



Bansilal Ramnath Agarwal Charitable Trust's
Vishwakarma Institute of Technology
(An Autonomous Institute affiliated to Savitribai Phule Pune University)

**Operating System
Lab**

Assignment No: 1

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Roll No : 39

Problems to be solved in the lab:

1. Change your password to a password you would like to use for the remainder of the semester.

```
lenon@~$ whoami
lenon

lenon@~$ sudo passwd lenon
New password:
Retype new password:
passwd: password updated successfully
```

2. Display the system's date.

```
lenon@~$ date
Wednesday 04 January 2023 06:59:26 AM IST
```

3. Count the number of lines in the /etc/passwd file.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?7
> cat /etc/passwd | wc -l
39
```

4. Find out who else is on the system.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?7
> who
lenon      tty1      2023-01-04 06:55 (:0)
```

5. Direct the output of the man pages for the date command to a file named mydate.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?7
> man date > mydate

~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?8
> ls mydate
mydate
```

6. Create a subdirectory called mydir.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?7
> mkdir mydir
```

7. Move the file mydate into the new subdirectory.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?7
> mv mydate mydir/

~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?7
> ls mydir/
mydate
```

8. Go to the subdirectory mydir and copy the file mydate to a new file called ourdate.

```
~/vit-comp/Module-4/Operating-System/Assignment-2/mydir on 🐱 main ?7
> cp mydate ourdate

~/vit-comp/Module-4/Operating-System/Assignment-2/mydir on 🐱 main ?7
> ls ourdate && file ourdate
ourdate
ourdate: Unicode text, UTF-8 text
```

9. List the contents of mydir.

```
~/vit-comp/Module-4/Operating-System/Assignment-2/mydir on 🐱 main ?7
> ls -la
drwxr-xr-x lenon lenon 4.0 KB Wed Jan  4 07:03:34 2023  .
drwxr-xr-x lenon lenon 4.0 KB Wed Jan  4 07:02:23 2023  ..
-rw-r--r-- lenon lenon 6.5 KB Wed Jan  4 07:01:16 2023  mydate
-rw-r--r-- lenon lenon 6.5 KB Wed Jan  4 07:03:34 2023  ourdate
```

10. Do a long listing on the file ourdate and note the permissions.

```
~/vit-comp/Module-4/Operating-System/Assignment-2/mydir on 🐱 main ?7
> ls -la
drwxr-xr-x lenon lenon 4.0 KB Wed Jan  4 07:03:34 2023  .
drwxr-xr-x lenon lenon 4.0 KB Wed Jan  4 07:02:23 2023  ..
-rw-r--r-- lenon lenon 6.5 KB Wed Jan  4 07:01:16 2023  mydate
-rw-r--r-- lenon lenon 6.5 KB Wed Jan  4 07:03:34 2023  ourdate
```

11. Display the name of the current directory starting from the root.

```
~/vit-comp/Module-4/Operating-System/Assignment-2/mydir on 🐱 main ?7
> pwd
/home/lenon/vit-comp/Module-4/Operating-System/Assignment-2/mydir
```

12. Move the files in the directory mydir back to your home directory.

```
~/vit-comp/Module-4/Operating-System/Assignment-2/mydir on 🐱 main ?7
> mv * ../

~/vit-comp/Module-4/Operating-System/Assignment-2/mydir on 🐱 main ?8
> ls ../
arguments.sh  factorial.sh  functions.sh  mydir  strings.sh
basic-arithmetic.sh  fibonacci.sh  ifladder.sh  nosfile  switch.sh
even-odd.sh    forloop.sh   mydate      ourdate  whileloop.sh
```


13. Display the first 5 lines of mydate.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on 🐱 main ?8
> cat mydate | head -n5
DATE(1)                                User Commands                                DATE(1)

NAME
    date - print or set the system date and time
```

14. Display the last 8 lines of mydate.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on 🐱 main ?8
> cat mydate | tail -n8
    This is free software: you are free to change and redistribute it.
    There is NO WARRANTY, to the extent permitted by law.

SEE ALSO
    Full documentation <https://www.gnu.org/software/coreutils/date>
    or available locally via: info '(coreutils) date invocation'

GNU coreutils 9.1                                November 2022                                DATE(1)
```

15. Remove the directory mydir.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on 🐱 main ?8
> rm -d mydir
```

16. Redirect the output of the long listing of files to a file named list.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on 🐱 main ?8
> ls -la > list

~/vit-comp/Module-4/Operating-System/Assignment-2 on 🐱 main ?9
> ls list
list
```

17. Select any 5 capitals of states in India and enter them in a file named capitals1. Choose 5 more capitals and enter them in a file named capitals2. Choose 5 more capitals and enter them in a file named capitals3. Concatenate all 3 files and redirect the output to a file named capitals.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?14
> cat capitals1.txt capitals2.txt capitals3.txt > capitals

~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?15
> wc -l capitals
15 capitals
```

18. Concatenate the file capitals2 at the end of file capitals.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?15
> wc -l capitals
15 capitals

~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?15
> cat capitals2.txt >> capitals

~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?15
> wc -l capitals
20 capitals
```

19. Give read and write permissions to all users for the file capitals.

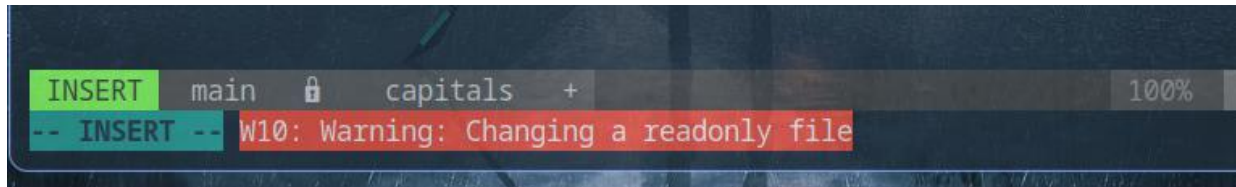
```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?15
> chmod a=r+w capitals

~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?15
> ls -l capitals
-rw-rw-rw- lenon lenon 158 B Wed Jan  4 11:18:48 2023 capitals
```

20. Give read permissions only to the owner of the file capitals. Open the file, make some changes and try to save it. What happens ?

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?15
> chmod u-r capitals

~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?15
> ls -l capitals
.-w-rw-rw- lenon lenon 158 B Wed Jan  4 11:18:48 2023 capitals
```

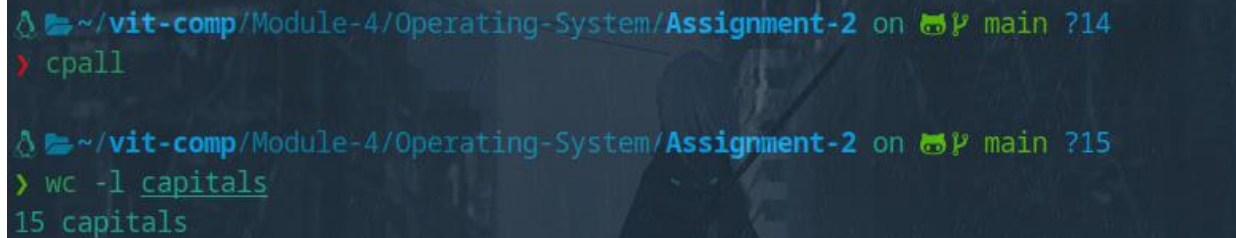


The screenshot shows a file editor window with a warning message: "W10: Warning: Changing a readonly file". The warning is displayed in a red box at the bottom of the editor. The editor's status bar shows "INSERT" mode, a lock icon, the file name "capitals", and a progress bar at 100%.

21. Create an alias to concatenate the 3 files capitals1, capitals2, capitals3 and redirect the output to a file named capitals. Activate the alias and make it run.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?14
> alias cpall='cat capitals1.txt capitals2.txt capitals3.txt > capitals'

~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?14
> ls capitals
lsd: capitals: No such file or directory (os error 2).
```



The screenshot shows a terminal window where the alias 'cpall' is defined and then executed. The output of the command is '15 capitals', indicating that the file 'capitals' now has 15 lines of content.

22. Find out the number of times the string “the” appears in the file mydate.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?9
> cat mydate | grep -i "the" | wc -l
25
```


23. Find out the line numbers on which the string “date” exists in mydate.

```
~ /vit-comp/Module-4/Operating-System/Assignment-2 on main ?9
> cat mydate | grep -in "date"
1:DATE(1)                                User Commands                                DATE(1)
4:    date - print or set the system date and time
7:    date [OPTION]... [+FORMAT]
8:    date [-u|--utc|--universal] [MMDDhhmm[[CC]YY][.ss]]
11:   Display date and time in the given FORMAT. With -s, or with [MMD-
12:   Dhhmm[[CC]YY][.ss]], set the date and time.
16:   -d, --date=STRING
20:       annotate the parsed date, and warn about questionable usage to
23:   -f, --file=DATEFILE
24:       like --date; once for each line of DATEFILE
27:       output date/time in ISO 8601 format. FMT='date' for date only
28:       (the default), 'hours', 'minutes', 'seconds', or 'ns' for date
37:       output date and time in RFC 5322 format. Example: Mon, 14 Aug
41:       output date/time in RFC 3339 format. FMT='date', 'seconds', or
42:       'ns' for date and time to the indicated precision. Example:
71:   %c    locale's date and time (e.g., Thu Mar 3 23:05:25 2005)
77:   %D    date; same as %m/%d/%y
81:   %F    full date; like %+4Y-%m-%d
135:  %x    locale's date representation (e.g., 12/31/99)
154:  By default, date pads numeric fields with zeroes. The following op-
175:  Convert seconds since the Epoch (1970-01-01 UTC) to a date
177:      $ date --date='@2147483647'
181:      $ TZ='America/Los_Angeles' date
185:      $ date --date='TZ="America/Los_Angeles" 09:00 next Fri'
187:DATE STRING
188:   The --date=STRING is a mostly free format human readable date string
190:   even "next Thursday". A date string may contain items indicating calen-
191:   dar date, time of day, time zone, day of week, relative time, relative
192:   date, and numbers. An empty string indicates the beginning of the day.
193:   The date string format is more complex than is easily documented here
210:   Full documentation <https://www.gnu.org/software/coreutils/date>
211:   or available locally via: info '(coreutils) date invocation'
213:GNU coreutils 9.1                                November 2022                                DATE(1)
```

24. Print all lines of mydate except those that have the letter “i” in them.

```
~ /vit-comp/Module-4/Operating-System/Assignment-2 on main ?9
> cat mydate | grep -vi "i" | head -n 5
DATE(1)                                User Commands                                DATE(1)

NAME
```

25. List the words of 4 letters from the file mydate.

```
~ /vit-comp/Module-4/Operating-System/Assignment-2 on main ?9
> grep -o -E '\b[[:alnum:]]{4}\b' mydate | head -n 5
DATE
User
DATE
NAME
date
```

26. List 5 states in north east India in a file mystates. List their corresponding capitals in a file mycapitals. Use the paste command to join the 2 files.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?17
> paste northeast.txt northcapitals.txt
Assam    Dispur
Arunachal Pradesh    Itanagar
Manipur  Imphal
Meghalaya    Shillong
Nagaland    Kohima
```

27. Use the cut command to print the 1 st and 3 rd columns of the /etc/passwd file for all students in this class.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?9
> cut -d ":" /etc/passwd -f 1,3
root:0
bin:1
daemon:2
mail:8
ftp:14
http:33
nobody:65534
dbus:81
systemd-coredump:980
systemd-network:979
systemd-oom:978
systemd-journal-remote:977
systemd-resolve:976
systemd-timesync:975
tss:974
```

28. Count the number of people logged in and also trap the users in a file using the tee command.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?9
> who | tee user.txt
lenon    tty1      2023-01-04 09:55 (:0)

~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?10
> cat user.txt
lenon    tty1      2023-01-04 09:55 (:0)
```


29. Convert the contents of mystates into uppercase.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?17
> cat capitals1.txt | tr '[a-z]' '[A-Z]'
NEW DELHI
MUMBAI
KOLKATA
BENGALURU
HYDERABAD
```

30. Create any two files & display the common values between them.

```
~/vit-comp/Module-4/Operating-System/Assignment-2 on main ?10
> comm functions.sh basic-arithmetic.sh
      #!/bin/bash

#
comm: file 1 is not in sorted order
      echo "Basic Arithmetic"
comm: file 2 is not in sorted order

      echo "Addition of $1 and $2 is $((($1 + $2)))"
      echo "Subtraction of $1 and $2 is $((($1 - $2)))"
      echo "Multiplication of $1 and $2 is $((($1 * $2)))"
      echo "Division of $1 and $2 is $((($1 / $2)))"

function addition(){
    echo "Addition of $1 and $2 is $((($1 + $2)))";
}

function subtraction(){
    echo "Subtraction of $1 and $2 is $((($1 - $2)))";
}

function multiplication(){
    echo "Multiplication of $1 and $2 is $((($1 * $2)))"
}

function division(){
    echo "Division of $1 and $2 is $((($1 / $2)))"
}

echo "Calculator functions: addition subtraction multiplication division"
"$@"

comm: input is not in sorted order
```