Operating System (CS301)

Assignment - 3

U19CS012

1) Write a shell script, which finds the prime factors of a given number.

Script:

```
read -p "Enter Number whose Prime Factors Needs to be Found : " no

# Invalid Input [Negative Numbers]
if [ $num -lt 1 ]; then
    echo "Only Positive Numbers Allowed!"
    exit 1
fi

# Special Case of 1
if [ $num -eq 1]; then
    echo "1 is Unit. It has No Prime Factors!"
    exit 1
fi

echo "The Prime Factors of $no are:"

for ((i = 2; i <= $no; i++));
do
    while [ $((no % $i)) == 0 ];
    do
        echo $i
        no=$((no / $i))
    done
done
```

Output:

```
bhagya@LAPTOP-1723NVO9:/mnt/c/Users/Admin/Desktop/OS_LAB_3/scripts$ ./Q1.sh
Enter Number whose Prime Factors Needs to be Found : 45
The Prime Factors of 45 are:
3
3
5
bhagya@LAPTOP-1723NVO9:/mnt/c/Users/Admin/Desktop/OS_LAB_3/scripts$ ./Q1.sh
Enter Number whose Prime Factors Needs to be Found : 36
The Prime Factors of 36 are:
2
2
3
3
bhagya@LAPTOP-1723NVO9:/mnt/c/Users/Admin/Desktop/OS_LAB_3/scripts$ ./Q1.sh
Enter Number whose Prime Factors Needs to be Found : 97
The Prime Factors of 97 are:
97
```

2) Write a shell script that accepts a positive integer value from the user, say 34, and prints out all the divisors of 34 as a list:

Enter a positive integer: 34

The divisors of 34 are: 1, 2, 17, and 34

Script:

```
read -p "Enter A Number whose Divisors need to be Found : " num

# Only Positive Numbers Allowed
if [ $num -lt 1 ]; then
    echo "Only Positive Numbers Allowed!"
    exit 1
fi

printf "The divisiors of $num are: "

for ((i=1; i <= $num; i++)); do
    if [ $(expr $num % $i) -eq 0 ]; then
        echo -n "$i "
    fi
done
echo ""
```

Output:

```
bhagya@LAPTOP-1723NVO9:/mnt/c/Users/Admin/Desktop/OS_LAB_3/scripts$ ./Q2.sh
Enter A Number whose Divisors need to be Found : 34
The divisors of 34 are: 1 2 17 34
bhagya@LAPTOP-1723NVO9:/mnt/c/Users/Admin/Desktop/OS_LAB_3/scripts$ ./Q2.sh
Enter A Number whose Divisors need to be Found : 120
The divisors of 120 are: 1 2 3 4 5 6 8 10 12 15 20 24 30 40 60 120
```

3) Write a shell script, which prints good morning or good evening depending on the login time of the user.

Script:

```
hour=$(date +%H)

if [ $hour -lt 12 ]; then
    echo "Good Morning"
elif [ $hour -lt 16 ]; then
    echo "Good Afternoon"
elif [ $hour -lt 20 ]; then
    echo "Good Evening"
else
    echo "Good Night"
fi
```

Output:

```
bhagya@LAPTOP-1723NVO9:/mnt/c/Users/Admin/Desktop/OS_LAB_3/scripts$ ./Q3.sh
Good Morning
```

4) A shell script, which takes as command line input a number n, and a word. It then prints the word n times, once on each line.

Script:

```
# $# -> No of Argument [Count]
if [ $# -ne 2 ]; then
    echo "2 Command Line Arguments Required"
    exit 1
fi

# First Argument: Word
word=$1
# Second Argument: No of Times to be Printed
```

```
num=$2

for ((i=0; i < $num;i++ )); do
    echo "$word"
done
```

Output:

```
bhagya@LAPTOP-1723NVO9:/mnt/c/Users/Admin/Desktop/OS_LAB_3/scripts$ ./Q4.sh ThankYou 5
ThankYou
ThankYou
ThankYou
ThankYou
ThankYou
```

5) Write a shell script, which finds the total number of blank lines in the given file.

Script:

```
#!/bin/bash

read -p "Enter a File name: " file
echo "Number of blank space in $file is: "

# Method 1
grep -c "^$" $file

# References
# 1.) https://tuxthink.blogspot.com/2012/01/couting-number-of-blank-lines-in-file.html
```

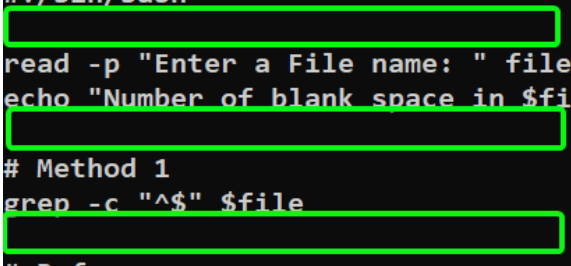
Output:

```
bhagya@LAPTOP-1723NVO9:/mnt/c/Users/Admin/Desktop/OS_LAB_3/scripts$ ./Q5.sh
Enter a File name: Q5.sh
Number of blank space in Q5.sh is:
3
bhagya@LAPTOP-1723NVO9:/mnt/c/Users/Admin/Desktop/OS_LAB_3/scripts$ cat Q5.sh
#!/bin/bash

read -p "Enter a File name: " file
echo "Number of blank space in $file is: "

# Method 1
grep -c "^$" $file

# References
# 1.) https://tuxthink.blogspot.com/2012/01/couting-number-of-blank-lines-in-file.html
```



6) A shell script, which reports the names and sizes of all the files in a directory whose size exceeds 1000 bytes, in descending order of their sizes and the total number of such files.

Script:

```
echo "Files greater than 1000 bytes : "
find . -maxdepth 1 -type f -size +1000c -ls | sort -r -n -k7
echo "Number of such files : "
find . -maxdepth 1 -type f -size +1000c -ls | sort -r -n -k7 | wc -l

# -maxdepth 1 : find files only in current directory
# -type f : find only files
# -size +1000c : find only files greather than 1000 bytes ("c" = bytes)
# -ls : list them
# -r Option: Sorting In Reverse Order
# -n Option : To sort a file numerically
# -k7 Option : to sort on the seventh column.
# wc -l : To Count the Number of Lines

# References
# 1.) https://unix.stackexchange.com/questions/394672/sort-files-greater-than-1000-bytes-in-descending-order
# 2.) https://www.geeksforgeeks.org/sort-command-linuxunix-examples/
```

Output:

```
bhagya@LAPTOP-1723NVO9:/mnt/c/Users/Admin/Desktop/OS_LAB_3/scripts$ ./Q6.sh
Files greater than 1000 bytes :
5348024558323968     40 -rwxrwxrwx   1 bhagya   bhagya     37816 Aug 14 10:42 ./file
8444249301670168     24 -rwxrwxrwx   1 bhagya   bhagya     24115 Aug 14 10:42 ./file2
7318349395204899      8 -rwxrwxrwx   1 bhagya   bhagya      7808 Aug 14 10:43 ./file3
5348024558026694      8 -rwxrwxrwx   1 bhagya   bhagya      4202 Aug 14 10:43 ./file4
2251799814539982      4 -rwxrwxrwx   1 bhagya   bhagya      1655 Aug 14 10:44 ./file5
Number of such files :
5
```


SUBMITTED BY:

U19CS012

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