ABHISHEK SHARMA
CS THIRD YEAR
SECTION : "I"
ROLL NO.: 01
ENROLLMENT NO.: 12019009001127

OPERATING SYSTEMS LABORATORY

DAY 5

ASSIGNMENT 5

DATE : 16.08.2021
PLATFORM USED : UBUNTU 20.04 LTS

UNIVERSITY OF ENGINEERING & MANAGEMENT, KOLKATA
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

► **Lab Assignment :**

Q1. Write a shell script to find out whether an integer input through the keyboard is an odd number or an even number.

```
clear
echo "----Even or odd number----"
echo -n "Enter a number: "
read n
echo -n "Result: "
if [ `expr $n % 2` == 0 ]
then
        echo "$n is even"
else
        echo "$n is odd"
fi
```

Output :

```
abhisheks008@LAPTOP-9RGGUF05: ~
----Even or odd number----
Enter a number: 25
Result: 25 is odd
```

Q2. Write a shell script to find out whether any year input through the keyboard is a leap year or not. If no argument is supplied the current year should be assumed.

```
val="$1"
if [ $# -eq 0 ]
then
        val=2021
fi

a=`expr $val % 4`

b=`expr $val % 100`

c=`expr $val % 400`


if [ $a -eq 0 ]
then
        if [ $b -eq 0 ]
        then
                if [ $c -eq 0 ]
                then
                        echo "$val is Leap year"
                else
                        echo "$val is Not a leap year"
                fi
        else
                echo "$val is Leap year"
        fi
else
        echo "$val is Not a leap year"
fi
```

Output :

```
abhisheks008@LAPTOP-9RGGUF05:~$ bash ./a5l2
2021 is Not a leap year
abhisheks008@LAPTOP-9RGGUF05:~$ bash ./a5l2 2008
2008 is Leap year
abhisheks008@LAPTOP-9RGGUF05:~$ bash ./a5l2 2012
2012 is Leap year
abhisheks008@LAPTOP-9RGGUF05:~$ bash ./a5l2 2000
2000 is Leap year
abhisheks008@LAPTOP-9RGGUF05:~$ bash ./a5l2 1900
1900 is Not a leap year
```

Q3. Write a shell script to find the maximum of three numbers provided as command line arguments.

```
a="$1"
b="$2"
c="$3"
if [ $# -lt 3 ]
then
        echo "$0 requred 3 arguments to process the program!"
        exit 1
fi

if [ $a -gt $b -a $a -gt $c ]
then
        echo "$a is the largest number"
elif [ $b -gt $a -a $b -gt $c ]
then
        echo "$b is the largest number"
elif [ $c -gt $b -a $c -gt $a ]
then
        echo "$c  is the largest number"
else
        echo "Sorry cannot find the largest number among these!"

fi
```

Output :

```
abhisheks008@LAPTOP-9RGGUF05:~$ sh a5l3 102 12 68
102 is the largest number
abhisheks008@LAPTOP-9RGGUF05:~$ sh a5l3 12 12 12
Sorry cannot find the largest number among these!
abhisheks008@LAPTOP-9RGGUF05:~$ sh a5l3 12 36
a5l3 requred 3 arguments to process the program!
```

Q4. Write a shell script to check whether a given number is prime or not.

```
echo "Enter any number"
read num
function prime
{
for ((i=2; i<=num/2; i++))
do
        if [ $((num%i)) -eq 0 ]
        then
                echo "$num is not a prime number"
                exit
        fi
done
echo "$num is a prime number"
}
r=`prime $number`
echo "$r"
```

Output :

```
abhisheks008@LAPTOP-9RGGUF05:~$ bash ./a5l4
Enter any number
7
7 is a prime number
abhisheks008@LAPTOP-9RGGUF05:~$ bash ./a5l4
Enter any number
9
9 is not a prime number
```

► **Home Assignments :**

Q1. Write a shell script to find the factorial value of any integer entered through the keyboard.

```
abhisheks008@LAPTOP-9RGGUF05:~$ cat a5h1
echo "Enter a number"
read num
fact=1
while [ $num -gt 1 ]
do
        fact=$((fact * num))
        num=$((num-1))
done
echo $fact
```

Output :

```
abhisheks008@LAPTOP-9RGGUF05:~$ bash ./a5h1
Enter a number
5
120
```

Q2. Write a shell script to generate all combinations of 1, 2 and 3.

```
echo "All the combinations of 1, 2 and 3"
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
```

Output :

```
abhisheks008@LAPTOP-9RGGUF05:~$ bash ./a5h2
All the combinations of 1, 2 and 3
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
```

Q3. Write a shell script to print all prime numbers in a given range.

```
abhisheks008@LAPTOP-9RGGUF05:~$ cat a5h3
echo "Enter the lower bound : "
read x
echo "Enter the upper bound : "
read y
echo -e "\nGenerating the prime numbers"
while [[ $x -le $y ]]
do
if [[ $x -le 2 ]]
then
        continue
fi
let LIMIT=$x-1
for ((a=2; a<=LIMIT; a++))
        do
                let check=$x%$a
                if [[ check -eq 0 ]]
                then
                        break
                fi
        done
if [[ $a -gt $LIMIT ]]
then
        echo "$x is a prime number"
fi
let x=$x+1
done
```

Output :

```
abhisheks008@LAPTOP-9RGGUF05:~$ bash a5h3
Enter the lower bound :
3
Enter the upper bound :
20

Generating the prime numbers
3 is a prime number
5 is a prime number
7 is a prime number
11 is a prime number
13 is a prime number
17 is a prime number
19 is a prime number
```

Q4. Write a shell script to calculate the sum of digits of any number entered through keyboard.

```
echo "Enter the number "
read num
g=$num
s=0
while [ $num -gt 0 ]
do
        k=$(( $num % 10 ))
        num=$(( $num / 10 ))
        s=$(( $s + $k ))
done
echo "sum of digits of $g is : $s"
```

Output :

```
abhisheks008@LAPTOP-9RGGUF05:~$ bash ./a5h4
Enter the number
444
sum of digits of 444 is : 12
```

Q5. Rajesh's basic salary (BASIC) is input through the keyboard. His dearness allowance (DA) is 52% of BASIC. House rent allowance (HRA) is 15% of BASIC. Contributory provident fund is 12% of (BASIC + DA).
Write a shell script to calculate his gross salary and take home salary using the following formula:
Gross salary = BASIC + DA + HRA
Take home salary = Gross salary - (BASIC + DA) * 0.12

```
echo "Enter your BASIC salary (in Rupees) : "
read sal
da=`expr $sal \* 52 / 100`
hra=`expr $sal \* 15 / 100`
gross=`expr $sal + $da + $hra`
a=`expr $sal + $da`
pv=`expr $a \* 12 / 100`
take=`expr $gross - $pv`
echo "Gross Salary Rs. $gross"
echo "Take home salary Rs. $take"
```

Output :

```
abhisheks008@LAPTOP-9RGGUF05:~$ bash ./a5h5
Enter your BASIC salary (in Rupees) :
50000
Gross Salary Rs. 83500
Take home salary Rs. 74380
```

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