

Output:-

Enter the year

2016

It is a leap year

Enter the year

200

not a leap year

Enter the year

800

the given year is leap year

Enter the year

2021

It is not a leap year

Expt. No. 1

LAB-1

a) Shell script to find if the given year is leap year or not

#!/bin/sh

echo "Enter the year"

read year

if [\$(year % 400) -eq 0]

then

echo "the given year is leap year"

elif [\$(year % 4) -eq 0]

then

if [\$(year % 100) -eq 0]

then

echo "not a leap year"

else

echo "It is a leap year"

fi

else

echo "It is not a leap year"

fi

Expt. No. _____

Output:-

Enter the radius

5

78.53

Enter the radius

0

0

- ⑥ Shell script to find area of a circle.

#!/bin/bash

echo "Enter the radius"

read rad

pi=3.142

area=`echo \$pi*\$rad*\$rad|bc`

echo \$area

Expt. No. _____

Output:-

Enter any number

-10

Number is negative

Enter any number

0

Number is zero

Enter any number

7

Number is positive

- Q) Shell script to check whether the given number is zero/ positive/ negative.

```
#!/bin/sh
echo "Enter any number:"
read num
if [ $num -eq 0 ]
then
echo "Number is zero"
elif [ $num -lt 0 ]
then
echo "Number is negative"
else
echo "Number is positive"
fi
```

Expt. No. _____

Output:-

Enter the first number -10

Enter the second number 6

Enter the third number 9

9 is the greatest

@) Shell script to find biggest of 3 numbers.

```
#!/bin/bash
read a
read b
read c
echo "Enter the first number $a"
echo "Enter the second number $b"
echo "Enter the third number $c"
if [ $a -gt $b -a $a -gt $c ]
then
    echo "$a is the greatest"
elif [ $b -gt $a -a $b -gt $c ]
then
    echo "$b is the greatest"
else
    echo "$c is the greatest"
fi
```

Output:-

Enter the number

6

720

Enter the number

1

1

Enter the number

0

0

Expt. No. 2

LAB-2

- ④ Shell script to find the factorial of a number.

```
#!/bin/bash
echo "Enter the number"
read n
fact=1
while [ $n -gt 1 ]
do
    fact=$((fact * n))
    n=$((n-1))
done
echo $fact
```

Expt. No. _____

Output:-

Enter the base salary of the employee

5654

Gross salary of employee is 7349.

(b) Shell script to compute the gross salary of an employee.
Dearness allowance is 10%, House rent allowance is 20%.

```
#!/bin/sh
echo "Enter the base salary of the employee"
read base
da = `expr $base.* 10/100/bc`
hra = `expr $base.* 20/100/bc`
gross = `expr $base + $da + $hra/bc`
echo "Gross salary of the employee is $gross"
```

Teacher's Signature : _____

Expt. No. _____

Output:-

Enter the temperature in Fahrenheit

898

481.11

Temperature in celsius is 481.11

Enter the temperature in Fahrenheit

32

0

Temperature in celsius is 0.

@ Shell script to convert the temperature Fahrenheit to celsius.

#!/bin/bash

echo "Enter the temperature in Fahrenheit"

read f

var = `expr \$f -32/9`

car = `expr 5*var/9`

cel = echo "scale=2; \$car" | bc

echo "Temperature in celsius is \$cel"

Teacher's Signature : _____

Output:-

Enter the first Number

6

Enter the second Number

8

perform addition

14

perform subtraction

-2

perform multiplication

48

perform division

0.75

Expt. No. _____

d) Shell script to perform arithmetic operations on given 2 numbers

```
#!/bin/sh
echo "Enter the first number"
read a
echo "Enter the second number"
read b
echo "perform addition"
echo "$a + $b" | bc
echo "perform subtraction"
echo "$a - $b" | bc
echo "perform multiplication"
echo "$a * $b" | bc
echo "perform division"
echo "scale = 2; $a / $b" | bc
```

Teacher's Signature : _____

Output:-

Enter the nth number

8

Sum of even number is : 20

Enter the nth number

-5

Sum of even number is 10

Expt. No. 3

LAB-3

a) shell script to find the sum of even numbers upto n.

```
#!/bin/bash
echo "Enter the nth number"
read n
sum=0
for ((i=0; i<=$n; i=i+2))
do
    sum=`expr $sum +$i|bc`
done
echo "Sum of even numbers is:$sum"
```

Output:-

123

131

132

133

111

112

113

121

211

212

213

221

222

223

231

232

233

311

312

313

321

322

323

331

332

333

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⑥ Shell script to print the combinations of numbers 123

#!/bin/bash

for i in 123

do

for j in 123

do

for k in 123

do

echo \$i \$j \$k

done

done

done

Teacher's Signature : _____

Output:-

Enter the number 4

Enter the power 4

Exponential value is 256

Enter the number 5

Enter the power 0

Exponential value is 1.

Expt. No. _____

@ Shell script to find power of a number

```
#!/bin/bash
echo "Enter the number"
read n
echo "Enter the power"
read p
val=1
while [ $p -gt 0 ]
do
    val=$(($val * n))
    p=$((p-1))
done
echo "Exponential value is $val"
```

Expt. No. _____

Output:-

Enter the nth number

6

Sum of n natural number is : 21

② Shell script to find sum of n natural number.

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

```
echo "Enter the nth number"
```

```
read n
```

```
sum=0
```

```
for ((i=0; i<=$n; i++))
```

```
do
```

```
sum='expr $sum +$i/bc'
```

```
done
```

```
echo "Sum of n natural number is : $sum"
```

Teacher's Signature : _____

Output:-

Enter the CIE marks

45

Enter the SEE marks

78

Enter the CIE marks

82

Enter the SEE marks

32

Enter the CIE marks

50

Enter the SEE marks

98

Enter the CIE marks

23

Enter the SEE marks

22

Enter the CIE marks

43

Enter the SEE marks

44

Enter the CIE marks

45

Enter the SEE marks

78

4 Subjects passed

2 Subjects failed

Expt. No. 4

LAB-4

@ Shell script to display the pass class of a student.

#!/bin/bash

for ((i=1; i<=6; i=i+1))

do

echo "Enter the CIE marks"

read cie

echo "Enter the SEE marks"

read see

total=\$((cie+see))

if [\$total -gt 40]

then

countpass=\$((countpass+1))

else

countfail=\$((countfail+1))

fi

done

echo "\$countpass subjects passed"

echo "\$countfail subjects failed"

Teacher's Signature :

Output:-

Enter the number

-3

The fibonacci series is :

given number is invalid
number should be greater than 0.

Enter the number

8

The fibonacci series is :

0

1

1

2

3

5

8

13

Expt. No. _____

(b) Shell script to find Fibonacci series upto n

#!/bin/bash

echo "Enter the number"

read n

a=0

b=1

echo "The fibonacci series is :"

if [\$n -gt 0]

then

for ((i=0; i<n; i+))

do

echo "\$a"

fib=\$((a+b))

a=\$b

b=\$fib

done

else

echo "given number is invalid"

echo "number should be greater than 0"

fi

Teacher's Signature : _____

Output:-

Enter a line of text:

Hi BMSCE, stranht passed 5th sem.

The given string has 7 vowels in it.

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Q) Shell script to count the number of vowels of a string

```
#!/bin/sh
```

```
echo -n "Enter a line of text: "
```

```
read string
```

```
vowCount=$(echo $string | grep -o -i "[aeiou]" | wc -l)
```

```
echo "The given string has $vowCount vowels in it."
```

Teacher's Signature: _____

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Output:-

\$ cat Demo1

Today is 22/01/2022

Welcome world, Hi Ananth

Have a great day

Enter the filename:

Demo1

Number of characters in Demo1 is 65

Number of words in Demo1 is 11

Number of lines in Demo1 is 4

(a) Shell script to check number of lines, words, characters in a file.

#!/bin/sh

echo "Enter the filename:"

read file

w='cat \$file | wc -w'

c='cat \$file | wc -c'

l='wc -l < \$file'

echo number of characters in \$file in \$c

echo number of words in \$file in \$w

echo number of lines in \$file in \$l

Teacher's Signature : _____

Output:-

SHELL=/bin/bash

SESSION_MANAGER=local/amanth-VirtualBox:@/tmp/.ICE-unix/1658,
unix/amanth-VirtualBox:/tmp/.ICE-unix/1658

QT_ACCESSIBILITY=1

COLORTERM=truecolor

XDG_CONFIG_DIRS=/etc/xdg /xdg-ubuntu:/etc/xdg

XDG_MENU_PREFIX=gnome-

LANGUAGE=en_IN:en

GNOME_SHELL_SESSION_MODE=ubuntu

XMODIFIERS=@im=ibus

DESKTOP_SESSION=ubuntu

SSH_AGENT_PID=1582

GTK_MODULES=gail:atk-bridge

PWD=/home/amanth

LOGNAME=amanth

XDG_SESSION_DESKTOP=ubuntu

XDG_SESSION_TYPE=x11

DISPLAY=:0

SHLVL=1

QT_IM_MODULE=ibus

XDG_RUNTIME_DIR=/run/user/1000

JOURNAL_STREAM=8:36332

GDMSESSION=ubuntu

XDG_DATA_DIRS=/usr/share/ubuntu:/usr/local/share/:/usr/share/:
/var/lib/snapd/desktopPATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin/bin:
usr/games:/usr/local/games:/snap/binDBUS_SESSION_BUS_ADDRESS=unix:path=/run/user/1000/bus
=.out

Expt. No. 5

LAB-5

@ Write a c/c++ program to that outputs the contents of its Environment list.

Program :-

```
#include <stdio.h>
int main (int argc, char* argv[ ])
{
    int i;
    char **ptr;
    for (ptr=environment; *ptr!=0; ptr++) /*echo all env strings*/
        printf ("%s\n", *ptr);
    return 0;
}
```

Teacher's Signature :

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- (b) Write a C/C++ program to emulate the unix ln command.

Program:-

#include <stdio.h>

#include <sys/types.h>

#include <unistd.h>

#include <string.h>

int main (int argc, char *argv [])

{

if (argc < 3 || argc > 4 || (argc == 4 && strcmp(argv[1], "-s")))

{

printf ("Usage : ./a.out [-s] <old-file> <new-link>\n");

return 1;

}

if (argc == 4)

{ if ((symlink(argv[2], argv[3])) == -1)

printf ("Cannot create symbolic link\n");

else

printf ("Symbolic link created\n");

}

else {

if ((link(argv[1], argv[2])) == -1)

printf ("cannot create hard link\n");

else

printf ("Hard link created\n"); }

return 0;

}

Output:-

```
$ gcc Sysprogram3.c
$ ./a.out area.sh abc
Hard link created
$ ls -l
-rwxrwxrwx 1 ananth ananth 103 Dec 6 123 combination.sh
-rwxrwxrwx 2 ananth ananth 117 Dec 7 abc
-rwxrwxr-x 1 ananth ananth 16816 Jan 8 a.out
-rwxrwxrwx 2 ananth ananth 117 Dec 12 area.sh
-rwxrwxrwx 1 ananth ananth 174 Dec 19 check.sh
(Bolded columns are hardlink count and mode no respectively)
```

```
$ ./a.out demo.sh abc
Cannot create hardlink (Because abc already exists)
```

```
$ gcc Sysprogram3.c
$ ./a.out -s area.sh 12345
Symbolic link created
```

```
$ ls -l
-rwxrwxrwx 1 ananth ananth 7 Jan 10 11:25 12345 → area.sh
```

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Output:-

```
$ gcc Sysprogram-1.c
$ ./a.out
```

System supports job control
 System supports saved set-UID and saved set-GID
 chown_restricted option is 0
 pathname_trunc option is 1
 Disable character for terminal files is 0

② C/C++ POSIX compliant program that prints the POSIX defined configuration options using feature test macros.

Program:-

```
#define _POSIX_SOURCE
#define _POSIX_C_SOURCE 199309L
#include <stdio.h>
#include <unistd.h>
int main()
{
#ifndef _POSIX_JOB_CONTROL
printf ("System supports JOB control\n");
#else
printf ("System does not support JOB control\n");
#endif
#ifndef _POSIX_SAVED_IDS
printf ("System supports saved set-UID and saved set-GID\n");
#else
printf ("System does not support saved set-UID and set-GID\n");
#endif
#ifndef _POSIX_CHOWN_RESTRICTED
printf ("chown_restricted option is 1\n");
#else
printf ("System does not support chown_restricted option\n");
#endif
#ifndef _POSIX_NO_TRUNC
printf ("Pathname trunc option is 1\n");
#else

```

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```
printf ("System does not support system-wide pathname  
trunc option \\n");  
#endif  
#ifdef _POSIX_VDISABLE  
printf ("Disable character for terminal files is \'.d\\n',  
-POSIX_VDISABLE);  
#else  
printf ("System does not support -POSIX_VDISABLE \\n");  
#endif  
return 0;  
}
```

Output:-

/*Terminal 1 - writer process*/

\$ gcc sysprogram_4.c

./a.out Demo "Hi ananth"

After this open new Terminal by pressing shift + ctrl + N

/*Terminal 2 - reader process*/

\$./a.out Demo
Hi ananth.

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- (d) Write a C/C++ program that demonstrates interprocess communication b/w a reader process and a writer process. Use mkfifo, open, read, write and close APIs in program.

Program:-

```
#include <sys/types.h>
#include <unistd.h>
#include <fcntl.h>
#include <sys/stat.h>
#include <string.h>
#include <errno.h>
#include <stdio.h>

int main ( int argc, char* argv[ ] )
{
    int fd;
    char buf[256];
    if (argc != 2 && argc != 3)
    {
        printf ("USAGE %s <file> [<arg>]\n", argv[0]);
        return 0;
    }
    mkfifo (argv[1], S_IFIFO | S_IRWXU | S_IRWXG | S_IROWXO);
    if (argc == 2)
    {
        fd = open (argv[1], O_RDONLY | O_NONBLOCK);
        while (read (fd, buf, sizeof (buf)) > 0)
            ;
    }
}
```

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```
printf ("%s", buf);
```

{

else

{

```
fd = open (argv [1], O_WRONLY);
```

```
write (fd, argv [2], strlen (argv [2]));
```

{

```
close (fd);
```

{