

# **Operating System Lab**

## **Assignment Solution Report**

**Submitted by,**

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# Question 1

Write a shell script that has 2 user created variables, uv1 and uv2. Ask for the values of the variables from the user and take in any values (real/integer/character) for the 2 variables. Test the program for different types of uv1 and uv2.

(a) Print them as:

- (i) value of uv1 followed by value of uv2 separated by a comma and
- (ii) value of uv2 followed by value of uv1 separated by the word "and".

(b) Print the variables in reverse order [If uv1 is 1234, then output should be 4321]

## Solution

```
#!/bin/bash

echo 'Enter variable 1:'
read uv1
echo 'Enter variable 2:'
read uv2

echo "Values = $uv1 , $uv2"
echo "Values and = $uv1 and $uv2"

echo $uv1 | rev
echo $uv2 | rev

exit 0
```

# Output

```
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ./q1.sh
Enter variable 1:
1234
Enter variable 2:
6789
Values = 1234 , 6789
Values and = 1234 and 6789
4321
9876
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$
```

## Question 2

Write a shell script to count the number of lines in a file. Test if the file is present. If not, create and write.

## Solution:


```
#!/bin/bash

echo 'Enter filename:'
read n

file='files/'$n

if [ -f $file ]
then
    wc -l < $file
else
    touch $file
fi
```

# Output

Assignment_1 > files >  q2.txt	
1	67
2	98
3	fgj
4	xsd
5	serasf
6	vbnvh
7	ccgse
8	dtyoy
9	435sf

```
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ./q2.sh
Enter filename:
q2.txt
8
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$
```

## Question 3

Write a shell script that counts the number of ordinary files (not directories) in the current working directory and its sub-directories. Repeat the count of files including the sub-directories that the current working directory has.

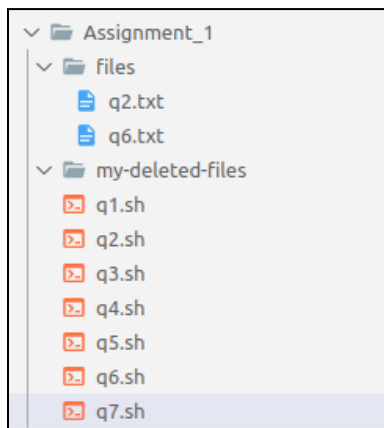
## Solution

```
#!/bin/bash

find -type f | wc -l

exit 0
```

## Output



```
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ./q3.sh
9
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$
```

## Question 4

Write a shell program to duplicate the UNIX rm command with the following features: a. Instead of deleting the files, it will move them to a my-deleted-files directory. If the file already exists in the my-deleted-files directory, then the existing file (in the my-deleted-files) will have the version number zero (0) appended to it and the newly deleted file will have version number one(1) appended to it. Go on incrementing the version nos., if required.b. The command will have a switch -c that will clear the entire my-deleted-files directory after asking for confirmation.

## Solution

```
#!/bin/bash

DELETED='my-deleted-files'

while getopts ":c" option; do
    case $option in
        c) cd $DELETED; rm *; exit;;
    esac
done

read -p 'Enter filename: ' FILE
l=${#FILE}

check=$(ls $DELETED | grep $FILE)
#n=$(ls $DELETED | grep -c ${FILE:0:l-4})
#echo 'n: ' $n
#echo $check

c=0

if [ $check == $FILE ]      #file exists in folder
then
    echo 'if block'
    OLD_FILE=${FILE:0:l-4}${c}${FILE:l-4:l-1}
    touch $DELETED/'$OLD_FILE
    c=$(expr $c + 1)
    NEW_FILE=${FILE:0:l-4}${c}${FILE:l-4:l-1}
```

```
touch $DELETED/'/$NEW_FILE
mv $DELETED/'/$FILE $DELETED/'/$OLD_FILE
mv $FILE $DELETED/'/$NEW_FILE
#c=$(expr $c + 1)
else
    echo 'else block'
    mv $FILE $DELETED
fi

#echo $c
```



# Output

```
avraneel@asus-computer: ~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ls
files my-deleted-files q1.sh q2.sh q3.sh q4.sh q5.sh q6.sh q7.sh sample.txt
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ls my-deleted-files/
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ./q4.sh
Enter filename: sample.txt
./q4.sh: line 19: [: ==: unary operator expected
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ls
files my-deleted-files q1.sh q2.sh q3.sh q4.sh q5.sh q6.sh q7.sh
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ls my-deleted-files/
sample.txt
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$
```

```
avraneel@asus-computer: ~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ls
files my-deleted-files q1.sh q2.sh q3.sh q4.sh q5.sh q6.sh q7.sh sample.txt
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ls my-deleted-files/
sample.txt
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ./q4.sh
Enter filename: sample.txt
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ls
files my-deleted-files q1.sh q2.sh q3.sh q4.sh q5.sh q6.sh q7.sh
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ls my-deleted-files/
sample0.txt sample1.txt
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$
```

```
avraneel@asus-computer: ~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ls my-deleted-files/
sample0.txt sample1.txt
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ./q4.sh -c
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ls my-deleted-files/
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ls
files my-deleted-files q1.sh q2.sh q3.sh q4.sh q5.sh q6.sh q7.sh
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$
```

## Question 5

Write a script called `birthday_match.sh` that takes two birthdays of the form `DD/MM/YYYY` (e.g., `15/05/2000`) and returns whether there is a match if the two people were born on the same day of the week (e.g. Friday). And then find out the age/s in years/months/days.

## Solution

```
#!/bin/bash

read -p 'Enter birthday 1: ' b1
read -p 'Enter birthday 2: ' b2

#b1=19/09/2002
#b2=21/04/2006

day1=${b1:0:2}
month1=${b1:3:2}
year1=${b1:6:4}

day2=${b2:0:2}
month2=${b2:3:2}
year2=${b2:6:4}

date1=$(date -d $month1/$day1/$year1 +%a)
date2=$(date -d $month2/$day2/$year2 +%a)

sec1=$(date -d $month1/$day1/$year1 +%s)
sec2=$(date -d $month2/$day2/$year2 +%s)

sec_cur=$(date +%s)

echo $date1 $date2

if [ $date1 == $date2 ]
then
    echo 'Equal'
```

```

else
    echo 'Not equal'
fi

echo $sec1 $sec2

age1=$(expr $sec_cur - $sec1)
age2=$(expr $sec_cur - $sec2)

age1_min=$(expr $age1 / 60)
age2_min=$(expr $age2 / 60)

age1_hr=$(expr $age1_min / 60)
age2_hr=$(expr $age2_min / 60)

age1_day=$(expr $age1_hr / 24)
age2_day=$(expr $age2_hr / 24)

age1_month=$(expr $age1_day / 30)
age2_month=$(expr $age2_day / 30)

age1_yr=$(expr $age1_month / 12)
age2_yr=$(expr $age2_month / 12)

age1_month_new=$(expr $age1_month - $(expr $age1_yr \* 12))
age2_month_new=$(expr $age2_month - $(expr $age2_yr \* 12))

age1_day_new=$(expr $age1_day - $(expr $age1_month \* 30))
age2_day_new=$(expr $age2_day - $(expr $age2_month \* 30))

echo 'Age 1 = ' $age1_yr ' yr' $age1_month_new ' month' $age1_day_new '
day.'
echo 'Age 2 = ' $age2_yr ' yr' $age2_month_new ' month' $age2_day_new '
day.'

```

# Output

```
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ./q5.sh
Enter birthday 1: 19/09/2002
Enter birthday 2: 21/04/2006
Thu Fri
Not equal
Age 1 = 20 yr 2 month 24 day.
Age 2 = 16 yr 7 month 4 day.
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$
```

## Question 6

Write a shell script that accepts a filename as an input and performs the following activities on the given file. The program asks for a string of characters (that is, any word) to be provided by the user. The file will be searched to find whether it contains the given word. If the file contains the given word, the program will display (a) the number of occurrences of the word. The program is also required to display (b) the line number in which the word has occurred and no. of times the word has occurred in that line (Note: the word may occur more than once in a given line). If the file does not contain the word, an appropriate error message will be displayed.

## Solution

```
#!/bin/bash

read -p 'Enter filename: ' f
read -p 'Enter words: ' w

#f='files/q6.txt'
#w='sky'

file=$(<$f)
c=0

for var in $file
do
    if [ $var == $w ]; then
        c=$(expr $c + 1)
    fi
done

echo 'Total no. of occurrences: ' $c

echo 'Line numbers: '
grep -n $w $f

c=0

echo 'Number of occurrences in each line: '
```


```

while read line;
do
    for i in $line;
    do
        if [ $i == $w ]; then
            c=$(expr $c + 1)
        fi
    done
    echo $c
    c=0
done < $f

```


## Output

```

Assignment_1 > files >  q6.txt
1  bluesky sky skyforge skyrim sky
2  fbkwsy srki sky skybe sky dffhg xg
3  sky
4  apple
5  orange sky
6  sky blue
7  

```

```

avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ./q6.sh
Enter filename: files/q6.txt
Enter words: sky
Total no. of occurrences: 7
Line numbers:
1:bluesky sky skyforge skyrim sky
2:fbkwsy srki sky skybe sky dffhg xg
3:sy
5:orange sky
6:sy blue
Number of occurrences in each line:
2
2
1
0
1
1
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ 

```

## Question 7

Extend the shell script written in (6) to perform the following task: User is asked to enter two different patterns or words. The first pattern will have to be matched with the contents of the file and replaced by the second pattern if a match occurs. If the first pattern does not occur in the file, an appropriate error message will be displayed.

## Solution

```
#!/bin/bash

read -p 'Enter filename: ' f
read -p 'Enter words: ' w

#f='files/q6.txt'
#w='sky'

file=$(<$f)
c=0

for var in $file
do
    if [ $var == $w ]; then
        c=$(expr $c + 1)
    fi
done

echo 'Total no. of occurrences: ' $c

echo 'Line numbers: '
grep -n $w $f

c=0

echo 'Number of occurrences in each line: '

while read line;
do
```

```
for i in $line;
do
    if [ $i == $w ]; then
        c=$(expr $c + 1)
    fi
done
echo $c
c=0
done < $f

#q7 begins here

read -p 'Enter 2nd word: ' w2

#w2='earth'

echo " "

new_file=${file//$w/$w2}

echo "$new_file" > $f
```



# Output

File before execution:

```
Assignment_1 > files > q6.txt
1 bluesky sky skyforge skyrim sky
2 fbkwsy srki sky skybe sky dffhg xg
3 sky
4 apple
5 orange sky
6 sky blue
7
```

```
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$ ./q7.sh
Enter filename: files/q6.txt
Enter words: sky
Total no. of occurrences: 7
Line numbers:
1:bluesky sky skyforge skyrim sky
2:fbkwsy srki sky skybe sky dffhg xg
3:sy
5:orange sky
6:sy blue
Number of occurrences in each line:
2
2
1
0
1
1
1
Enter 2nd word: earth
avraneel@asus-computer:~/My Workspace/BCSE resources/3rd Year 1st Semester/Operating Systems Lab/Assignment_1$
```

File after execution:

```
Assignment_1 > files > q6.txt
1 blueearth earth earthforge earthrim earth
2 fbkwearth srki earth earthbe earth dffhg xg
3 earth
4 apple
5 orange earth
6 earth blue
7
```

