

LAB-2

1. Write a Shell Script which works like a calculator and performs below operations
Addition, Subtract, Division and Multiplication.

```
echo "Enter number 1:"
read a
echo "Enter number 2:"
read b

echo "Operations:-"
echo "1. Addition"
echo "2. Subtraction"
echo "3. Multiplication"
echo "4. Division"
echo "Enter Choice : "

read ch

# For Addition
if [ $ch == 1 ]
then
    ans=$(( $a + $b ))
    echo "Addition = $ans"

# For Substraction
elif [ $ch == 2 ]
then
    ans=$(( $a - $b ))
    echo "Substraction = $ans"

# For Multiplication
elif [ $ch == 3 ]
then
    ans=$(( $a * $b ))
    echo "Multiplication = $ans"

# For Division
elif [ $ch == 4 ]
then
    if [ $b != 0 ]
    then
        ans=$(( $a / $b ))
        echo "Division = $ans"
    else
        echo "Please Enter non-zero value in number 2..."
    fi

#Invalid Choice
else
```

```
    echo "Invalid choice!"
fi
```

2. Write a Shell Script to find a greater number out of 2 numbers.

```
echo "Enter number 1 : "
read a
echo "Enter number 2 : "
read b

# For finding greater number among two numbers
if [ $a -gt $b ]
then
    echo "a=$a is greater"
elif [ $b -gt $a ]
then
    echo "b=$b is greater"
else
    echo "a and b are equal"
fi
```

LAB-3

1. Write a Shell Script to check given number is ODD or EVEN.

```
echo "Enter number : "
read n

# For finding ODD or EVEN number
if [ `expr $n % 2` -eq 0 ]
then
    echo "Number is even"
else
    echo "Number is odd"
fi
```

2. Write a Shell Script to find the largest among the 3 given numbers using if...else.

```
echo "Enter first number: "
read a

echo "Enter second number: "
read b

echo "Enter third number: "
read c

if [ $a -ge $b -a $a -ge $c ]
then
    echo "a is max"
fi

if [ $b -ge $a -a $b -ge $c ]
then
    echo "b is max"
fi
```

```
if [ $c -ge $a -a $c -ge $b ]
then
    echo "c is max"
fi
```

3. Write a Shell Script to find the largest among the 3 given numbers using nested if.

```
echo "Enter first number: "
read a

echo "Enter second number: "
read b

echo "Enter third number: "
read c

# Using Nested if statement....
if [ $a -eq $b -a $a -eq $c ]
then
    echo "All are equal"
else
    if [ $a -ge $b ]
    then
        if [ $a -ge $c ]
        then
            echo "a is max"
        else
            echo "c is max"
        fi
    else
        if [ $b -ge $c ]
        then
            echo "b is max"
        else
            echo "c is max"
        fi
    fi
fi
```

4. Write a Shell Script to find the largest among the 3 given numbers using if-else-if ladder.

```
echo "Enter first number: "
read a

echo "Enter second number: "
read b

echo "Enter third number: "
read c

# Using if-else-if ladder
```

```
if [ $a -gt $b -a $a -gt $c ]
then
    echo "a is max"
elif [ $b -gt $a -a $b -gt $c ]
then
    echo "b is max"
elif [ $c -gt $a -a $c -gt $b ]
then
    echo "c is max"
else
    echo "All are equal"
fi
```

LAB-4

1. Write a Shell Script to check given year is Leap year or not.

```
echo "Enter Year:"
read y

year=$y

y=$(( $y % 4 ))
if [ $y -eq 0 ]
then
    echo "$year is Leap Year!"
else
    echo "$year is not a Leap Year!"
fi
```

2. Write a shell script to generate mark sheet of a student. Take 3 subjects, calculate and display total marks, percentage and Class obtained by the student.

```
echo "Enter Subject-1 marks: "
read s1

echo "Enter Subject-2 marks: "
read s2

echo "Enter Subject-3 marks: "
read s3

total=$(( $s1 + $s2 + $s3 ))
echo "Total Marks : $total"

per=$(( $total / 3 ))
echo "Percentage: $per %"

if [ $per -gt 70 ]
then
    echo "Distinction Class"
elif [ $per -ge 61 -a $per -le 70 ]
then
    echo "First Class"
elif [ $per -ge 51 -a $per -le 60 ]
```

```
then
    echo "Second Class"
elif [ $per -ge 41 -a $per -le 50 ]
then
    echo "Third Class"
else
    echo "Fail"
fi
```

LAB-5

1. Write a Shell Script to print 1 to n numbers using while loop.

```
echo "Enter n : "
read n
i=1
echo "Number list:-"
while [ $i -le $n ]
do
echo $i
i=`expr $i + 1`
done
```

2. Write a Shell Script to find Sum & Average of n numbers.

```
echo "Enter Size(N) "
read N
i=1
sum=0

echo "Enter Numbers"
while [ $i -le $N ]
do
    read num          #get number
    sum=`expr $sum + $num`  #sum+=num
    i=`expr $i + 1`
done

avg=`expr $sum / $N`
echo "Sum is $sum"
echo "Average is $avg"
```

3. Write a Shell Script to display the multiplication table of the given number.

```
echo "Enter a Number"
read n
i=1
while [ $i -le 10 ]
do
    echo " $n x $i = `expr $n \* $i`"
    i=`expr $i + 1`
done
```

LAB-6

1. Write a Shell Script to find factorial of given number n.

```
echo "Enter number"
read num

fact=1

while [ $num -gt 1 ]
do
    fact=$((fact * num))    #fact = fact * num
    num=$((num - 1))        #num = num - 1
done

echo $fact
```

2. Write a Shell Script to check whether a given number is palindrome or not.

```
echo "Enter number"
read number

realnumber=$number

n=`expr $number % 10`
number=`expr $number / 10`

while [[ $number -ne 0 ]]
do
    n=`expr $n \* 10 + $number % 10`
    number=`expr $number / 10`
done

if [[ $n -eq $realnumber ]]; then
    echo "Palindrome"
else
    echo "Not Palindrome"
fi
```

LAB-7

1. Write a Shell Script to find the value of one number raised to the power of another.

```
echo "Input number"
read no
echo "Input power"
read power

counter=0
ans=1

while [ $power -ne $counter ]
do
    ans=`expr $ans \* $no`
    counter=`expr $counter + 1`
done

echo "$no power of $power is $ans"
```

2. Write a Shell Script to check whether a given number is prime or not.

```
echo "Enter number"
read number
prime=1
for (( i = 2; $i < $number; i++ ))
do
    if [[ `expr $number % $i` -eq 0 ]]
    then
        prime=0
    fi
done
if [[ $prime -eq 1 ]]
then
    echo "Prime"
else
    echo "Not Prime"
fi
```

3. Write a Shell Script in which will accept a number n and display first m prime numbers as output?

```
echo "enter start no="
read i
echo "enter end no="
read j
flag=0
tem=2
count=1

while [ $i -ne $j ]
do
    temp=`echo $i`

    while [ $temp -ne $tem ]
    do
        temp=`expr $temp - 1`
        n=`expr $i % $temp`

        if [ $n -eq 0 -a $flag -eq 0 ]
        then
            flag=1
        fi
    done

    if [ $flag -eq 0 ]
    then
        echo " prime No $count  = $i"
        count=`expr $count + 1`
    else
        flag=0
    fi
    i=`expr $i + 1`
```

```
        if [ $count -eq 11 ]
        then
            break
        fi
    done
```

LAB-8

1. Write a Shell Script to print the pyramid structure for the given number.

```
echo "Enter size of pyramid : "
read n
i=0
for((k=1; k<=n; k++))
do
    # This loop print spaces
    for((a=i; a<=n; a++))
    do
        printf " ";
    done

    # This loop print the left side of the pyramid
    for((j=1; j<=k; j++))
    do
        printf "*";
    done

    # This loop print right side of the pyramid.
    for((i=1; i<k; i++))
    do
        printf "*";
    done

    # New line
    echo;
done
```

2. Write a Shell Script to check whether the given string is palindrome or not.

```
echo "Enter String"
read String
size=`expr length "$String"`
msg="Palindrome"
for (( i = 0, j = size-1; i < size; i++,j-- )); do
    if [[ ${String:i:1} != ${String:j:1} ]]; then
        msg="Not Palindrome"
    fi
done
echo "String is $msg"
```

LAB-9

1. Write a Shell Script to find first n Fibonacci numbers like: 0 1, 1, 2, 3, 5, 13

```
echo "Enter Range"
read number
```



```
n1=1
n2=1
echo "Fibonacci Series:-"
for (( i = 0; $i < $number; i++ )); do
    echo $n2
    temp=$n1
    n1=`expr $n1 + $n2`
    n2=$temp
done
```

2. To scans the name of the command and executes it.

```
echo "Command:-"
echo "1.cal"
echo "2.ls"
echo "3.date"
echo "Enter choice:"
read choice
case $choice in
    1)
        echo $(cal)
        ;;
    2)
        echo $(ls)
        ;;
    3)
        echo $(date)
        ;;
esac
```

3. Write a Shell Script to display current month calendar.

```
echo "Current Month Calendar"
echo $(cal)
```

LAB-10

1. Write a Shell Script which will print the following menu and execute the given task?

- a) Display calendar of current month
- b) Display today's date and time
- c) Display usernames that are currently logged in the system
- d) Display your name at given x, y position
- e) Display your terminal number

```
echo "1. Display calendar of current month"
echo "2. Display today's date and time"
echo "3. Display usernames that are currently logged in the system"
echo "4. Display your name at given x, y position"
echo "5. Display your terminal number"
```

```
echo "Enter choice:"
read choice
case $choice in
```

```

1)
echo $(cal)
;;
2)
echo $(date)
;;
3)
echo $(whoami)
;;
4)
printf "%20s%30s\n" Maulik Trivedi
;;
5)
echo $(tty)
;;
esac

```

LAB-11

1. Write a Shell Script to read n numbers as command arguments and sort them in descending order.

```

echo "Enter N"
read n
for (( i = 1; i <= n; i++ )); do
    echo "Enter Array ["$i"] : "
    read array[i]
done
for (( i = 1; i <= 5; i++ )); do
    for (( j = i+1; j <= 5; j++ )); do
        if [[ ${array[i]} > ${array[j]} ]]; then
            temp=${array[i]}
            array[i]=${array[j]}
            array[j]=$temp
        fi
    done
done
echo "Elements of sorted array:-"
for (( i = 1; i <= 5; i++ )); do
    echo ${array[i]}
done

```

2. Write a Shell Script to display all executable files, directories and zero sized files from current directory.

```

#display empty file
find /home/student/Documents/ -type f -empty

#display directory
$ ls -d */

#display executable file
find /home/student/.anaconda/navigator/ -executable -type f

```

3. Write a Shell Script to display the date, time and a welcome message (like Good Morning etc.). The time should be displayed with a.m. or p.m. and not in 24 hours notation.

```
HH=`date +%H`  
time=`date +"%M %p"`  
  
if [ $HH -ge 12 ]  
then  
    HH=`expr $HH % 12`  
    if [ $HH -lt 5 ]  
    then  
        msg="GOOD AFTERNOON"  
    elif [ $HH -ge 5 ] && [ $HH -lt 9 ]  
    then  
        msg="GOOD EVENING"  
    else  
        msg="GOOD NIGHT"  
    fi  
    echo "$msg ,CURRENT TIME $HH:$time" exit 1  
else  
    if [ $HH -lt 5 ]  
    then  
        msg="GOOD NIGHT"  
    else  
        msg="GOOD MORNING"  
    fi  
    echo "$msg ,CURRENT TIME $HH:$time"  
fi
```

LAB-12

1. Write a Shell Script to validate the entered date. (E.g. Date format is: dd-mm-yyyy).

```
# store day, month and year  
dd=0  
mm=0  
yy=0  
  
# store number of days in a month  
days=0  
  
# get day, month and year  
echo -n "Enter day (dd) : "  
read dd  
  
echo -n "Enter month (mm) : "  
read mm  
  
echo -n "Enter year (yyyy) : "  
read yy  
  
# if month is negative (<0) or greater than 12  
# then it is invalid month
```

```
if [ $mm -le 0 -o $mm -gt 12 ];
then
    echo "$mm is invalid month."
    exit 1
fi

# Find out number of days in given month
case $mm in
    1) days=31;;
    2) days=28 ;;
    3) days=31 ;;
    4) days=30 ;;
    5) days=31 ;;
    6) days=30 ;;
    7) days=31 ;;
    8) days=31 ;;
    9) days=30 ;;
    10) days=31 ;;
    11) days=30 ;;
    12) days=31 ;;
    *) days=-1;;
esac

# find out if it is a leap year or not

if [ $mm -eq 2 ]; # if it is feb month then only check of leap year
then
    if [ $((yy % 4)) -ne 0 ] ; then
        : # not a leap year : means do nothing and use old value of days
    elif [ $((yy % 400)) -eq 0 ] ; then
        # yes, it's a leap year
        days=29
    elif [ $((yy % 100)) -eq 0 ] ; then
        : # not a leap year do nothing and use old value of days
    else
        # it is a leap year
        days=29
    fi
fi

# if day is negative (<0) and if day is more than
# that months days then day is invalid
if [ $dd -le 0 -o $dd -gt $days ];
then
    echo "$dd day is invalid"
    exit 3
fi

# if no error that means date dd/mm/yyyy is valid one
echo "$dd/$mm/$yy is a valid date"
```

2. Write a Shell Script which checks whether a given user is valid or not.

```
echo "enter user : "
read user
```

```
echo "Validating the $user ..."
if [ `grep -c $user /etc/passwd` -eq 0 ]
then
    echo
    echo "INVALID USERNAME."
else
    echo "$user IS A VALID USER."
fi
```

3. Write a Shell Script that finds total no. of users and finds out how many of them are currently logged in.

```
cat /etc/passwd>user.txt
    set `wc -l user.txt`
    log=`who -a | wc -l`
echo "There are $1 users"
echo "There are $log user logged in currently "
```

4. Write an awk program using function, which convert each word in a given text into capital.

```
a="UPPER CASE"
echo "$a" | awk '{print tolower($0)}'
```

5. Write a program for process creation using C. (Use of gcc compiler).

```
#include <stdio.h>
#include <sys/types.h>
#include <unistd.h>
int main()
{

    // make two process which run same
    // program after this instruction
    fork();

    printf("Hello world!\n");
    return 0;
}
```

Output:
Hello world!
Hello world!