle Monitor                  N/A                    Ready

Folder: \Lenovo\Vantage
TaskName                                 Next Run Time          Status
======================================== ====================== ===============
INFO: There are no scheduled tasks presently available at your access level.
```

- chkdsk


Administrator: Command Prompt
Microsoft Windows [Version 10.0.19045.3208]
(c) Microsoft Corporation. All rights reserved.
C:\Windows\system32>chkdsk C: /f
The type of the file system is NTFS.
Cannot lock current drive.
Chkdsk cannot run because the volume is in use by another
process. Would you like to schedule this volume to be
checked the next time the system restarts? (Y/N) chkdsk C:
Chkdsk cannot run because the volume is in use by another
process. Would you like to schedule this volume to be
checked the next time the system restarts? (Y/N) Y
This volume will be checked the next time the system restarts.
C:\Windows\system32>

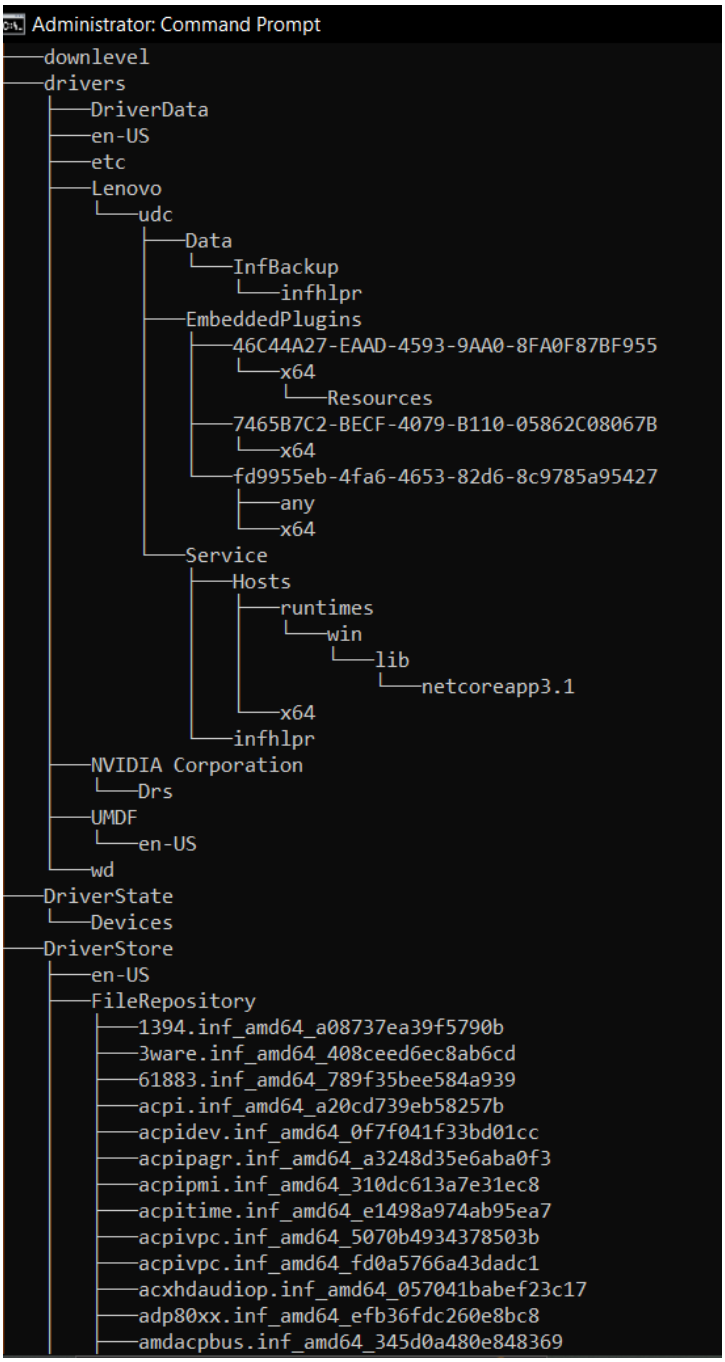

Lenovo
Fixing (C:) Stage 2: 81% (2049397 of 2528874); Total: 72%; ETA: 0:00:30 .

- tree

K. J. Somaiya College of Engineering, Mumbai-77
(A Constituent College of Somaiya Vidyavihar University)
Department of Computer Engineering

```
C:\Windows\system32>tree
Folder PATH listing for volume Windows-SSD
Volume serial number is 624A-2670
C:.
├───0409
├───1033
├───AdvancedInstallers
├───am-et
├───AMD
│   └───amdkmpfd
├───AppLocker
├───appraiser
├───ar-SA
├───bg-BG
├───Boot
│   └───en-US
├───Bthprops
├───CatRoot
│   ├───{127D0A1D-4EF2-11D1-8608-00C04FC295EE}
│   └───{F750E6C3-38EE-11D1-85E5-00C04FC295EE}
├───catroot2
│   ├───{127D0A1D-4EF2-11D1-8608-00C04FC295EE}
│   └───{F750E6C3-38EE-11D1-85E5-00C04FC295EE}
├───CodeIntegrity
│   ├───CiPolicies
│   │   ├───Active
│   │   ├───Internal
│   │   └───Staged
│   └───Tokens
│       ├───Active
│       └───Staged
├───Com
│   ├───dmp
│   └───en-US
├───config
│   ├───Journal
│   ├───RegBack
│   ├───systemprofile
│   └───TxR
├───ContainerSettingsProviders
├───cs-CZ
├───da-DK
├───DDFs
├───de-DE
├───Dism
│   └───en-US
├───dolbyaposvc
├───downlevel
├───drivers
```

K. J. Somaiya College of Engineering, Mumbai-77
(A Constituent College of Somaiya Vidyavihar University)
Department of Computer Engineering



- create a batch file

```
D:\All sems\TY\sem 5\OS>Notepad hi.bat

D:\All sems\TY\sem 5\OS>echo "hi" >>hi.bat
```

hi - Notepad

File Edit Format View Help

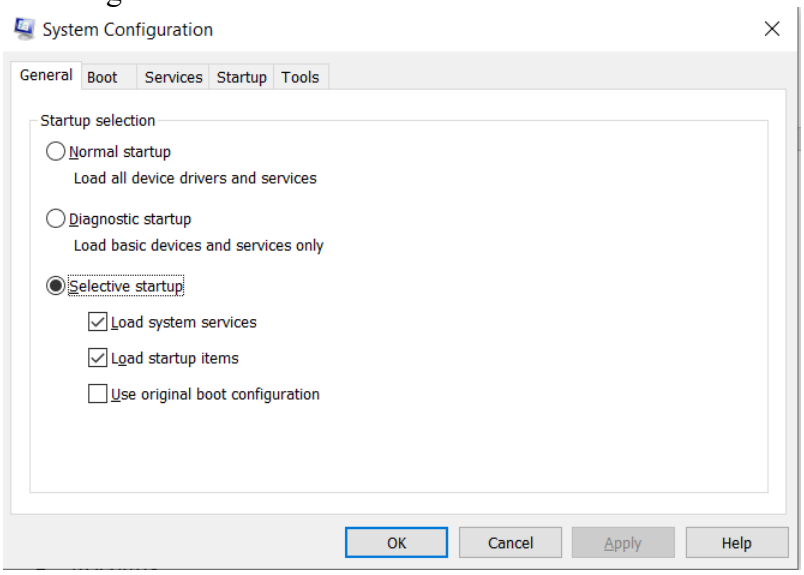
```
@ECHO OFF
:: is this a comment
TITLE SAMPLE BATCH FILE
echo hello world
ECHO ==========================

ECHO NETWORK INFO

ECHO ==========================

ipconfig

ECHO ==========================

ECHO HARDWARE INFO

ECHO ==========================

systeminfo | findstr /c:"Total Physical Memory"

wmic cpu get name

wmic diskdrive get name,model,size

wmic path win32_videocontroller get name

wmic path win32_VideoController get CurrentHorizontalResolution,CurrentVerticalResolution
ECHO ==========================

ECHO WINDOWS INFO

ECHO ==========================

systeminfo | findstr /c:"OS Name"

systeminfo | findstr /c:"OS Version"

systeminfo | findstr /c:"System Type"
Pause
```

```
D:\All sems\TY\sem 5\OS>hi.bat
hello world
==========================
NETWORK INFO
==========================

Windows IP Configuration


Ethernet adapter Ethernet:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . : 150.213.1.3

Ethernet adapter Ethernet 2:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::e9e3:7a10:ef42:ff01%17
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter Local Area Connection* 1:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::3b4e:cd93:e2db:3e61%6
   IPv4 Address. . . . . . . . . . . : 192.168.0.104
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.0.1
==========================
HARDWARE INFO
==========================
Total Physical Memory:     7,549 MB
Name
AMD Ryzen 5 4600H with Radeon Graphics

Model                Name               Size
Micron MTFDHBA512QFD  \\.\PHYSICALDRIVE0  512105932800
```

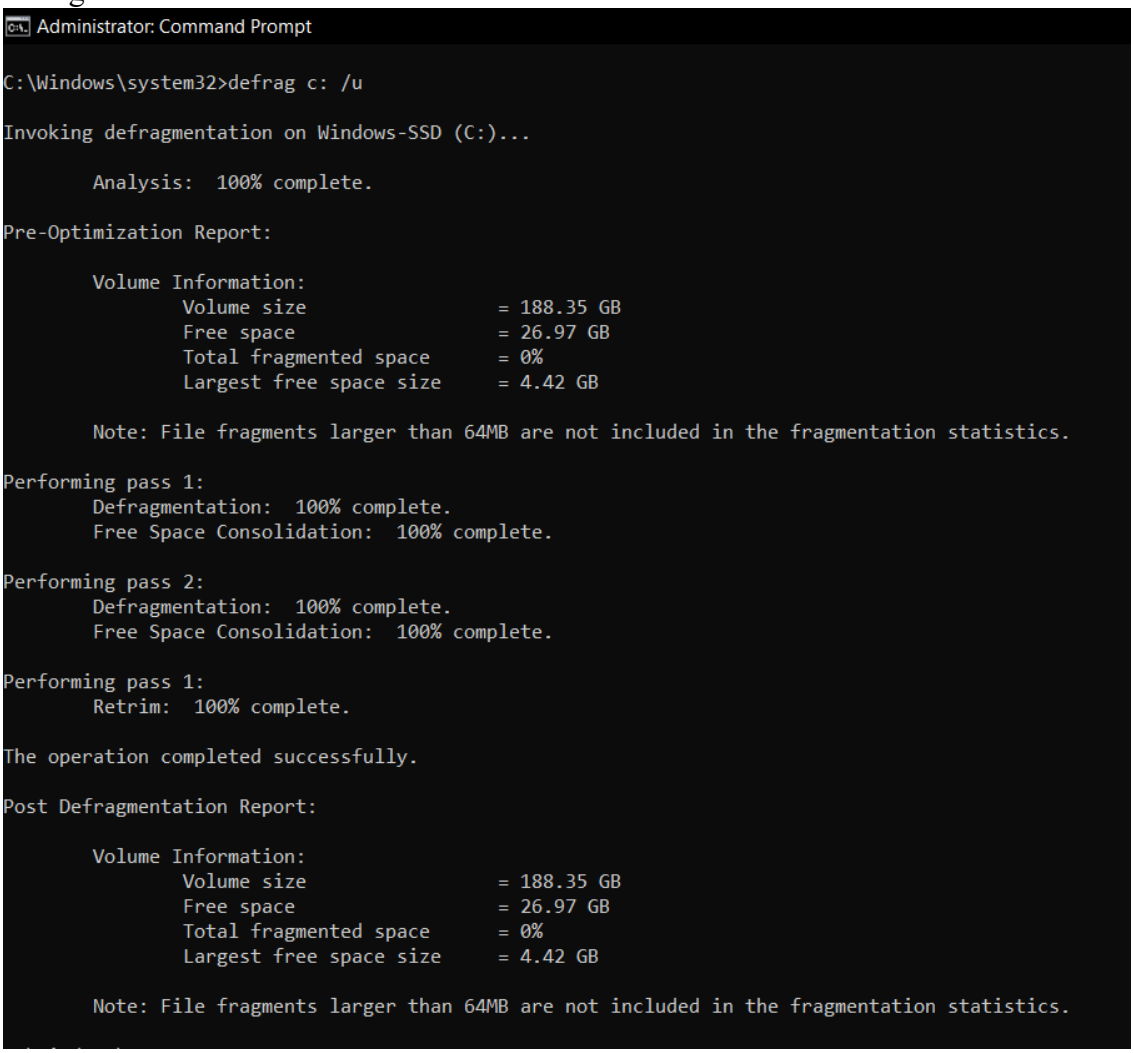
K. J. Somaiya College of Engineering, Mumbai-77
(A Constituent College of Somaiya Vidyavihar University)
Department of Computer Engineering

```
Model                 Name                Size
Micron MTFDHBA512QFD  \\.\PHYSICALDRIVE0  512105932800

Name
AMD Radeon(TM) Graphics
NVIDIA GeForce GTX 1650

CurrentHorizontalResolution  CurrentVerticalResolution
1920                         1080


============================
WINDOWS INFO
============================
OS Name:                   Microsoft Windows 10 Home Single Language
OS Version:                10.0.19045 N/A Build 19045
BIOS Version:              LENOVO FCCN19WW, 30-05-2022
System Type:               x64-based PC
Press any key to continue . . .
```

1) Windows utilities: msconfig, defragmenter, performance monitor, task manager, registry editor, event viewer, process explorer
   - msconfig



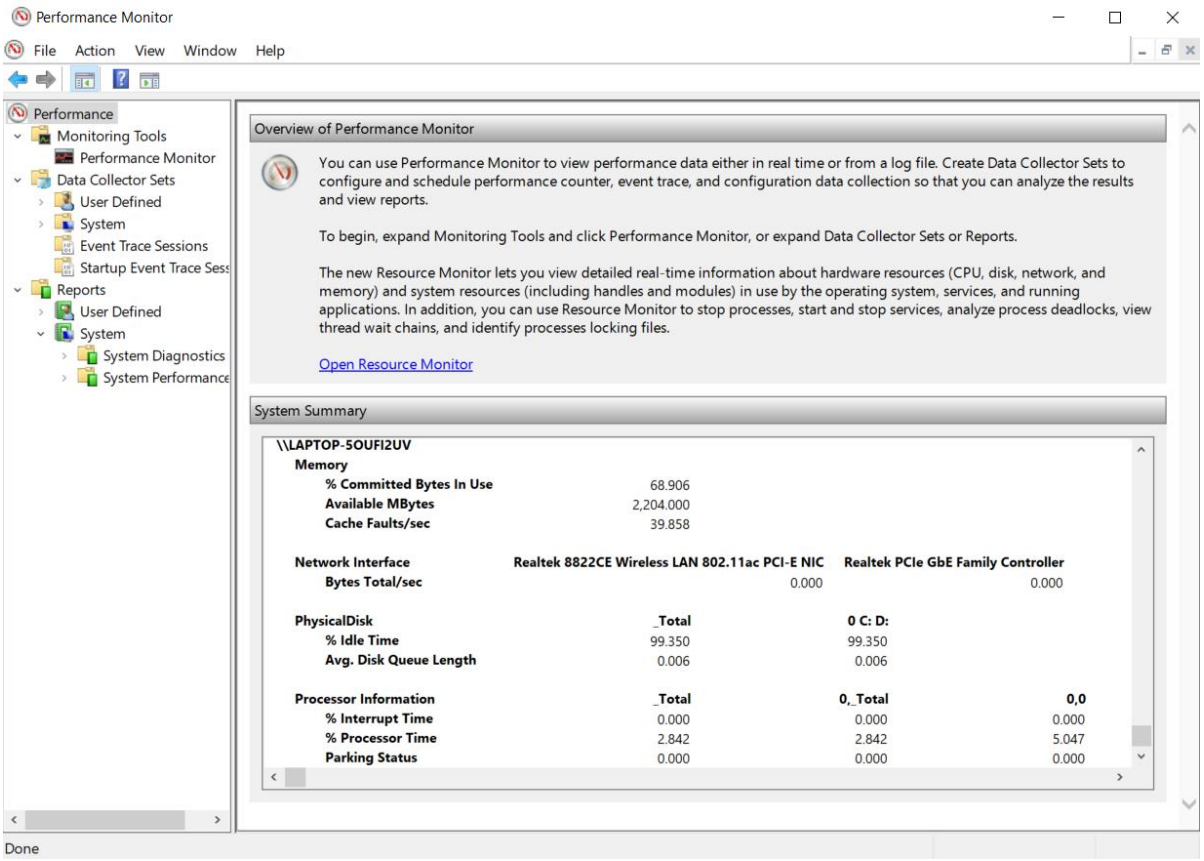
- defragmenter



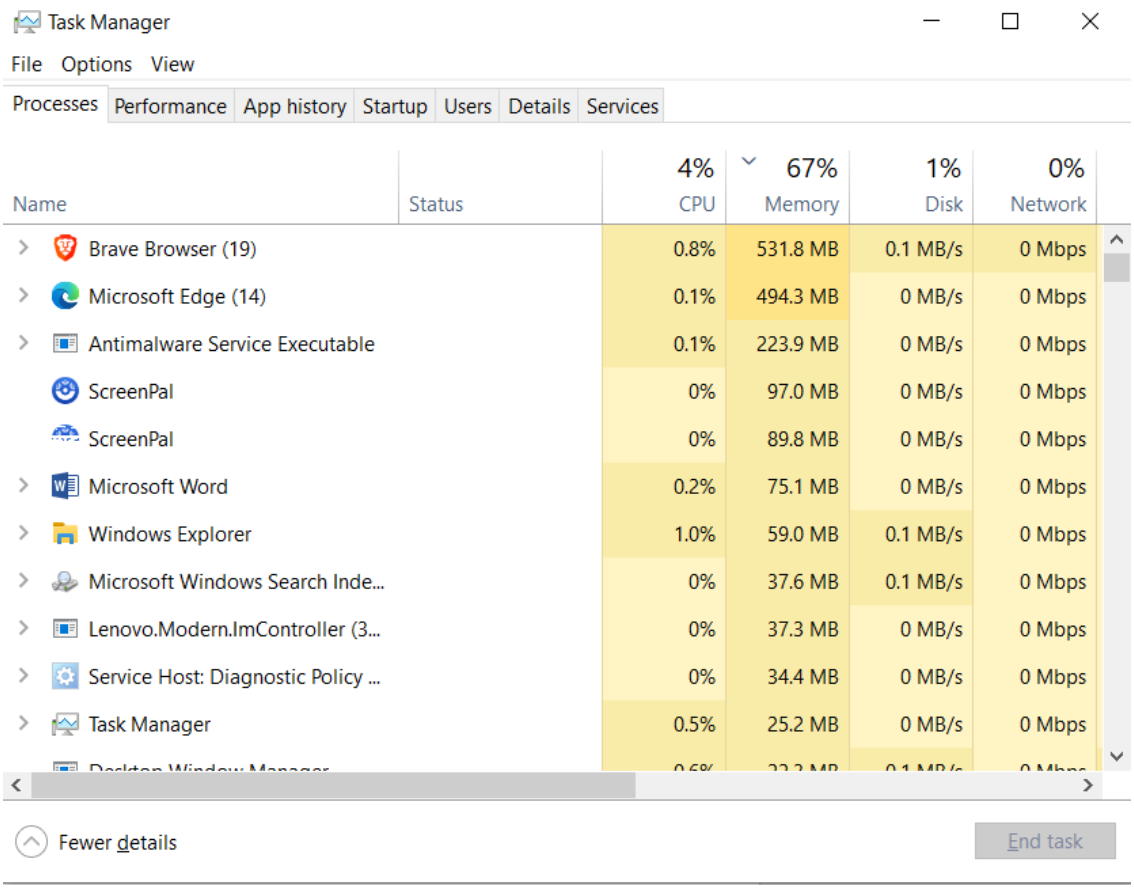
K. J. Somaiya College of Engineering, Mumbai-77
(A Constituent College of Somaiya Vidyavihar University)
Department of Computer Engineering

```
C:\Windows\system32>defrag d: /u

Invoking defragmentation on New Volume (D:)...

        Analysis:  100% complete.

Pre-Optimization Report:

        Volume Information:
                Volume size                = 287.33 GB
                Free space                 = 263.42 GB
                Total fragmented space     = 0%
                Largest free space size    = 257.49 GB

        Note: File fragments larger than 64MB are not included in the fragmentation statistics.

Performing pass 1:
        Free Space Consolidation:  100% complete.

Performing pass 2:
        Free Space Consolidation:  100% complete.

Performing pass 1:
        Retrim:  100% complete.

The operation completed successfully.

Post Defragmentation Report:

        Volume Information:
                Volume size                = 287.33 GB
                Free space                 = 263.42 GB
                Total fragmented space     = 0%
                Largest free space size    = 263.23 GB

        Note: File fragments larger than 64MB are not included in the fragmentation statistics.
```

- performance monitor

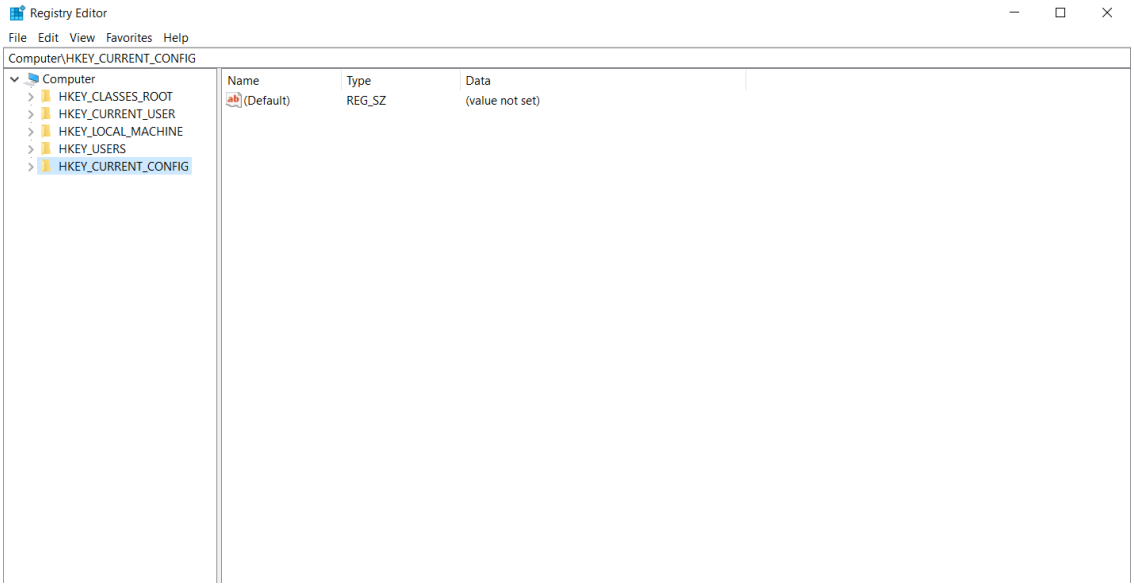


- task manager

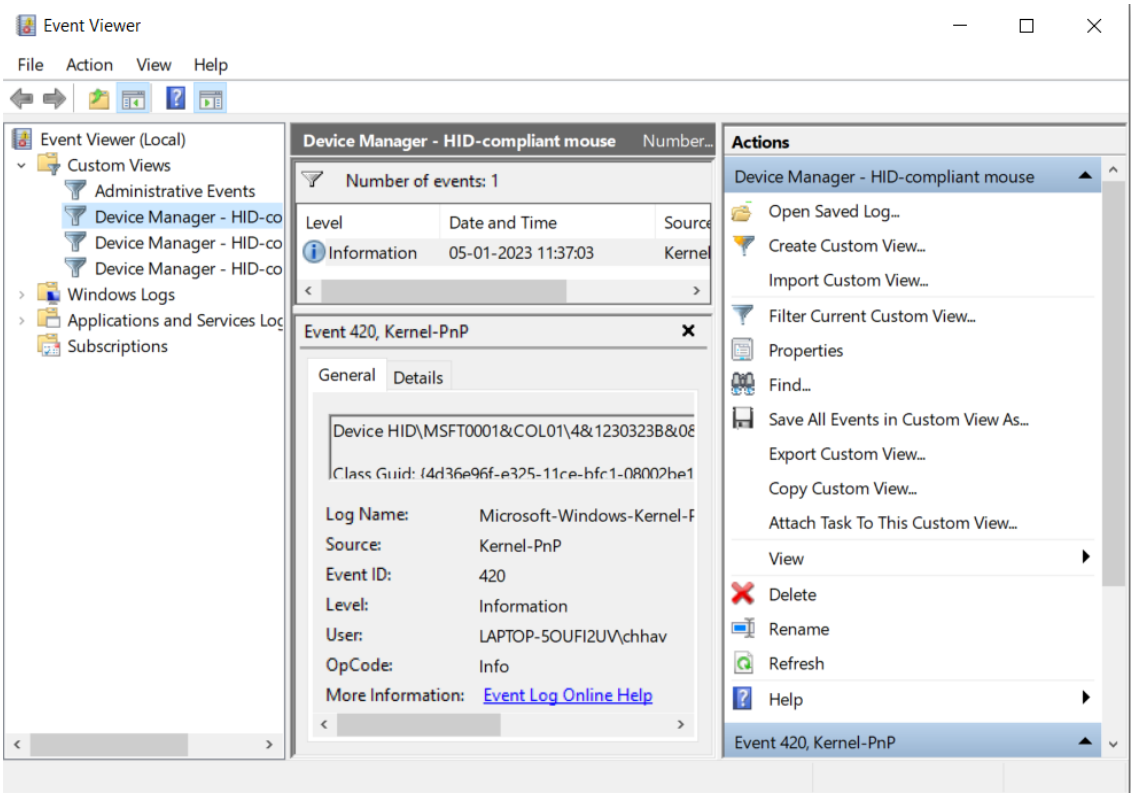


K. J. Somaiya College of Engineering, Mumbai-77
(A Constituent College of Somaiya Vidyavihar University)
Department of Computer Engineering

- registry editor



- event viewer



Conclusion:

Used and understood various UNIX commands, DOS commands, Windows utilities. Learnt about shells and kernel programming. All commands were executed successfully.

Post Lab Descriptive Questions

1. Explain how do you read and interpret syntax of any OS command.

a. Identify the command: Know the name of the command you want to use.
b. Check the manual: Most operating systems provide a manual page (man page) for each command. Type 'man <command_name>' in the terminal to access it.
c. Understand the options: Commands often have various options to modify their behavior. Options are typically preceded by a dash (-) or double dash (--).
d. Arguments: Commands may require additional arguments (e.g., filenames, paths) to execute correctly.
e. Order matters: Some commands expect specific order of options and arguments.
f. Practice and experimentation: Try out the command with different options and arguments to understand its behavior better.

2. Explain different functions of the operating systems.

a. Process management: Scheduling, creation, and termination of processes.
b. Memory management: Allocating and managing memory resources for processes.
c. File system management: Handling file creation, deletion, and organization.
d. Device management: Managing communication with hardware devices.
e. User interface: Providing a means for users to interact with the system (e.g., GUI or command-line interface).
f. Security: Enforcing access control and protecting the system from unauthorized access.
g. Networking: Facilitating communication between computers and devices over a network.
h. Error handling: Detecting and resolving errors to maintain system stability.
i. Software management: Installing, updating, and removing software packages.

3. What are the default permissions assigned by Unix for Directory.

The default permissions for a directory in Unix (and Unix-like systems) are typically 755. This means:

Owner: Full permissions (read, write, execute).
Group: Read and execute permissions.
Others: Read and execute permissions.

4. Give the difference between DOS and WINDOWS.

- DOS is a single-user, command-line-based OS primarily used in the early days of personal computers.
- Windows is a multi-user, graphical user interface (GUI) based OS developed by Microsoft.
- DOS is text-based and lacks a GUI, while Windows provides a visual desktop environment.
- Windows supports multitasking, allowing multiple programs to run simultaneously, whereas DOS is single-tasking.
- Windows supports more advanced hardware and networking capabilities compared to DOS.

5. Explain Booting Process.

a. Power-on self-test (POST): The computer's hardware is checked to ensure it's functioning correctly.

b. Bootloader: A small program, like GRUB or NTLDR, is loaded from the boot device (e.g., hard drive) into memory.

c. Kernel loading: The bootloader loads the OS kernel into memory.

d. Initialization: The kernel initializes essential system components and drivers.

e. User space initiation: The kernel starts the init process, which initializes the rest of the system, services, and user space processes.

f. Graphical User Interface (GUI): In Windows and many modern Linux systems, the GUI is loaded, allowing user interaction. In some Linux distributions, a display manager may handle the login process.

g. User login: The user logs in, and the operating system becomes fully functional, ready to run applications and handle user requests.

K. J. Somaiya College of Engineering, Mumbai-77
(A Constituent College of Somaiya Vidyavihar University)
Department of Computer Engineering

Date: _____ **Signature of faculty in-charge**