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DEPARTMENT OF COMPUTER ENGINEERING & APPLICATIONS
Institute of Engineering & Technology

Lab Manual

Subject Name & Code: OPERATING SYSTEM LAB
(BCAC 0818)

Course: BCA

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OPERATING SYSTEM LAB (BCAC 0818)

Prerequisite: Familiarity with programming constructs

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Case Study on Open Standard and Software:

Introduction to Linux operating system and Preparing for Installation – Installation Checklist, Hardware Requirements, Partitioning, Installation problems, Working with the System, Shells and Utilities, Linux commands, File Handling using vi editor, Getting familiar with shell scripts.

1. Introduction to Linux Operating System

Linux is an open-source operating system that follows the principles of open standards. It provides users and developers with the freedom to modify, distribute, and use the software without proprietary restrictions. Linux is widely adopted in various domains such as servers, desktops, and embedded systems due to its flexibility, security, and cost-effectiveness.

2. Preparing for Installation

To ensure a smooth installation process for Linux, careful preparation is required. The preparation steps involve checking hardware compatibility, understanding partitioning schemes, and following a checklist to avoid potential problems.

3. Installation Checklist

Before installing Linux, ensure that the following items are in place:

- **Backup of important data:** Ensure that all important data on the computer is backed up.
- **Linux distribution:** Select and download the appropriate Linux distribution (e.g., Ubuntu, Fedora, CentOS).
- **Create a bootable USB:** Use tools like Rufus or UNetbootin to create a bootable USB drive for installation.
- **Check hardware compatibility:** Ensure that the system's hardware supports the selected Linux distribution.
- **Partitioning scheme:** Plan how to partition the hard disk. Linux generally needs at least a root ("/") partition and a swap partition.

4. Hardware Requirements

While Linux can run on a wide range of hardware, it is important to verify the minimum system requirements for the chosen distribution.

- **Minimum hardware requirements:**
 - Processor: 1 GHz (x86 or x86_64)
 - RAM: 1 GB for lightweight distributions, 2-4 GB for mainstream ones (e.g., Ubuntu, Fedora)
 - Hard Disk: Minimum 20 GB
 - Display: VGA capable of 1024x768 screen resolution

5. Partitioning

Linux allows for flexible partitioning schemes. It is recommended to use the following partitions:

- **Root ("/"):** This is where the operating system files are stored.
- **Swap:** This is used for virtual memory. Its size is typically 1.5 times the system's RAM.
- **Home ("/home"):** This partition stores user data and settings.
- **Optional partitions:** You may choose to have separate partitions for /boot or /var for better system management.

6. Installation Problems

Common installation problems include:

- **Boot issues:** The system might fail to boot if the bootloader (GRUB) is not properly configured.
- **Partitioning errors:** Incorrect partitioning can result in data loss or installation failure.
- **Driver issues:** Some hardware components (e.g., Wi-Fi, graphics cards) may not be supported out of the box.

To address these issues, ensure that you:

- **Check documentation:** Review the distribution's installation guide.

- **Test live environments:** Use a live USB session to test the hardware before installation.
- **Update drivers:** Download the necessary drivers from the manufacturer if required.

7. Working with the System

Once Linux is installed, familiarize yourself with the desktop environment (e.g., GNOME, KDE, or Xfce) and package management tools (e.g., apt, yum, or dnf) to install software.

- **Package management:** Use commands like `sudo apt install <package>` (Debian-based) or `sudo dnf install <package>` (Fedora-based) to install software.

8. Shells and Utilities

Linux provides powerful shell environments like Bash, Zsh, and others. Shells allow users to interact with the system through command-line utilities. Important shell utilities include:

- **Navigating directories:** `cd`, `ls`
- **Copying and moving files:** `cp`, `mv`
- **Displaying file contents:** `cat`, `less`

9. Linux Commands

Some essential Linux commands for system management include:

- **System management:**
 - `sudo`: Execute commands with superuser privileges.
 - `df -h`: Show disk space usage.
 - `free -m`: Display memory usage.
- **File management:**
 - `touch <filename>`: Create a new file.
 - `rm <filename>`: Remove a file.
 - `chmod`: Change file permissions.

10. File Handling using vi Editor

The **vi editor** is a powerful text editor in Linux. Basic vi commands include:

- **Entering vi:** `vi <filename>`

- **Insert mode:** Press i to start editing the file.
- **Save and exit:** Press Esc followed by :wq to save and exit.

11. Getting Familiar with Shell Scripts

Shell scripting automates tasks in Linux. A simple shell script example:

```
#!/bin/bash
```

```
echo "Hello, World!"
```

To run the script, save it as script.sh, then execute the following:

```
chmod +x script.sh
```

```
./script.sh
```

Shell scripts can handle loops, conditions, and functions, making them ideal for automating tasks like backups, file management, or system monitoring.

Conclusion

Linux, with its open standards and vast capabilities, is a robust operating system suited for diverse computing needs. Understanding the installation process, commands, and scripting enhances productivity and efficiency in managing Linux systems.

EXPERIMENT NO: 2

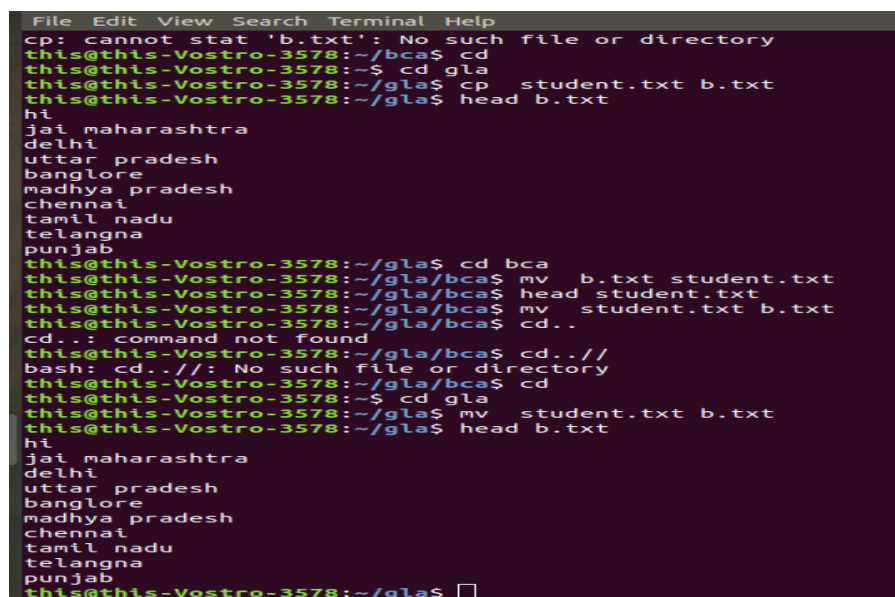
Environment: Ubuntu

Objective: Implement the following basic commands (with options) used in UNIX/LINUX OS: a) cp b) mv c) sort d) cut e) who f) whoami g) ps h) kill i) bc j) top k) grep l) chmod

Layout :

Procedure:

1. cp



```
File Edit View Search Terminal Help
cp: cannot stat 'b.txt': No such file or directory
this@this-Vostro-3578:~/bca$ cd
this@this-Vostro-3578:~$ cd gla
this@this-Vostro-3578:~/gla$ cp student.txt b.txt
this@this-Vostro-3578:~/gla$ head b.txt
hi
jai maharashtra
delhi
uttar pradesh
banglore
madhya pradesh
chennai
tamil nadu
telangna
punjab
this@this-Vostro-3578:~/gla$ cd bca
this@this-Vostro-3578:~/gla/bca$ mv b.txt student.txt
this@this-Vostro-3578:~/gla/bca$ head student.txt
hi
jai maharashtra
delhi
uttar pradesh
banglore
madhya pradesh
chennai
tamil nadu
telangna
punjab
this@this-Vostro-3578:~/gla/bca$ mv student.txt b.txt
this@this-Vostro-3578:~/gla/bca$ cd..
cd..: command not found
this@this-Vostro-3578:~/gla/bca$ cd../
bash: cd../: No such file or directory
this@this-Vostro-3578:~/gla/bca$ cd
this@this-Vostro-3578:~$ cd gla
this@this-Vostro-3578:~/gla$ mv student.txt b.txt
this@this-Vostro-3578:~/gla$ head b.txt
hi
jai maharashtra
delhi
uttar pradesh
banglore
madhya pradesh
chennai
tamil nadu
telangna
punjab
this@this-Vostro-3578:~/gla$
```


DESCRIPTION-

cp - copy files and directories

SYNTAX-

- cp <first file name><second file name>

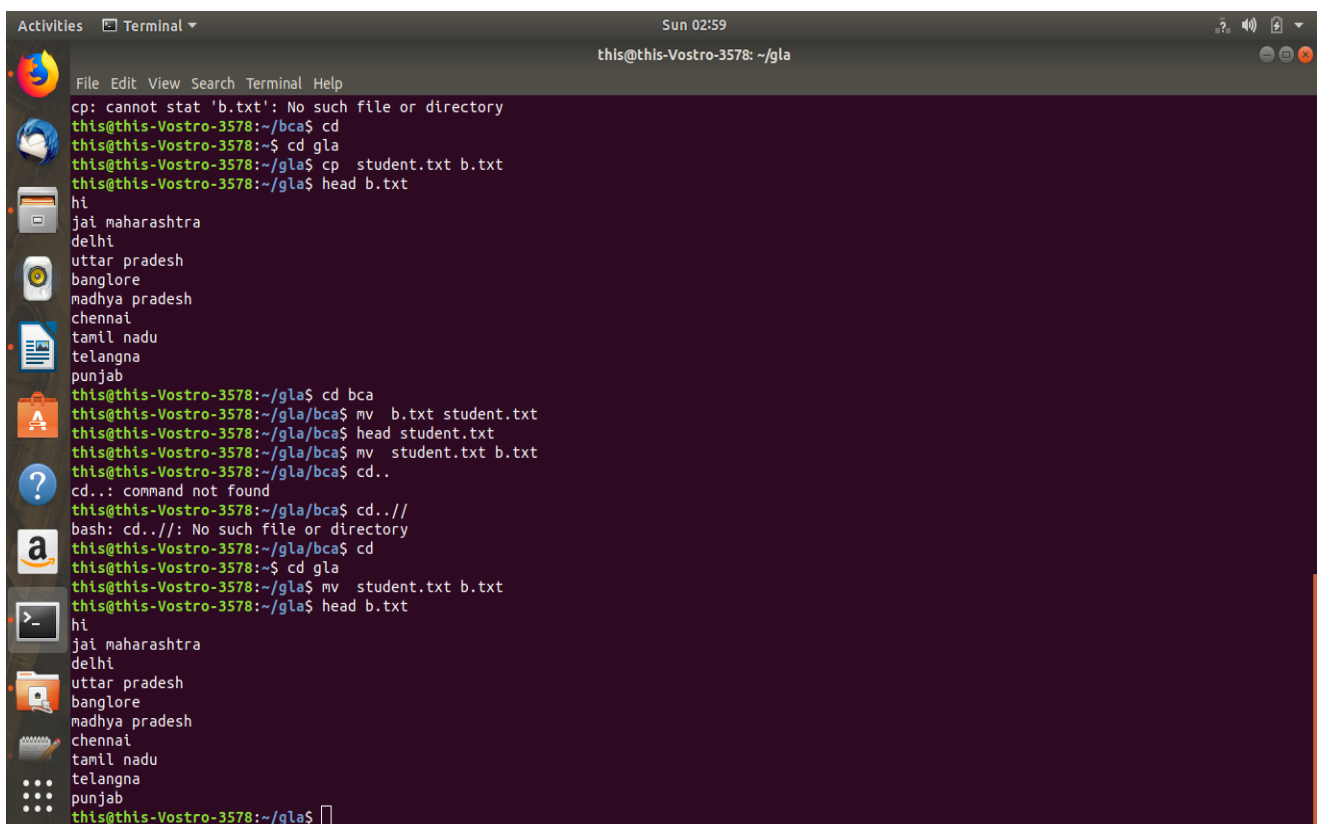
2. mv

DESCRIPTION-

Rename SOURCE to DEST, or move SOURCE(s) to DIRECTORY.

SYNTAX-

- mv <file_name1><file_name2>



```
Activities  Terminal  Sun 02:59
this@this-Vostro-3578: ~/gla

File Edit View Search Terminal Help
cp: cannot stat 'b.txt': No such file or directory
this@this-Vostro-3578:~/bca$ cd
this@this-Vostro-3578:~$ cd gla
this@this-Vostro-3578:~/gla$ cp student.txt b.txt
this@this-Vostro-3578:~/gla$ head b.txt
hi
jai maharashtra
delhi
uttar pradesh
banglore
madhya pradesh
chennai
tamil nadu
telangna
punjab
this@this-Vostro-3578:~/gla$ cd bca
this@this-Vostro-3578:~/gla/bca$ mv b.txt student.txt
this@this-Vostro-3578:~/gla/bca$ head student.txt
hi
jai maharashtra
delhi
uttar pradesh
banglore
madhya pradesh
chennai
tamil nadu
telangna
punjab
this@this-Vostro-3578:~/gla/bca$ mv student.txt b.txt
this@this-Vostro-3578:~/gla/bca$ cd..
cd..: command not found
this@this-Vostro-3578:~/gla/bca$ cd.../
bash: cd.../: No such file or directory
this@this-Vostro-3578:~/gla/bca$ cd
this@this-Vostro-3578:~$ cd gla
this@this-Vostro-3578:~/gla$ mv student.txt b.txt
this@this-Vostro-3578:~/gla$ head b.txt
hi
jai maharashtra
delhi
uttar pradesh
banglore
madhya pradesh
chennai
tamil nadu
telangna
punjab
this@this-Vostro-3578:~/gla$
```

3. sort

DESCRIPTION-

Write sorted concatenation of all FILE(s) to standard output.

SYNTAX-

- sort <file_name>
- sort -n <file_name>
- sort -r <file_name>

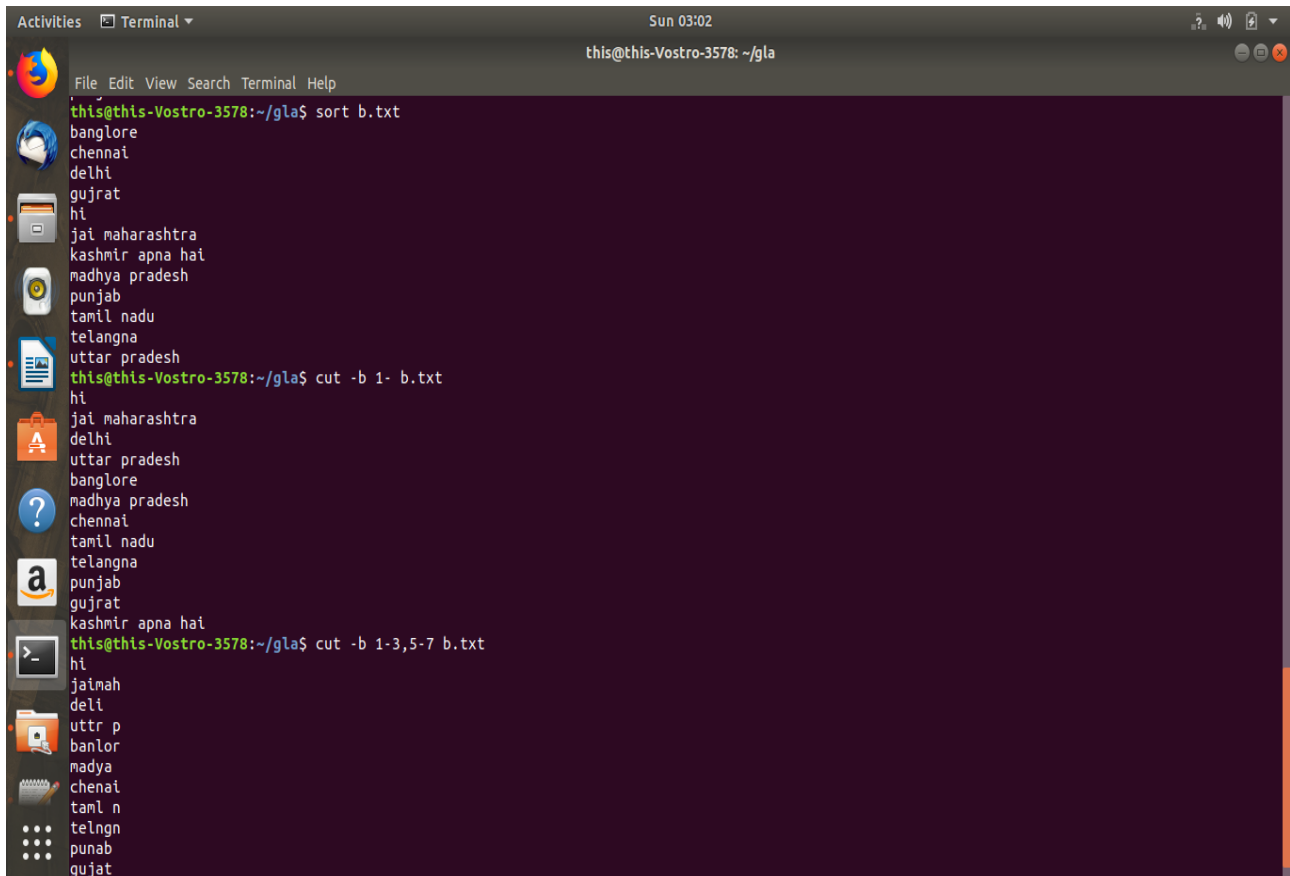
4. cut

DESCRIPTION-

cut - remove sections from each line of files

SYNTAX-

- cut -b <file_name>
- cut -c <file_name>kill - send a signal to a process



```
File Edit View Search Terminal Help
this@this-Vostro-3578:~/gla$ sort b.txt
banglore
chennai
delhi
gujrat
hi
jai maharashtra
kashmir apna hai
madhya pradesh
punjab
tamil nadu
telangna
uttar pradesh
this@this-Vostro-3578:~/gla$ cut -b 1- b.txt
hi
jai maharashtra
delhi
uttar pradesh
banglore
madhya pradesh
chennai
tamil nadu
telangna
punjab
gujrat
kashmir apna hai
this@this-Vostro-3578:~/gla$ cut -b 1-3,5-7 b.txt
hi
jaimah
deli
uttr p
banlor
madya
chenai
taml n
telngn
punab
gujat
```

5. who

DESCRIPTION-

show who is logged on

SYNTAX-

- who

6. whoami

DESCRIPTION-

print effective userid

SYNTAX-

- whoami

7. ps

DESCRIPTION-

report a snapshot of the current processes.

SYNTAX-

- ps

8. kill

DESCRIPTION-

kill - send a signal to a process to kill.

SYNTAX-

- kill <process_id>

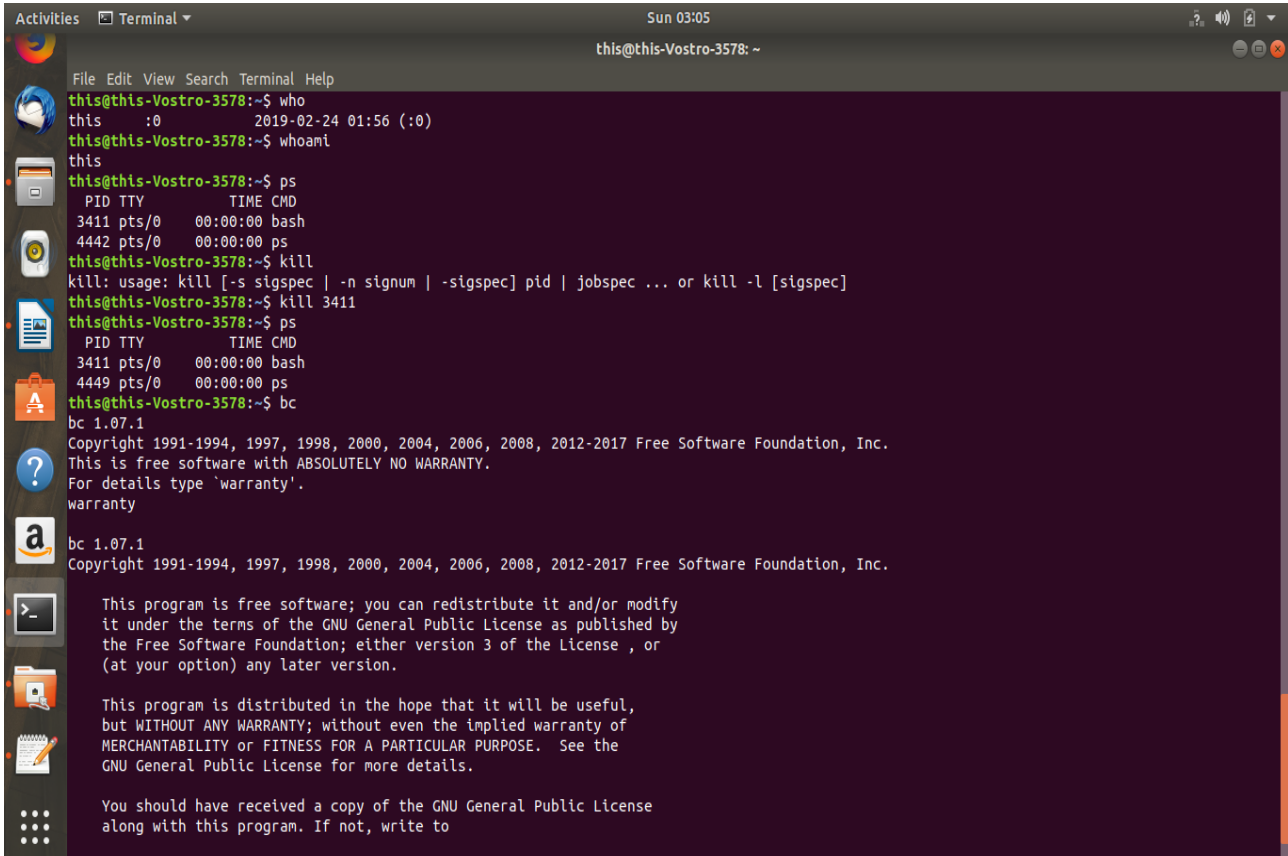
9. bc

DESCRIPTION-

An arbitrary precision calculator language.

SYNTAX-

- bc



```
Activities Terminal Sun 03:05 this@this-Vostro-3578: ~
File Edit View Search Terminal Help
this@this-Vostro-3578:~$ who
this      :0                2019-02-24 01:56 (:0)
this@this-Vostro-3578:~$ whoami
this
this@this-Vostro-3578:~$ ps
  PID TTY          TIME CMD
 3411 pts/0    00:00:00 bash
 4442 pts/0    00:00:00 ps
this@this-Vostro-3578:~$ kill
kill: usage: kill [-s sigspec | -n signum | -sigspec] pid | jobspec ... or kill -l [sigspec]
this@this-Vostro-3578:~$ kill 3411
this@this-Vostro-3578:~$ ps
  PID TTY          TIME CMD
 3411 pts/0    00:00:00 bash
 4449 pts/0    00:00:00 ps
this@this-Vostro-3578:~$ bc
bc 1.07.1
Copyright 1991-1994, 1997, 1998, 2000, 2004, 2006, 2008, 2012-2017 Free Software Foundation, Inc.
This is free software with ABSOLUTELY NO WARRANTY.
For details type 'warranty'.
warranty
bc 1.07.1
Copyright 1991-1994, 1997, 1998, 2000, 2004, 2006, 2008, 2012-2017 Free Software Foundation, Inc.

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it under the terms of the GNU General Public License as published by
the Free Software Foundation; either version 3 of the License , or
(at your option) any later version.

This program is distributed in the hope that it will be useful,
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MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See the
GNU General Public License for more details.

You should have received a copy of the GNU General Public License
along with this program.  If not, write to
```

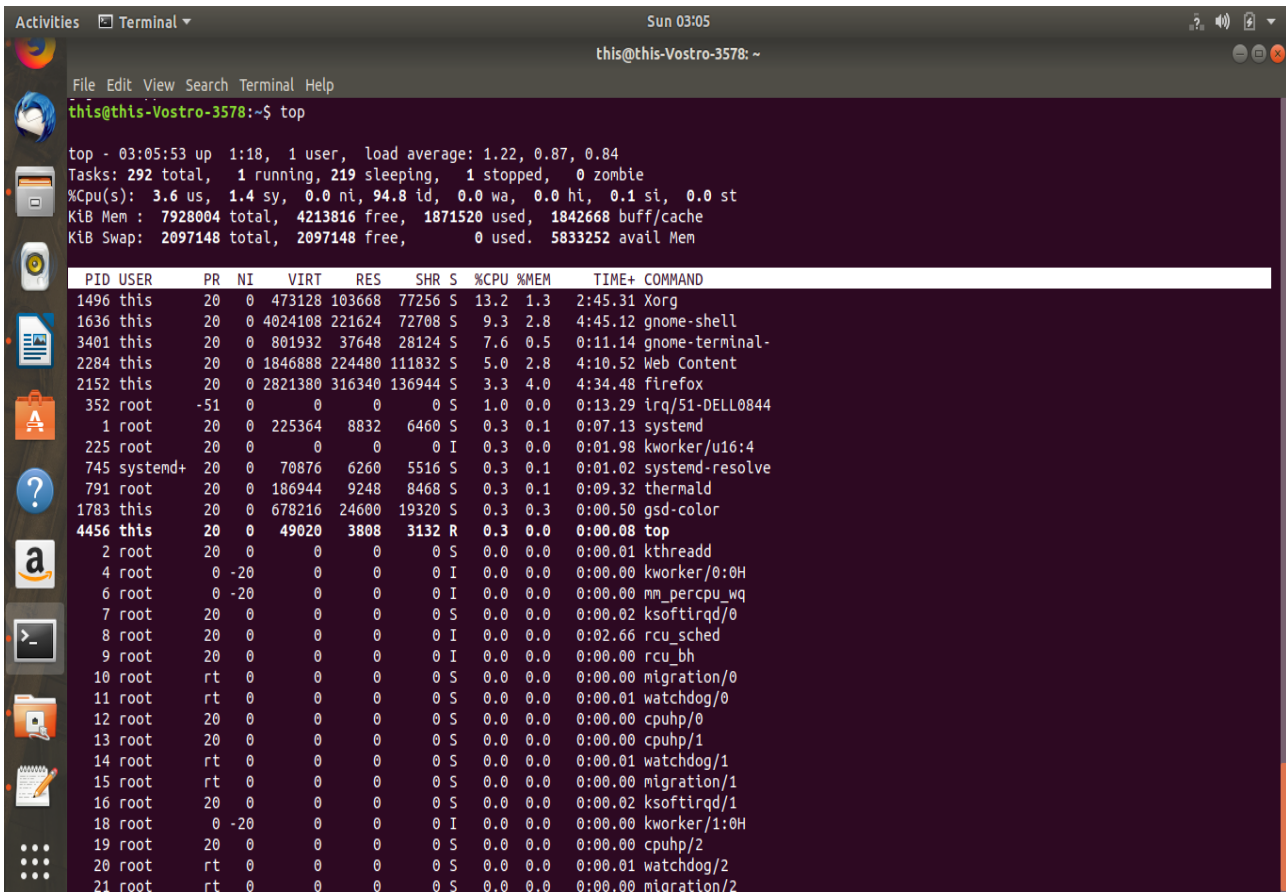
10. top

DESCRIPTION-

top - display Linux processes

SYNTAX-

- top



```
File Edit View Search Terminal Help
this@this-Vostro-3578:~$ top

top - 03:05:53 up 1:18, 1 user, load average: 1.22, 0.87, 0.84
Tasks: 292 total, 1 running, 219 sleeping, 1 stopped, 0 zombie
%Cpu(s): 3.6 us, 1.4 sy, 0.0 ni, 94.8 id, 0.0 wa, 0.0 hi, 0.1 si, 0.0 st
KiB Mem : 7928004 total, 4213816 free, 1871520 used, 1842668 buff/cache
KiB Swap: 2097148 total, 2097148 free, 0 used, 5833252 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     TIME+ COMMAND
 1496 this        20   0 473128 103668 77256 S   13.2   1.3   2:45.31 Xorg
 1636 this        20   0 4024108 221624 72708 S    9.3   2.8   4:45.12 gnome-shell
 3401 this        20   0 801932  37648 28124 S    7.6   0.5   0:11.14 gnome-terminal-
2284 this        20   0 1846888 224480 111832 S    5.0   2.8   4:10.52 Web Content
2152 this        20   0 2821380 316340 136944 S    3.3   4.0   4:34.48 firefox
 352 root        -SI   0      0      0    0 S    1.0   0.0   0:13.29 irq/51-DELL0844
   1 root        20   0 225364   8832  6460 S    0.3   0.1   0:07.13 systemd
225 root        20   0      0      0    0 I    0.3   0.0   0:01.98 kworker/u16:4
 745 systemd+    20   0  70876   6260  5516 S    0.3   0.1   0:01.02 systemd-resolve
 791 root        20   0 186944   9248  8468 S    0.3   0.1   0:09.32 thermald
1783 this        20   0 678216  24600 19320 S    0.3   0.3   0:00.50 gsd-color
4456 this        20   0  49020   3808  3132 R    0.3   0.0   0:00.08 top
   2 root        20   0      0      0    0 S    0.0   0.0   0:00.01 kthreadd
   4 root        0 -20      0      0    0 I    0.0   0.0   0:00.00 kworker/0:0H
   6 root        0 -20      0      0    0 I    0.0   0.0   0:00.00 mm_percpu_wq
   7 root        20   0      0      0    0 S    0.0   0.0   0:00.02 ksoftirqd/0
   8 root        20   0      0      0    0 I    0.0   0.0   0:02.66 rcu_sched
   9 root        20   0      0      0    0 I    0.0   0.0   0:00.00 rcu_bh
  10 root        rt    0      0      0    0 S    0.0   0.0   0:00.00 migration/0
  11 root        rt    0      0      0    0 S    0.0   0.0   0:00.01 watchdog/0
  12 root        20   0      0      0    0 S    0.0   0.0   0:00.00 cpuhp/0
  13 root        20   0      0      0    0 S    0.0   0.0   0:00.00 cpuhp/1
  14 root        rt    0      0      0    0 S    0.0   0.0   0:00.01 watchdog/1
  15 root        rt    0      0      0    0 S    0.0   0.0   0:00.00 migration/1
  16 root        20   0      0      0    0 S    0.0   0.0   0:00.02 ksoftirqd/1
  18 root        0 -20      0      0    0 I    0.0   0.0   0:00.00 kworker/1:0H
  19 root        20   0      0      0    0 S    0.0   0.0   0:00.00 cpuhp/2
  20 root        rt    0      0      0    0 S    0.0   0.0   0:00.01 watchdog/2
  21 root        rt    0      0      0    0 S    0.0   0.0   0:00.00 migration/2
```

11. grep

DESCRIPTION-

print lines matching a pattern

SYNTAX-

- grep

12. chmod

DESCRIPTION-

change file mode bits.

SYNTAX-

- chmod -x <file_name>

chmod -w <file_name>

EXPERIMENT NO: 3

Environment: Ubuntu

Objective: Implement the following basic commands (with options) used in UNIX/LINUX OS: a) ls b) mkdir c) cd d) cat e) man f) date g) cal h) rm i) rmdir j) head k) tail l) pwd

Layout:

```
this@this-Vostro-3578:~$ ls
a.c          del.c        ins.c        ls.c         Public
a.out        del.c        insert       LS.C         rttik
arpit        delete1.c   insert1.c   max.c        search.c
beg.c        delete.c    insert.c     maxi.c       stack.c
'command1(1).docx' Desktop     karani.c    merge.c      Templates
'command1(1).docx' Documents  karan2.c    Music        Videos
command1.docx double1.c   karan.c     node1.c
command.docx examples.desktop link1.c     node.c
d.c          ins1.c     link.c      Pictures
this@this-Vostro-3578:~$ ls -a
.          delete.c    ls.c
..         Desktop    LS.C
a.c        Documents  max.c
a.out      double1.c  maxi.c
arpit      examples.desktop merge.c
.bash_history .gnupg     .mozilla
.bash_logout .ICEauthority Music
.bashrc     ins1.c     node1.c
beg.c       ins.c      node.c
.cache      insert     Pictures
'command1(1).docx' insert1.c  .profile
'command1(1).docx' insert.c   Public
command1.docx karani.c  rttik
command.docx karan2.c search.c
.config     karan.c  .ssh
d.c         link1.c  stack.c
del.c       link.c   .sudo_as_admin_successful
del.c       .local  Templates
delete1.c   ~/.lock command.docx# Videos
this@this-Vostro-3578:~$
```

Procedure:

1. ls

DESCRIPTION-

List information about the FILES (the current directory by default).

Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.

SYNTAX-

- ls
- ls -a
- ls -A
- ls -s

- `ls -t`
- `ls -r`
- `ls -lh`
- `ls -lrt`

```

this@this-Vostro-3578:~$ ls
a.c          del1.c      ins.c       ls.c        Public
a.out        del.c       insert      LS.C        ritik
arpit        delete1.c  insert1.c  max.c       search.c
beg.c        delete.c    insert.c    maxi.c      stack.c
'command1(1).docx' Desktop    karan1.c   merge.c     Templates
'command1(1).docx' Documents  karan2.c   Music       Videos
command1.docx double1.c   karan.c    node1.c
command.docx examples.desktop link1.c    node.c
d.c          ins1.c     link.c     Pictures

this@this-Vostro-3578:~$ ls -a
.          delete.c      ls.c
..         Desktop      LS.C
a.c        Documents    max.c
a.out      double1.c    maxi.c
arpit      examples.desktop merge.c
.bash_history .gnupg       .mozilla
.bash_logout .ICEauthority Music
.bashrc    ins1.c       node1.c
beg.c      ins.c       node.c
.cache     insert      Pictures
'command1(1).docx' insert1.c    .profile
'command1(1).docx' insert.c     Public
command1.docx karan1.c    ritik
command.docx karan2.c    search.c
.config     karan.c     .ssh
d.c         link1.c     stack.c
del1.c      link.c      .sudo_as_admin_successful
del.c       .local      Templates
delete1.c   ~/.lock.command.docx# Videos

this@this-Vostro-3578:~$

```

```

this@this-Vostro-3578:~$ ls -A
d.c          link1.c      stack.c
del1.c       link.c       .sudo_as_admin_successful
del.c        .local      Templates
delete1.c    ~/.lock.command.docx# Videos

this@this-Vostro-3578:~$ ls -l
total 204
4 a.c          Documents    max.c
12 a.out       double1.c    maxi.c
4 arpit       examples.desktop merge.c
4 beg.c       .gnupg       .mozilla
4 .bash_history .ICEauthority Music
4 .bash_logout .bashrc      ins1.c
4 .cache       ins.c       node1.c
'command1(1).docx' insert      Pictures
'command1(1).docx' insert1.c    .profile
command1.docx karan1.c    Public
command.docx karan2.c    ritik
.config       karan.c     search.c
d.c           link1.c     .ssh
del1.c        link.c      stack.c
del.c         .local      .sudo_as_admin_successful
delete1.c     ~/.lock.command.docx# Templates
delete.c      ls.c        Videos
Desktop       LS.C

this@this-Vostro-3578:~$ ls -ls
total 204
4 a.c          4 delete1.c    4 karan1.c    4 node1.c
12 a.out       4 delete.c     4 karan2.c    4 node.c
4 arpit       4 Desktop     4 karan.c     4 Pictures
4 beg.c       4 Documents   4 link1.c     4 Public
8 'command1(1).docx' 4 double1.c   4 link.c      4 ritik
8 'command1.docx' 12 examples.desktop 4 ls.c        4 search.c
8 command.docx  4 ins1.c      4 LS.C        4 stack.c
12 command.docx 4 ins.c       4 max.c       4 Templates
4 d.c          4 insert      4 maxi.c      4 Videos
4 del1.c       4 insert1.c   4 merge.c
4 del.c        4 insert.c    4 Music

```

Lab Manual

OPERATING SYSTEM LAB (BCAC 0818)

```

this@this-Vostro-3578:~$ ls -t
Pictures      d.c          del.c        insert.c     a.c
command.docx  command1.docx search.c     delete.c     Music
'command(1).docx' node1.c      karan2.c    insert       Public
'command(1).docx' node.c       karan1.c    max.c       Templates
Desktop       beg.c       karan.c     delete1.c   Videos
a.out        del1.c     link1.c     maxi.c     examples.desktop
stack.c      insert1.c  link.c      ritik
Documents    ins1.c    arpit      ls.c
double1.c    ins.c     merge.c    LS.C

this@this-Vostro-3578:~$ ls -r
Videos      Music      karan2.c    Documents  'command(1).docx'
Templates  merge.c    karan1.c    Desktop    'command1(1).docx'
stack.c     maxi.c     insert.c    delete.c   beg.c
search.c    max.c     insert1.c   delete1.c  arpit
ritik       LS.C      insert      del.c      a.out
Public      ls.c      ins.c       del1.c     a.c
Pictures    link.c    ins1.c      d.c
node.c      link1.c   examples.desktop command.docx
node1.c     karan.c  double1.c   command1.docx

this@this-Vostro-3578:~$

```

```

this@this-Vostro-3578:~$ ls -lh
total 204K
-rw-rw-r-- 1 this this 131 Jan 18 23:16 a.c
-rwxr-xr-x 1 this this 8.3K Feb 20 05:08 a.out
drwxr-xr-x 3 this this 4.0K Jan 24 20:14 arpit
-rw-rw-r-- 1 this this 472 Feb 11 01:23 beg.c
-rw-rw-r-- 1 this this 6.9K Feb 22 01:44 'command(1).docx'
-rw-rw-r-- 1 this this 7.6K Feb 22 01:44 'command(1).docx'
-rw-rw-r-- 1 this this 6.9K Feb 15 02:49 command1.docx
-rw-rw-r-- 1 this this 8.4K Feb 22 01:55 command.docx
-rw-rw-r-- 1 this this 690 Feb 20 04:53 d.c
-rw-rw-r-- 1 this this 436 Feb 11 01:03 del1.c
-rw-rw-r-- 1 this this 511 Feb 10 18:47 del.c
-rw-rw-r-- 1 this this 427 Jan 20 20:20 delete1.c
-rw-rw-r-- 1 this this 509 Jan 20 21:55 delete.c
drwxr-xr-x 3 this this 4.0K Feb 20 05:11 Desktop
drwxr-xr-x 2 this this 4.0K Feb 20 04:59 Documents
-rw-rw-r-- 1 this this 810 Feb 20 04:56 double1.c
-rw-rw-r-- 1 this this 8.8K Nov 12 08:34 examples.desktop
-rw-rw-r-- 1 this this 450 Feb 10 19:50 ins1.c
-rw-rw-r-- 1 this this 332 Feb 10 19:02 ins.c
-rw-rw-r-- 1 this this 609 Jan 20 21:32 insert
-rw-rw-r-- 1 this this 475 Feb 11 00:58 insert1.c
-rw-rw-r-- 1 this this 610 Jan 20 22:07 insert.c
-rw-rw-r-- 1 this this 176 Feb 3 06:13 karan1.c
-rw-rw-r-- 1 this this 74 Feb 3 06:25 karan2.c
-rw-rw-r-- 1 this this 224 Feb 3 05:53 karan.c
-rw-rw-r-- 1 this this 596 Jan 29 05:27 link1.c
-rw-rw-r-- 1 this this 414 Jan 29 05:08 link.c
-rw-rw-r-- 1 this this 462 Jan 18 23:49 ls.c
-rw-rw-r-- 1 this this 382 Jan 18 23:42 LS.C
-rw-rw-r-- 1 this this 452 Jan 20 20:37 max.c
-rw-rw-r-- 1 this this 332 Jan 20 20:17 maxi.c
-rw-rw-r-- 1 this this 782 Jan 20 22:40 merge.c
drwxr-xr-x 2 this this 4.0K Nov 12 14:14 Music
-rw-rw-r-- 1 this this 1.1K Feb 11 06:12 node1.c
-rw-rw-r-- 1 this this 575 Feb 11 03:26 node.c
drwxr-xr-x 2 this this 4.0K Feb 22 02:02 Pictures

```

```
File Edit View Search Terminal Help
this@this-Vostro-3578:~$ ls -ltr
total 204
-rw-r--r-- 1 this this 8980 Nov 12 08:34 examples.desktop
drwxr-xr-x 2 this this 4096 Nov 12 14:14 Videos
drwxr-xr-x 2 this this 4096 Nov 12 14:14 Templates
drwxr-xr-x 2 this this 4096 Nov 12 14:14 Public
drwxr-xr-x 2 this this 4096 Nov 12 14:14 Music
-rw-rw-r-- 1 this this 131 Jan 18 23:16 a.c
-rw-rw-r-- 1 this this 382 Jan 18 23:42 LS.C
-rw-rw-r-- 1 this this 462 Jan 18 23:49 ls.c
drwxr-xr-x 2 this this 4096 Jan 19 02:16 ritik
-rw-rw-r-- 1 this this 332 Jan 20 20:17 max1.c
-rw-rw-r-- 1 this this 427 Jan 20 20:20 delete1.c
-rw-rw-r-- 1 this this 452 Jan 20 20:37 max.c
-rw-rw-r-- 1 this this 609 Jan 20 21:32 insert
-rw-rw-r-- 1 this this 509 Jan 20 21:55 delete.c
-rw-rw-r-- 1 this this 610 Jan 20 22:07 insert.c
-rw-rw-r-- 1 this this 782 Jan 20 22:40 merge.c
drwxr-xr-x 3 this this 4096 Jan 24 20:14 arpit
-rw-rw-r-- 1 this this 414 Jan 29 05:08 link.c
-rw-rw-r-- 1 this this 596 Jan 29 05:27 link1.c
-rw-rw-r-- 1 this this 224 Feb 3 05:53 karan.c
-rw-rw-r-- 1 this this 176 Feb 3 06:13 karan1.c
-rw-rw-r-- 1 this this 74 Feb 3 06:25 karan2.c
-rw-rw-r-- 1 this this 499 Feb 10 17:47 search.c
-rw-rw-r-- 1 this this 511 Feb 10 18:47 del.c
-rw-rw-r-- 1 this this 332 Feb 10 19:02 ins.c
-rw-rw-r-- 1 this this 450 Feb 10 19:50 ins1.c
-rw-rw-r-- 1 this this 475 Feb 11 00:58 insert1.c
-rw-rw-r-- 1 this this 436 Feb 11 01:03 del1.c
-rw-rw-r-- 1 this this 472 Feb 11 01:23 beg.c
-rw-rw-r-- 1 this this 575 Feb 11 03:26 node.c
-rw-rw-r-- 1 this this 1030 Feb 11 06:12 node1.c
-rw-rw-r-- 1 this this 6965 Feb 15 02:49 command1.docx
-rw-rw-r-- 1 this this 690 Feb 20 04:53 d.c
-rw-rw-r-- 1 this this 810 Feb 20 04:56 double1.c
drwxr-xr-x 2 this this 4096 Feb 20 04:59 Documents
-rw-rw-r-- 1 this this 292 Feb 20 05:07 stack.c
```

2. mkdir

DESCRIPTION-

Create the DIRECTORY(ies), if they do not already exist.

SYNTAX-

- `mkdir <directory_name>`

3. cd

DESCRIPTION-

It changes your working directory. Use it to move around within the hierarchy of your file system.

SYNTAX-

- `cd`
- `cd <directory_name>`
- `cd..`
- `cd../..`

4. cat

DESCRIPTION-

Concatenate FILE(s) to standard output.

SYNTAX-

- cat <file_name>
- cat ><file_name>
- cat <file_name1>><file_name2>

5. man

DESCRIPTION-

man - an interface to the on-line reference manuals

SYNTAX-

- man <command>

6. date

DESCRIPTION-

date - print or set the system date and time

SYNTAX-

- date
- date -d

7. cal

DESCRIPTION-

cal, ncal — displays a calendar and the date of Easter

SYNTAX-

- cal

8. rm

DESCRIPTION-

rm - remove files or directories

SYNTAX-

- rm <file_name>
- rm <directory_name>

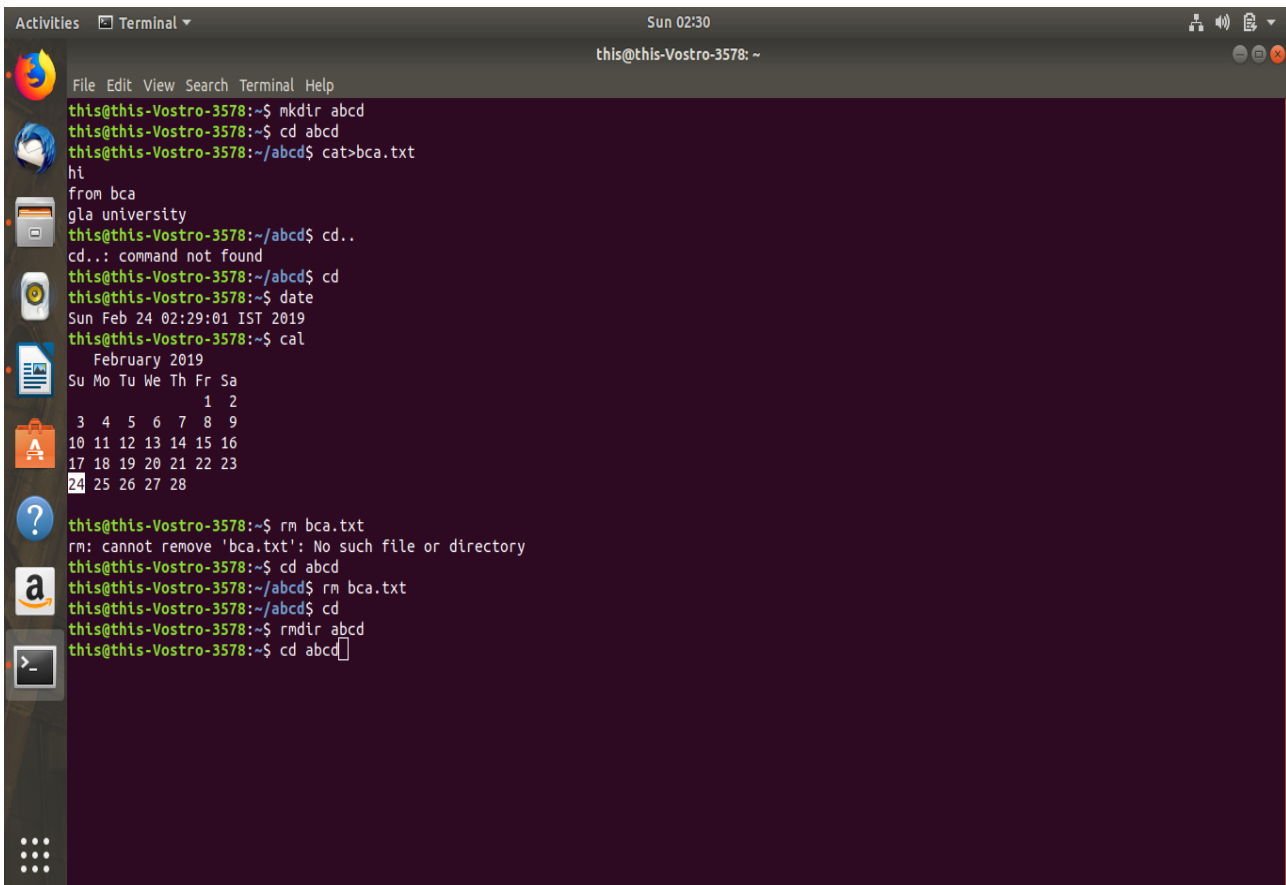
9. rmdir

DESCRIPTION-

rmdir - remove empty directories

SYNTAX-

- rmdir <directory_name>



```
Activities  Terminal  Sun 02:30
this@this-Vostro-3578: ~

File Edit View Search Terminal Help
this@this-Vostro-3578:~$ mkdir abcd
this@this-Vostro-3578:~$ cd abcd
this@this-Vostro-3578:~/abcd$ cat>bca.txt
hi
from bca
gla university
this@this-Vostro-3578:~/abcd$ cd..
cd..: command not found
this@this-Vostro-3578:~/abcd$ cd
this@this-Vostro-3578:~$ date
Sun Feb 24 02:29:01 IST 2019
this@this-Vostro-3578:~$ cal
February 2019
Su Mo Tu We Th Fr Sa
                1  2
 3  4  5  6  7  8  9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28
this@this-Vostro-3578:~$ rm bca.txt
rm: cannot remove 'bca.txt': No such file or directory
this@this-Vostro-3578:~$ cd abcd
this@this-Vostro-3578:~/abcd$ rm bca.txt
this@this-Vostro-3578:~/abcd$ cd
this@this-Vostro-3578:~$ rmdir abcd
this@this-Vostro-3578:~$ cd abcd
```

10. head

DESCRIPTION-

head - output the first part of files

SYNTAX-

- head <file_name>

11. tail

DESCRIPTION-

tail - output the last part of files

SYNTAX-

- tail <file_name>

12. pwd

DESCRIPTION-

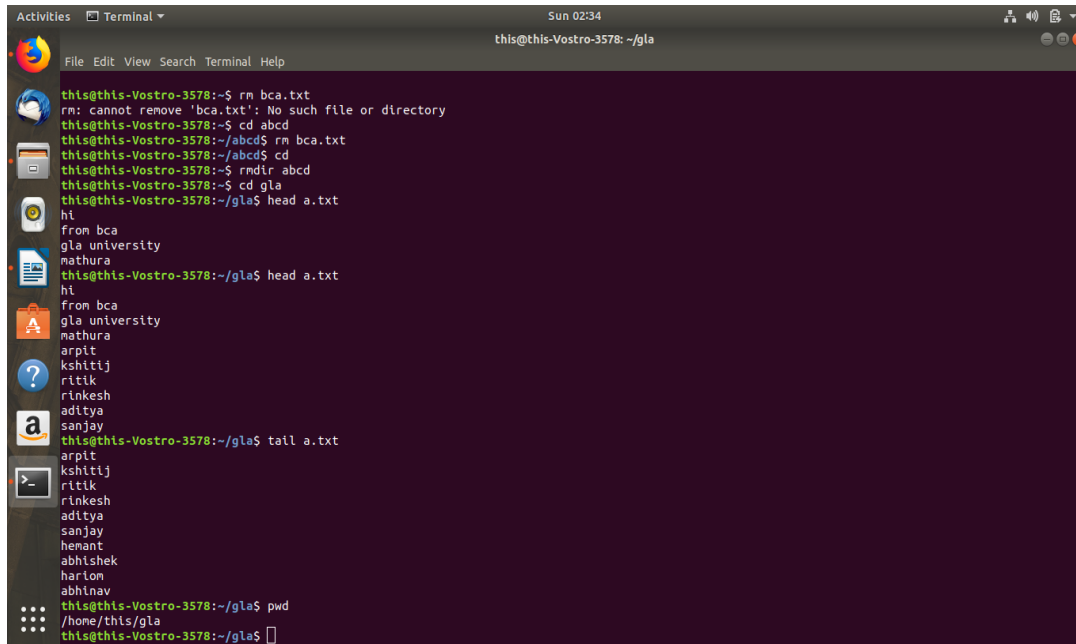
pwd - print name of current/working directory

SYNTAX-

- pwd

Lab Manual

OPERATING SYSTEM LAB (BCAC 0818)



The screenshot shows a terminal window titled 'this@this-Vostro-3578: ~/gla'. The terminal displays the following commands and their outputs:

```
this@this-Vostro-3578:~$ rm bca.txt
rm: cannot remove 'bca.txt': No such file or directory
this@this-Vostro-3578:~$ cd abcd
this@this-Vostro-3578:~/abcd$ rm bca.txt
this@this-Vostro-3578:~/abcd$ cd
this@this-Vostro-3578:~$ rmdir abcd
this@this-Vostro-3578:~$ cd gla
this@this-Vostro-3578:~/gla$ head a.txt
hi
from bca
gla university
mathura
this@this-Vostro-3578:~/gla$ head a.txt
hi
from bca
gla university
mathura
arpit
kshittij
ritik
rinkesh
aditya
sanjay
this@this-Vostro-3578:~/gla$ tail a.txt
arpit
kshittij
ritik
rinkesh
aditya
sanjay
hemant
abhishek
harlon
abhinav
this@this-Vostro-3578:~/gla$ pwd
/home/this/gla
this@this-Vostro-3578:~/gla$
```

EXPERIMENT NO: 4

Environment: Ubuntu

Objective: Write a shell script to find whether a number is even or odd.

Layout:

```
harsh@Ubuntu:~/Desktop/lab3$ sh evenodd.sh
Hello user, Enter a number to check whether it is odd or even: 55
55 is odd
harsh@Ubuntu:~/Desktop/lab3$ sh evenodd.sh
Hello user, Enter a number to check whether it is odd or even: 44
44 is even
```

Procedure:

```
#!/bin/bash
```

```
read -p "Hello user, Enter a number to check whether it is odd or even: " num
if [ "$(expr $num % 2)" -eq 0 ]
then
    echo "$num is even"
else
    echo "$num is odd"
fi
```

EXPERIMENT NO: 5

Environment: Ubuntu

Objective: Write a shell script to check if the number entered at the command line is prime or not.

Layout:

```
harsh@Ubuntu:~/Desktop/lab3$ sh prime.sh
Enter a number: 12
12 is composite (not prime)
harsh@Ubuntu:~/Desktop/lab3$ sh prime.sh
Enter a number: 13
13 is Prime
```

Procedure:

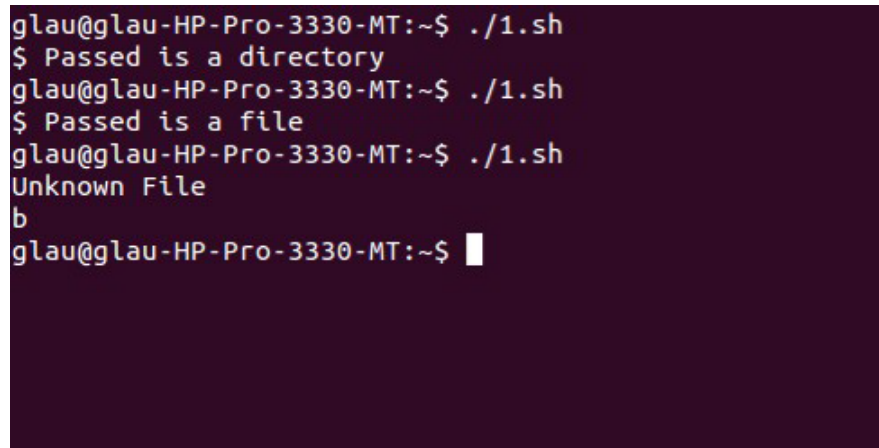
```
#!/bin/bash
read -p "Enter a number: " num
i=2
f=0
while [ $i -le `expr $num / 2` ]
do
if [ `expr $num % $i` -eq 0 ]
then
f=1
fi
i=`expr $i + 1`
done
if [ $f -eq 1 ]
then
echo "$num is composite (not prime)"
else
echo "$num is Prime"
fi
```

EXPERIMENT NO: 6

Environment: Uuntu

Objective: Write a shell script to input the name of a file as command line argument and display whether it is a file, a directory or anything else.

Layout:



```
glau@glau-HP-Pro-3330-MT:~$ ./1.sh
$ Passed is a directory
glau@glau-HP-Pro-3330-MT:~$ ./1.sh
$ Passed is a file
glau@glau-HP-Pro-3330-MT:~$ ./1.sh
Unknown File
b
glau@glau-HP-Pro-3330-MT:~$
```

Procedure:

```
#!/bin/bash
```

```
Passed="abc.txt"
if [ -d "${Passed}" ]
then
echo "$ Passed is a directory";
else
if [ -f "${Passed}" ]
then
echo "$ Passed is a file";
else
echo "Unknown File"
```

```
echo $Passed
exit $[Passed]
fi
fi
```

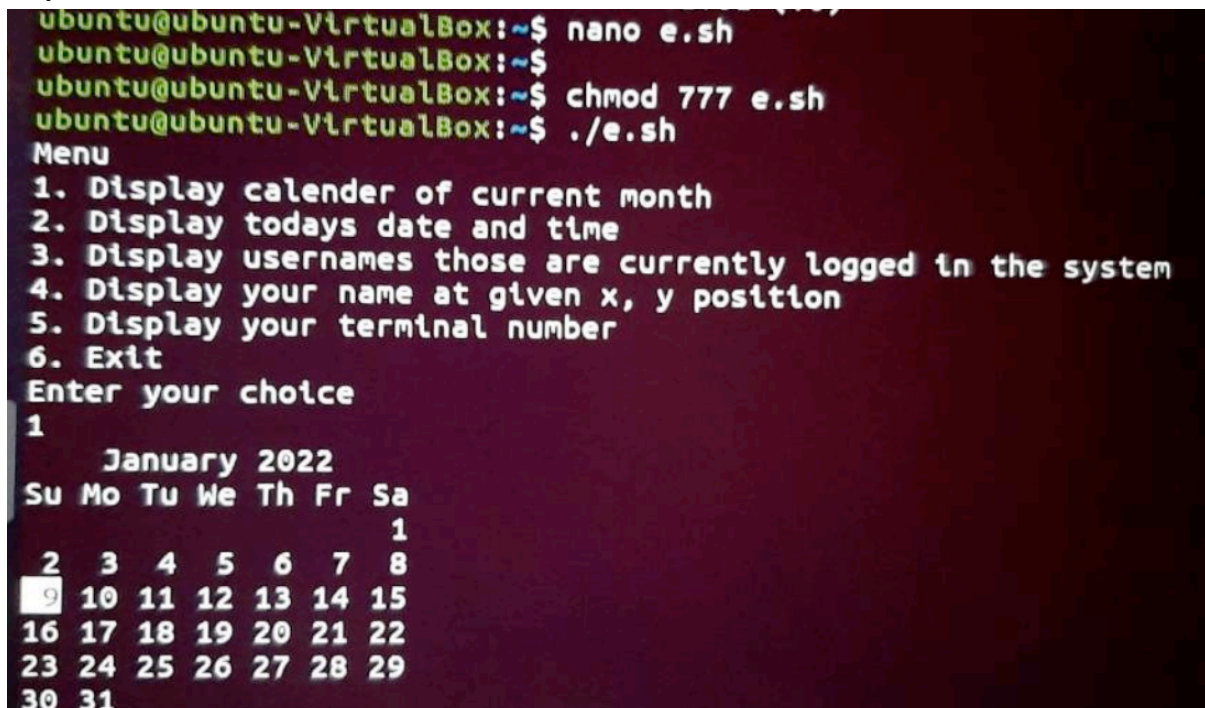
EXPERIMENT NO: 7

Environment: Ubuntu

Objective: Write a menu driven shell script, which will print the following menu and execute the given task.

- Display a calendar of current month
- Display today's date and time
- Display username those are currently logged in the system
- Display your name at the given x,y position.
- Display your terminal number.

Layout:



```
ubuntu@ubuntu-VirtualBox:~$ nano e.sh
ubuntu@ubuntu-VirtualBox:~$
ubuntu@ubuntu-VirtualBox:~$ chmod 777 e.sh
ubuntu@ubuntu-VirtualBox:~$ ./e.sh
Menu
1. Display calender of current month
2. Display todays date and time
3. Display usernames those are currently logged in the system
4. Display your name at given x, y position
5. Display your terminal number
6. Exit
Enter your choice
1
    January 2022
Su Mo Tu We Th Fr Sa
      1
 2  3  4  5  6  7  8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31
```

Procedure:

```
#!/bin/bash
echo "Menu"
echo "1. Display calender of current month " echo "2. Display
todays date and time"
echo "3. Display usernames those are currently logged in the system"
echo "4. Display your name at given x, y position" echo "5. Display your
terminal number"
echo "6. Exit"
echo "Enter your choice" read c
case $c in
1) cal;;2) date;;
3) who;;
4) clear
echo "Enter x, y position"
read x
read y
tput cup $x $y
whoami;;
```