

St. Francis Institute of Technology, Mumbai-400 103
Department of Information Technology

A.Y. 2023-2024
 Class: SE-ITA/B, Semester: IV

Subject: **UNIX LAB**

Experiment – 2: Study and Implementation of UNIX general purpose utility commands.

1. **Aim:** To Study and implement UNIX general purpose utility commands.
2. **Objectives:** After study of this experiment, the student will be able to
 - Apply UNIX general purpose utility commands.
3. **Outcomes:** After study of this experiment, the student will be able to
 - Understand and apply UNIX general purpose utility commands. (L402.1)
4. **Prerequisite:** UNIX Shell.
1. **Requirements:** Personal Computer, Ubuntu OS, Internet Connection, LibreOffice.

2. Pre-Experiment Exercise:

Brief Theory:

UNIX CLI

Command Line Interpreter(CLI) is a command line program that accepts text input to execute operating system functions. In UNIX, the CLI is called as **terminal**. We can type our commands and get them executed in the terminal. When multiple command line interfaces are provided by a single operating system, each of them is referred to as **shell**. The default shell in UNIX is **Bourne shell**, whereas the default shell in Ubuntu is **Bash shell**.

3. Laboratory Exercise

A. Procedure

Explain the following UNIX commands with syntax and example:

cd, mkdir, rmdir, pwd, gedit, cat, mv, rm, ls, cp, ps, man, who, whoami, echo, date, time, kill, cal, history, more, less, bc, man, finger, clear, logout, reboot, halt, shutdown, poweroff.

B. Result/Observation/Program code

4. Post-Experiments Exercise

A. Extended Theory:

None.

B. Questions:

Write the commands and output of those for the following:

1. To display file size in human readable form.
2. To order files based on Last Modified Time in Descending Order.
3. To display files Recursively.
4. To display Weekday name in full short (like Monday, Tuesday).
5. To display Current Date; shown in MM/DD/YY.
6. To display time; shown as HH:MM:SS. Note: Hours in 24 Format
7. To displays week number of year, with Sunday as first day of week (00..53).

8. To display Julian calendar and Julian days.
9. To add a specified number of months before or after the current one in output.
10. To list Processes in a Hierarchy.

C. Conclusion:

1. Write what was performed in the experiment.
2. Mention few applications of what was studied.
3. Write the significance of the topic studied in the experiment.

D. References:

1. Sumitabha Das, UNIX Concepts and Applications, 3rd Ed., Tata McGraw Hill.
2. Yashwant Kanetkar, UNIX Shell Programming, BPB Publications.



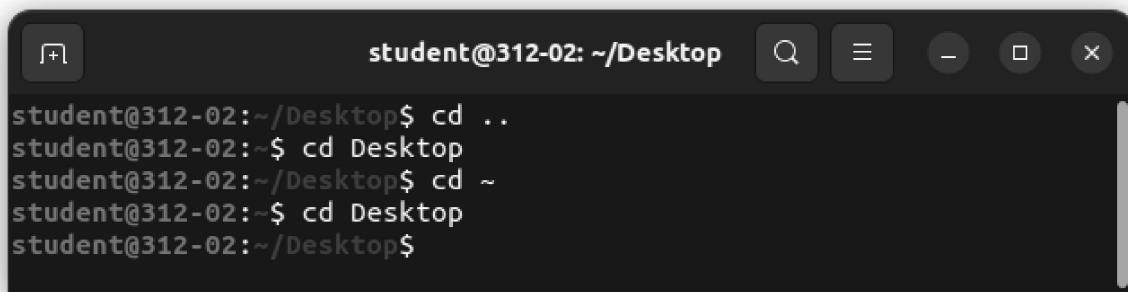
Name:Vishal Rajesh Mahajan
Class: SE INFT A

Roll No: 63
EXP No.: 2

LAB-EXERCISE:

1.Command : cd

Observation:When I use the cd Command in Ubuntu, I can change my current working directory.
By providing a specific path as an argument, I navigate to that directory.If i use cd without any arguments,
It takes me to my home directory.

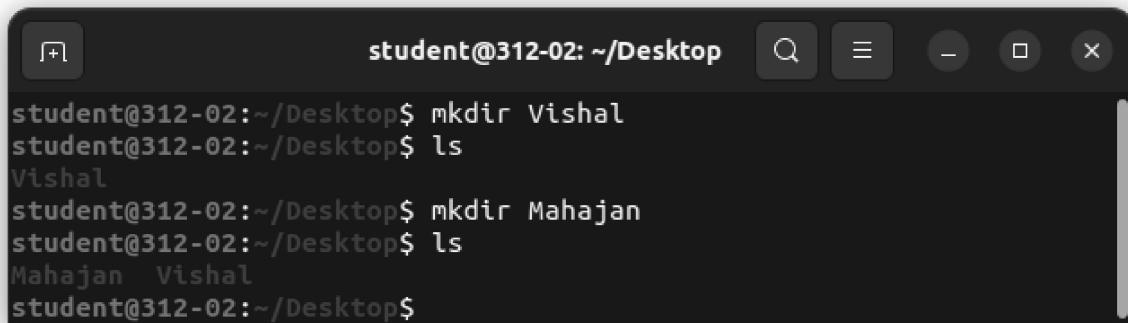


A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window has standard Linux-style window controls at the top right. The terminal output shows the user navigating through their directory structure:

```
student@312-02:~/Desktop$ cd ..  
student@312-02:~$ cd Desktop  
student@312-02:~/Desktop$ cd ~  
student@312-02:~$ cd Desktop  
student@312-02:~/Desktop$
```

2.Command: mkdir

Observation:When I used the mkdir command in ubuntu,I was able to create a new directory.By specifying the directory name (Vishal, Mahajan) as an argument, I was able to quickly make a new folder with Vishal and Mahjan as their name in the current directory.

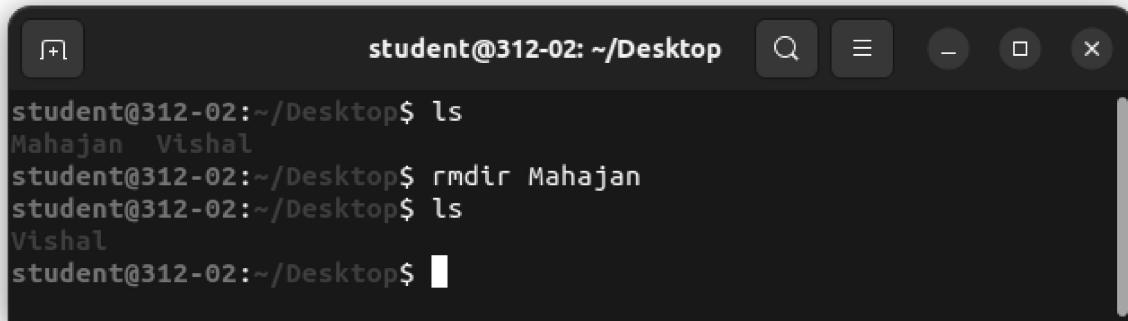


A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window has standard Linux-style window controls at the top right. The terminal output shows the creation of two new directories:

```
student@312-02:~/Desktop$ mkdir Vishal  
student@312-02:~/Desktop$ ls  
Vishal  
student@312-02:~/Desktop$ mkdir Mahajan  
student@312-02:~/Desktop$ ls  
Mahajan Vishal  
student@312-02:~/Desktop$
```

3.Command: rmdir

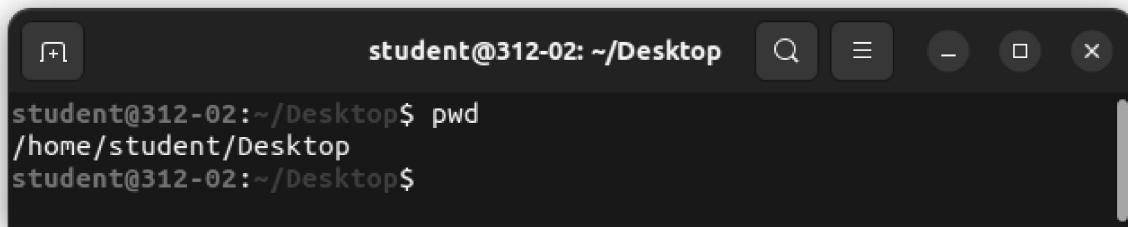
Observation: When I used the rmdir command in Ubuntu with a argument Mahajan, I was able to remove previously created directory Mahajan in the current directory



```
student@312-02: ~/Desktop$ ls
Mahajan Vishal
student@312-02:~/Desktop$ rmdir Mahajan
student@312-02:~/Desktop$ ls
Vishal
student@312-02:~/Desktop$
```

4.Command : pwd

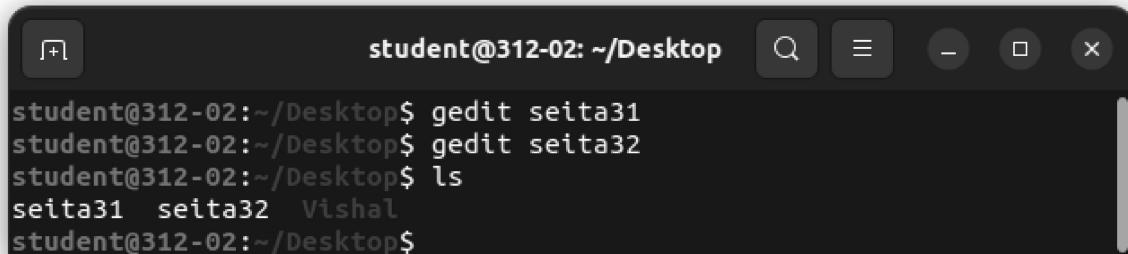
Observation: When I used the pwd command in Ubuntu, it displayed the present working directory, showing the full path of my current location within the file system



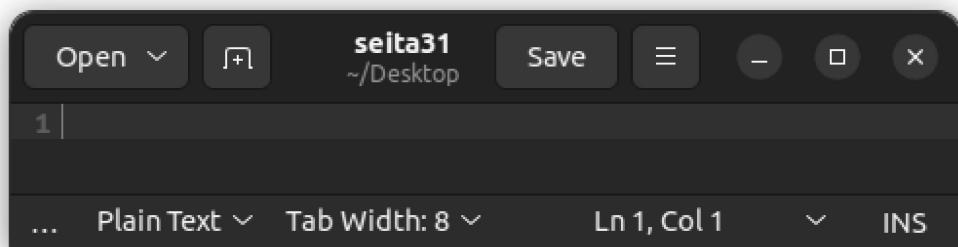
```
student@312-02: ~/Desktop$ pwd
/home/student/Desktop
student@312-02:~/Desktop$
```

5.Command: gedit

Observation: When I used the gedit command in Ubuntu, it opened the text editor, allowing me to Create, edit, or view text files with a graphical user interface.

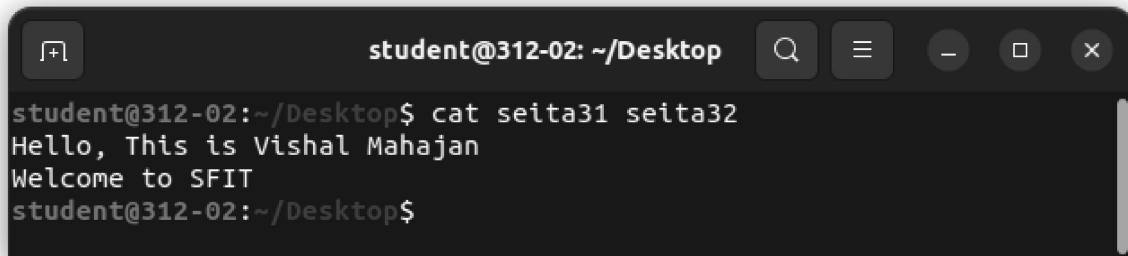


```
student@312-02:~/Desktop$ gedit seita31
student@312-02:~/Desktop$ gedit seita32
student@312-02:~/Desktop$ ls
seita31  seita32  Vishal
student@312-02:~/Desktop$
```



6.Command : Cat

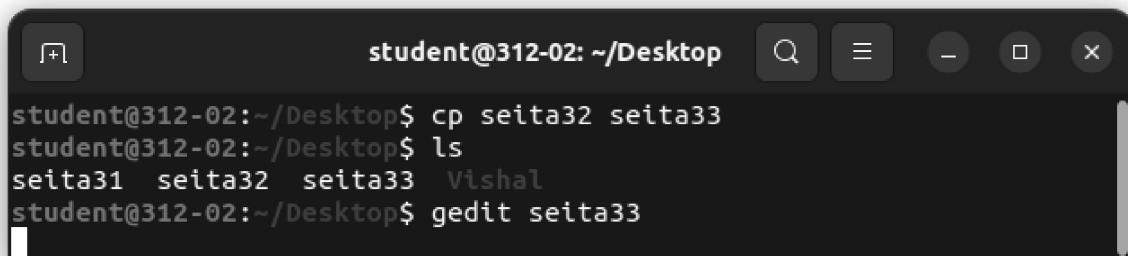
Observation: When I used the cat command in Ubuntu, it displayed the contents of a text file in the terminal. It's a versatile command that can concatenate and display the content of multiple files as well.



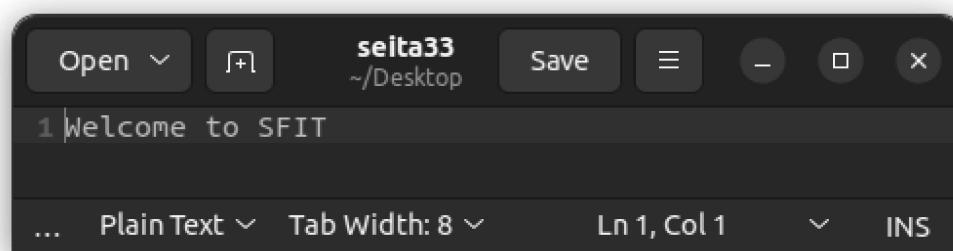
```
student@312-02:~/Desktop$ cat seita31 seita32
Hello, This is Vishal Mahajan
Welcome to SFIT
student@312-02:~/Desktop$
```

7.Command: cp

Observation: When I used the cp command in Ubuntu, it allowed me to copy files or directories. By providing source and destination arguments, I could duplicate files or create backups effortlessly.

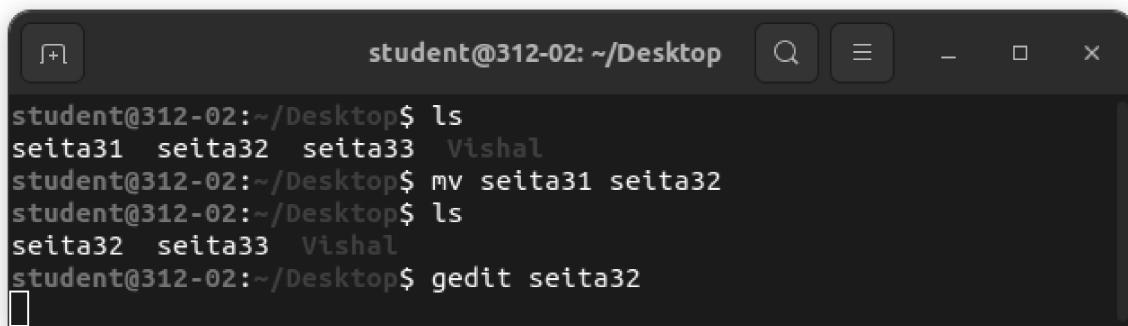


```
student@312-02:~/Desktop$ cp seita32 seita33
student@312-02:~/Desktop$ ls
seita31 seita32 seita33 Vishal
student@312-02:~/Desktop$ gedit seita33
```



8.Command : mv

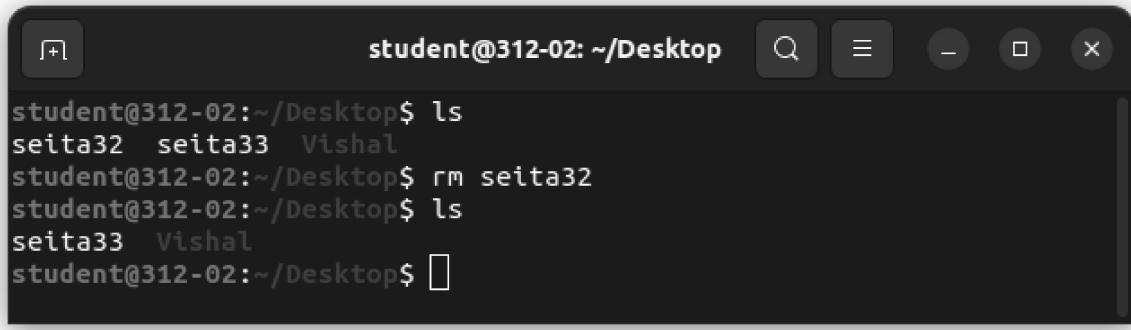
Observation: When I used the 'mv' command in Ubuntu, I could move or rename files and directories. It allowed me to relocate items within the file system or change their names efficiently.



```
student@312-02:~/Desktop$ ls
seita31 seita32 seita33 Vishal
student@312-02:~/Desktop$ mv seita31 seita32
student@312-02:~/Desktop$ ls
seita32 seita33 Vishal
student@312-02:~/Desktop$ gedit seita32
```

9. Command: rm

Observation: When I used the `rm` command in Ubuntu, it allowed me to remove files or directories. It's important to use it with caution, as deleted files are typically not recoverable..

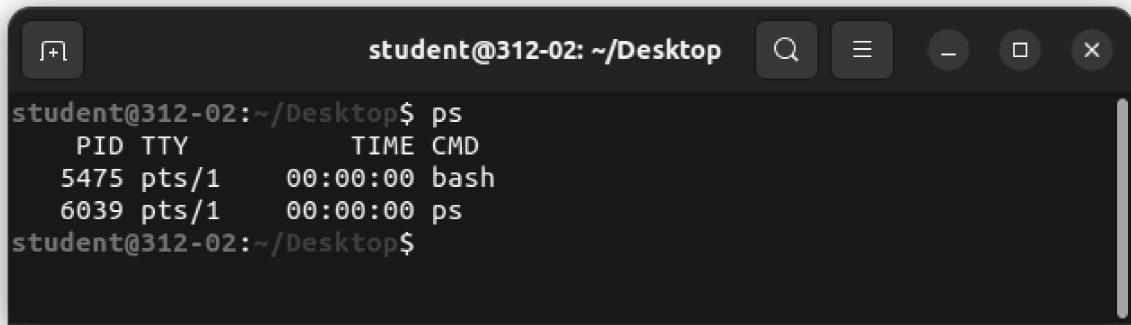


```
student@312-02: ~/Desktop$ ls
seita32 seita33 Vishal
student@312-02:~/Desktop$ rm seita32
student@312-02:~/Desktop$ ls
seita33 Vishal
student@312-02:~/Desktop$ 
```

A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window has standard Linux-style window controls at the top right. The terminal displays a sequence of commands: "ls" shows files "seita32", "seita33", and "Vishal". "rm seita32" is run, which removes the file "seita32". A second "ls" command shows only "seita33" and "Vishal" remain.

10.Command: ps

Observation: When I used the `ps` command in Ubuntu, it displayed a snapshot of currently running processes. This command provides information such as process ID (PID), terminal associated with the process, and the command used to start the process.

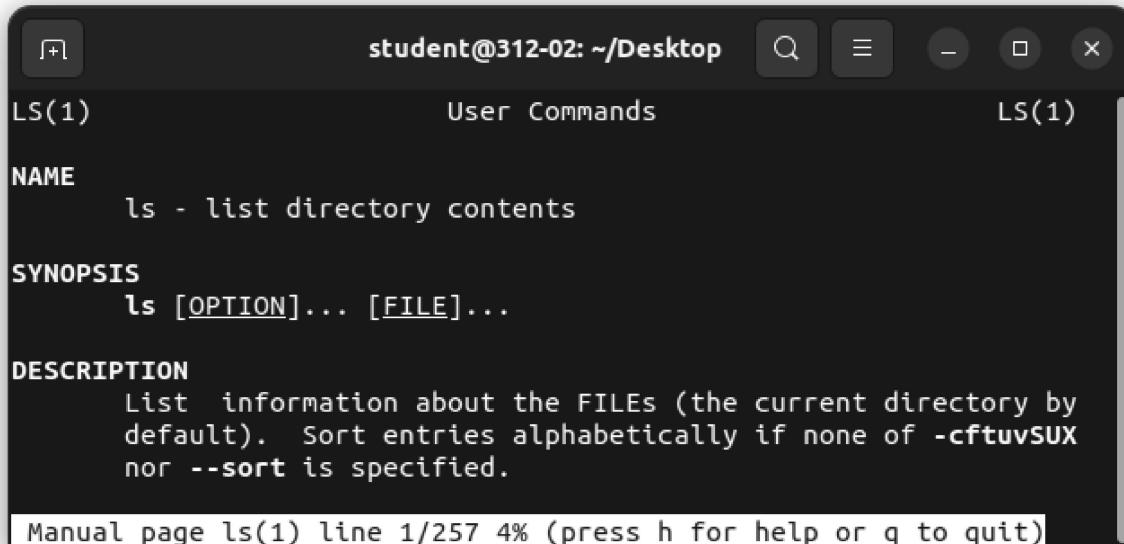


```
student@312-02:~/Desktop$ ps
  PID TTY      TIME CMD
 5475 pts/1    00:00:00 bash
 6039 pts/1    00:00:00 ps
student@312-02:~/Desktop$ 
```

A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window has standard Linux-style window controls at the top right. The terminal displays the output of the "ps" command, which lists two processes: "bash" with PID 5475 and "ps" with PID 6039, both running on terminal "pts/1".

11.Command: man

Observation: When I used the `man ls` command in Ubuntu, it displayed the manual page for the `ls` command. This manual page provides detailed information about the command, including its options, usage, and explanations of various features.



```
student@312-02: ~/Desktop
LS(1)                               User Commands                               LS(1)

NAME
    ls - list directory contents

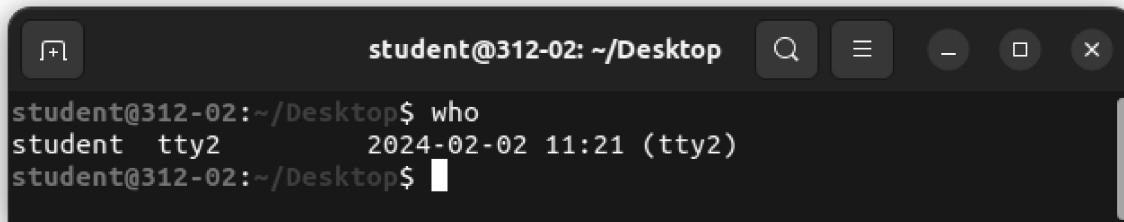
SYNOPSIS
    ls [OPTION]... [FILE]...

DESCRIPTION
    List information about the FILEs (the current directory by default). Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.

Manual page ls(1) line 1/257 4% (press h for help or q to quit)
```

12.Command: who

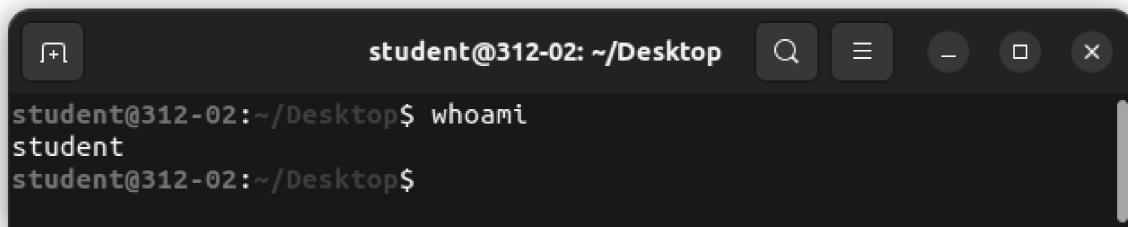
Observation: When I used the `who` command in Ubuntu, it displayed information about users currently logged into the system. This includes details such as the username, terminal, login time.



```
student@312-02:~/Desktop$ who
student  tty2          2024-02-02 11:21 (tty2)
student@312-02:~/Desktop$
```

13.Command: whoami

Observation:When I used the `whoami` command in Ubuntu, it displayed the username associated with the current user session. This command is helpful for quickly identifying the user executing the command.



```
student@312-02: ~/Desktop
student@312-02:~/Desktop$ whoami
student
student@312-02:~/Desktop$
```

A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window has standard Linux-style window controls at the top right. The terminal displays three lines of text: the prompt "student@312-02: ~/Desktop", the command "whoami", and the output "student".

14.Command: Echo

Observation:When I used the `echo` command with `bc` in Ubuntu, I could perform various mathematical operations

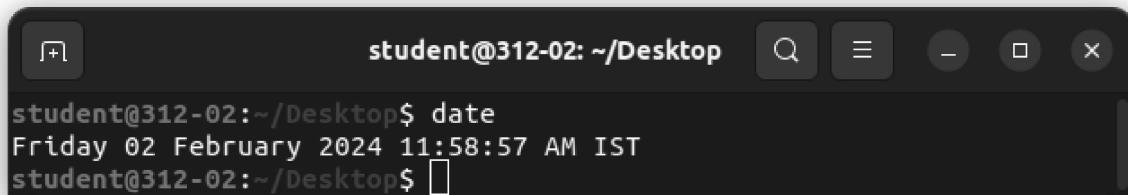


```
student@312-02: ~/Desktop
student@312-02:~/Desktop$ echo Vishal Mahajan
Vishal Mahajan
student@312-02:~/Desktop$ echo 2+3
2+3
student@312-02:~/Desktop$ echo 2+3|bc
5
student@312-02:~/Desktop$ echo 2-3|bc
-1
student@312-02:~/Desktop$ echo 2*3|bc
6
student@312-02:~/Desktop$ echo 2/3|bc
0
student@312-02:~/Desktop$
```

A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window has standard Linux-style window controls at the top right. The terminal displays several lines of text demonstrating the use of the echo command with the bc pipe operator to perform arithmetic operations like addition, subtraction, multiplication, and division.

15.Command: date

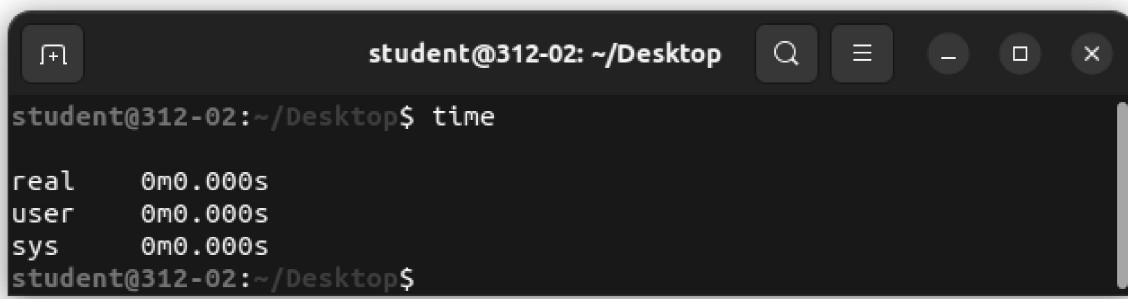
Observation:When I used the 'date' command in Ubuntu, it displayed the current date and time. The default output includes the day of the week, month, day of the month, time in 24-hour format, timezone, and year.



```
student@312-02: ~/Desktop$ date
Friday 02 February 2024 11:58:57 AM IST
student@312-02: ~/Desktop$
```

16.Command: time

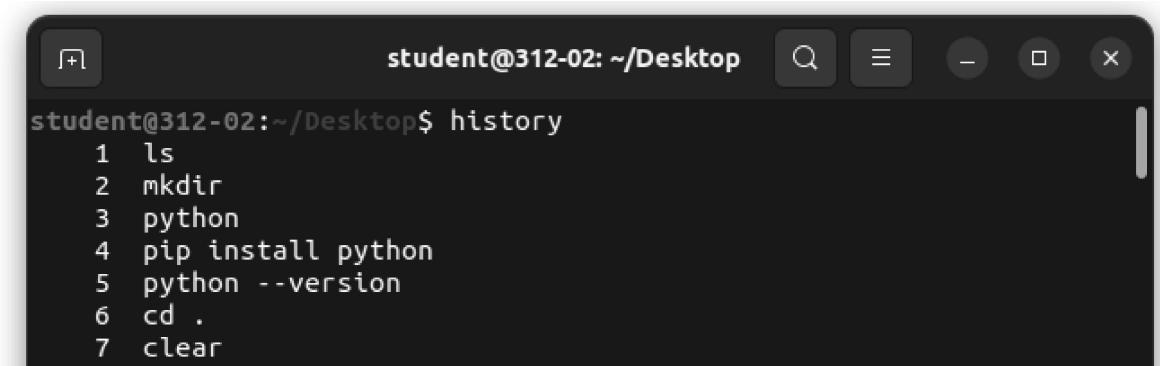
Observation:when I used time command, I showed me the user and sys time



```
student@312-02: ~/Desktop$ time
real    0m0.000s
user    0m0.000s
sys     0m0.000s
student@312-02: ~/Desktop$
```

17.Command: history

Observation:When I used the history command in Ubuntu, it displayed a list of previously executed commands, including their line numbers.



```
student@312-02: ~/Desktop$ history
 1 ls
 2 mkdir
 3 python
 4 pip install python
 5 python --version
 6 cd .
 7 clear
```

18.Command: cal

Observation: When I used the `cal 2024` command in Ubuntu, it displayed the calendar for the year 2024, showing each month with the days of the week and their corresponding dates.

```
student@312-02: ~/Desktop$ cal 2024
2024
January           February          March
Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa
  1  2  3  4  5  6       1  2  3  4  5  6  7   1  2  3  4  5  6  7  8  9
  7  8  9 10 11 12 13   4  5  6  7  8  9 10  1  2  3  4  5  6  7  8  9
14 15 16 17 18 19 20   11 12 13 14 15 16 17 10 11 12 13 14 15 16
21 22 23 24 25 26 27  18 19 20 21 22 23 24 17 18 19 20 21 22 23
28 29 30 31            25 26 27 28 29               24 25 26 27 28 29 30
                                         31

April             May                June
Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa
  1  2  3  4  5  6       1  2  3  4  5  6  7   1  2  3  4  5  6  7  8
  7  8  9 10 11 12 13   5  6  7  8  9 10 11  2  3  4  5  6  7  8
14 15 16 17 18 19 20   12 13 14 15 16 17 18  9 10 11 12 13 14 15
21 22 23 24 25 26 27  19 20 21 22 23 24 25 16 17 18 19 20 21 22
28 29 30              26 27 28 29 30 31               23 24 25 26 27 28 29
                                         30

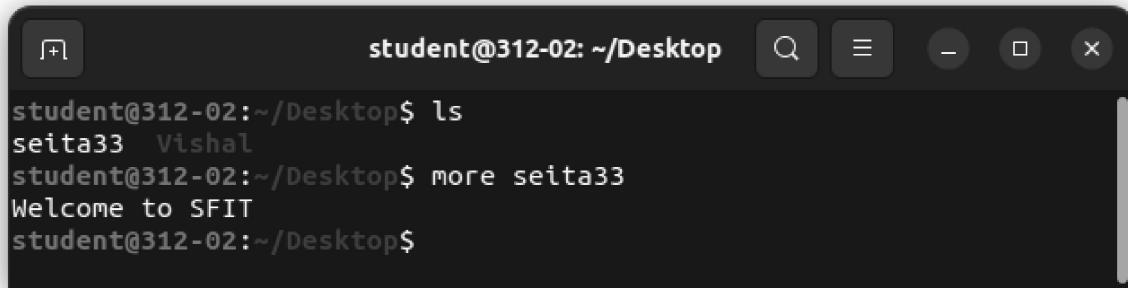
July              August             September
Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa
  1  2  3  4  5  6       1  2  3  4  5  6  7   1  2  3  4  5  6  7
  7  8  9 10 11 12 13   4  5  6  7  8  9 10  8  9 10 11 12 13 14
14 15 16 17 18 19 20   11 12 13 14 15 16 17 15 16 17 18 19 20 21
21 22 23 24 25 26 27  18 19 20 21 22 23 24 22 23 24 25 26 27 28
28 29 30 31            25 26 27 28 29 30 31 29 30

October          November          December
Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa
  1  2  3  4  5               1  2               1  2  3  4  5  6  7
  6  7  8  9 10 11 12     3  4  5  6  7  8  9   8  9 10 11 12 13 14
13 14 15 16 17 18 19     10 11 12 13 14 15 16 15 16 17 18 19 20 21
20 21 22 23 24 25 26    17 18 19 20 21 22 23 22 23 24 25 26 27 28
27 28 29 30 31          24 25 26 27 28 29 30 29 30 31

student@312-02: ~/Desktop$
```

19.Command: More

Observation: When you used the `more seita33` command, it attempted to display the contents of the file named "seita33" using the `more` command.

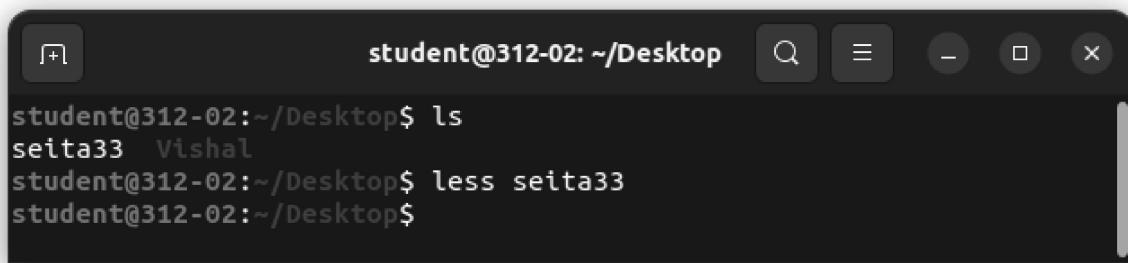


A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window has standard Linux-style window controls at the top right. The terminal prompt is "student@312-02: ~/Desktop\$". The user runs the command "ls", which lists files "seita33" and "Vishal". Then, the user runs "more seita33", which displays the file's contents. The file contains the text "Welcome to SFIT". Finally, the user types "student@312-02: ~/Desktop\$".

```
student@312-02:~/Desktop$ ls
seita33 Vishal
student@312-02:~/Desktop$ more seita33
Welcome to SFIT
student@312-02:~/Desktop$
```

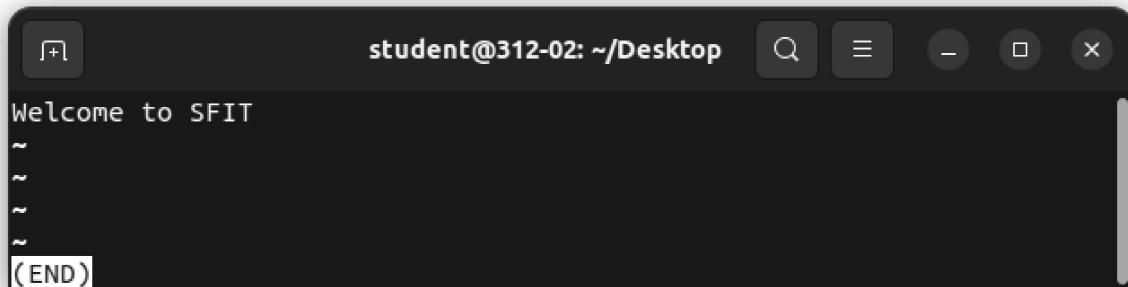
20.Command: Less

Observation: When I used the `less seita33` command in Ubuntu, it displayed the contents of the file named "seita33" using the `less` pager. This allows for navigating through the file content using keyboard commands, such as arrow keys for scrolling and 'q' to exit.



A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window has standard Linux-style window controls at the top right. The terminal prompt is "student@312-02: ~/Desktop\$". The user runs the command "ls", which lists files "seita33" and "Vishal". Then, the user runs "less seita33", which displays the file's contents. The file contains the text "Welcome to SFIT". Finally, the user types "student@312-02: ~/Desktop\$".

```
student@312-02:~/Desktop$ ls
seita33 Vishal
student@312-02:~/Desktop$ less seita33
student@312-02:~/Desktop$
```

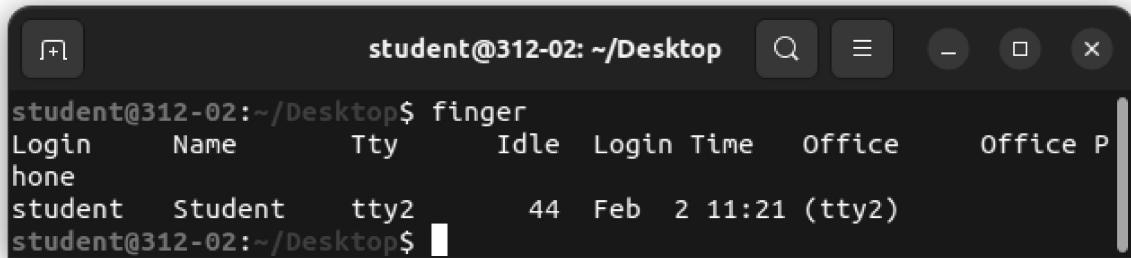


A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window has standard Linux-style window controls at the top right. The terminal prompt is "student@312-02: ~/Desktop\$". The user runs the command "less seita33", which displays the file's contents. The file contains the text "Welcome to SFIT". The user has navigated through the file using the arrow keys. The bottom of the screen shows the text "(END)" in a larger font, indicating the user has reached the end of the file.

```
Welcome to SFIT
~
~
~
~
(END)
```

21.Command: Finger

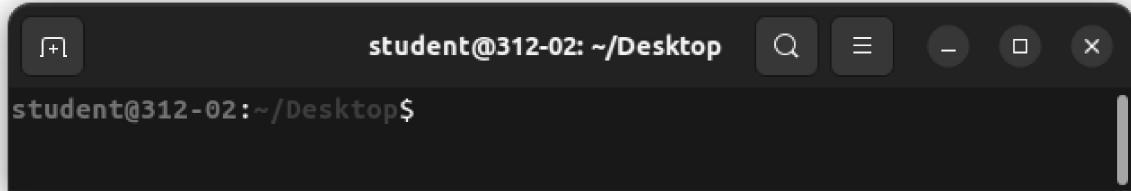
Observation:When I used the `finger` command in Ubuntu, it displayed information about users, including their login name, terminal, login time, and other details. This command provides a quick overview of user activity on the system.



```
student@312-02: ~/Desktop$ finger
Login      Name      Tty      Idle  Login Time  Office      Office P
hone
student  Student    tty2       44  Feb  2 11:21 (tty2)
student@312-02:~/Desktop$
```

22.Command: Clear

Observation:When I used the `clear` command in Ubuntu, it cleared the terminal screen.



```
student@312-02: ~/Desktop$ clear
student@312-02:~/Desktop$
```

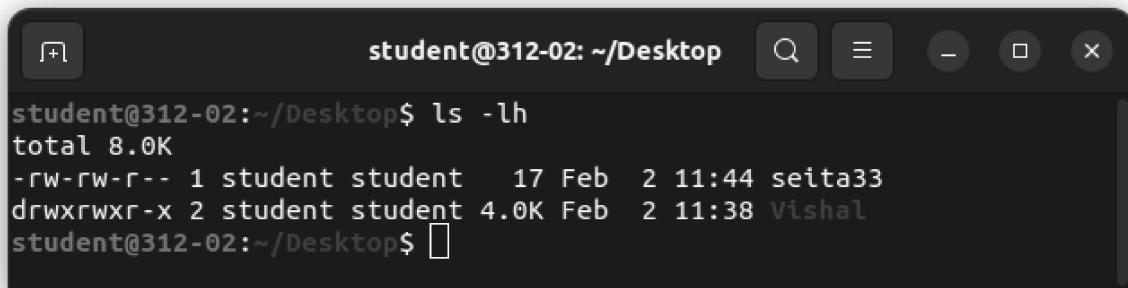
4.POST EXPERIMENT-EXERCISE:

B. Questions:

Write the commands and output of those for the following:

1.To display file size in human readable Form: ls -lh

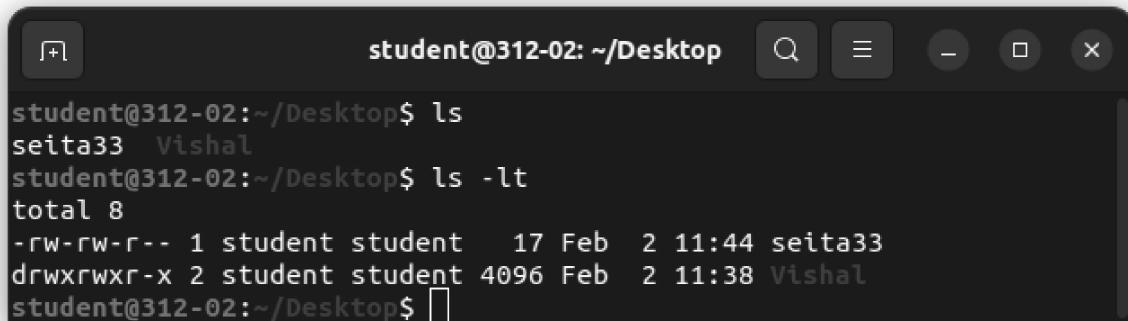
Observation: When I used the `ls -lh` command in Ubuntu, it displayed a detailed list of files and directories in the current directory, including their sizes, permissions, owners, and modification dates. The `-l` option indicates a long listing format, while the `-h` option makes file sizes human-readable. This command provides a detailed overview of the files and directories in the current location.



```
student@312-02:~/Desktop$ ls -lh
total 8.0K
-rw-rw-r-- 1 student student 17 Feb 2 11:44 seita33
drwxrwxr-x 2 student student 4.0K Feb 2 11:38 Vishal
student@312-02:~/Desktop$
```

2.To order files based on Last Modified Time in Descending Order: ls -lt

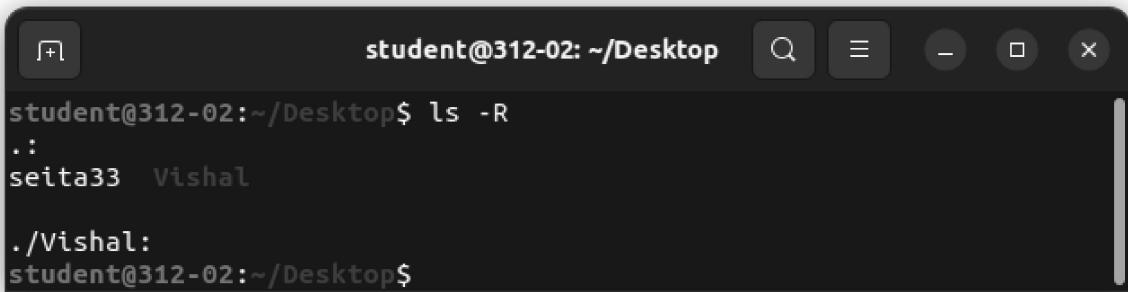
Observation: When I used the `ls -lt` command in Ubuntu, it displayed a list of files and directories in the current directory, sorted by modification time, with the most recently modified files or directories appearing first. The `-l` option indicates a long listing format, and the `-t` option sorts by modification time. This command is useful for quickly identifying the most recently modified files or directories in a directory.



```
student@312-02:~/Desktop$ ls
seita33 Vishal
student@312-02:~/Desktop$ ls -lt
total 8
-rw-rw-r-- 1 student student 17 Feb 2 11:44 seita33
drwxrwxr-x 2 student student 4096 Feb 2 11:38 Vishal
student@312-02:~/Desktop$
```

3.To display file recursively: ls -R

Observation: When I used the `ls -R` command in Ubuntu, it displayed a recursive listing of files and directories in the current directory and all subdirectories. This command provides a comprehensive view of the directory structure and contents, including files and directories at different levels of depth.

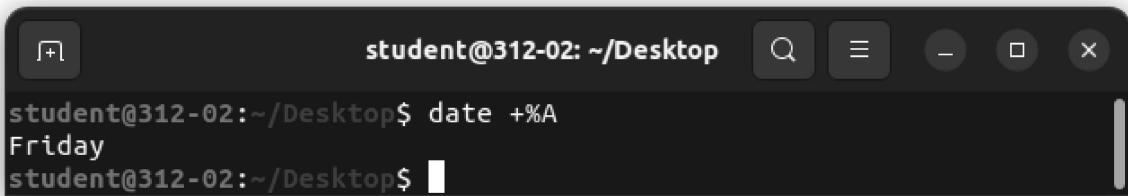


```
student@312-02: ~/Desktop$ ls -R
.:
seita33  Vishal

./Vishal:
student@312-02:~/Desktop$
```

4.To display Weekday name in full short (like Monday, Tuesday).

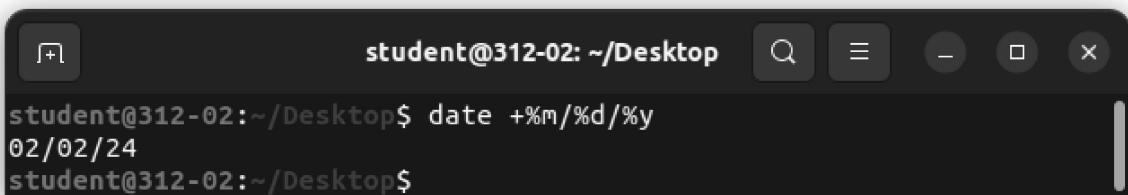
Observation: It showed me current day



```
student@312-02: ~/Desktop$ date +%%A
Friday
student@312-02:~/Desktop$
```

5. To display Current Date; shown in MM/DD/YY.

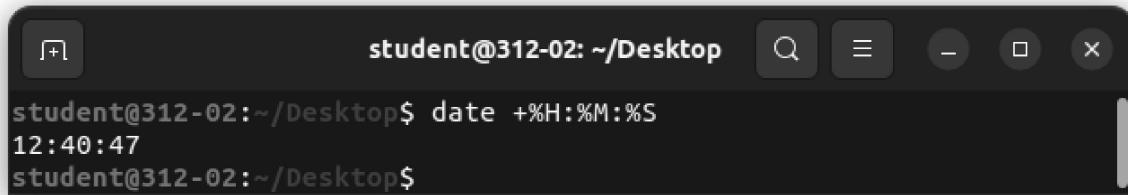
Observation: It showed me date in MM/DD/YY



```
student@312-02: ~/Desktop$ date +%%m/%%d/%%y
02/02/24
student@312-02:~/Desktop$
```

6. To display time; shown as HH:MM:SS. Note: Hours in 24 Format

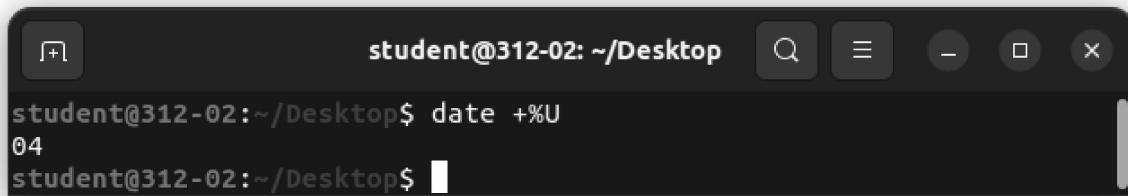
Observation: It showed me time in HH:MM:SS format



A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window contains the following text:
student@312-02:~/Desktop\$ date +%H:%M:%S
12:40:47
student@312-02:~/Desktop\$

7. To displays week number of year, with Sunday as first day of week (00..53).

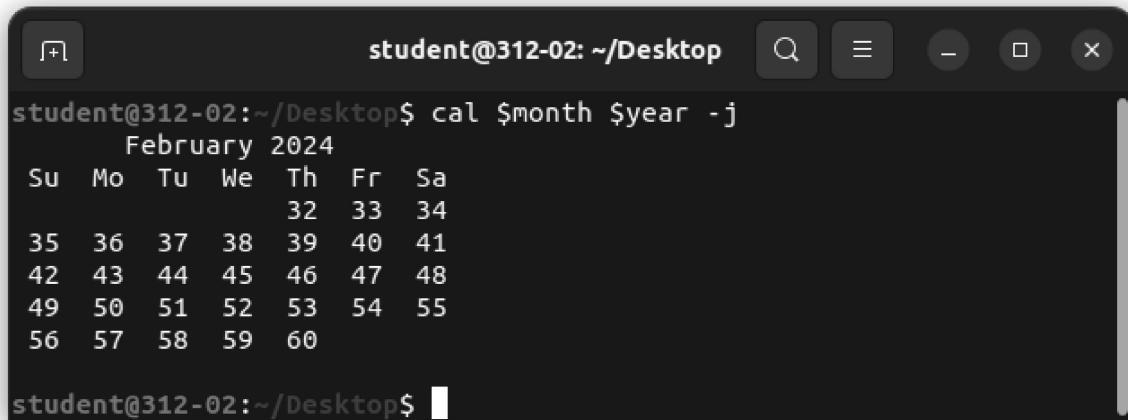
Observation:It showed me number of week



A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window contains the following text:
student@312-02:~/Desktop\$ date +%U
04
student@312-02:~/Desktop\$

8. To display Julian calendar and Julian days.

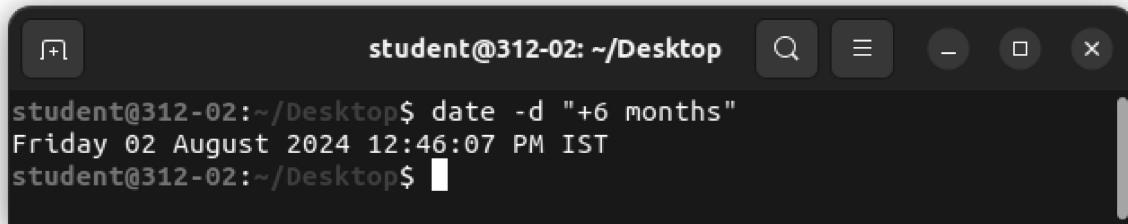
Observation: It showed current month in Julian calendar



A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window contains the following text:
student@312-02:~/Desktop\$ cal \$month \$year -j
February 2024
Su Mo Tu We Th Fr Sa
35 36 37 38 39 40 41
42 43 44 45 46 47 48
49 50 51 52 53 54 55
56 57 58 59 60
student@312-02:~/Desktop\$

9. To add a specified number of months before or after the current one in output.

Observation: It showed a specified number of months before or after the current one in output.

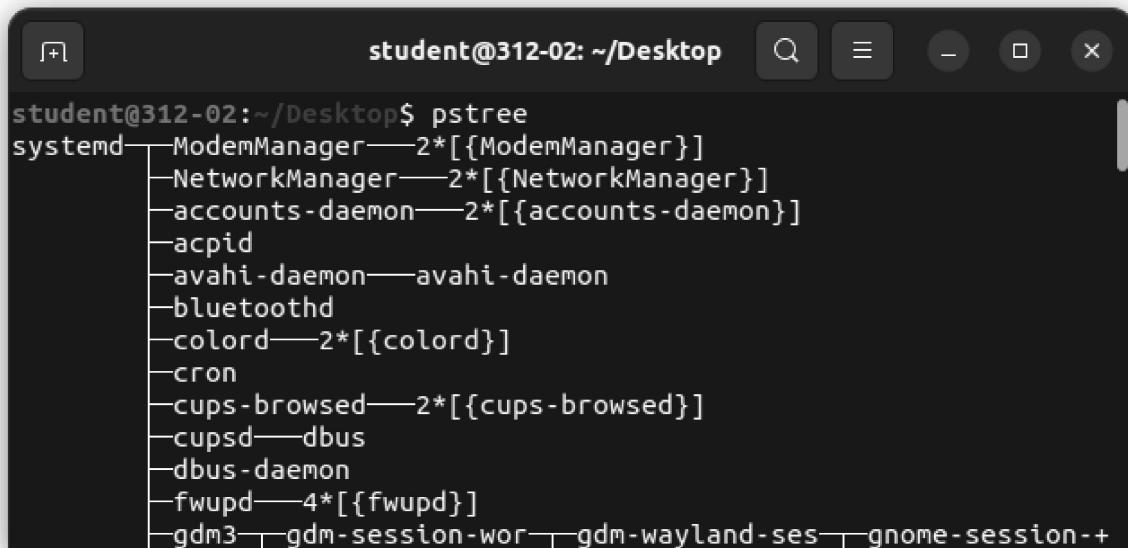


A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window contains the following text:

```
student@312-02:~/Desktop$ date -d "+6 months"
Friday 02 August 2024 12:46:07 PM IST
student@312-02:~/Desktop$
```

10. To list Processes in a Hierarchy.

Observation: When I used the `pstree` command in Ubuntu, it displayed a tree diagram of processes running on the system, starting with the init process at the root. Each process is displayed with its process ID (PID) and parent process ID (PPID), showing the hierarchical relationship between processes. This command provides a visual representation of the process hierarchy on the system.



A screenshot of a terminal window titled "student@312-02: ~/Desktop". The window contains the following text:

```
student@312-02:~/Desktop$ pstree
systemd--ModemManager--2*[{ModemManager}]
          |----NetworkManager--2*[{NetworkManager}]
          |----accounts-daemon--2*[{accounts-daemon}]
          |----acpid
          |----avahi-daemon--avahi-daemon
          |----bluetoothd
          |----colord--2*[{colord}]
          |----cron
          |----cups-browsed--2*[{cups-browsed}]
          |----cupsd--dbus
          |----dbus-daemon
          |----fwupd--4*[{fwupd}]
          |----gdm3--gdm-session-wor--gdm-wayland-ses--gnome-session-+
```