**Exp 2:**

Pwd :
gray@gray:~$ pwd
/home/gray
mkdir :
gray@gray:~/Master$ mkdir and
gray@gray:~/Master$ ls
and exp_z_1.txt skill_1.sh xor
cd :
gray@gray:~$ cd Master/
gray@gray:~/Master$ pwd
/home/gray/Master
touch :
gray@gray:~/Master$ touch exp_1.txt
gray@gray:~/Master$ ls
exp_1.txt
gray@gray:~/Master$ touch exp_x_1.txt exp_y_1.txt
ls :
gray@gray:~/Master$ ls
exp_1.txt exp_x_1.txt exp_y_1.txt
cat :
gray@gray:~/Master$ cat exp_y_1.txt exp_x_1.txt
Namaste
World
gray@gray:~/Master$ cat > nor.txt
hello world
gray@gray:~/Master$ cat >> nor.txt
extc ipmv ccn anfl
gray@gray:~/Master$ cat nor.txt exp_z_1.txt
hello world
world
mv :
gray@gray:~/Master$ ls
exp_1.txt exp_y_1.txt exp_z_1.txt
gray@gray:~/Master$ mkdir xor
gray@gray:~/Master$ mv exp_1.txt xor
gray@gray:~/Master$ ls
exp_y_1.txt exp_z_1.txt xor
grep :
gray@gray:~/Master$ grep a *.txt
exp_y_1.txt:Namaste
date :
gray@gray:~/Master$ date

Wednesday 31 January 2024 04:56:56 PM ISTtime :
gray@gray:~/Master$ time
real
0m0.000s
user 0m0.000s
sys
0m0.000s
free :
gray@gray:~/Master$ free
total
used
free
shared buff/cache available
Mem:
7856836 1476656 1843432
344060 4536748
Swap:
2097148
0 2097148
echo :
gray@gray:~/Master$ echo extc
extc
ps :
gray@gray:~/Master$ ps
PID TTY
TIME CMD
3544 pts/1 00:00:00 bash
20687 pts/1 00:00:00 ps
cal :
gray@gray:~/Master$ cal
January 2024
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
wc :
gray@gray:~/Master$ wc exp_z_1.txt
1 1 6 exp_z_1.txt
chmod :
gray@gray:~/Master$ touch skill_1.sh
gray@gray:~/Master$ ./skill_1.sh
bash: ./skill_1.sh: Permission denied

```
gray@gray:~/Master$ chmod u+x skill_1.sh
gray@gray:~/Master$ ls -l skill_1.sh
-rwxrw-r-- 1 gray gray 16 Jan 31 17:05 skill_1.sh
gray@gray:~/Master$ ./skill_1.sh
Hello Extc
chown :
gray@gray:~/Master$ sudo adduser nxon
gray@gray:~/Master$ sudo usermod -aG sudo nxon
5723780gray@gray:~/Master$ sudo chown nxon:users xnor.txt
gray@gray:~/Master$ ls -l xnor.txt
-rw-rw-r-- 1 nxon users 0 Jan 31 17:38 xnor.txt
umask :
gray@gray:~/Master$ umask
0002
gray@gray:~/Master$ umask -S
u=rwx,g=rwx,o=rx
```

**Exp_3 :**

**Code:**

```c
#include<stdio.h>

#include <unistd.h>

#include<string.h>

#include<fcntl.h>

int main()

{

char data[64];

printf("getuid : %d \n",getuid());

printf("geteuid : %d \n",geteuid());

printf("getgid : %d \n",getgid());

printf("getegid : %d \n",getegid());

int fd = open("/home/shraddha/SYCALL.txt", O_CREAT | O_RDWR | O_APPEND);

printf("fd : %d\n", fd);

int read1 = read(fd,data,64);

printf("%d\n",read1);

int w = write(fd,"smita",strlen("smita"));

close(fd);

}
```

**Output:**
```
gray@gray:~$ touch exp.cpp
gray@gray:~$ nano exp.cpp
gray@gray:~$ chmod x+u exp.cpp
```

```
chmod: invalid mode: 'x+u'
Try 'chmod --help' for more information.
gray@gray:~$ chmod u+x exp.cpp
gray@gray:~$ g++ exp.cpp -o exp
gray@gray:~$ ./exp
getuid : 1000
geteuid : 1000
getgid : 1000
getegid : 1000
fd : -1
-1
```

**Exp 4 :**

**Code:**

```bash
#!/bin/bash

#Display current logged in user and logname.

echo "Display current logged in user and logname."

echo "Hi,$USER! This is username."

echo "Hello, $LOGNAME! This is logname"; echo ""

#Display top 10 processes in descending order.

echo "Display top 10 processes in descending order"; echo ""

CPU1=$(top -b -n1 |tail -10)

echo "$CPU1"; echo ""

#Display processes with highest memory usage.

echo "Display processes with highest memory usage"; echo ""

CPU=$(top -b -n1 |head -10)

echo "$CPU"; echo ""

#Display Virtulmemory statistics.

echo "Display VirtulMemory statistics"; echo ""

vmstat= vmstat

echo "$vmstat"; echo ""

#Display current shell, home directory, operating system type, current path setting

echo "Display current shell, home directory, operating system type, current path setting"

ALL=$(uname -a); echo ""
```

echo "alternative for -a is: --all: #prints all information";

echo "$ALL"

S=$(uname -s); echo ""

echo "alternative for -s is: --kernel-name: #prints the kernel name"

echo "$S"

R=$(uname -r); echo ""

echo "alternative for -r is: --kernel-release: #prints the kernel release"

echo "$R"

V=$(uname -v); echo ""

echo "alternative for -v is: --kernel-version: #prints the kernel version"

echo "$V"

#Display current working directory.

echo "Present working directory "

echo "$PWD"; echo ""

#Display current shell

echo "Display current program shell"

echo $0 $SHELL "$$"

echo "$0: Name of currently running .sh file"

echo "$SHELL: Folder"

echo "$$: PID"

**Output :**

gray@gray:~$ touch exp_4.sh

gray@gray:~$ nano exp_4.sh

gray@gray:~$ ./exp_4.sh

bash: ./exp_4.sh: Permission denied

gray@gray:~$ chmod u+x exp_4.sh

gray@gray:~$ ./exp_4.sh

Display current logged in user and logname.

Hi,gray! This is username.

Hello, gray! This is logname


Display top 10 processes in descending order


 10376 gray      20   0 1132.3g 204040 129980 S   0.0   2.6   0:08.09 chrome

 10445 gray      20   0 1132.3g 483672 138524 S   0.0   6.2   0:41.37 chrome

 10469 gray      20   0 1132.3g  67020  51584 S   0.0   0.9   0:00.02 chrome

 10487 root     20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/7:2-events

 10498 root     20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/2:2

 10517 root      0 -20      0      0      0 I   0.0   0.0   0:00.58 kworker/u17:3-i915_flip

 10589 root     20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/u16:3-ext4-rsv-conversion

 10598 gray     20   0   9972   3456   3200 S   0.0   0.0   0:00.00 exp_4.sh

 10599 gray     20   0   9972   1432   1280 S   0.0   0.0   0:00.00 exp_4.sh

 10601 gray     20   0   8408   2048   2048 S   0.0   0.0   0:00.00 tail

Display processes with highest memory usage

top - 12:27:40 up  4:20,  1 user,  load average: 0.30, 0.37, 0.37

Tasks: 297 total,   1 running, 295 sleeping,   0 stopped,   1 zombie

%Cpu(s):  2.3 us,  0.8 sy,  0.0 ni, 96.9 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st

MiB Mem :   7672.7 total,    421.8 free,   2249.5 used,   5001.5 buff/cache

MiB Swap:   2048.0 total,   2047.7 free,      0.2 used.   4655.7 avail Mem

| PID | USER | PR | NI | VIRT | RES | SHR | S | %CPU | %MEM | TIME+ | COMMAND |
|-----|------|----|----|------|-----|-----|---|------|------|-------|---------|
| 530 | root | -51 | 0 | 0 | 0 | 0 | S | 6.7 | 0.0 | 2:04.54 | irq/158-rtw88_pci |
| 2090 | gray | 9 | -11 | 2579584 | 29148 | 21980 | S | 6.7 | 0.4 | 8:06.53 | pulseaudio |
| 2285 | gray | 20 | 0 | 5845244 | 285376 | 137768 | S | 6.7 | 3.6 | 13:23.48 | gnome-shell |

Display VirtulMemory statistics

procs -----------memory---------- ---swap-- -----io---- -system-- ------cpu-----

 r  b  swpd  free  buff  cache  si  so   bi   bo   in   cs us sy id wa st

 2  0   256 431884 222892 4898628   0   0   40   54  265  160  4  1 94  0  0

Display current shell, home directory, operating system type, current path setting

alternative for -a is:    --all:                         #prints all information

Linux gray 6.5.0-26-generic #26~22.04.1-Ubuntu SMP PREEMPT_DYNAMIC Tue Mar 12 10:22:43 UTC 2 x86_64 x86_64 x86_64 GNU/Linux


alternative for -s is:    --kernel-name:                    #prints the kernel name

Linux


alternative for -r is:    --kernel-release:          #prints the kernel release

6.5.0-26-generic


alternative for  -v is:   --kernel-version:          #prints the kernel version

#26~22.04.1-Ubuntu SMP PREEMPT_DYNAMIC Tue Mar 12 10:22:43 UTC 2

Present working directory

/home/gray


Display current program shell

./exp_4.sh /bin/bash 10598

./exp_4.sh:      Name of currently running .sh file

/bin/bash:      Folder

10598:            PID

**Exp 5 :**

**Output:**

gray@gray:~$ sudo useradd xor

[sudo] password for gray:

gray@gray:~$ sudo passwd xor

New password:

Retype new password:

passwd: password updated successfully

gray@gray:~$ sudo groupadd sz

gray@gray:~$ cat /etc/group | tail -2

xor:x:1002:

sz:x:1003:

gray@gray:~$ compgen -u | tail -2

postgres

xor

gray@gray:~$ compgen -u | tail -2

postgres

Xor

gray@gray:~$ ls -la

total 1004280

drwxr-x--- 58 gray gray    12288 Mar 24 12:38  .

drwxr-xr-x  4 root root     4096 Jan 31 17:41  ..

-rw-rw-r-- 1 gray gray   45025 Oct 29 15:46  16794265975711683122300692.jpeg

-rw-rw-r-- 1 gray gray  244693 Oct 29 13:31  33592.csv

-rw-rw-r-- 1 gray gray   4740 Dec 21 11:35  Academic_Fee_Receipt_Gosavi_compressed.pdf

-rw-rw-r-- 1 gray gray  634513 Dec 10 12:21 'Applight Free Website Template -
Free-CSS.com.zip'

-rw-rw-r-- 1 gray gray  697419 Nov 14 08:57  Armos_v1.pdf

-rw------- 1 gray gray   30396 Mar 24 08:11  .bash_history

gray@gray:~$ sudo userdel xor

gray@gray:~$ sudo groupdel sz

gray@gray:~$ compgen -u | tail -2

monetdb

postgres

gray@gray:~$ who

gray    tty2      2024-03-24 08:07 (tty2)

gray@gray:~$ whoami

gray

**Code :**

```bash
#!/bin/bash

# Script to add a user to Linux system

# --------------------------------------------------------------------------

if [ $(id -u) -eq 0 ]; then

read -p "Enter username : " username

read -s -p "Enter password : " password
```

```
egrep "^$username" /etc/passwd >/dev/null

if [ $? -eq 0 ]; then

echo "$username exists!"

exit 1

else

pass=$(perl -e 'print crypt($ARGV[0], "password")' $password)

useradd -m -p $pass $username

        [ $? -eq 0 ] && echo "User has been added to system!" || echo "Failed to add a user!"

fi

else

echo "Only root may add a user to the system"

exit 2

fi
```

**Output :**

```
gray@gray:~$ touch exp_5.1.sh

gray@gray:~$ nano exp_5.1.sh

gray@gray:~$ chmod u+x exp_5.1.sh

gray@gray:~$ sudo ./exp_5.1.sh

Enter username : xor

Enter password : User has been added to system!
```

**Code :**

```
password="mihyajfwheifhwkfnw"
```

```
pass=$(perl -e 'print crypt($ARGV[0], "password")' $password)

echo "$pass"
```

**Output:**

```
gray@gray:~$ touch exp_5.sh

gray@gray:~$ nano exp_5.sh

gray@gray:~$ chmod u+x exp_5.sh

gray@gray:~$ ./exp_5.sh

papd4.h7YLhrk
```
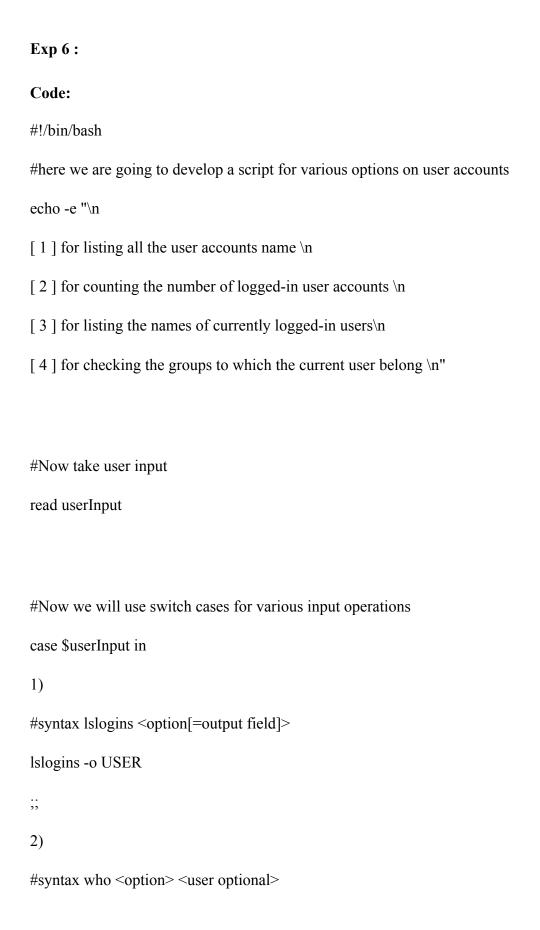
**Exp 6 :**

**Code:**

#!/bin/bash

#here we are going to develop a script for various options on user accounts

echo -e "\n

[ 1 ] for listing all the user accounts name \n

[ 2 ] for counting the number of logged-in user accounts \n

[ 3 ] for listing the names of currently logged-in users\n

[ 4 ] for checking the groups to which the current user belong \n"


#Now take user input

read userInput


#Now we will use switch cases for various input operations

case $userInput in

1)

#syntax lslogins <option[=output field]>

lslogins -o USER

;;

2)

#syntax who <option> <user optional>

#grep used to filter

who --count | grep users

;;

3)

#-q option is to count the number of users and print the logged-in users.

# instead of -q, --count can also be used.

# -v is used to exclude any pattern

who -q | grep -v users

;;

4)

#syntax groups <option> [USERNAME]

groups

;;

*)

echo -e "Please Enter Correct Input \n"

;;

esac

**Output :**
gray@gray:~$ touch exp_6.sh
gray@gray:~$ nano exp_6.sh
gray@gray:~$ chmod u+x exp_6.sh
gray@gray:~$ ./exp_6.sh


[ 1 ] for listing all the user accounts name

[ 2 ] for counting the number of logged-in user accounts

[ 3 ] for listing the names of currently logged-in users

[ 4 ] for checking the groups to which the current user belong

1
USER
root
daemon
bin
sys
sync
games
man
lp
mail
news
uucp
proxy
www-data
backup
list
irc
gnats
systemd-network
systemd-resolve
messagebus
systemd-timesync
syslog
_apt
tss
uuidd
systemd-oom
tcpdump
avahi-autoipd
usbmux
dnsmasq
kernoops
avahi

cups-pk-helper
rtkit
whoopsie
sssd
speech-dispatcher
fwupd-refresh
nm-openvpn
saned
colord
geoclue
pulse
gnome-initial-setup
hplip
gdm
monetdb
postgres
gray
nxon
nobody
gray@gray:~$ ./exp_6.sh


[ 1 ] for listing all the user accounts name

[ 2 ] for counting the number of logged-in user accounts

[ 3 ] for listing the names of currently logged-in users

[ 4 ] for checking the groups to which the current user belong

2
# users=1
gray@gray:~$ ./exp_6.sh


[ 1 ] for listing all the user accounts name

[ 2 ] for counting the number of logged-in user accounts

[ 3 ] for listing the names of currently logged-in users

[ 4 ] for checking the groups to which the current user belong

3
gray
gray@gray:~$ ./exp_6.sh


[ 1 ] for listing all the user accounts name

[ 2 ] for counting the number of logged-in user accounts

[ 3 ] for listing the names of currently logged-in users

[ 4 ] for checking the groups to which the current user belong

4
gray adm cdrom sudo dip plugdev lpadmin lxd sambashare