OPERATING SYSTEMS LABSHEET TWO

1. Understand the following program, line by line.

```
#!/bin/sh
case $# in
0) set `date`; m=$2; y=$6 ;;
1) m=$1; set `date`; y=$6 ;;
*) m=$1; y=$2 ;;
esac

case $m in
jan*|Jan*) m=1 ;;
feb*|Feb*) m=2 ;;
mar*|Mar*) m=3 ;;
apr*|Apr*) m=4 ;;
may*|May*) m=5 ;;
jun*|Jun*) m=6 ;;
jul*|Jul*) m=7 ;;
aug*|Aug*) m=8 ;;
sep*|Sep*) m=9 ;;
oct*|Oct*) m=10 ;;
nov*|Nov*) m=11 ;;
dec*|Dec*) m=12 ;;
[1-9]|10|11|12) ;;
*)   y=$m; m="" ;;
esac

/usr/bin/cal $m $y
```

Solution :-

```
#!/bin/sh
case $# in
```

checks number of arguments and choose the apropriate action

```
0) set `date`; m=$2; y=$6 ;;
```

  sets the current date.
  gets month from 2nd argument, year from sixth argument.

```
1) m=$1; set `date`; y=$6 ;;
```

get month and assign to m. set the date and assign the current year to y

*) m=$1; y=$2 ;;

if the number of arguments is neither 0 nor 1, then catch all
assign 1st argument to month and 2nd argument to year.

esac

/* convert the month if it is in textual form, into number. */

```
case $m in
jan*|Jan*) m=1 ;;
feb*|Feb*) m=2 ;;
mar*|Mar*) m=3 ;;
apr*|Apr*) m=4 ;;
may*|May*) m=5 ;;
jun*|Jun*) m=6 ;;
jul*|Jul*) m=7 ;;
aug*|Aug*) m=8 ;;
sep*|Sep*) m=9 ;;
oct*|Oct*) m=10 ;;
nov*|Nov*) m=11 ;;
dec*|Dec*) m=12 ;;
[1-9]|10|11|12) ;;   /* numeric month
*)   y=$m; m="" ;;   /* plain year
esac

/usr/bin/cal $m $y   /* run the real one with converted arguments.
```

run the commands with various arguments.

```
cal dec
date
cal dec
cal 9 1992
cal 9
```

2. Run the program

./cal.sh 8 2013

```
linux@linux-Inspiron-3520:~/OS$ chmod +x free.sh
linux@linux-Inspiron-3520:~/OS$ ./free.sh 8 2013
    August 2013
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
```

./cal.sh August 2013

```
linux@linux-Inspiron-3520:~/OS$ ./free.sh August 2013
    August 2013
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
```

./free.sh 3 2014

```
linux@linux-Inspiron-3520:~/OS$ ./free.sh 3 2014
     March 2014
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
```

3. Modify the cal to accept more than one month, as in
 ./cal.sh oct nov
      or
./cal.sh oct – nov

```
#!/bin/sh

case $# in
 0) set `date`; m1=$2;m2=$2; y=$6 ;;
 1) m=$1;m2=$1; set `date`; y=$6 ;;
 2) m1=$1;m2=$2;set `date`; y=$6;;
 3)
    if test "$2" = -
    then
        m1=$1
        m2=$3;
        set `date`;y=$6;
    else
        m1=$1;
        m2=$2;
        y=$3
fi
;;
4)m1=$1;m2=$3;y=$4;;
*) echo "hai"; m1=$1;m2=$2; y=$3 ;;
esac

case $m1 in
jan*|Jan*) m1=1 ;;
feb*|Feb*) m1=2 ;;
mar*|Mar*) m1=3 ;;
apr*|Apr*) m1=4 ;;
may*|May*) m1=5 ;;
jun*|Jun*) m1=6 ;;
jul*|Jul*) m1=7 ;;
aug*|Aug*) m1=8 ;;
sep*|Sep*) m1=9 ;;
oct*|Oct*) m1=10 ;;
nov*|Nov*) m1=11 ;;
dec*|Dec*) m1=12 ;;
[1-9]|10|11|12) ;;
*)y=$m1; m1="" ;;
```

```
esac

case $m2 in
jan*|Jan*) m2=1 ;;
feb*|Feb*) m2=2 ;;
mar*|Mar*) m2=3 ;;
apr*|Apr*) m2=4 ;;
may*|May*) m2=5 ;;
jun*|Jun*) m2=6 ;;
jul*|Jul*) m2=7 ;;
aug*|Aug*) m2=8 ;;
sep*|Sep*) m2=9 ;;
oct*|Oct*) m2=10 ;;
nov*|Nov*) m2=11 ;;
dec*|Dec*) m2=12 ;;
[1-9]|10|11|12) ;;
*) y=$m2; m="" ;;
esac

if  [  "$m1" -le "$m2"  ]
then
        while [ $m1 -le $m2 ]
        do
                /usr/bin/cal $m1 $y
                m1=$(( m1 +1 ))
        done
fi
```

output:-

```
                                                    30 31
linux@linux-Inspiron-3520:~/OS$ chmod +x calnew.sh
linux@linux-Inspiron-3520:~/OS$ ./calnew.sh oct - nov
    October 2014
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

   November 2014
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
```

```
linux@linux-Inspiron-3520:~/OS$ ./calnew.sh oct  nov
    October 2014
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

   November 2014
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
```

4. Write a series of scripts that will count the number of parameters on the command line,
first using for statement, use while and also until statement. (Three scripts)

using for loop statement:-

```
#! /bin/sh
no=0
for i in $*
do
```

```
        no=$((no + 1))
done
echo "There are $no arguments"
```

```
linux@linux-Inspiron-3520:~/OS$ gedit lab2_Q4a.sh
linux@linux-Inspiron-3520:~/OS$ chmod +x lab2_Q4a.sh
linux@linux-Inspiron-3520:~/OS$ ./lab2_Q4a.sh 1 2 3
There are 3 arguments
```

using while loop statement:-

```
# !/bin/sh
no=0
while test  $# -gt 0
do
        no=$(( no +1))
        shift
done
echo "The number of arguments are $no"
```

```
linux@linux-Inspiron-3520:~/OS$ gedit lab2_Q4b.sh
linux@linux-Inspiron-3520:~/OS$ chmod +x lab2_Q4b.sh
linux@linux-Inspiron-3520:~/OS$ ./lab2_Q4b.sh 1 2 3
The number of arguments are 3
```

using until loop statement:-

```
linux@linux-Inspiron-3520:~/OS$ gedit lab2_Q4c.sh
linux@linux-Inspiron-3520:~/OS$ chmod +x lab2_Q4c.sh
linux@linux-Inspiron-3520:~/OS$ ./lab2_Q4c.sh 1 2 3
The number of arguments are 3
```

5. Write a script to find the factorial of a number entered through keyboard (use read)

solution:-

```
#! /bin/sh
index=1
```

```
fact=1
echo "enter a number"
read number
while [ "$index" -le "$number" ]
do
fact=`expr $fact \* $index`
index=`expr $index + 1`
done
echo "The factorial is $fact"
```

```
linux@linux-Inspiron-3520:~/OS$ chmod +x lab2_Q5.sh
linux@linux-Inspiron-3520:~/OS$ ./lab2_Q5.sh
enter a number
5
The factorial is 120
```

6. Write a program to print all prime numbers from 1 to 300

```
# !/bin/sh

start=3
stop=300



while [ $start -ne $stop ]
do
	temp=`expr $start / 2 `
	flag=0
	t=$((start + 0))
	i=2
	while [ $i -le $temp ]
	do
		check=`expr $t % $i`
		if [ $check -eq 0 -a $flag -eq 0 ]
		then

			flag=1
		fi
		i=$((i + 1))
	done
	if [ $flag -eq 0 ]
	then
```

```
        echo "$start"
    fi
    start=`expr $start + 1 `
done
```

```
linux@linux-Inspiron-3520:~/OS$ chmod +x lab2_Q6.sh
linux@linux-Inspiron-3520:~/OS$ ./lab2_Q6.sh
3
5
7
11
13
17
19
23
29
31
37
41
43
47
53
59
61
67
71
73
79
83
89
97
101
103
107
109
113
127
131
137
139
149
151
157
163
167
173
```

```
179
181
191
193
197
199
211
223
227
229
233
239
241
251
257
263
269
271
277
281
283
293
```

7. Write a script to find the reverse of a number.

Solution :-

```
#! /bin/sh

read -p "Enter a number " number
while [ $number -ne 0  ]
do
        temp=$((number % 10))
        reverse=$((reverse * 10 ))
        reverse=$(( reverse + temp ))
        number=$((number / 10 ))
done
echo "The reversed number is $reverse"
```

```
linux@linux-Inspiron-3520:~/OS$ chmod +x lab2_Q7.sh
linux@linux-Inspiron-3520:~/OS$ ./lab2_Q7.sh
Enter a number 543
The reversed number is 345
```

8. A file contains details of 10 students. Details include (Student Name, RollNo, Address, TotalMarks). Field of each record can be delimited by space bar. Write a shell script which provide the following options

a) Sort the records in the order of student name
b) Sort the record in the order of Roll No
c) Sort the record in the order of Address
d) Sort the record in the order of Total Marks
In the above sorted records display the first two records and the last two records after each sort.
e) Search for a particular record based on the key value (rollno) entered by user.

```
#! /bin/sh
echo "The student_details is as follows"
cat student_details
echo "Press 1 to sort the records in the order of student names"
echo "Press 2 to sort the record in the order of Roll No"
echo "Press 3 to sort the record in the order of Address"
echo "Press 4 to sort the record in the order of Total Marks"
echo "Press 5 to search for a particular record based on the key value (rollno) entered by user"
echo "Option 1-4 also displays the first two records and the last two records after each sort"
read -p "Enter your choice (1-5) " i
case $i in

1)echo -n  "Records sorted in the order of names:"
sort  student_details -o outfile
cat outfile
echo "The first two records after the sort"
cut -d' '  -f1 outfile | head -3
echo "The last two records after sort"
cut -d' '  -f1 outfile | tail -2
echo  "The first two lines after the sort"
head -3 outfile
echo ""
echo "The last two lines after sort"
```

```
echo ""
tail -2 outfile
;;


2)echo -n  "Records sorted in the order of rollnos:"
sort -k 2n student_details -o outfile
cat outfile
echo "The first two records after the sort"
cut -d' '  -f2 outfile | head -3
echo "The last two records after sort"
cut -d' '  -f2 outfile | tail -2
echo  "The first two lines after the sort"
head -3 outfile
echo ""
echo "The last two lines after sort"
echo ""
tail -2 outfile
;;


3)echo -n  "Records sorted in the order of addresses:"
sort -k 3b student_details -o outfile
 cat outfile
echo "The first two records after the sort"
cut -d' '  -f3 outfile | head -3
echo "The last two records after sort"
cut -d' '  -f3 outfile | tail -2
echo  "The first two lines after the sort"
head -3 outfile
echo ""
echo "The last two lines after sort"
echo ""
tail -2 outfile
;;


4)echo -n  "Records sorted in the order of marks:"
sort -k  4n student_details -o outfile
 cat outfile
echo "The first two records after the sort"
cut -d' '  -f4 outfile | head -3
echo "The last two records after sort"
cut -d' '  -f4 outfile | tail -2
```

```
echo  "The first two lines after the sort"
head -3 outfile
echo ""
echo "The last two lines after sort"
echo ""
tail -2 outfile
;;


5)read -p "Enter the key (rollno) to search for" rollno
grep "$rollno " student_details


;;
*)echo "WRONG CHOICE" ;;
 esac
```

```
linux@linux-Inspiron-3520:~/OS$ chmod +x lab2_Q8.sh
linux@linux-Inspiron-3520:~/OS$ ./lab2_Q8.sh
The student_details is as follows
Surya 501 Thrissur,kerala 98
Savita 48 Trento,Italy 87
Sreepriya 156 Kalpathy,Palakkad 45
Sowmya 23 Alaska,America 65


Press 1 to sort the records in the order of student names
Press 2 to sort the record in the order of Roll No
Press 3 to sort the record in the order of Address
Press 4 to sort the record in the order of Total Marks
Press 5 to search for a particular record based on the key value (rollno) entere
d by user
Option 1-4 also displays the first two records and the last two records after ea
ch sort
Enter your choice (1-5) 1
Records sorted in the order of names:

Savita 48 Trento,Italy 87
Sowmya 23 Alaska,America 65
Sreepriya 156 Kalpathy,Palakkad 45
Surya 501 Thrissur,kerala 98
The first two records after the sort


Savita
The last two records after sort
Sreepriya
Surya
The first two lines after the sort


Savita 48 Trento,Italy 87

The last two lines after sort

Sreepriya 156 Kalpathy,Palakkad 45
Surya 501 Thrissur,kerala 98
```