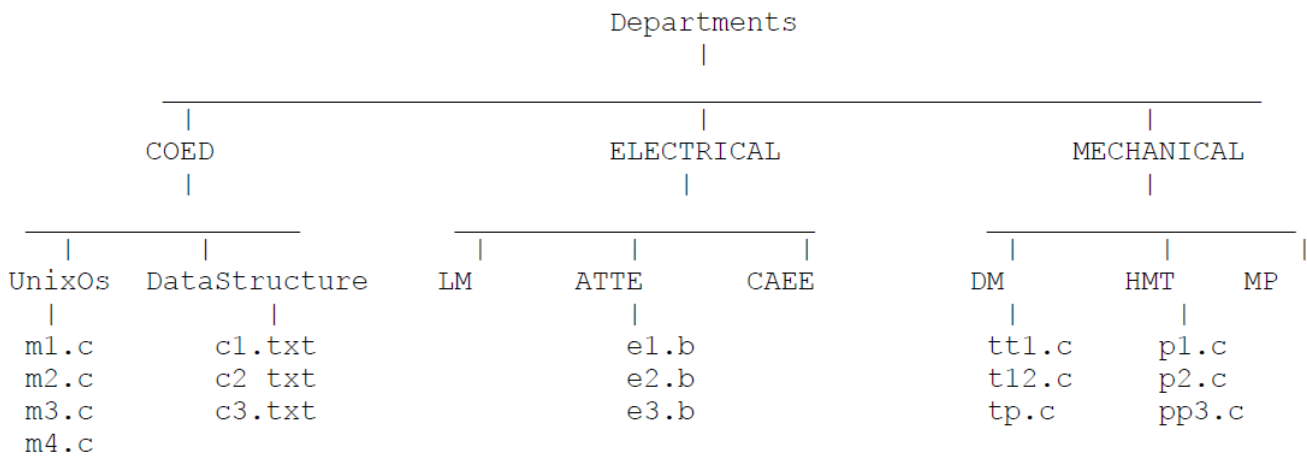# Operating System (CS301)

## Assignment - 1

## U19CS012

1.) Create the directory and files for the following structure and write single UNIX command for each given instruction:

```
                                 Departments
                                     |
        _____|_____
        |                               |                                |
       COED                         ELECTRICAL                       MECHANICAL
        |                               |                                |
   _____|_____              _____|_____        _____|_____
   |           |              |          |          |        |          |           |
 UnixOs  DataStructure       LM        ATTE       CAEE       DM        HMT          MP
   |           |                         |                   |          |
  m1.c       c1.txt                     e1.b                 tt1.c      p1.c
  m2.c       c2 txt                     e2.b                t12.c      p2.c
  m3.c       c3.txt                     e3.b                tp.c       pp3.c
  m4.c
```

```
bhagya@bhagya-VirtualBox:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos
bhagya@bhagya-VirtualBox:~$ cd Desktop/
bhagya@bhagya-VirtualBox:~/Desktop$ mkdir Departments
bhagya@bhagya-VirtualBox:~/Desktop$ cd Departments/
bhagya@bhagya-VirtualBox:~/Desktop/Departments$ mkdir COED ELECTRICAL MECHANICAL
bhagya@bhagya-VirtualBox:~/Desktop/Departments$ cd COED/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED$ mkdir UnixOS DataStructure
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED$ cd UnixOS/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED/UnixOS$ touch m1.c m2.c m3.c m4.c
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED/UnixOS$ cd ../DataStructure/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED/DataStructure$ touch c1.txt c2.txt
c3.txt
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED/DataStructure$ cd ../../ELECTRICAL/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/ELECTRICAL$ mkdir LM ATTE CAEE
bhagya@bhagya-VirtualBox:~/Desktop/Departments/ELECTRICAL$ cd ATTE/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/ELECTRICAL/ATTE$ touch e1.b e2.b e3.b
bhagya@bhagya-VirtualBox:~/Desktop/Departments/ELECTRICAL/ATTE$ cd ../../MECHANICAL/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL$ mkdir DM HMT MP
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL$ cd DM/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/DM$ touch tt1.c tt2.c tp.c
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/DM$ cd ../HMT/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ touch p1.c p2.c pp3.c
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ ▮
```

# 1. Display the entire structure.

**Command:**

```
sudo apt-get install tree

cd ../../

tree
```

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ sudo apt-get install tre
e
[sudo] password for bhagya:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi libgstreamer-plugins-bad1.0-0
  libva-wayland2
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  tree
0 upgraded, 1 newly installed, 0 to remove and 263 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://in.archive.ubuntu.com/ubuntu focal/universe amd64 tree amd64 1.8.0-1 [43.0
 kB]
Fetched 43.0 kB in 0s (272 kB/s)
Selecting previously unselected package tree.
(Reading database ... 183351 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) ...
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ cd ../../
bhagya@bhagya-VirtualBox:~/Desktop/Departments$ tree
```

**Tree in Next Page**

**Output:**



```
bhagya@bhagya-VirtualBox:~/Desktop/Departments$ tree
.
├── COED
│   ├── DataStructure
│   │   ├── c1.txt
│   │   ├── c2.txt
│   │   └── c3.txt
│   └── UnixOS
│       ├── m1.c
│       ├── m2.c
│       ├── m3.c
│       └── m4.c
├── ELECTRICAL
│   ├── ATTE
│   │   ├── e1.b
│   │   ├── e2.b
│   │   └── e3.b
│   ├── CAEE
│   └── LM
└── MECHANICAL
    ├── DM
    │   ├── tp.c
    │   ├── tt1.c
    │   └── tt2.c
    ├── HMT
    │   ├── p1.c
    │   ├── p2.c
    │   └── pp3.c
    └── MP
```

2. Assume that you are in Departments directory. Write a command to copy m1.c of UnixOs directory to DM directory.

**Command:**

When only the directory name is specified as a destination, the copied file has the same name as the original file.

```
cp COED/unix0S/m1.c MECHANICAL/DM/
```

OR

```
cp COED/unix0S/m1.c MECHANICAL/DM/m1.c
```

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments$ cp COED/UnixOS/m1.c MECHANICAL/DM/m1.c
```

**Output:**
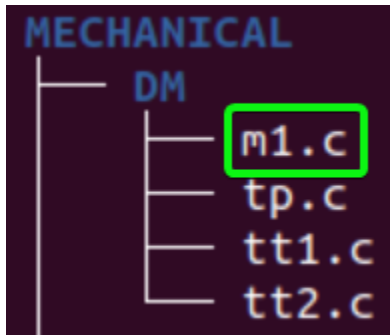


```
cp Src_file Dest_file
```

If the 2nd file doesn't exist, then first it creates one and content is copied to it. But if it existed then it is simply **overwritten** without any warning. So be careful when you choose destination file name.
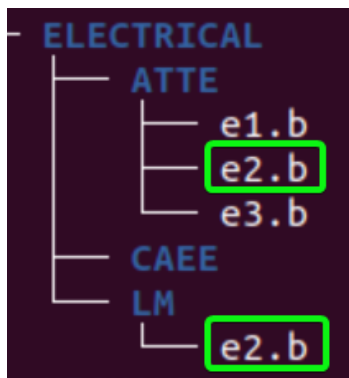
3. Assume that you are in Data Structure directory. Write a command to copy file e2 from ATTE to LM.

**Command:**

```
cp ../../ELECTRICAL/ATTE/e2.b ../../ELECTRICAL/LM/e2.b
```

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments$ cd COED/DataStructure/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED/DataStructure$ cp ../../ELECTRICAL/
ATTE/e2.b ../../ELECTRICAL/LM/e2.b
```

**Output:**



4. Assume that you are in HMT directory. Copy all files of HMT directory, having 3 characters filename, to MP directory.

**Command:**

```
cp COED/unix0S/m1.c MECHANICAL/DM/
```

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ cp ???.* ../MP/
```

**Output:**
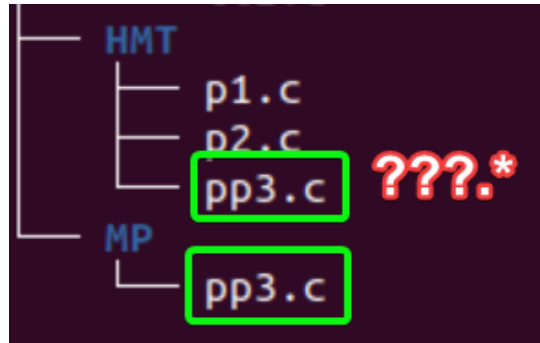


5. Assume that you are in Departments directory. Copy all files of COED directory having first character "c" in name to CAEE directory.

**Command:**

`cp COED/*/c*.* ELECTRICAL/CAEE/`

**Output:**



6. Change the name of file tp.c of DM to ctp.c.

**Command:**

```
mv tp.c ctp.c
```

If the destination file **doesn't exist**, it will be created. In the above command **mv** simply replaces the source filename in the directory with the destination filename (new name). If the destination file **exist**, then it will be **overwrite** and the source file will be deleted. By default, **mv** doesn't prompt for overwriting the existing file, so be careful!!

**Output:**

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments$ cd MECHANICAL/DM/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/DM$ mv tp.c ctp.c
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/DM$ tree
.
├── ctp.c
├── m1.c
├── tt1.c
└── tt2.c
```

## 7. Rename e1.b to e1.c.

**Command:**

```
mv e1.b e1.c
```

**Output:**

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/DM$ cd ../../ELECTRICAL/ATTE/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/ELECTRICAL/ATTE$ mv e1.b e1.c
bhagya@bhagya-VirtualBox:~/Desktop/Departments/ELECTRICAL/ATTE$ tree
.
├── e1.c
├── e2.b
└── e3.b
```

## 8. Delete file having second char. p of HMT directory.

**Command:**

```
rm ?p*.*
```

rm stands for **remove** here. rm command is used to remove objects such as files, directories, symbolic links and so on from the file system like UNIX. To be more precise, rm removes **references to objects** from the filesystem, where those objects might have had multiple references (for example, a file with two different names). **By default, it does not remove directories.** This command normally works silently and you should be very careful while running **rm** command because once you delete the files then you are not able to recover the contents of files and directories.

**Output:**

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/ELECTRICAL/ATTE$ cd ../../MECHANICAL/HMT
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ tree
.
├── p1.c
├── p2.c
└── pp3.c

0 directories, 3 files
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ rm ?p*.*
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ tree
.
├── p1.c      ?p*.* Files Removed
└── p2.c
```

9. Assume that you are in ELECTRICAL directory delete m1.c of ~~DM~~ UnixOs directory.

**Command:**

`rm ../COED/UnixOs/m1.c`

**Output:**

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ cd ../../ELECTRICAL/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/ELECTRICAL$ cd ../COED/UnixOS/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED/UnixOS$ tree
.
├── m1.c
├── m2.c
├── m3.c
└── m4.c

0 directories, 4 files
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED/UnixOS$ cd ../../ELECTRICAL/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/ELECTRICAL$ rm ../COED/UnixOS/m1.c
bhagya@bhagya-VirtualBox:~/Desktop/Departments/ELECTRICAL$ cd ../COED/UnixOS/
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED/UnixOS$ tree
.
├── m2.c
├── m3.c      m1.c deleted
└── m4.c
```

10. Assume that you are in MECHANICAL directory. Delete all files of Unix Os directory having 2 characters in filename.

**Command:**

`rm ../COED/UnixOs/??.*`

**Output:**



## 11. You are in MP Directory, display the current directory path.

**Command:**

**pwd**

**pwd** stands for **P**rint **W**orking **D**irectory. It prints the path of the working directory, starting from the root.

**Output:**



## 12. Remove UnixOs directory

**Command:**

**rmdir UnixOs**

**Output:**

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED$ tree
.
├── DataStructure
│   ├── c1.txt
│   ├── c2.txt
│   └── c3.txt
└── UnixOS

2 directories, 3 files
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED$ rmdir UnixOS
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED$ tree
.
└── DataStructure
    ├── c1.txt
    ├── c2.txt
    └── c3.txt

1 directory, 3 files
```

**Folder Removed Successfully**

13. Display current date and time.

**Command:**

`date`

**Output:**



```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED$ date
Tuesday 03 August 2021 12:19:31 AM IST
```

14. Display content of file c3 with page break.

**Command:**

`less c3.txt`

**Output:**



```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/COED/DataStructure$ less c3.txt
```

What is Lorem Ipsum?

Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book. It has survived not only five centuries, but also the leap into electronic typesetting, remaining essentially unchanged. It was popularised in the 1960s with the release of Letraset sheets containing Lorem Ipsum passages, and more recently with desktop publishing software like Aldus PageMaker including versions of Lorem Ipsum.

**Page Break 1**

Why do we use it?

It is a long established fact that a reader will be distracted by the readable content of a page when looking at its layout. The point of using Lorem Ipsum is that it has a more-or-less normal distribution of letters, as opposed to using 'Content here, content here', making it look like readable English. Many desktop publishing packages and web page editors now use Lorem Ipsum as their default model text, and a search for 'lorem ipsum' will uncover many web sites still in their infancy. Various versions have evolved over the years, sometimes by accident, sometimes on purpose (injected humour and the like).

**Page Break 2**

**Where does it come from?**

Contrary to popular belief, Lorem Ipsum is not simply random text. It has roots in a piece of classical Latin literature from 45 BC, making it over 2000 years old. Richard McClintock, a Latin professor at Hampden-Sydney College in Virginia, looked up one of the more obscure Latin words, consectetur, from a Lorem Ipsum passage, and going through the cites of the word in classical literature, discovered the undoubtable source. Lorem Ipsum comes from sections 1.10.32 and 1.10.33 of "de Finibus Bonorum et Malorum" (The Extremes of Good and Evil) by Cicero, written in 45 BC. This book is a treatise on the theory of ethics, very popular during the Renaissance. The first line of Lorem Ipsum, "Lorem ipsum dolor sit amet..", comes from a line in section 1.10.32.

**Page Break 3 Below**

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The standard chunk of Lorem Ipsum used since the 1500s is reproduced below for those interested. Sections 1.10.32 and 1.10.33 from "de Finibus Bonorum et Malorum" by Cicero are also reproduced in their exact original form, accompanied by English versions from the 1914 translation by H. Rackham.

**4 Pages & 3 Page Breaks**

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**Able to Scroll up & down [Due to less command]**

c3.txt

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:

bhagya@bhagya-VirtualBox: ~/Desktop/Departments/COED/DataStru...

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age editors now use Lorem Ipsum as their default model text, and a search for 'lorem ip
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he 1914 translation by H. Rackham.
(END)

## 15. Change the permissions of file p2.c to different modes possible
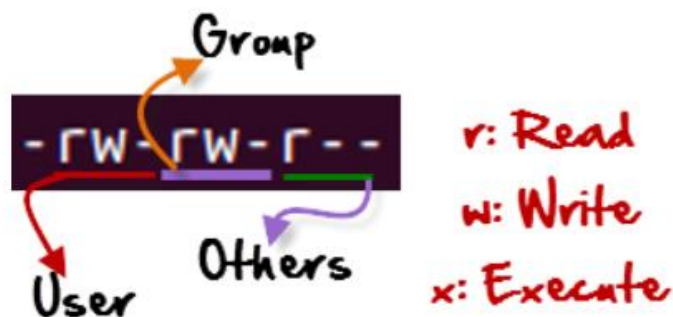
| Number | Permission Type | Symbol |
|--------|-----------------|--------|
| 0 | No Permission | --- |
| 1 | Execute | --x |
| 2 | Write | -w- |
| 3 | Execute + Write | -wx |
| 4 | Read | r-- |
| 5 | Read + Execute | r-x |
| 6 | Read +Write | rw- |
| 7 | Read + Write +Execute | rwx |

**Command:**

```
To View Permission
ls -l

To Change Permissions
chmod 764 file_name
```

**Output:**

A.) Checking Current File Permissions

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ ls -l p2.c
-rw-rw-r-- 1 bhagya bhagya 0 Jul 27 16:02 p2.c
```

B.) chmod 764 and Checking Permissions Again

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ ls -l p2.c
-rw-rw-r-- 1 bhagya bhagya 0 Jul 27 16:02 p2.c
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ chmod 764 p2.c
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ ls -l p2.c
-rwxrw-r-- 1 bhagya bhagya 0 Jul 27 16:02 p2.c
```

Read + Write + Execute (rwx)

764

Read (r--)
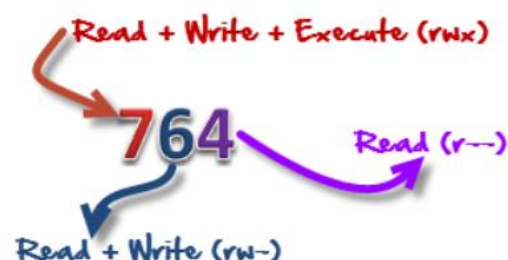
Read + Write (rw-)

'764' absolute code says the following:

- Owner can read, write and execute
- Usergroup can read and write
- World can only read

| Operator | Description |
|---|---|
| + | Adds a permission to a file or directory |
| - | Removes the permission |
| = | Sets the permission and overrides the permissions set earlier. |

| User Denotations | |
|---|---|
| u | user/owner |
| g | group |
| o | other |
| a | all |

C1.) Current File Permissions

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ ls -l p2.c
-rw-rw-r-- 1 bhagya bhagya 0 Jul 27 16:02 p2.c
```

C2.) Setting Permissions to 'Other' Users

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ chmod o=rwx p2.c
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ ls -l p2.c
-rw-rw-rwx 1 bhagya bhagya 0 Jul 27 16:02 p2.c
```

C3.) Adding 'Execute' Permissions to 'Group'

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ chmod g+x p2.c
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ ls -l p2.c
-rw-rwxrwx 1 bhagya bhagya 0 Jul 27 16:02 p2.c
```

C4.) Removing 'Read' Permissions from 'user/owner'

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ chmod u-r p2.c
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ ls -l p2.c
--w-rwxrwx 1 bhagya bhagya 0 Jul 27 16:02 p2.c
```

## 16. You are in root directory, display the all filename of MP directory.

**Command:**

```
To Navigate to Root Directory
cd /

To List all the Files on MP Folder
ls /home/<your username>/Desktop/Departments/MECHANICAL/MP
```

**Output:**



## 17. Clear all the screen on which u work.

**Command:**

```
clear
```

**Output:**
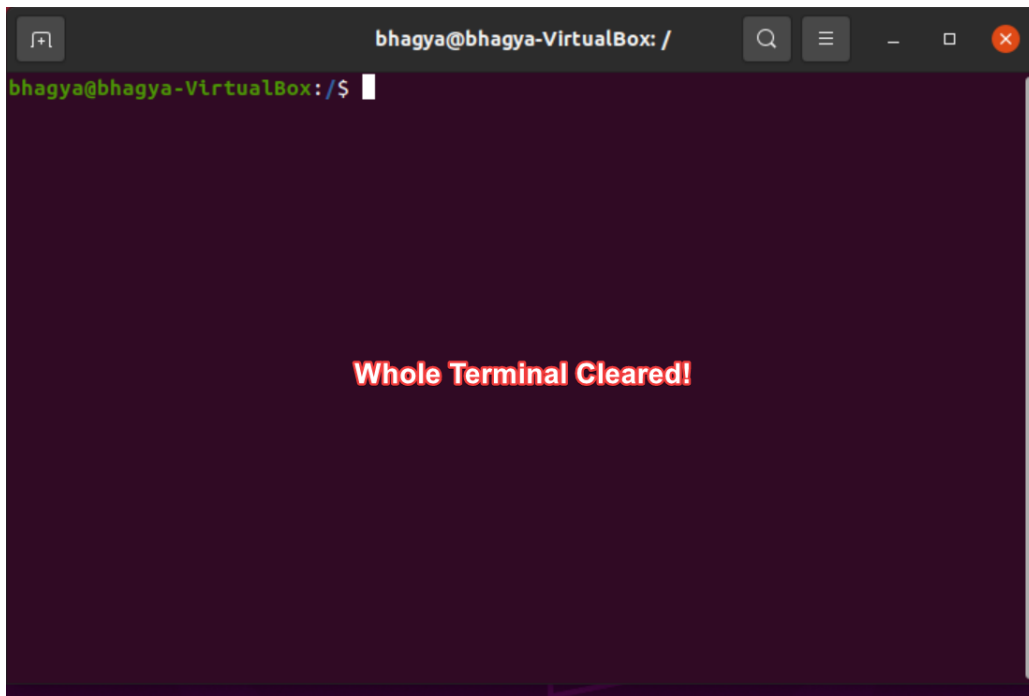


## SUBMITTED BY:

### U19CS012

BHAGYA VINOD RANA