Experiment [2]: [Linux file systems permissions and essential commands]

Name: Vaishnavi Kumari Roll.: 590029048 Date: 12-09-2025

AIM:

- [To Learn linux file systems permissions and essential commands]

Requirements:

- [Any Linux Distro, any kind of text editor (vs code, vim, notepad, nano, etc)]

Theory:

- [Basic Linux file systems permissions and essential commands]

Procedure & Observations

TASK 1: [Directory Navigation]

Task Statement:

- [Create a directory called dir1 in your home directory, then create directories dir2, dir2, and dir3. Navigate to the scripts directory and display your current path.]

Explanation:

- [Use mkdir to create the wanted directory we can use cd to navigate and use pwd to show current path]

Command(s):

‴ mkdir dir1 cd dir1 mkdir dir2 dir3 cd dir2 pwd ‴

Output:

TASK 2: [FIle Creation and Content]

Task Statement:

- [Create three files in the docs directory: myfile.txt, file1.txt, file2.txt and file3.txt.]

Explanation:

- [We can use touch to create empty files and using echo "text" > file.txt to add content to a file and using cat to display file contents]

Command(s):

```
touch myfile.txt
ls
touch file1.txt file2.txt file3.txt
ls
```

Output:

TASK 3: [FIle Operations]

Task Statement:

- [Copy original.txt to the data directory.]

Explanation:

- [- We can use the cp source destination to copy files and using the mv oldname newname to rename files also using the same command mv file directory/ to move files to another directory we can also combine copy and rename: cp file.txt newdir/newname.txt]

Command(s):

```
cp original.txt backup_original.txt
cp-r dir1 dir2
cp-v dir1 dir2
cp file2 backup_file.txt
```

Output:

TASK 4: [FIle Permissions]

Task Statement:

- [Create a shell script file called exp2. Make the file executable only for the owner.]

Explanation:

- [Using chmod u+x filename we can make the file executable for user only using ls -l to check for permissions also script files typically need executable permission to run]

Command(s):

```
touch exp2
chmod +x exp2
ls -l exp2
chmod +w exp2
ls -l exp2
chmod -w exp2
ls -l exp2
chmod 755 exp2
ls -l exp2
chmod 644 exp2
ls -l exp2
```

Output:

TASK 5: [FIle Viewing]

Task Statement:

- [Create a file called expe6.sh with numbers 1 to 20 (each on a new line). Display only the first 5 lines, then only the last 3 lines, then search for lines containing the number "1".]

Explanation:

- [I can quickly generate a list of numbers by running seq 1 20 > numbers.txt. To check the first few numbers, I use head -n 5 to see the first 5 lines, and tail -n 3 to see the last 3 lines. If I want to find all numbers containing a "1", I can use grep "1". Alternatively, I could create the list manually by using multiple echo commands.]

Command(s):

```
seq 1 20 > numbers.txt
head -n 5
tail -n 3
grep "1"
```

Output:

TASK 6: [Text Editing]

Task Statement:

- [Using nano, create a file called config.txt with the following content:

Database=localhost Port=5432 Username=admin

Save the file and then display its contents.]

Explanation:

- [I open a file in Nano using nano file1.txt and type my content normally. Once I'm done, I press Ctrl+O to save the file and Ctrl+X to exit Nano. After that, I use cat to check the contents and make sure everything was saved correctly.]

Command(s):

```
vim filename.txt
```

Alternatively

```
nano file1.txt
```

Output:

```
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ nano file1.txt
```
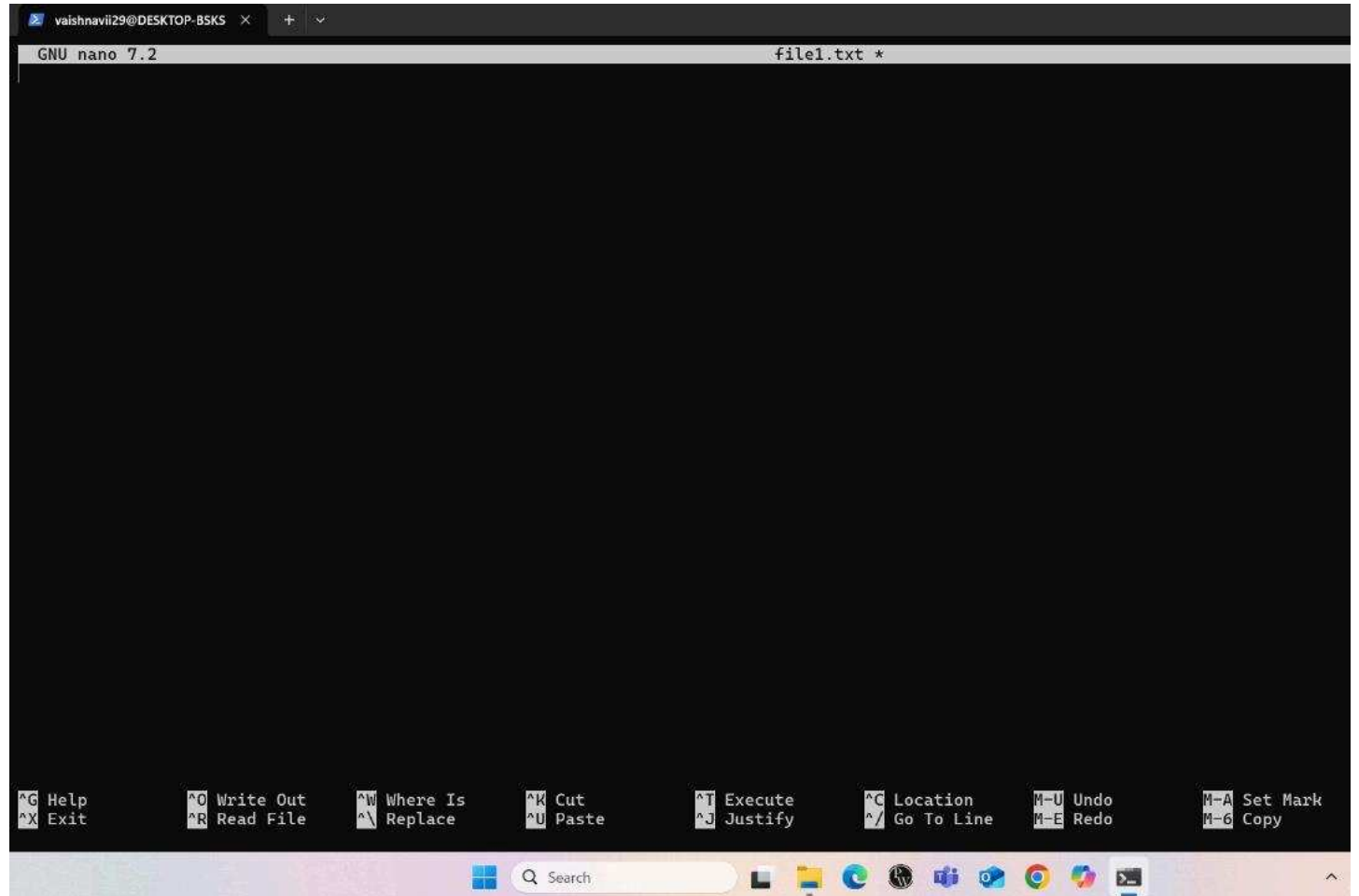
```
  GNU nano 7.2                                          file1.txt *



















^G Help       ^O Write Out   ^W Where Is    ^K Cut         ^T Execute     ^C Location    M-U Undo      M-A Set Mark
^X Exit       ^R Read File   ^\ Replace     ^U Paste       ^J Justify     ^/ Go To Line  M-E Redo      M-6 Copy
```

vaishnavii29@DESKTOP-BSKS   ×   +   ∨

|
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
-- INSERT --

4 cm of rain
Monday
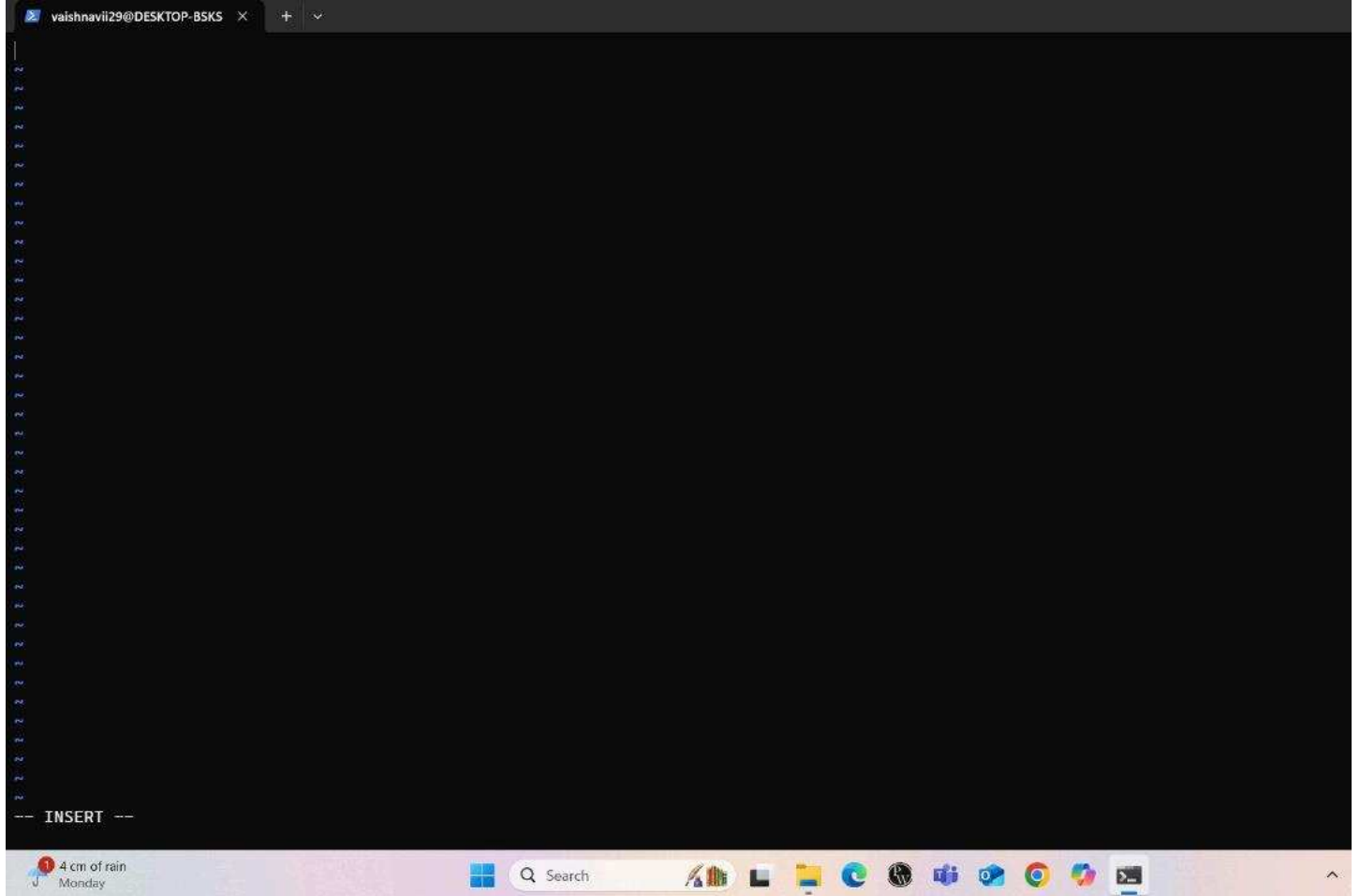
TASK 7: [System Information]

Task Statement:

- [Create a file called system_info.txt that contains: your username, current date, your current directory, and disk usage information in human-readable format.]

Explanation:

- [I can use whoami to check my username, date to see the current date, and pwd to know my current directory. To check disk usage, I use df -h. I can save the output of any command to a file by using redirection like command >> filename.txt. If I want to add labels, I use echo like this: echo "Username:" >> file.txt.]

Command(s):

```
cd scripts
touch system_info.txt
echo "Username:" >> system_info.txt
whoami >> system_info.txt
echo "Date:" >> system_info.txt
date >> system_info.txt
echo "Current Directory:" >> system_info.txt
pwd >> system_info.txt
echo "Disk Usage:" >> system_info.txt
df -h >> system_info.txt
```

Output:

TASK 8: [Process and History]

Task Statement:

- [Display your command history and count how many commands you've executed. Then show the top 10 most recent commands.]

Explanation:

- [I can use history to see all the commands I've typed. To count the total number of commands, I use history | wc -l. If I want to view just the last 10 commands, I can use history 10 or history | tail -10. The wc -l command simply counts the number of lines in the output.]

Command(s):

```
history
history 20
```

Output:


```
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ history
    1  sudo apt install nemo && nemo
    2  sudo apt update -y
    3  touch first txt
    4  ls
    5  sudo apt install nemo && NEMO
    6  sudo apt update -y
    7  touch first txt
    8  ls
    9  virtualbox
   10  sudo apt install virtualbox-qt
   11  virtualbox
   12  CR mkdir
   13  mkdir -p lab3
   14  rmdir lab3/
   15  man
   16  man man
   17  touch lab3/file1
   18  man mkdir
   19  mkdir -p lab3
   20  touch lab3/file1
   21  ls
   22  touch ./lab3/file1
   23  nano readme.txt
   24  readmevim.txt
   25  vim readmevim.txt
   26  whoami
   27  who
   28  who --help
   29  uname
   30  uname -a
   31  df
   32  history
   33  history | grep "man"
   34  history > hsitory2.txt
   35  rm hsitory2.txt
   36  echo $SHELL
   37  vim .text.sh
   38  vim .txt
   39  vim .txt1.sh
   40  mv .txt1.sh test1.sh
```

```
  568  clear
  569  top
  570  htop
  571  sudo apt install htop
  572  htop
  573  clear
  574  history
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ history 20
  556  sudo apt update
  557  clear
  558  unname
  559  clear
  560  uname
  561  uname -a
  562  uname -r
  563  uname -o
  564  df
  565  df -h
  566  df-h /
  567  df -h /
  568  clear
  569  top
  570  htop
  571  sudo apt install htop
  572  htop
  573  clear
  574  history
  575  history 20
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ history | grep htop
  570  htop
  571  sudo apt install htop
  572  htop
  576  history | grep htop
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ ! !
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ !!
! !
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ !567
df -h /
Filesystem      Size  Used Avail Use% Mounted on
/dev/sdd        1007G  3.0G  953G   1% /
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ S
```

TASK 10: [Comprehensive Cleanup]

Task Statement:

- [Set the permissions of your backup.sh script to be readable, writable, and executable by owner, readable and executable by group, and readable by others. Then create a summary file that lists the total number of files and directories in your entire test_project.]

Explanation:

- [I can set permissions for backup.sh using chmod 754 backup.sh to give rwxr-xr-- permissions. Alternatively, I can use chmod u=rwx,g=rx,o=r backup.sh. To count all files, I use find . -type f | wc -l, and to count directories, I use find . -type d | wc -l. If I want to see the full directory structure recursively, I use ls -R. I can also combine multiple commands with && or save the outputs to a summary file for later reference.]

Command(s):

```
find . -type f
find . -type d
```

Output:


```
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find /home -name file3
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find /home -iname FILE3
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find . /home -type d -name dir_1
./dir_1
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find . /home -type f -name file3
./dir_1/file3
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find /home -type l
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find ./home -type l-
find: Must separate multiple arguments to -type using: ','
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find . /home -type l
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find /home -size +100M
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find /home -size +1KB
find: invalid -size type 'B'
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find /home -size +1k
/home
/home/vaishnavii29
/home/vaishnavii29/a.out
/home/vaishnavii29/.cache
/home/vaishnavii29/.bash_history
/home/vaishnavii29/VirtualBox VMs
/home/vaishnavii29/VirtualBox VMs/linux
/home/vaishnavii29/VirtualBox VMs/linux/linux.vbox
/home/vaishnavii29/VirtualBox VMs/linux/linux.vdi
/home/vaishnavii29/VirtualBox VMs/linux/linux.vbox-prev
/home/vaishnavii29/public_folder
/home/vaishnavii29/documents
/home/vaishnavii29/documents/projects
/home/vaishnavii29/documents/projects/linux_tutorial
/home/vaishnavii29/.scriptexp5.sh.swo
/home/vaishnavii29/.bashrc
/home/vaishnavii29/dir3
/home/vaishnavii29/dir1
/home/vaishnavii29/.landscape
/home/vaishnavii29/.local
/home/vaishnavii29/.local/share
/home/vaishnavii29/.local/share/nano
/home/vaishnavii29/.local/share/gedit
/home/vaishnavii29/.local/share/flatpak
/home/vaishnavii29/.local/share/flatpak/db
/home/vaishnavii29/.local/share/recently-used.xbel
/home/vaishnavii29/dir11
```



```
/home/vaishnavii29/.viminfo
/home/vaishnavii29/.scriptexp5.sh.swp
/home/vaishnavii29/dir2
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find /home -mtime -7
/home/vaishnavii29
/home/vaishnavii29/a.out
/home/vaishnavii29/.motd_shown
/home/vaishnavii29/first.c
/home/vaishnavii29/.bash_history
/home/vaishnavii29/.lesshst
/home/vaishnavii29/VirtualBox VMs
/home/vaishnavii29/VirtualBox VMs/linux
/home/vaishnavii29/VirtualBox VMs/linux/linux.vbox
/home/vaishnavii29/VirtualBox VMs/linux/linux.vdi
/home/vaishnavii29/VirtualBox VMs/linux/linux.vbox-prev
/home/vaishnavii29/public_folder
/home/vaishnavii29/documents
/home/vaishnavii29/documents/projects
/home/vaishnavii29/documents/projects/linux_tutorial
/home/vaishnavii29/first2.c
/home/vaishnavii29/dir3
/home/vaishnavii29/dir1
/home/vaishnavii29/.local/share
/home/vaishnavii29/.local/share/gedit
/home/vaishnavii29/.local/share/gedit/gedit-metadata.xml
/home/vaishnavii29/.local/share/flatpak
/home/vaishnavii29/.local/share/flatpak/db
/home/vaishnavii29/.local/share/recently-used.xbel
/home/vaishnavii29/dir11
/home/vaishnavii29/exp2
/home/vaishnavii29/.config
/home/vaishnavii29/.config/gedit
/home/vaishnavii29/.config/gedit/accels
/home/vaishnavii29/.config/htop
/home/vaishnavii29/.config/htop/htoprc
/home/vaishnavii29/.config/VirtualBox
/home/vaishnavii29/.config/VirtualBox/selectorwindow.log.2
/home/vaishnavii29/.config/VirtualBox/VBoxSVC.log.7
/home/vaishnavii29/.config/VirtualBox/VBoxSVC.log.6
/home/vaishnavii29/.config/VirtualBox/selectorwindow.log.3
/home/vaishnavii29/.config/VirtualBox/selectorwindow.log.5
```

```
/home/vaishnavii29/.config/QtProject.conf
/home/vaishnavii29/.viminfo
/home/vaishnavii29/dir2
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find /home -atime +30
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find /home -ctime -1
/home/vaishnavii29/.motd_shown
/home/vaishnavii29/.bash_history
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find /home -perm 644
/home/vaishnavii29/.bash_logout
/home/vaishnavii29/.cache/motd.legal-displayed
/home/vaishnavii29/.profile
/home/vaishnavii29/.scriptexp5.sh.swo
/home/vaishnavii29/.bashrc
/home/vaishnavii29/first2.c
/home/vaishnavii29/file1
/home/vaishnavii29/.landscape/sysinfo.log
/home/vaishnavii29/.local/share/gedit/gedit-metadata.xml
/home/vaishnavii29/exp2
/home/vaishnavii29/.config/gedit/accels
/home/vaishnavii29/.config/enchant/en_US.exc
/home/vaishnavii29/.config/enchant/en_US.dic
/home/vaishnavii29/.config/QtProject.conf
/home/vaishnavii29/.scriptexp5.sh.swp
/home/vaishnavii29/.sudo_as_admin_successful
/home/vaishnavii29/file2
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find /home -perm -644
/home
/home/vaishnavii29/.bash_logout
/home/vaishnavii29/a.out
/home/vaishnavii29/.motd_shown
/home/vaishnavii29/scriptexp5.sh
/home/vaishnavii29/.cache/motd.legal-displayed
/home/vaishnavii29/.profile
/home/vaishnavii29/test1.sh
/home/vaishnavii29/first.c
/home/vaishnavii29/VirtualBox VMs
/home/vaishnavii29/VirtualBox VMs/linux
/home/vaishnavii29/public_folder
/home/vaishnavii29/documents
/home/vaishnavii29/documents/projects
/home/vaishnavii29/documents/projects/linux_tutorial
```

```
/home/vaishnavii29/.sudo_as_admin_successful
/home/vaishnavii29/file2
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$
vaishnavii29@DESKTOP-BSKS7E4:/mnt/c/Users/DELL/Desktop/New folder/linux$ find /home -perm /111
/home
/home/vaishnavii29
/home/vaishnavii29/a.out
/home/vaishnavii29/scriptexp5.sh
/home/vaishnavii29/.cache
/home/vaishnavii29/test1.sh
/home/vaishnavii29/first.c
/home/vaishnavii29/VirtualBox VMs
/home/vaishnavii29/VirtualBox VMs/linux
/home/vaishnavii29/public_folder
/home/vaishnavii29/documents
/home/vaishnavii29/documents/projects
/home/vaishnavii29/documents/projects/linux_tutorial
/home/vaishnavii29/dir3
/home/vaishnavii29/dir1
/home/vaishnavii29/.landscape
/home/vaishnavii29/.local
/home/vaishnavii29/.local/share
/home/vaishnavii29/.local/share/nano
/home/vaishnavii29/.local/share/gedit
/home/vaishnavii29/.local/share/flatpak
/home/vaishnavii29/.local/share/flatpak/db
/home/vaishnavii29/dir11
/home/vaishnavii29/script5.sh
/home/vaishnavii29/.config
/home/vaishnavii29/.config/gedit
/home/vaishnavii29/.config/htop
/home/vaishnavii29/.config/VirtualBox
/home/vaishnavii29/.config/dconf
/home/vaishnavii29/.config/procps
/home/vaishnavii29/.config/enchant
/home/vaishnavii29/script.sh
/home/vaishnavii29/dir2
```