B M S. COLLEGE OF ENGINEERING

(Autonomous Institution)

RECORD OF PRACTICAL WORK

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SUBJECT : USP - LAB

SEMESTER : V BRANCH : CSE

ROLL NO : USN : 035

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Particulars of the Experiments Performed

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OUTPUT

case 1 :- Enter the year
2000
2000 is a leap year

case 2 - Enter the year
1990
1990 is not a leap year

case 3 - Enter the year
2012
2012 is a leap year

Date 25/10/2021

Expt. No. 1 Page No. 1

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

```
#!/bin/sh
echo "Enter the year"
read y
if [ `expr $y % 400` -eq 0 ]
then
        echo "$y is a leap year"
elif [ `expr $y % 4` -eq 0 ]
then
        echo "$y is a leap year"
else
        echo "$y is not a leap year"
fi
```

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OUTPUT

```
Enter the radius
12
Area is 452.16
```

Date 25/10/2021

Expt. No. 2 Page No. 2

Shell script to find the area of a circle

```
#!/bin/sh
echo "Enter the radius"
read r
pi = 3.14
area = `echo $pi \* $r \* $r | bc`
echo "Area is $area"
```

Teacher's Signature :

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OUTPUT

case 1 → Enter the number
1
1 is positive

case 2 → Enter the number
-1
-1 is negative

case 3 → Enter the number
0
Number is zero

Date 25/10/2021

Expt. No. 3 Page No. 3

Shell script to check if a number is positive, negative or zero

```
#!/bin/sh
echo "Enter the number"
read n
if [ $n -lt 0 ]
then
        echo "$n is negative"
elif [ $n -gt 0 ]
then
        echo "$n is positive"
else
        echo "$n is zero"
fi
```

Teacher's Signature :

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OUTPUT →

```
Enter number 1
25
Enter number 2
50
Enter numbe 3
75
Printing Largest
75
```

Date 25/10/2021

Expt. No. 4 Page No. 4

Shell script to find the largest of three numbers

```
#!/bin/sh
        echo "Enter number 1"
        read n1
        echo "Enter number 2"
        read n2
        echo "Enter number 3"
        read n3
        echo "Printing largest"
        if [ $n1 -gt $n2 -a $n1 -gt $n3 ]
        then
                echo "$n1"
        elif [ $n2 -gt $n1 -a $n2 -gt $n3 ]
        then
                echo "$n2"
        else
                echo "$n3"
fi
```

Teacher's Signature :

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OUTPUT

```
Enter the number
4
24
```

Expt. No. 5

Date 8/11/2021

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Shell script to find the factorial of a number

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

Teacher's Signature :

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OUTPUT

```
Enter basic salary
200
260
```

Expt. No. 6

Date 8/11/2021

Page No. 6

Shell script to calculate the Gross salary

```
#! /bin/sh
echo "Enter basic salary"
read sal
hra = $ (( sal * 20/100 ))
da = $ (( sal * 10/100 ))
gross = $ (( sal + da + hra ))
echo "Gross salary = $gross"
```

Teacher's Signature :

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OUTPUT

```
Enter temperature in Fahrenheit
100
100 degree Fahrenheit = 37.7778 degree celsius
```

Date 8/11/2021

Expt. No. 7

Page No. 7

Write shell script to convert temperature from Fahrenheit to celsius

```
#!/bin/sh
echo " Enter temperature in Fahrenheit "
read f
c =` echo "scale = 4; ($f -32) / 1.8 " | bc `
echo " $f degree Fahrenheit = $c degree celsius"
```

Teacher's Signature :

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OUTPUT

1. Addition
2. Subtraction
3. Multiplication
4. Division

1.
Enter two numbers
10
20
Answer = 30

2.
Enter two numbers
10
20
Answer = -10

3.
Enter two numbers
10
20
Answer = 200

4.
Enter two numbers
10
20
Answer = 0.5

Shell script to perform arithmetic operations on two given numbers

```
#!/bin/sh
echo "1. Addition \n 2. Subtraction \n 3. Multiplication \n
    4. Division "
read choice
echo "Enter the two numbers
read a
read b
case $choice in
1) ans = $((a + b)) ;;
2) ans = $((a - b)) ;;
3) ans = $((a * b)) ;;
4) ans = `echo "scale=2 ; $a / $b" | bc` ;;
*) ans = 0 ; echo "Enter valid input " ; Exit 0 ;;
esac
echo " Answer = $ans"
```


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OUTPUT

```
Enter value of n
10
Sum = 30
```

Date 15/11/2021

Expt. No. 9

Page No. 9

Shell script to calculate sum of even numbers upto n

```
#!/bin/sh
echo " Enter value of n "
read n
even = 2
while [ $even -le $n ]
do
        sum = $(( sum +even ))
        even = $(( even + 2 ))
done
echo " Sum = $sum "
```

Teacher's Signature :

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OUTPUT

```
1 1 1
1 1 2
1 1 3
1 2 1
1 2 2
1 2 3
1 3 1
1 3 2
1 3 3
2 1 1
2 1 2
2 1 3
2 2 1
2 2 2
2 2 3
2 3 1
2 3 2
2 3 3
3 1 1
3 1 2
3 1 3
3 2 1
3 2 2
3 2 3
3 3 1
3 3 2
3 3 3
```

Date 15/11/2021

Expt. No. 10

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Shell script to print all combinations of 1 2 3

```
#!/bin/sh
for i in 1 2 3
do
    for j in 1 2 3
    do
        for k in 1 2 3
        do
            echo "$i $j $k"
        done
    done
done
```

Teacher's Signature :

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OUTPUT

```
Enter a number
2
Enter power of number
3
Answer = 8
```

Expt. No. 11 Date 15/11/2021

Page No. 11

Shell script to calculate power of a number

```
#!/bin/sh
echo "Enter a number"
read num
echo "Enter power of number"
read pow
expo = 1
total = 1
while [ $expo -ne $((pow+1)) ]
do
        total = $((total * n))
        expo = $((expo + 1))
done
echo "answer = $total"
```

Teacher's Signature :

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OUTPUT

```
Enter value of n
3
Enter number to be added
10
Enter number to be added
20
Enter number to be added
30
Total = 60
```

Date 15/11/2021

Expt. No. 12

Page No. 12

Shell script to find the sum of n natural numbers

```
#!/bin/sh
echo " Enter value of n "
read n
total = 0
while [ $n -gt 0 ]
do
        echo " Enter the number to be added "
        read num
        total = $ (( total + num ))
        n = $((n -1))
done
echo " Total = $total "
```

6/11/2021

Teacher's Signature :

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OUTPUT

```
Enter CIE marks of subject 1
40
Enter SEE marks of subject 1
80
Grade of subject = A
Enter CIE marks of subject 2
19
Enter SEE marks of subject 2
60
Grade of subject = F
Enter CIE marks of subject 3
38
Enter SEE marks of subject 3
84
Grade of subject = A
Enter CIE marks of subject 4
28
Enter SEE marks of subject 4
84
Grade of subject = B
Enter CIE marks of subject 5
18
Enter SEE marks of subject 5
80
Enter CIE marks of subject 6
48
Enter SEE marks of subject 6
92
Grade of subject = S

Number of pass subjects = 4
Number of fail subjects = 2
```


Shell script to display pass class of a student

```
#!/bin/sh
n=1
pass=0
fail=0
while [ $n -lt 7 ] ; do
    echo "Enter CIE marks of subject $n"
    read cie
    echo "Enter SEE marks of subject $n"
    read see
    if [ $cie -lt 20 -o $see -lt 40 ]
    then ; fail = $((fail+1))
    echo "Grade of subject $n = F" ; else
    pass = $((pass+1))
    see = $((see/2))
    grade = $((cie+see))
    if [ $grade -ge 90 ]
    then echo "Grade of subject = S"
    if [ $grade -ge 80 -a $grade -lt 90 ]
    then echo "Grade of subject = A"
    if [ $grade -ge 70 -a $grade -lt 80 ]
    then echo "Grade of subject = B"
    if [ $grade -ge 60 -a $grade -lt 70 ]
    then echo "Grade of subject = C"
```


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```
    if [ $grade -ge 50 -a $grade -lt 60 ]
    then echo " Grade of subject = D"
    if [ $grade -ge 40 -a $grade -lt 50 ]
    then echo "Grade of subject = E"
    fi
    fi
    n= $((n+1))
done
echo " Number of pass subjects = $pass"
echo "Number of failed subjects= $fail"
```


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OUTPUT

```
Enter the value of n
8
Fibonacci Series
0 1 1 2 3 5 8 13
```

Expt. No. 14 Date 29/11/2021

Page No. 15

Shell script to find Fibonacci series up to n numbers

```
#!/bin/sh
echo "Enter value of n"
read n
echo "Fibonacci series"
num0 = 0
num1 = 1
echo "$num0"
while [ $n -gt 0 ]
do
        fibo = $((num1 + num0))
        echo "$num1"
        num0 = num1
        num1 = $fibo
        n = $((n-1))
done
```

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OUTPUT

```
Enter a string
Hello this is computer
e o i i o u e
Number of vowels in the string is = 7
```

Date 29/11/2021

Expt. No. 15

Page No. 16

Shell script to count the number of vowels in a string

```
#!/bin/sh
echo "Enter a string"
read str
len = $ (expr length $str)
count = 0
while [ $len -gt 0 ]
do
        ch = $(echo $str | cut -c $len )
        case $ch in
                [aeiouAEIOU])
                        count = $ ((count+1))
                        echo $ch
                        ;;
        esac
        len = $ ((len-1))
done
echo " Number of vowels in a string is = "
echo " $ count"
```

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OUTPUT

```
Enter File path
bmsce@ubuntu : ~/ pacq . txt $
Number of lines = 3
Number of words = 21
Number of characters = 108
```

Date 29/11/2021

Expt. No. 16 Page No. 17

Shell script to check number of lines, words and characters

```
#!/bin/sh
echo "Enter File Path"
read str
lines =`wc -l $str`
words =`wc -wc $str`
char =`wc -c $str`
echo "Number of lines : $lines"
echo "Number of words : $words"
echo "Number of characters : $char"
```

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DUTPUT

SSH_AGENT_PID = 3207
HOSTNAME = localhost.localdomain
SHELL = /bin/bash
TERM = xterm
HISTSIZE = 1000
KDE_NO_IPV6 = 1
GTK_RC_FILES = /etc/gtk/root/gtkrc-1.2-gnome2
WINDOWID = 4404273
OLDPWD = /root/bin
QTDIR = /usr/lib/qt-3.3
QTINC = /usr/lib/qt 3.3/include
USER = root
LS_COLOURS = no = 00
KDEDIR = /usr
MAIL = /var/spool/mail/root
PATH = /usr/lib/qt
HOME = /root
SHLVL = 2
LOGNAME = root
QTLIB = /usr/lib/qt-3.3/lib
COLORTERM = gnome-terminal

Date 13/12/2021

Expt. No. 17 Page No. 18

Write a C Program that outputs the content of its environment list

```
#include <stdio.h>
int main (int argc, char * argv[])
{
    int i;
    char ** pt;
    extern char ** environ;
    for (pt = environ; *pt != 0; pt++)
            printf ("%s", *pt);
    return 0;
}
```

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OUTPUT

```
Usage ./a.out [-s] fname linkname
      ./a.out 1 2 3 4
Usage ./a.out [-s] fname linkname
      ./aput 1.c z
Hard link created.
-sf ./a.out -s 1a.c z7
    Symbolic link created.
```


Write C program to emulate the unix ln command

```
#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] fname linkname");
        return 1;
    }
    if (argc == 4)
    {
        if ((symlink(argv [2], argv [3])) == -1)
            printf ("Cannot create soft link");
        else
            printf (" Soft link created");
    }
    else
    {   if ((argv [1], argv [2])) == -1)
        printf (" Cannot create hard link");
        else
            printf (" Hard link created");
    }
return 0;
}
```


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OUTPUT

System supports job control
System supports saved set UID and saved set GID
chown_restricted option is 1
Pathname trunc option is 1
Disable character for terminal files is zero

Date 13/12/2021

Expt. No. 19 Page No. 20

Write a C program that prints POSIX defined configuration options supported on any given system using features test macros.

```
#define _POSIX_SOURCE
#define _POSIX_C_SOURCE 199309L
#include <stdio.h>
#include <unistd.h>
int main()
{
  #ifdef _POSIX_JOB_CONTROL
      printf("System supports job control");
  #else
      printf("Does not support job control");
  #endif
  #ifdef _POSIX_SAVED_IDS
      printf("System supports saved set UID and GID");
  #else
      printf("System does not support saved set UID and GID");
  #endif
  #ifdef _POSIX_CHOWN_RESTRICTED
      printf("chown_restricted options %d", _POSIX_CHOWN_RESTRICTED);
  #else
      printf("System does not support chown restricted");
  #endif
  #ifdef _POSIX_NO_TRUNC
      printf("Pathname truncate option is %d", _POSIX_NO_TRUNC);
```

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```
#else
    printf ("System does not support system wide pathname func option");
#endif
#ifdef _POSIX_VDISABLE
    printf ("Disable file character is %d", _POSIX_VDISABLE);
#else
    printf ("System does not support _POSIX_VDISABLE");
#endif
return 0;
}
```


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OUTPUT

TERMINAL 1

./a.out FIFO1 "This is USP & CD lab"

After this open New Terminal

TERMINAL 2

./a.out FIFO 1

This is USP & CD lab

Write C program which demonstrates interprocess communication between a reader process and writer process. Using mkfifo, open, read, write API's.

```
#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 buff[256];
    if(argc != 2 && argc != 3)
    {
        printf (" USAGE %s <file> [<arg>] ", argv[0] );
        return 0;
    }
    mkfifo (argv[1], S_FIFO | S_IRWXU | S_IRWXG | S_IRWXO);
    if (argc == 2)
    {
        fd = open (argv[1], O_RDONLY | O_NONBLOCK);
        while (read (fd, buf, sizeof (buf)) > 0)
        printf (" %s", buf );
    }
```


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```
else
{
    fd = open (argv[1], O_WRONLY);
    write (fd, argv[2], strlen (argv[2]));
}
close (fd);
}
```


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