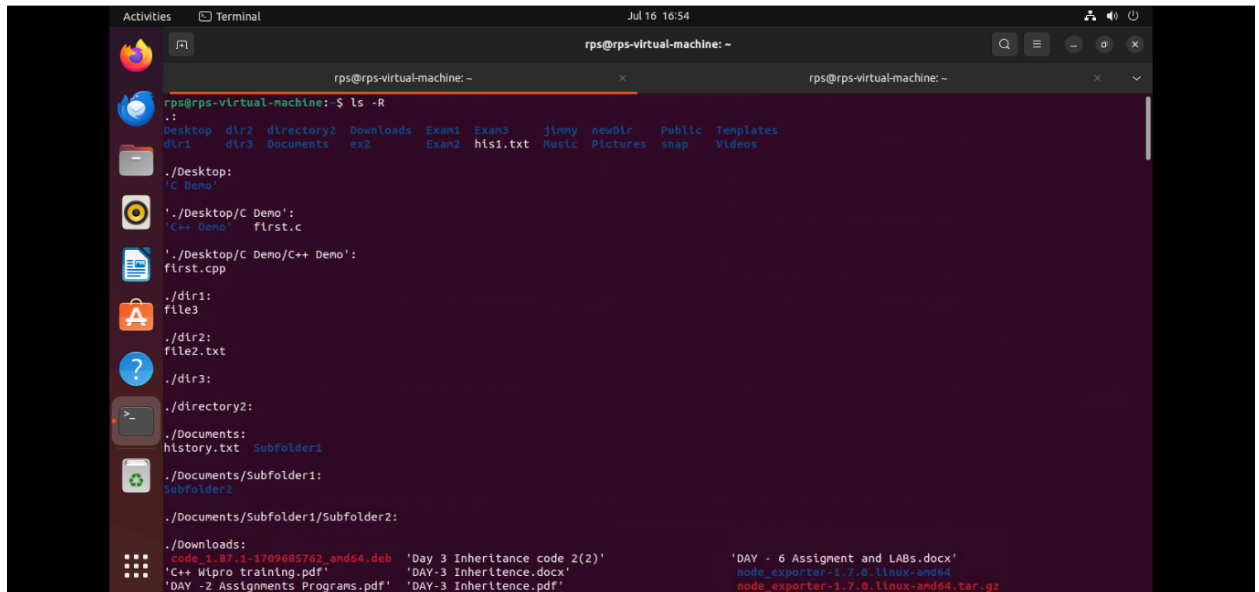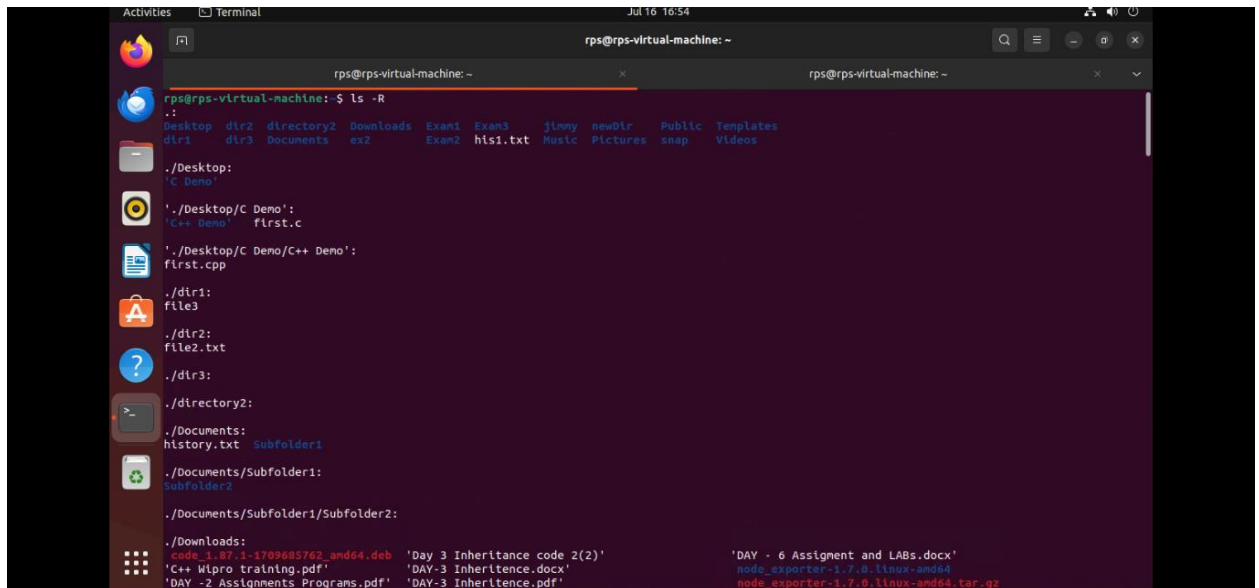# Assignment - Linux System Programming

1. Write a command using ls to list all files (including hidden files) in the current directory and its subdirectories.

2. Modify the previous command to display only files with a specific extension (e.g., .txt).

3. Enhance the report by including the file size for each listed file.

```
rps@rps-virtual-machine:~$ find . -type f -name "*txt" -exec ls -lh {} +
-rw-rw-r-- 1 rps rps    5 Mar 16  2023 ./.cache/tracker3/files/first-index.txt
-rw-rw-r-- 1 rps rps   10 Jul 16 16:09 ./.cache/tracker3/files/last-crawl.txt
-rw-rw-r-- 1 rps rps    5 Jun 15 11:09 ./.cache/tracker3/files/locale-for-miner-apps.txt
-rw-rw-r-- 1 rps rps  221 Mar 10 10:00 './.config/Code/Service Worker/CacheStorage/2b4d61bdfcf37cef5cf99195f8b34ac60c80a8d1/index.txt'
-rw-rw-r-- 1 rps rps  221 Mar 10 09:58 './.config/Code/Service Worker/CacheStorage/427ca6b9f671819530034b6d93e85e9a7a4028eb/index.txt'
-rw-rw-r-- 1 rps rps  247 Jun 24 11:23 ./.config/Code/WebStorage/3/CacheStorage/index.txt
-rw-rw-r-- 1 rps rps   21 Jul 16 16:02 ./dir2/file2.txt
```

4. Further refine the output to display only files modified within the last 24 hours. Combine the functionalities from points 2 and 4 to list only files with a specific extension (e.g., .jpg) modified in the last day.

```
rps@rps-virtual-machine:~$ find . -type f -mtime -1 -exec ls -lh {} +
-rw------- 1 rps rps 4.4K Jul 16 11:50 ./.bash_history
-rw-r--r-- 1 rps rps 8.0K Jul 16 12:06 ./.cache/event-sound-cache.tdb.20e4fcbd122f4fb0b036e74c4f6d9b44.x86_64-pc-linux-gnu
-rw-r--r-- 1 rps rps 3.2K Jul 16 12:03 ./.cache/mesa_shader_cache/3d/3881305099b34aadd12e81c437d2433313fbfb
-rw-r--r-- 1 rps rps 3.2K Jul 16 12:03 ./.cache/mesa_shader_cache/5c/a7e0180f448ab65f37dc23b298f0e0d0f91b60
-rw-r--r-- 1 rps rps 2.2K Jul 16 12:04 ./.cache/mesa_shader_cache/6a/3500a083d8de0049ab311ef3b2dd9a73e0b6ec
-rw-r--r-- 1 rps rps  591 Jul 16 12:03 ./.cache/mesa_shader_cache/a3/d8b6cc01cb1ad5bd0347392cf8fdaa3f3d6256
-rw-r--r-- 1 rps rps 1.3M Jul 16 12:04 ./.cache/mesa_shader_cache/index
-rw------- 1 rps rps 4.1K Jul 16 12:02 ./.cache/rhythmbox/album-art/store.tdb
-rw-rw-r-- 1 rps rps 1.1K Jul 16 12:02 ./.cache/rhythmbox/alternate-toolbar/entryview_db.xml
-rw------- 1 rps rps  233 Jul 16 12:04 ./.cache/thumbnails/fail/gnome-thumbnail-factory/c5f3028a22f5930e8132ade3022a7fed.png
```

5. Use dir / ls to list all files and folders in your current directory. How many files are there? (Excluding hidden files if applicable)

```
-rw-r--r-- 1 rps rps 1.6M Jul 16 10:03 ./snap/snap-store/common/.cache/gnome-software/odrs/ratings.json
rps@rps-virtual-machine:~$ find . -type f -name "*jpg" -mtime -1 -exec ls -lh {} +
rps@rps-virtual-machine:~$ ^C
rps@rps-virtual-machine:~$
```

6. Utilize dir / ls with appropriate flags to display only files with a specific extension (e.g., .txt). How many files of that type exist?

```
-rw-rw-r-- 1 rps rps   14 Mar 10 09:58 ./.vscode/extensions/twxs.cmake-0.0.17/node_modules/peg-cmake/test/CMakeLists.txt
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ ls -l | grep "^-" | wc -l
1
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ ls *.txt | wc -l
1
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ cd Downloads && ls -l | grep "$(date +%Y-%m-%d)"
rps@rps-virtual-machine:~/Downloads$ ls
code_1.87.1-1709685762_amd64.deb  'Day 3 Inheritance code 2(2)'         'DAY - 6 Assigment and LABs.docx'
'C++ Wipro training.pdf'           'DAY-3 Inheritence.docx'              node_exporter-1.7.0.linux-amd64
```

7. Navigate to your Downloads folder using cd. Then, use dir / ls to list the contents. Are there any recently downloaded files (modified today)?

```
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ ls *.txt | wc -l
1
rps@rps-virtual-machine:~$
```

8. Use dir / ls with flags to display both the filename and its size for each file in your current directory. Identify the largest file.

```
rps@rps-virtual-machine:~/Downloads$ ls -lh | awk '{print $5, $9}' | sort -nr |head -n 1
765 Operator
rps@rps-virtual-machine:~/Downloads$
rps@rps-virtual-machine:~/Downloads$ cd ~
rps@rps-virtual-machine:~$ ls -lh | awk '{print $5, $9}' | sort -nr |head -n 1
14K his1.txt
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ ls *.docx
ls: cannot access '*.docx': No such file or directory
rps@rps-virtual-machine:~$ ls *.txt
```

9. Practice using dir / ls with wildcards (e.g., dir *.docx) to list all files with a specific extension pattern (e.g., all Word documents).

```
rps@rps-virtual-machine:~/Downloads$ cd ~
rps@rps-virtual-machine:~$ ls -lh | awk '{print $5, $9}' | sort -nr |head -n 1
14K his1.txt
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ ls *.docx
ls: cannot access '*.docx': No such file or directory
rps@rps-virtual-machine:~$ ls *.txt
his1.txt
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ cd Documents && pwd
```

10. Use cd to navigate to your Documents folder. What is the full path of your Documents folder displayed by the prompt?

```
rps@rps-virtual-machine:~$ ls *.txt
his1.txt
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ cd Documents && pwd
/home/rps/Documents
rps@rps-virtual-machine:~/Documents$ cd ../
rps@rps-virtual-machine:~$ cd ..
rps@rps-virtual-machine:/home$ pwd
/home
rps@rps-virtual-machine:/home$ cd ..
rps@rps-virtual-machine:/$ cd -
```

11. Practice using cd .. to move back one directory level from your current location.

```
/home/rps/Documents
rps@rps-virtual-machine:~/Documents$ cd ../
rps@rps-virtual-machine:~$ cd ..
rps@rps-virtual-machine:/home$ pwd
/home
rps@rps-virtual-machine:/home$ cd ..
rps@rps-virtual-machine:/$ cd -
/home
rps@rps-virtual-machine:/home$ cd -
/
rps@rps-virtual-machine:~$ cd ~
rps@rps-virtual-machine:~$ pwd
/home/rps
rps@rps-virtual-machine:~$
```

12. Utilize pwd to display the full path of the current directory after navigating with cd.

```
his1.txt
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ cd Documents && pwd
/home/rps/Documents
rps@rps-virtual-machine:~/Documents$ cd ../
rps@rps-virtual-machine:~$ cd ..
rps@rps-virtual-machine:/home$ pwd
/home
rps@rps-virtual-machine:/home$ cd ..
rps@rps-virtual-machine:~$ cd -
/home
rps@rps-virtual-machine:/home$ cd -
/
rps@rps-virtual-machine:/$ cd ~
rps@rps-virtual-machine:~$ pwd
/home/rps
```

13. Explore using directory shortcuts (e.g., ~ for home directory) with cd to quickly reach specific locations.

```
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ cd Documents && ls
history.txt  subfolder
rps@rps-virtual-machine:~/Documents$ cd..
cd..: command not found
rps@rps-virtual-machine:~/Documents$ cd ../
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ cp ~/Desktop/file.txt ~/Documents/
cp: cannot stat '/home/rps/Desktop/file.txt': No such file or directory
rps@rps-virtual-machine:~$ ls Documents
```

14. Combine cd with dir / ls to navigate to a specific folder and then list its contents.

```
history.txt  Subfolder
rps@rps-virtual-machine:~/Documents$ cd..
cd..: command not found
rps@rps-virtual-machine:~/Documents$ cd ../
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ cp ~/Desktop/file.txt ~/Documents/
cp: cannot stat '/home/rps/Desktop/file.txt': No such file or directory
rps@rps-virtual-machine:~$ ls Documents
history.txt  Subfolder1
rps@rps-virtual-machine:~$ cp ~/Documents/history.txt ~/Desktop/
rps@rps-virtual-machine:~$ ls Desktop
'C Demo'   history.txt
rps@rps-virtual-machine:~$
```

15. Identify a file on your Desktop. Use cp to copy that file to your Documents folder. Verify the copy exists in Documents.

```
rps@rps-virtual-machine:~/Documents$ cd ../
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ cp ~/Desktop/file.txt ~/Documents/
cp: cannot stat '/home/rps/Desktop/file.txt': No such file or directory
rps@rps-virtual-machine:~$ ls Documents
history.txt  Subfolder
rps@rps-virtual-machine:~$ cp ~/Documents/history.txt ~/Desktop/
rps@rps-virtual-machine:~$ ls Desktop
'C Demo'   history.txt
rps@rps-virtual-machine:~$
```

16. Practice renaming a file on your Desktop using mv. Give it a new name and confirm the change using dir / ls.

```
'C Demo'   history.txt
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ mv ~/Desktop/history.txt ~/Desktop/newname.txt
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ cp Documents/img.jpg Desktop
cp: cannot stat 'Documents/img.jpg': No such file or directory
rps@rps-virtual-machine:~$
```

17. Locate a folder containing images. Use cp to copy a specific image file from that folder to another folder.

```
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ mv ~/Desktop/history.txt ~/Desktop/newname.txt
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ cp Documents/img.jpg Desktop
cp: cannot stat 'Documents/img.jpg': No such file or directory
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ mv Desktop/newname.txt/ Documents
mv: cannot stat 'Desktop/newname.txt/': Not a directory
```

18. Explore using mv to move a folder containing documents to a different location within your file system.

```
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ mv Desktop/newname.txt/ Documents
mv: cannot stat 'Desktop/newname.txt/': Not a directory
rps@rps-virtual-machine:~$ mv jimmy Documents
rps@rps-virtual-machine:~$
```

19. Try copying a file that already exists in the destination folder. What happens?
(Experiment with different flags for cp if applicable on your system)

```
cp: cannot stat 'Documents/img.jpg': No such file or directory
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ mv Desktop/newname.txt/ Documents
mv: cannot stat 'Desktop/newname.txt/': Not a directory
rps@rps-virtual-machine:~$ mv jimmy Documents
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ cp -i Documents/ newname.txt Desktop
cp: -r not specified; omitting directory 'Documents/'
cp: cannot stat 'newname.txt': No such file or directory
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ mkdir ~/Documents/Project\ Reports
rps@rps-virtual-machine:~$ ls
Desktop  dir2  directory2  Downloads  Exam1  Exam3   Music  Pictures  snap     Videos
```

20. Create a new folder named "Project Reports" inside your Documents folder using mkdir. Verify its existence using dir / ls.

21. Practice using mkdir with multiple arguments to create a nested folder structure (e.g., mkdir Documents/ProjectX/Reports).

22. Locate an empty folder you created earlier. Use rmdir to delete it. Confirm its removal with dir / ls.

23. Explore using dir / ls to identify empty folders within a specific directory.