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COE18B001

Linux Commands - Part II

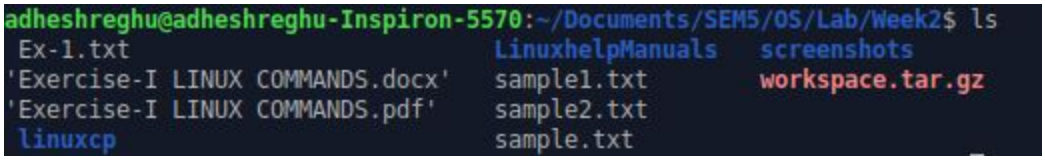
1. Find in Part I.

2. Create a directory and create a file inside that directory.

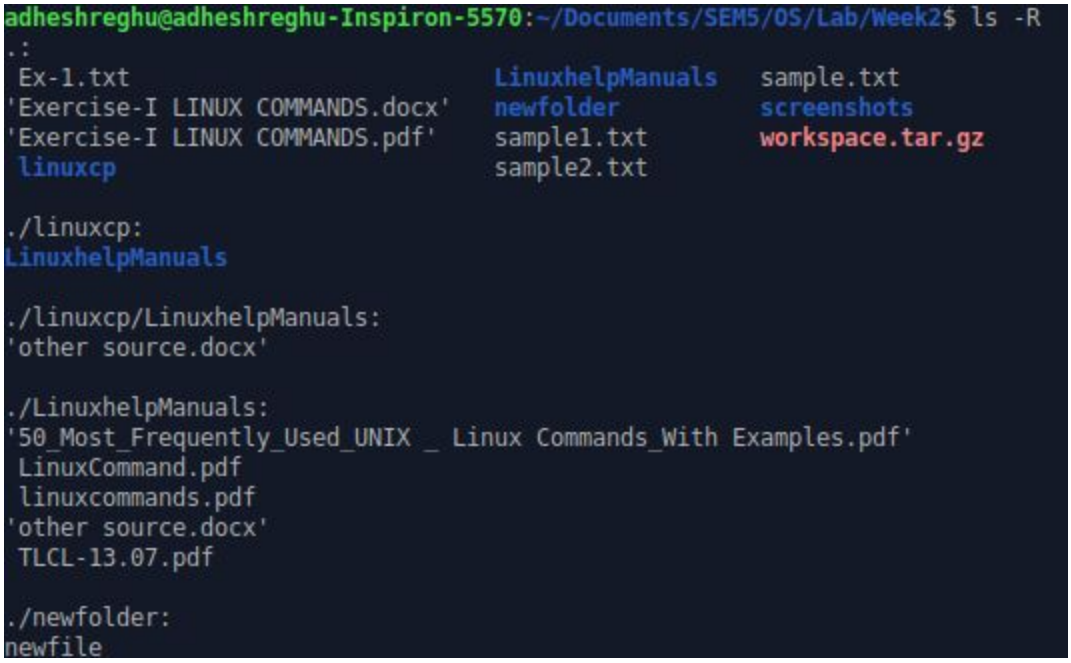
Code:

```
$ mkdir newfolder
$ cd newfolder
$ touch newfile
```

Output



After running the code given, we can see the newfolder is created with newfile inside it.



3. List the files and directories that are empty in a working directory.

Code:

```
$ find -empty
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ find -empty
./newfolder/newfile
./screenshots/q2
```

4. Show commands to delete empty and non-empty directory.

Command to delete empty files and directories

Code:

```
$ find -empty -delete
```

Output

Here newfolder1 is empty (only contains empty newfile1) whereas newfolder2 is non-empty.

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2/newfolder$ ls -R
.:
newfolder1  newfolder2

./newfolder1:

./newfolder2:
newfile2.txt
```

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2/newfolder$ find -empty -delete
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2/newfolder$ ls
newfolder2
```

Command to delete only non-empty directories (command executed with both folders intact.)

Code:

```
$ find . -mindepth 1 -maxdepth 1 -not -empty -type d | xargs rm -r
```

Output:

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2/newfolder$ ls -R
.:
newfolder1  newfolder2

./newfolder1:

./newfolder2:
newfile2.txt
```

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2/newfolder$ find . -mindepth 1 -maxd
epth 1 -not -empty -type d | xargs rm -r
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2/newfolder$ ls
newfolder1
```

5. Find the location of the input files using locate and find command.

Using Find:

Code:

```
$ find -name filename.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~$ find /home/adheshreghu/Documents/ -name sample1.txt
/home/adheshreghu/Documents/SEM5/OS/Lab/Week2/sample1.txt
```

Using locate:

Code:

```
$ locate filename.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~$ locate sample1.txt
/home/adheshreghu/Documents/SEM5/OS/Lab/Week2/sample1.txt
```

> **Note**
>
> **locate** command searches in a database called **updatedb**. Sometimes the updatedb may not be immediately refreshed. In such cases, we can refresh the updatedb using *sudo updatedb* command.

6. View the user permissions and ownership of the files in the current directory and change the ownership of some selected files to another user.

To view the user permission and ownership of files.

Code:

```
$ ls -l
```

Output

Lets review the permission and ownerships of the files before executing the command:

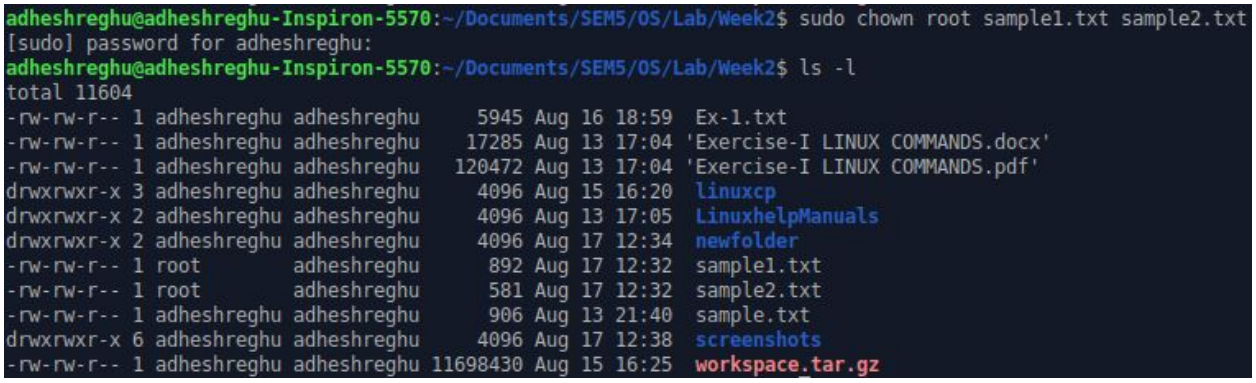
```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ ls -l
total 11604
-rw-rw-r-- 1 adheshreghu adheshreghu     5945 Aug 16 18:59  Ex-1.txt
-rw-rw-r-- 1 adheshreghu adheshreghu    17285 Aug 13 17:04 'Exercise-I LINUX COMMANDS.docx'
-rw-rw-r-- 1 adheshreghu adheshreghu   120472 Aug 13 17:04 'Exercise-I LINUX COMMANDS.pdf'
drwxrwxr-x 3 adheshreghu adheshreghu     4096 Aug 15 16:20  linuxcp
drwxrwxr-x 2 adheshreghu adheshreghu     4096 Aug 13 17:05  LinuxhelpManuals
drwxrwxr-x 2 adheshreghu adheshreghu     4096 Aug 17 12:34  newfolder
-rw-rw-r-- 1 adheshreghu adheshreghu      892 Aug 17 12:32  sample1.txt
-rw-rw-r-- 1 adheshreghu adheshreghu      581 Aug 17 12:32  sample2.txt
-rw-rw-r-- 1 adheshreghu adheshreghu      906 Aug 13 21:40  sample.txt
drwxrwxr-x 6 adheshreghu adheshreghu     4096 Aug 17 12:38  screenshots
-rw-rw-r-- 1 adheshreghu adheshreghu 11698430 Aug 15 16:25  workspace.tar.gz
```

To change ownership of selected files (say file1.txt and file2.txt)

Code:

```
$ sudo chown root file1.txt file2.txt
```

Output



Here the *root* specifies the new owner of the files.

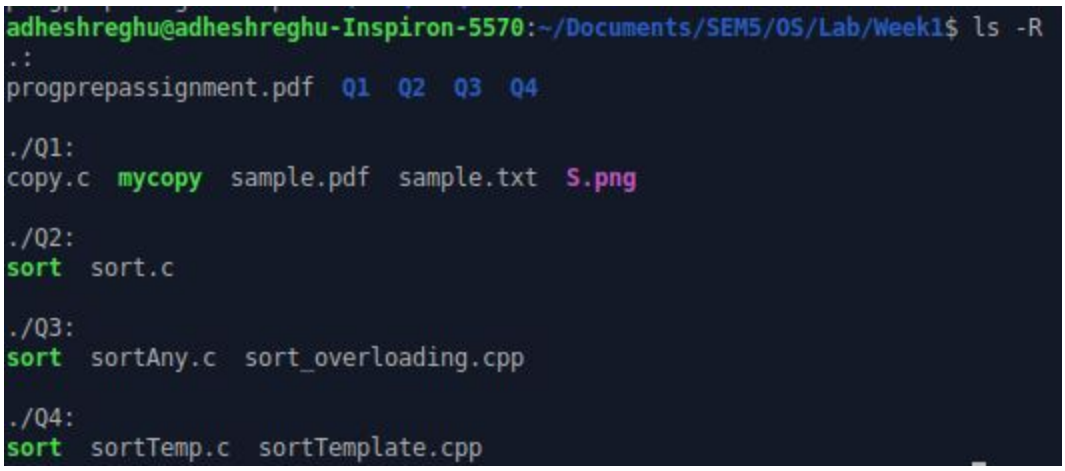
7. List all the files in the current directory and subdirectories.

This can be achieved by listing subdirectories recursively

Code:

```
$ ls -R
```

Output



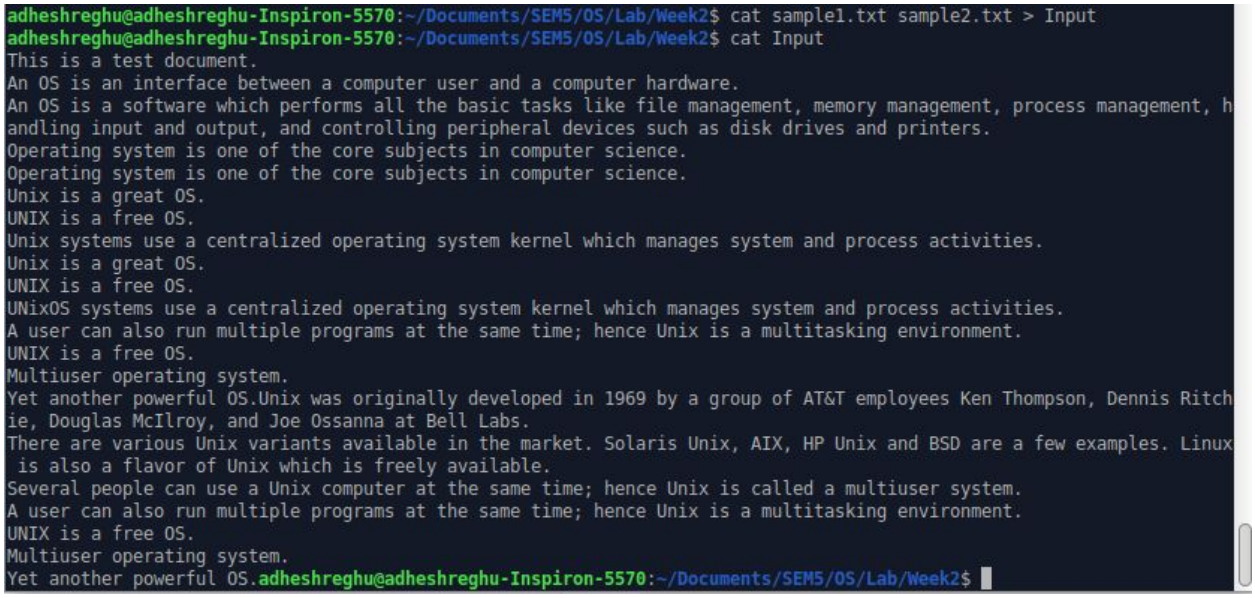
8. Concatenate the two input files: “sample1.txt” and “sample2.txt” and save it to a new file named “Input”.

`cat` command is used for this purpose.

Code:

```
$ cat sample1.txt sample2.txt > Input
```

Output

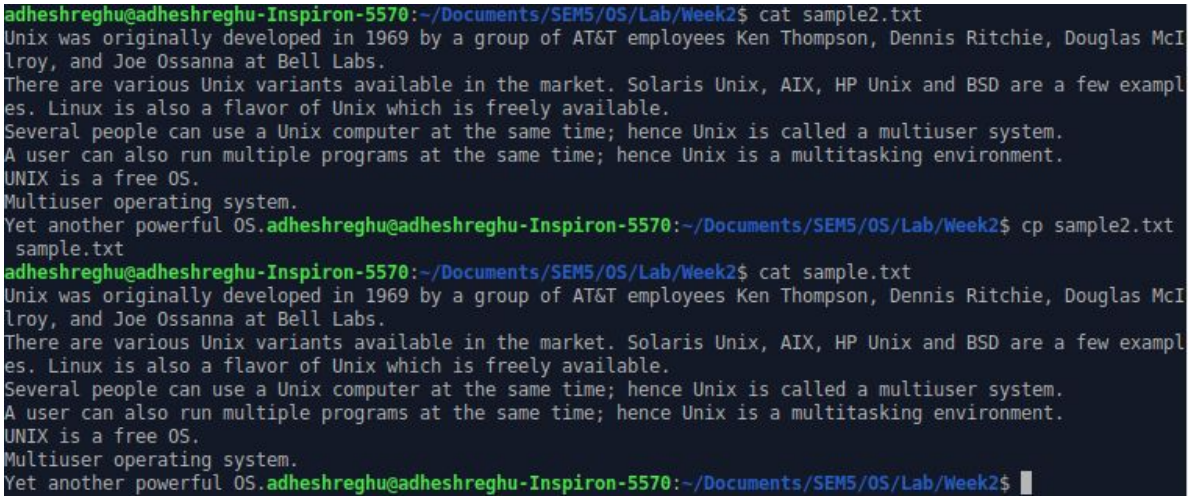


9. Copy the contents of file ‘sample2.txt’ to ‘sample.txt’.

Code:

```
$ cp sample2.txt sample.txt
```

Output

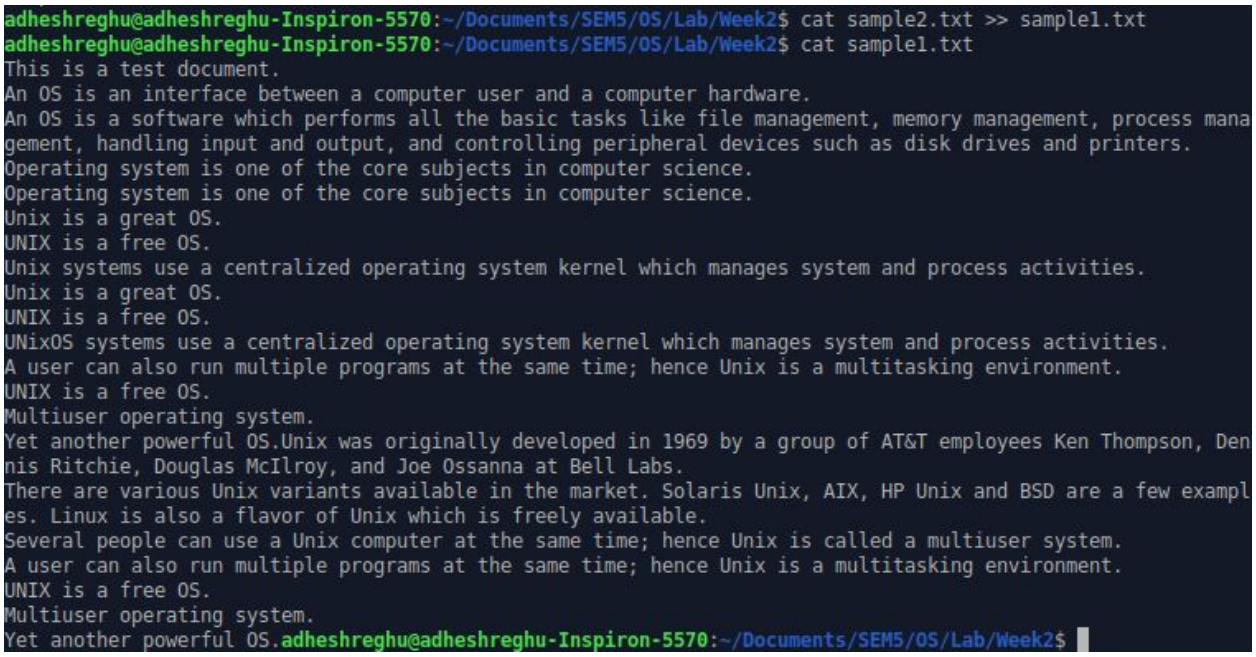


10. Append the file contents of input file ‘sample2.txt’ to the end of the first input file ‘sample1.txt’

Code:

```
$ cat sample2.txt >> sample1.txt
```

Output

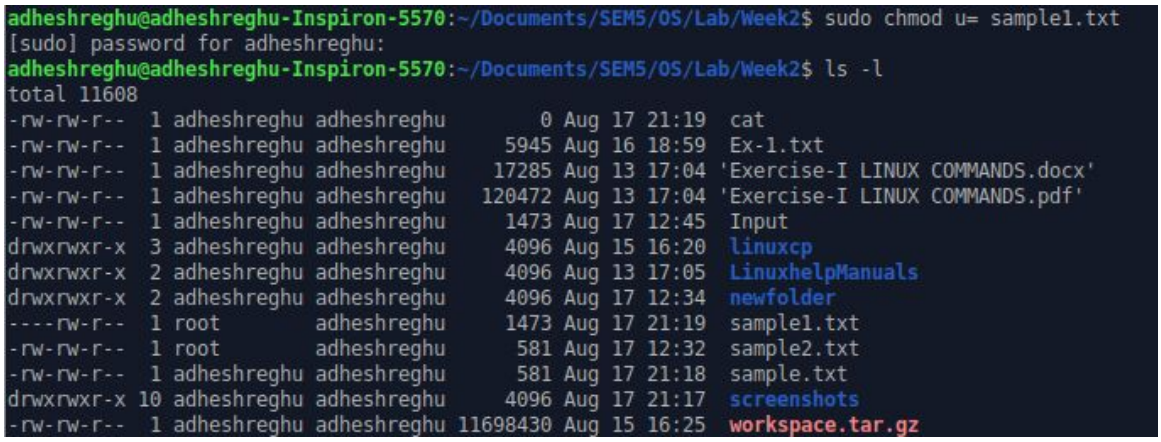


11. Remove the permission for the users to read, write and execute the file ‘sample.txt’.

Code:

```
$ sudo chmod u= sample1.txt
```

Output

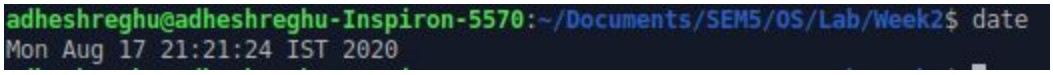


12. Display the current date with the day of week, month, time and the year.

Code:

```
$ date
```

Output

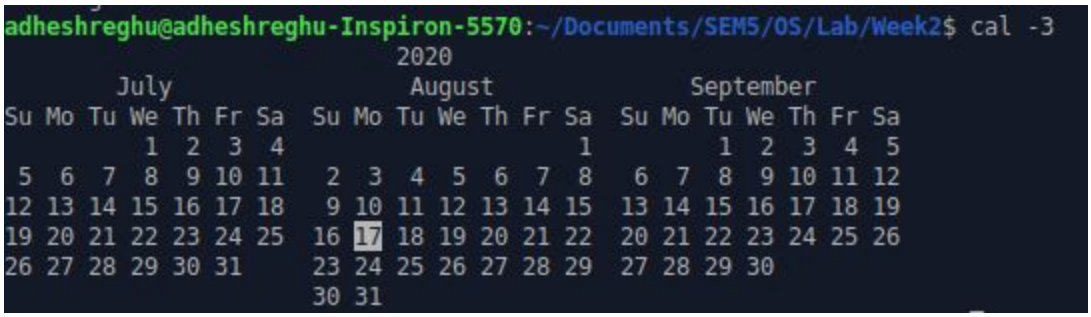


13. Show the calendar of previous, current and next month.

Code:

```
$ cal -3
```

Output



14. Sort the contents of the file ‘sample1.txt’ in alphabetical order.

Code:

```
$ sort sample1.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ sort sample1.txt
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process mana
gement, handling input and output, and controlling peripheral devices such as disk drives and printers.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
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Multiuser operating system.
Multiuser operating system.
Operating system is one of the core subjects in computer science.
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Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few exampl
es. Linux is also a flavor of Unix which is freely available.
This is a test document.
UNIX is a free OS.
UNIX is a free OS.
UNIX is a free OS.
UNIX is a free OS.
Unix is a great OS.
Unix is a great OS.
UNixOS systems use a centralized operating system kernel which manages system and process activities.
Unix systems use a centralized operating system kernel which manages system and process activities.
Yet another powerful OS.
Yet another powerful OS.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Den
nis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$
```

15. Erase duplicate records in the file ‘sample1.txt’ and display only the unique records

Code:

```
$ sort sample1.txt | uniq
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ sort sample1.txt | uniq
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process mana
gement, handling input and output, and controlling peripheral devices such as disk drives and printers.
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nis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$
```
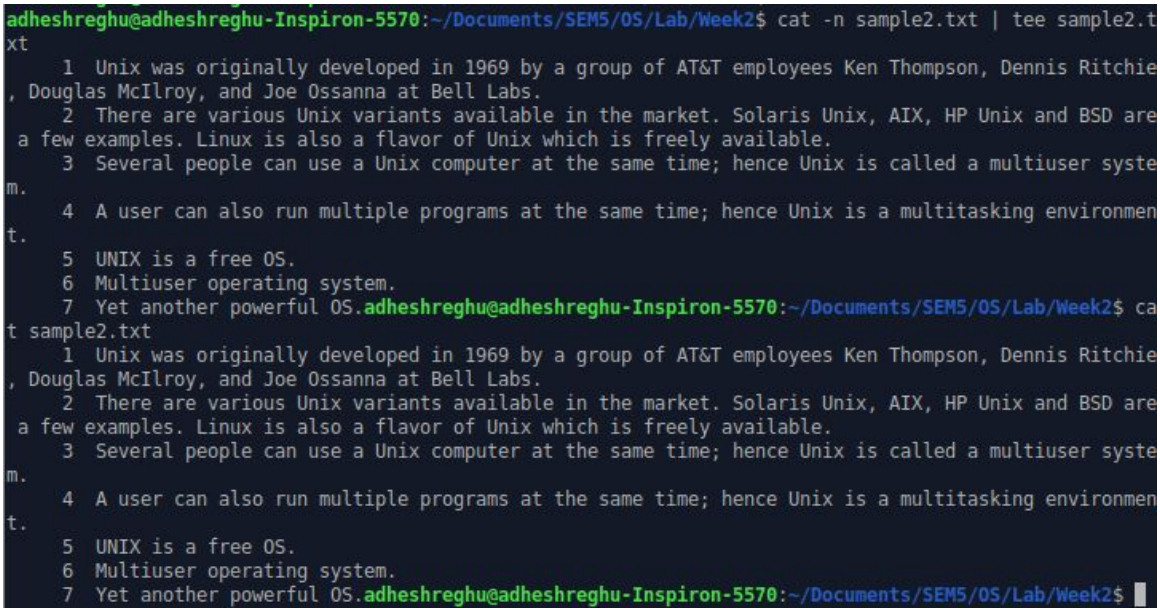

16. Add line numbers to the file ‘sample2.txt’

Code:

```
$ cat -n sample2.txt | tee sample2.txt
```

Output:

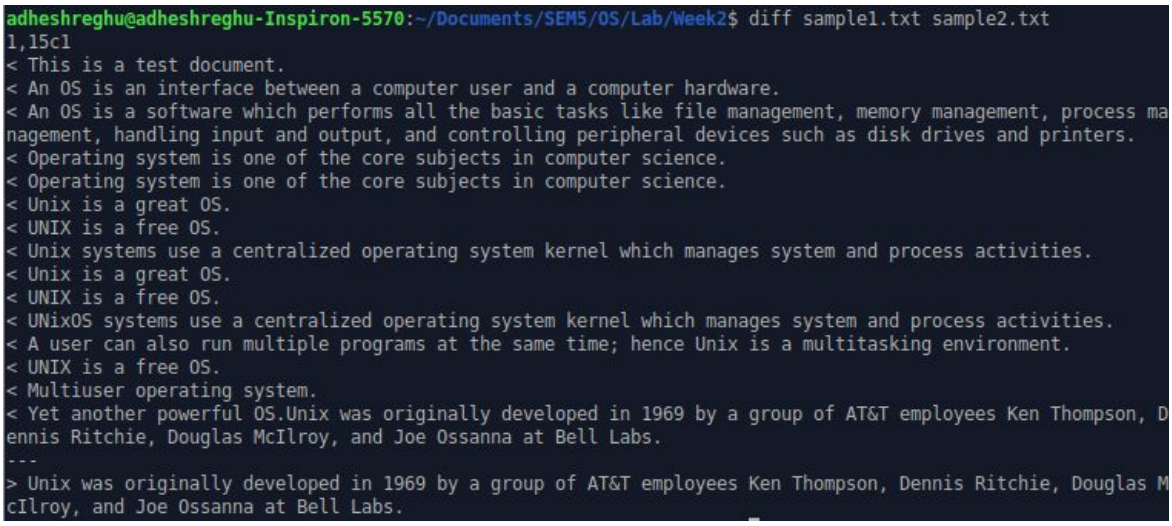


17. Find out whether the two pairs of input files are identical or not.

Code:

```
$ diff sample1.txt sample2.txt
```

Output

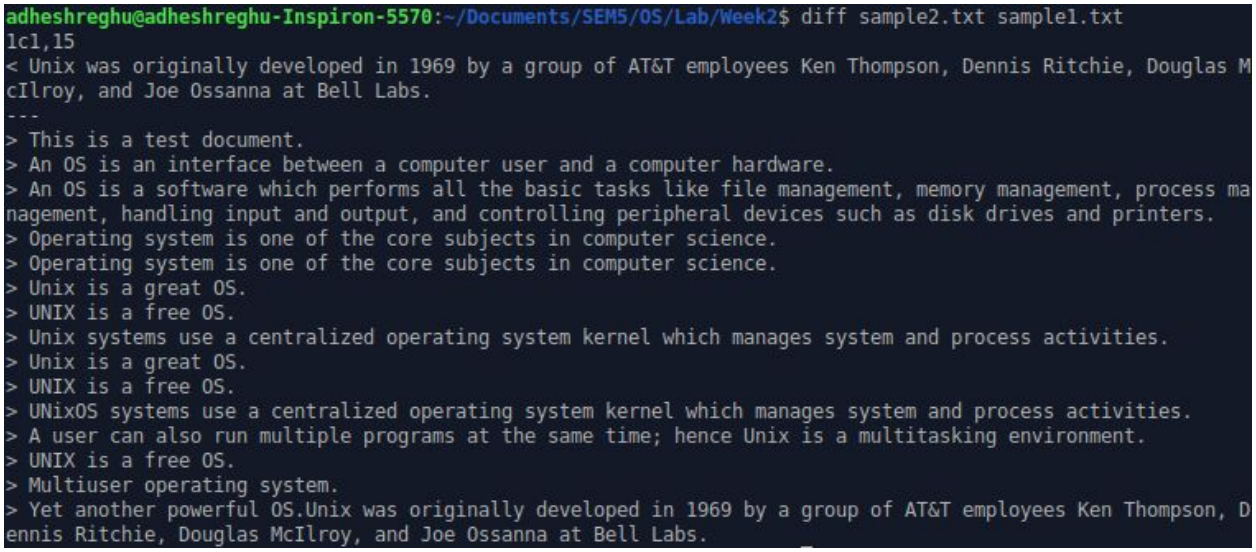


Let's take a look at the variation of the same command.

Code:

```
$ diff sample2.txt sample1.txt
```

Output



18. Show how the input file “sample1.txt” differs line by line from “sample2.txt” in context and unified mode.

In Context Mode.

Code:

```
$ diff -c sample1.txt sample2.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ diff -c sample1.txt sample2.txt
*** sample1.txt 2020-08-17 21:19:48.166527420 +0530
--- sample2.txt 2020-08-17 12:32:52.894457066 +0530
***************
*** 1,18 ****
! This is a test document.
! An OS is an interface between a computer user and a computer hardware.
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t, handling input and output, and controlling peripheral devices such as disk drives and printers.
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! UNIX is a free OS.
! Multiuser operating system.
! Yet another powerful OS.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis R
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  There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. L
inux is also a flavor of Unix which is freely available.
  Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
  A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
--- 1,4 ----
! Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy,
 and Joe Ossanna at Bell Labs.
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  A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
```

In Unified mode.

Code:

```
$ diff -u sample2.txt sample1.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ diff -u sample2.txt sample1.txt
--- sample2.txt 2020-08-17 12:32:52.894457066 +0530
+++ sample1.txt 2020-08-17 21:19:48.166527420 +0530
@@ -1,4 +1,18 @@
-Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy,
and Joe Ossanna at Bell Labs.
+This is a test document.
+An OS is an interface between a computer user and a computer hardware.
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 A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
```

19. Solve the arithmetic expression: ((8+12)*(5-3))/2 using linux commands.

Code:

```
$ NUM=$((((8+12)*(5-3))/2))
$ echo $NUM
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ NUM=$((((8+12)*(5-3))/2))
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ echo $NUM
20
```

20. Cut and display the first 10 characters of every line of the file “Input.txt”.

Code:

```
$ cut -c 1-10 < sample2.txt
```

Output:

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ cut -c 1-10 < sample2.txt
     1  Uni
     2  The
     3  Sev
     4  A u
     5  UNI
     6  Mul
     7  Yet
```

21. Print the name of the current working directory.

Code:

```
$ pwd
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ pwd
/home/adheshreghu/Documents/SEM5/OS/Lab/Week2
```

22. Process Status

a. List all the running processes with their corresponding PIDs.

Code:

```
$  ps
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ ps
  PID TTY          TIME CMD
15675 pts/0    00:00:00 bash
15968 pts/0    00:00:00 find
15969 pts/0    00:00:00 find
15972 pts/0    00:00:00 find
16041 pts/0    00:00:00 find
16043 pts/0    00:00:00 find
16046 pts/0    00:00:00 find
16052 pts/0    00:00:05 find
17896 pts/0    00:00:00 ps
```

b. List the processes that are not associated with the terminal.

Code:

```
$ ps T
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ ps T
  PID TTY      STAT   TIME COMMAND
15675 pts/0    Ss     0:00 bash
15968 pts/0    T      0:00 find -name sample1.txt
15969 pts/0    T      0:00 find ./ -name sample1.txt
15972 pts/0    T      0:00 find . -name sample1.txt
16041 pts/0    T      0:00 find /home/ sample1.txt
16043 pts/0    T      0:00 find /home/adheshreghu/ sample1.txt
16046 pts/0    T      0:00 find /home/adheshreghu/Documents/ sample1.txt
16052 pts/0    T      0:05 find /home/adheshreghu/Documents/ -name sample1.txt
17908 pts/0    R+     0:00 ps T
```

c. List the processes that are associated with the terminal.

Code:

```
$ ps a
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ ps a
  PID TTY      STAT   TIME COMMAND
 1154 tty7     Ssl+  71:01 /usr/lib/xorg/Xorg -core :0 -seat seat0 -auth /var/run/lightdm/root/:0 -nolisten tcp vt7
 1159 tty1     Ss+    0:00 /sbin/agetty -o -p -- \u --noclear tty1 linux
15675 pts/0    Ss     0:00 bash
15968 pts/0    T      0:00 find -name sample1.txt
15969 pts/0    T      0:00 find ./ -name sample1.txt
15972 pts/0    T      0:00 find . -name sample1.txt
16041 pts/0    T      0:00 find /home/ sample1.txt
16043 pts/0    T      0:00 find /home/adheshreghu/ sample1.txt
16046 pts/0    T      0:00 find /home/adheshreghu/Documents/ sample1.txt
16052 pts/0    T      0:05 find /home/adheshreghu/Documents/ -name sample1.txt
17919 pts/0    R+     0:00 ps a
25956 pts/1    Ss+    0:00 bash
```

23. Print the number of characters, number of lines and number of words all the given input files.

Code:

```
$ wc sample1.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ ps a
  PID TTY      STAT   TIME COMMAND
 1154 tty7     Ssl+  71:01 /usr/lib/xorg/Xorg -core :0 -seat seat0 -auth /var/run/lightdm/root/:0 -nolisten tcp vt7
 1159 tty1     Ss+    0:00 /sbin/agetty -o -p -- \u --noclear tty1 linux
15675 pts/0    Ss     0:00 bash
15968 pts/0    T      0:00 find -name sample1.txt
15969 pts/0    T      0:00 find ./ -name sample1.txt
15972 pts/0    T      0:00 find . -name sample1.txt
16041 pts/0    T      0:00 find /home/ sample1.txt
16043 pts/0    T      0:00 find /home/adheshreghu/ sample1.txt
16046 pts/0    T      0:00 find /home/adheshreghu/Documents/ sample1.txt
16052 pts/0    T      0:05 find /home/adheshreghu/Documents/ -name sample1.txt
17919 pts/0    R+     0:00 ps a
25956 pts/1    Ss+    0:00 bash
```

24. Print the length of the longest line from all the input files.

Code:

```
$ wc -L sample1.txt sample2.txt
```

Output

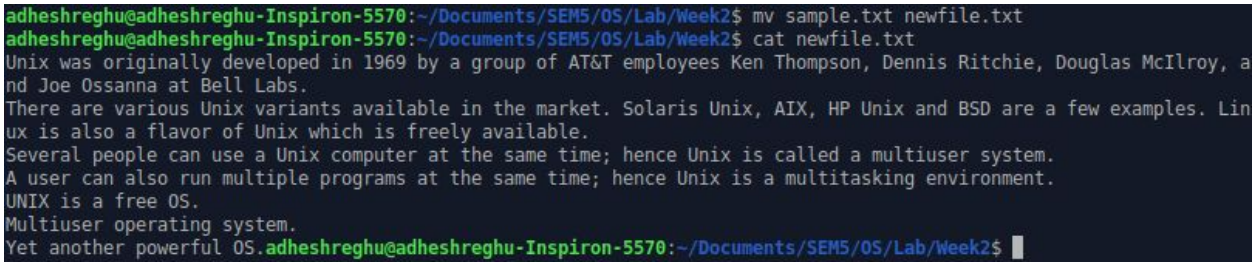
```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ wc -L sample1.txt sample2.txt
 211 sample1.txt
 169 sample2.txt
 211 total
```

25. Move the contents of the input file sample.txt to a new file.

Code:

```
$ mv sample.txt newfile.txt
```

Output

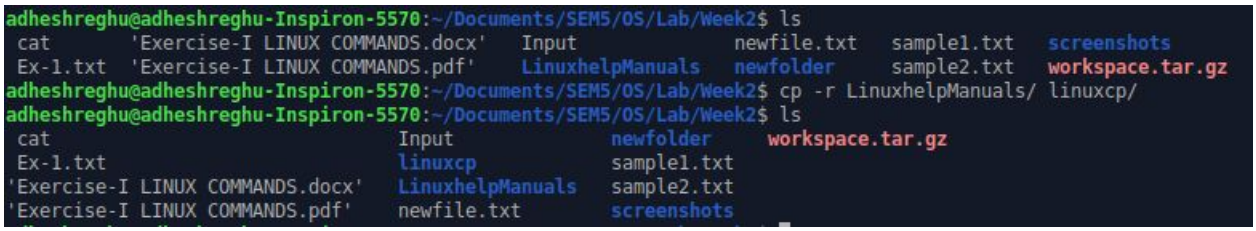


26. Copy the contents of one directory to another directory.

Code:

```
$ cp -r LinuxhelpManuals/ linuxcp/
```

Output



27. Reverse the lines of the two input files and concatenate the file contents using a single command.

Code:

```
$ tac sample1.txt sample2.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ tac sample1.txt sample2.txt
Yet another powerful OS.Multiuser operating system.
UNIX is a free OS.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Lin
ux is also a flavor of Unix which is freely available.
Yet another powerful OS.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Rit
chie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
Multiuser operating system.
UNIX is a free OS.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNixOS systems use a centralized operating system kernel which manages system and process activities.
UNIX is a free OS.
Unix is a great OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
UNIX is a free OS.
Unix is a great OS.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
An OS is a software which performs all the basic tasks like file management, memory management, process management,
 handling input and output, and controlling peripheral devices such as disk drives and printers.
An OS is an interface between a computer user and a computer hardware.
This is a test document.
Yet another powerful OS.Multiuser operating system.
UNIX is a free OS.
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There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Lin
ux is also a flavor of Unix which is freely available.
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, a
nd Joe Ossanna at Bell Labs.
```

28. Delete all the files with *.txt extension from the working directory using yes command.

Code:

```
$ yes | rm -i *.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ ls
 cat                              Input             newfolder     workspace.tar.gz
 Ex-1.txt                         linuxcp           sample1.txt
'Exercise-I LINUX COMMANDS.docx'  LinuxhelpManuals  sample2.txt
'Exercise-I LINUX COMMANDS.pdf'   newfile.txt       screenshots
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ yes | rm -i *.txt
rm: remove regular file 'Ex-1.txt'? rm: remove regular file 'newfile.txt'? rm: remove regular file 'sample1.txt'? r
m: remove regular file 'sample2.txt'? adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ ls
 cat                              Input             newfolder
'Exercise-I LINUX COMMANDS.docx'  linuxcp           screenshots
'Exercise-I LINUX COMMANDS.pdf'   LinuxhelpManuals  workspace.tar.gz
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$
```

29. Given the input file “sample1.txt”, print the number of the lines that match the pattern “system”.

Code:

```
$ grep -c "system" sample1.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ grep -c "system" sample1.txt
7
```

30. Having sample1 file as input, print the matched lines that contain the pattern “Unix” as whole words.

Code:

```
$ grep -h "Unix" sample1.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ grep -h "Unix" sample1.txt
Unix is a great OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
Yet another powerful OS.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Rit
chie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Lin
ux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
```

31. Print the lines from “sample1.txt” that do not match the pattern “OS”.

Code:

```
$ grep -v "OS" sample1.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ grep -v "OS" sample1.txt
This is a test document.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
Unix systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
Multiuser operating system.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Lin
ux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
Multiuser operating system.
```

32. Fetch the files that contain the word “OS”, “Operating System”, “Operating Systems” with its respective line number. (Ignore the case).

Code:

```
$ grep -n -e "OS" -e "Operating System" -e "Operating Systems" *
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ grep -n -e "OS" -e "Operating System" -e "Operatin
g Systems" *
Ex-1.txt:170:31. Print the lines from “sample1.txt” that do not match the pattern “OS”.
Ex-1.txt:173:   grep -v "OS" sample1.txt
Ex-1.txt:175:32. Fetch the files that contain the word “OS”, “Operating System”, “Operating Systems” with its respectiv
e line number. (Ignore the case).
Ex-1.txt:178:   grep -n -e "OS" -e "Operating System" -e "Operating Systems" *
Ex-1.txt:185:34. Find and replace the string “OS” with “Operating System”.
Ex-1.txt:188:   sed -i 's/OS/Operating Systems/g' sample1.txt
Input:2:An OS is an interface between a computer user and a computer hardware.
Input:3:An OS is a software which performs all the basic tasks like file management, memory management, process managem
ent, handling input and output, and controlling peripheral devices such as disk drives and printers.
Input:6:Unix is a great OS.
Input:7:UNIX is a free OS.
Input:9:Unix is a great OS.
Input:10:UNIX is a free OS.
Input:11:UNixOS systems use a centralized operating system kernel which manages system and process activities.
Input:13:UNIX is a free OS.
Input:15:Yet another powerful OS.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Denni
s Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
Input:19:UNIX is a free OS.
Input:21:Yet another powerful OS.
grep: linuxcp: Is a directory
grep: LinuxhelpManuals: Is a directory
newfile.txt:5:UNIX is a free OS.
newfile.txt:7:Yet another powerful OS.
grep: newfolder: Is a directory
sample1.txt:2:An OS is an interface between a computer user and a computer hardware.
sample1.txt:3:An OS is a software which performs all the basic tasks like file management, memory management, process m
anagement, handling input and output, and controlling peripheral devices such as disk drives and printers.
sample1.txt:6:Unix is a great OS.
sample1.txt:7:UNIX is a free OS.
sample1.txt:9:Unix is a great OS.
sample1.txt:10:UNIX is a free OS.
sample1.txt:11:UNixOS systems use a centralized operating system kernel which manages system and process activities.
sample1.txt:13:UNIX is a free OS.
sample1.txt:15:Yet another powerful OS.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
 Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
sample1.txt:19:UNIX is a free OS.
sample1.txt:21:Yet another powerful OS.
sample2.txt:5:UNIX is a free OS.
sample2.txt:7:Yet another powerful OS.
grep: screenshots: Is a directory
Binary file workspace.tar.gz matches
```

33. Having “sample1.txt” and “core” as the input and pattern respectively, along with the matched line print three lines before and after the pattern match.

Code:

```
$ grep -A 3 -B 3 "core" sample1.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ grep -A 3 -B 3 "core" sample1.txt
This is a test document.
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, han
dling input and output, and controlling peripheral devices such as disk drives and printers.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
```

34. Find and replace the string “OS” with “Operating System”.

Code:

```
$ sed -i 's/OS/Operating Systems/g' sample1.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ grep "OS" sample1.txt
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, han
dling input and output, and controlling peripheral devices such as disk drives and printers.
Unix is a great OS.
UNIX is a free OS.
Unix is a great OS.
UNIX is a free OS.
UNixOS systems use a centralized operating system kernel which manages system and process activities.
UNIX is a free OS.
Yet another powerful OS.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie
, Douglas McIlroy, and Joe Ossanna at Bell Labs.
UNIX is a free OS.
Yet another powerful OS.
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ sed -i 's/OS/Operating Systems/g' sample1.txt
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ cat sample1.txt
This is a test document.
An Operating Systems is an interface between a computer user and a computer hardware.
An Operating Systems is a software which performs all the basic tasks like file management, memory management, process
management, handling input and output, and controlling peripheral devices such as disk drives and printers.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
Unix is a great Operating Systems.
UNIX is a free Operating Systems.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great Operating Systems.
UNIX is a free Operating Systems.
UNixOperating Systems systems use a centralized operating system kernel which manages system and process activities.
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UNIX is a free Operating Systems.
Multiuser operating system.
Yet another powerful Operating Systems.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
 Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux i
s also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free Operating Systems.
Multiuser operating system.
Yet another powerful Operating Systems.adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$
```

35. List only the text files in the current working directory with its corresponding disk space occupied.

Code:

```
$ ls -lh *.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ ls -al *.txt| awk '{print $5, $9}'
5945 Ex-1.txt
581 newfile.txt
1638 sample1.txt
581 sample2.txt
```

To print only size and name:

```
$ ls -al *.txt| awk '{print $5, $9}'
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ ls -lh *.txt
-rw-rw-r-- 1 adheshreghu adheshreghu 5.9K Aug 16 18:59 Ex-1.txt
-rw-rw-r-- 1 adheshreghu adheshreghu  581 Aug 17 21:18 newfile.txt
-rwxrw-r-- 1 adheshreghu adheshreghu 1.6K Aug 17 21:43 sample1.txt
-rw-rw-r-- 1 adheshreghu adheshreghu  581 Aug 17 12:32 sample2.txt
```

36. Show the last modification time of all the input text files.

Code:

```
$ stat *.txt | awk '{if(($1=="Modify:") || ($1 == "File:")) {print}}'
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ stat *.txt | awk '{if(($1=="Modify:") || ($1 == "F
ile:")) {print}}'
  File: Ex-1.txt
Modify: 2020-08-16 18:59:44.702404000 +0530
  File: newfile.txt
Modify: 2020-08-17 21:18:26.382434000 +0530
  File: sample1.txt
Modify: 2020-08-17 21:43:06.622271162 +0530
  File: sample2.txt
Modify: 2020-08-17 12:32:52.894457000 +0530
```

37. Delete the line that has the word “Powerful” from text file “sample2.txt”.

Code:

```
$ sed '/powerful/d' sample2.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ sed '/powerful/d' sample2.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and J
oe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux i
s also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
```

38. Print the roll numbers that end with even numbers in the format (COE18B002) up to COE18B050.

Code:

```
$ awk 'BEGIN {for(i=2;i<=50;i=i+2) if(i>9){print "COE18B0"i} else print
"COE18B00"i;}'
```

Output:

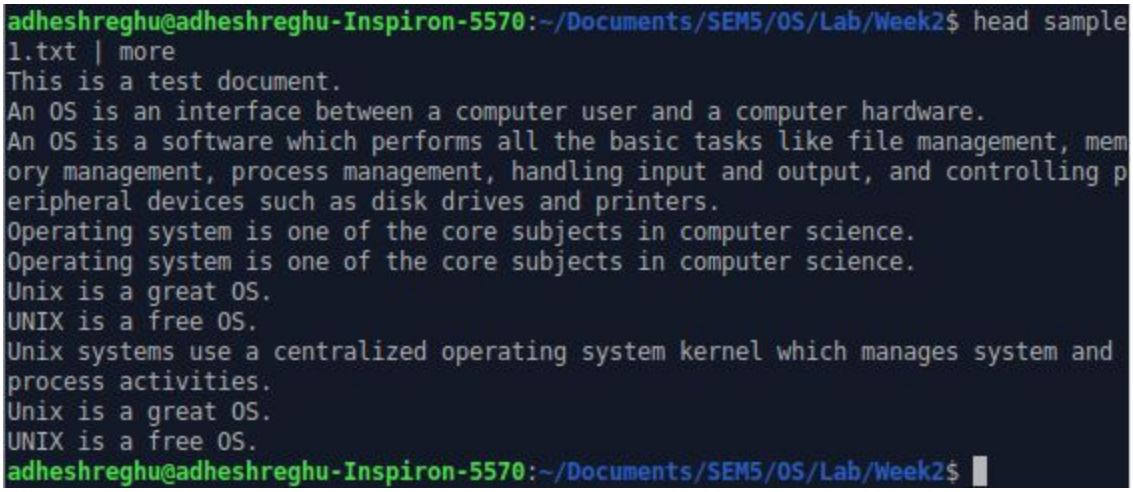
```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2/part1$ awk 'BEGIN {for(i=2;i<=50;i=
i+2) if(i>9){print "COE18B0"i} else print "COE18B00"i;}'
COE18B002
COE18B004
COE18B006
COE18B008
COE18B010
COE18B012
COE18B014
COE18B016
COE18B018
COE18B020
COE18B022
COE18B024
COE18B026
COE18B028
COE18B030
COE18B032
COE18B034
COE18B036
COE18B038
COE18B040
COE18B042
COE18B044
COE18B046
COE18B048
COE18B050
```

39. Use filter commands like head, tail, more to view the file contents page by page.

Head - prints the first 10 lines of the file in the stdout. Pipe with more to display page by page.
Tail - prints the last 10 lines of the file in the stdout. Pipe with more to display page by page.
More - filter to page text one screenful at a time
Code:

```
$ head sample1.txt | more
```

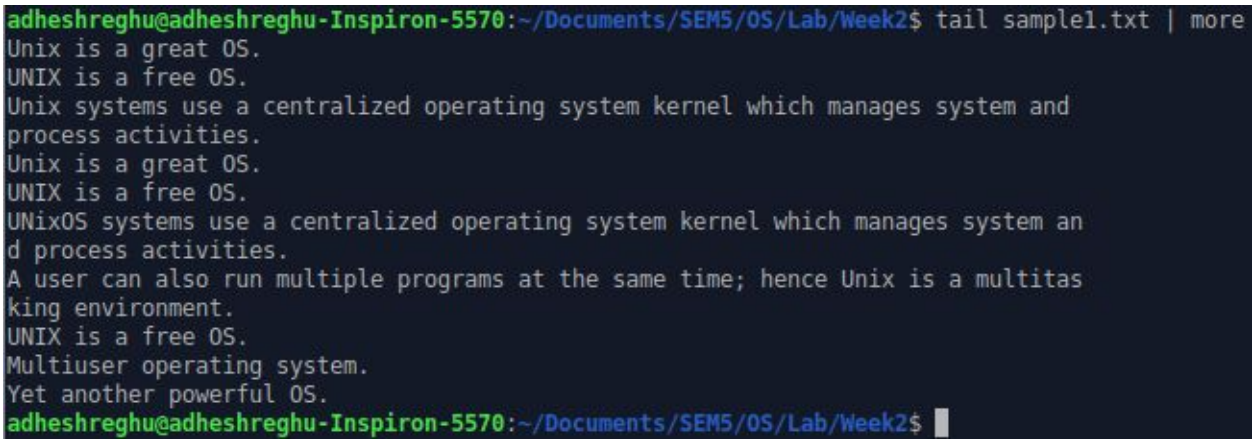
Output:



Code:

```
$ tail sample1.txt | more
```

Output:



Code:

```
$ more sample1.txt
```

Output:

```
An Operating System (OS) is an interface between a computer user and computer hardware. An operating sy
stem is a software which performs all the basic tasks like file management, memory management, process
management, handling input and output, and controlling peripheral devices such as disk drives and print
ers.

Some popular Operating Systems include Linux Operating System, Windows Operating System, VMS, OS/400, A
IX, z/OS, etc.
Definition

An operating system is a program that acts as an interface between the user and the computer hardware a
nd controls the execution of all kinds of programs.

Memory Management

Memory management refers to management of Primary Memory or Main Memory. Main memory is a large array o
f words or bytes where each word or byte has its own address.

Main memory provides a fast storage that can be accessed directly by the CPU. For a program to be execu
ted, it must in the main memory. An Operating System does the following activities for memory managemen
t –

    Keeps tracks of primary memory, i.e., what part of it are in use by whom, what part are not in use.

    In multiprogramming, the OS decides which process will get memory when and how much.

    Allocates the memory when a process requests it to do so.

    De-allocates the memory when a process no longer needs it or has been terminated.

Processor Management

In multiprogramming environment, the OS decides which process gets the processor when and for how much
time. This function is called process scheduling. An Operating System does the following activities for
 processor management –

    Keeps tracks of processor and status of process. The program responsible for this task is known as
traffic controller.

--More--(76%)
```

40. Compress the current working directory contents to a tar file and extract those files from the compressed tar file.

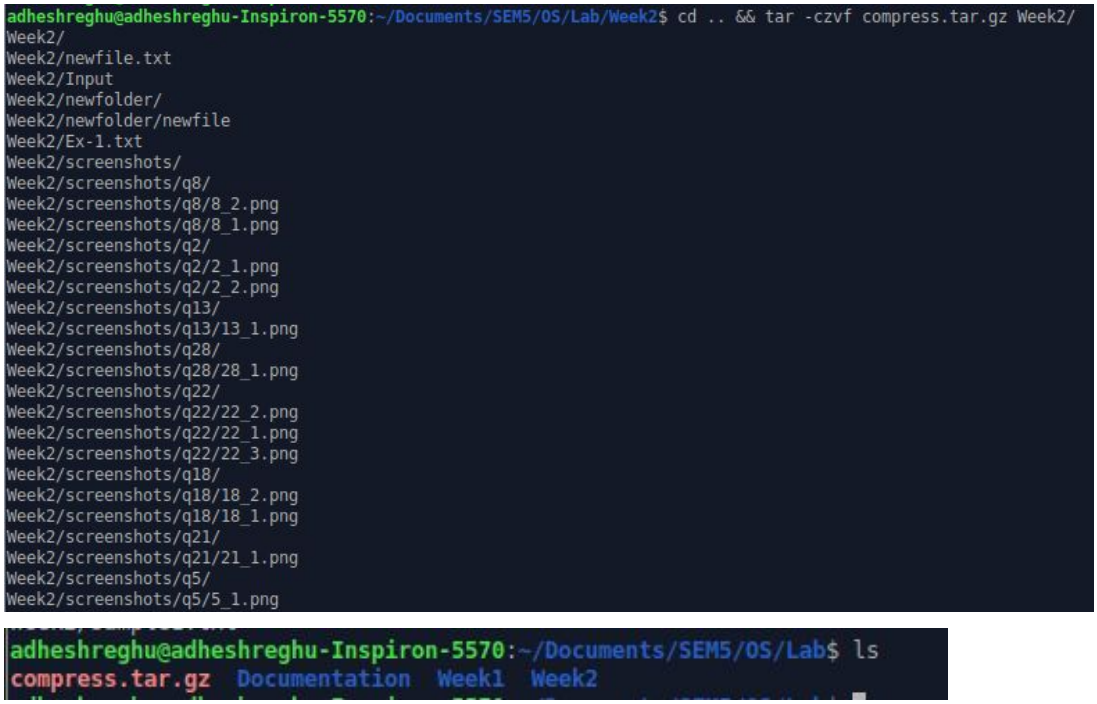
Let's compress the current working directory:

Code:

```
$ cd .. && tar -czvf compress.tar.gz Week2/
```

It creates the compress directory in the parent directory.

Output



Now, let's extract the files from the compressed file

Code:

```
$ tar -xzvf compress.tar.gz --one-top-level=extract
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab$ tar -xzvf compress.tar.gz --one-top-level=extracted
Week2/
Week2/newfile.txt
Week2/Input
Week2/newfolder/
Week2/newfolder/newfile
Week2/Ex-1.txt
Week2/screenshots/
Week2/screenshots/q8/
Week2/screenshots/q8/8_2.png
Week2/screenshots/q8/8_1.png
Week2/screenshots/q2/
Week2/screenshots/q2/2_1.png
Week2/screenshots/q2/2_2.png
Week2/screenshots/q13/
Week2/screenshots/q13/13_1.png
Week2/screenshots/q28/
Week2/screenshots/q28/28_1.png
Week2/screenshots/q22/
Week2/screenshots/q22/22_2.png
Week2/screenshots/q22/22_1.png
Week2/screenshots/q22/22_3.png
Week2/screenshots/q18/
Week2/screenshots/q18/18_2.png
Week2/screenshots/q18/18_1.png
Week2/screenshots/q21/
Week2/screenshots/q21/21_1.png
Week2/screenshots/q5/
Week2/screenshots/q5/5_1.png
```

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab$ ls
compress.tar.gz  Documentation  extracted  Week1  Week2
```

> **Note**
>
> --one-top-level creates a new directory beneath the extraction directory (or the one passed to `-C') and use it to guard against tarbombs.

41. Compress the files using zip command.

a. Zip the input file “sample1.txt” as samplezip.zip and remove the file from the current directory after zipping.

Code:

```
$ zip samplezip.zip sample1.txt && rm sample1.txt
```

Output

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ zip samplezip.zip sample1.txt && rm sample1.txt
  adding: sample1.txt (deflated 58%)
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ ls
 Ex-1.txt                          Input             newfile.txt   samplezip.zip
'Exercise-I LINUX COMMANDS.docx'   linuxcp           newfolder     screenshots
'Exercise-I LINUX COMMANDS.pdf'    LinuxhelpManuals  sample2.txt
```

b. Add “sample2.txt” and update the zip archive.

Code:

```
$ zip -u samplezip.zip sample2.txt
```

Output

Before executing the code.

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ zipinfo samplezip.zip
Archive:  samplezip.zip
Zip file size: 535 bytes, number of entries: 1
-rw-rw-r--  2.3 unx      906 tx defN 20-Aug-17 23:51 sample1.txt
1 file, 906 bytes uncompressed, 381 bytes compressed:  57.9%
```

After executing the code

```
adheshreghu@adheshreghu-Inspiron-5570:~/Documents/SEM5/OS/Lab/Week2$ zipinfo samplezip.zip
Archive:  samplezip.zip
Zip file size: 1020 bytes, number of entries: 2
-rw-rw-r--  2.3 unx      906 tx defN 20-Aug-17 23:51 sample1.txt
-rw-rw-r--  2.3 unx      581 tx defN 20-Aug-17 12:32 sample2.txt
2 files, 1487 bytes uncompressed, 734 bytes compressed:  50.6%
```

Note

zipinfo filename.zip lists detailed information about a ZIP archive.

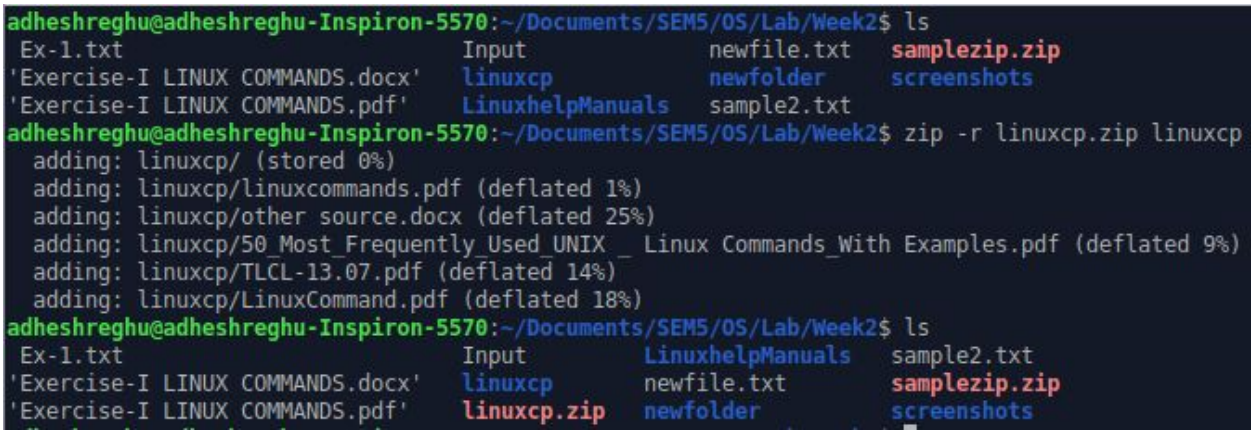
c. Zip a directory with all its contents.

Let us zip linuxcp directory.

Code:

```
$ zip -r linuxcp.zip linuxcp
```

Output



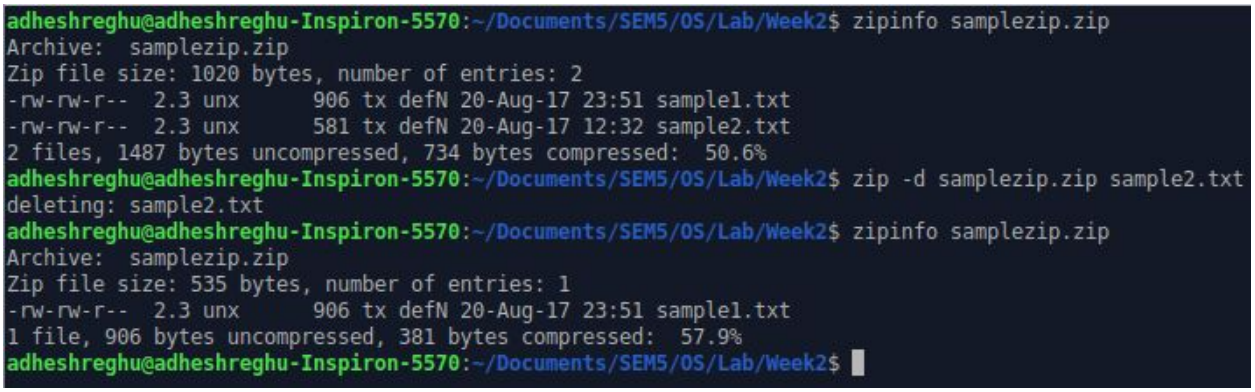
d. Remove a file from the zip archive.

Let us remove sample2.txt from samplezip.zip

Code:

```
$ zip -d samplezip.zip sample2.txt
```

Output



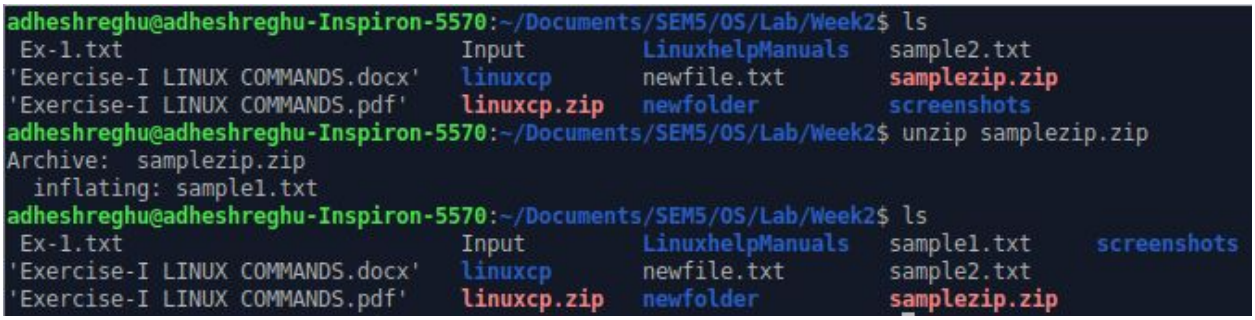
e. Unzip the contents from samplezip.zip.

Now samplezip.zip has only sample1.txt in it. Let us unzip it.

Code:

```
$ unzip samplezip.zip
```

Output



You can notice that sample1.txt has been unzipped into the directory.