OS ASSIGNMENT-1 REPORT

Lab1- GNU/Linux Basics: Shell, Commands, System Calls

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QUESTIONS

Perform the following exercises:

1) Use the who command and redirect the result to a file called myfile1. Use the more command to see the contents of myfile1.

2) Use the sed command to delete the first character and last character in each line of a file.

3) Use the grep command to find how many lines of a file contain a given word. The filename and the word are provided as inputs.

4) Use the date and who commands in sequence (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile2 . Use the more command to check the contents of myfile2.

5) Write a (i) shell script program and (ii) C program to display “HELLO-WORLD”

a) Compare the running time of both the programs using time command

6) Write a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.

7) Write a shell script to perform the following string operations:

a) To extract a substring from a given string

b) To find the length of a given string

8) Implement in C the following Linux commands using System calls: cat and mv

ANSWERS

1) who>myfile1

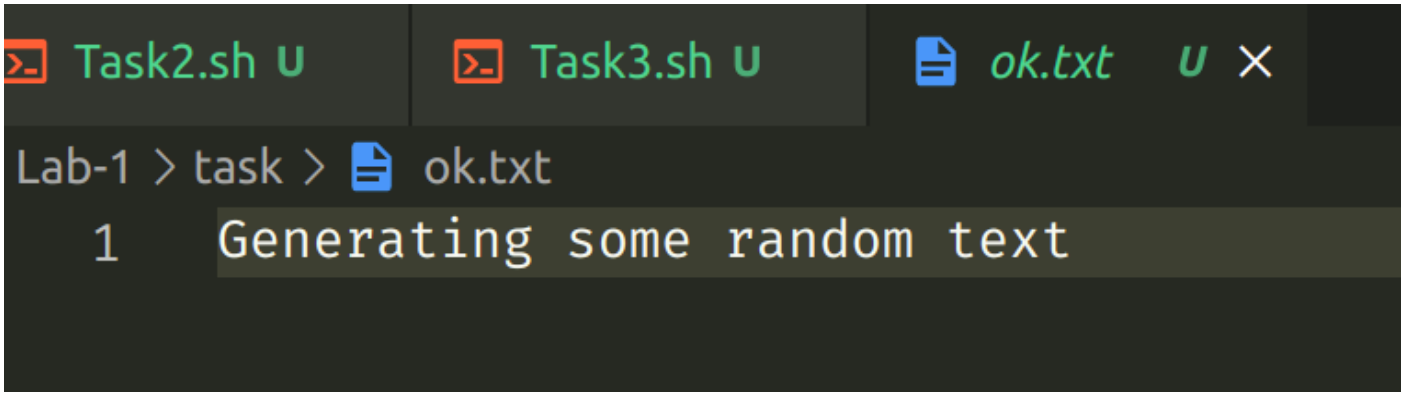
more myfile1

```
  bash "/home/alpha/Documents/GitHub/CS310-OS/Lab-1/task/Task1.sh"
● alpha@alpha-HP:~/Documents/GitHub/CS310-OS$ bash "/home/alpha/Docume
  nts/GitHub/CS310-OS/Lab-1/task/Task1.sh"
  alpha    :0           2022-09-04 15:05 (:0)
○ alpha@alpha-HP:~/Documents/GitHub/CS310-OS$
```

2) sed 's/^.\{1\}//;s/.\{1\}$//' hello.txt

```
alpha@alpha-HP:~/Documents/GitHub/CS310-OS$ bash "/home/alpha/Documents/GitHub/C
S310-OS/Lab-1/task/Task2.sh"
enerating some random texalpha@alpha-HP:~/Documents/GitHub/CS310-OS$
```

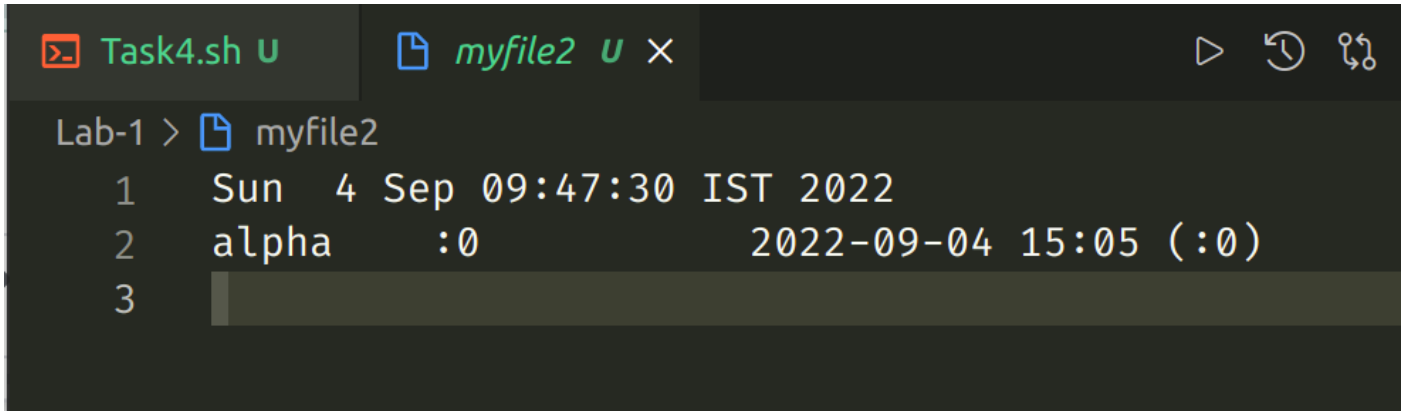
3) grep -c $2 $1



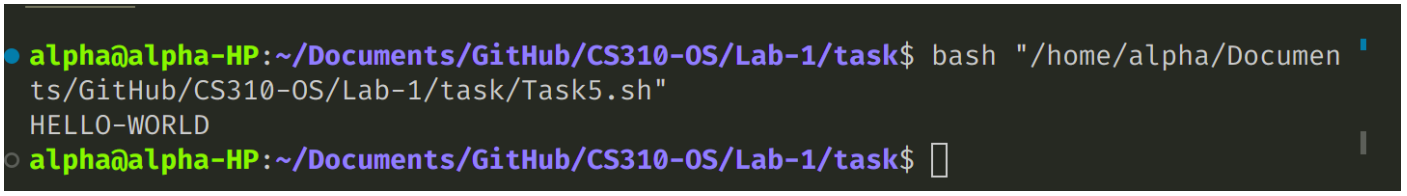

```
● alpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$ ./Task3.sh ok.txt some
  1
○ alpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$
```

4) date > myfile2 && who >> myfile2 && more myfile2

```
● alpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$ bash "/home/alpha/Documen
  ts/GitHub/CS310-OS/Lab-1/task/Task4.sh"
  Sun  4 Sep 10:07:29 IST 2022
  alpha    :0           2022-09-04 15:05 (:0)
```



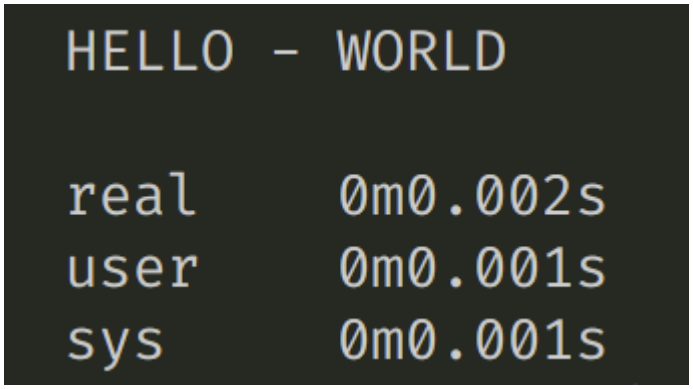
5) (a) (i) echo "HELLO-WORLD"



(ii) // C program to display “HELLO - WORLD”

```
#include <stdio.h>

int main()

{

  printf("HELLO - WORLD\n");

}
```

b) for hello_world.c



for hello_world.bash

```
tHub/CS310-OS/Lab-1/some.bash"
HELLO-WORLD

real    0m0.002s
user    0m0.001s
sys     0m0.001s
```

6) for file in $@

do

if [-f $file]

then

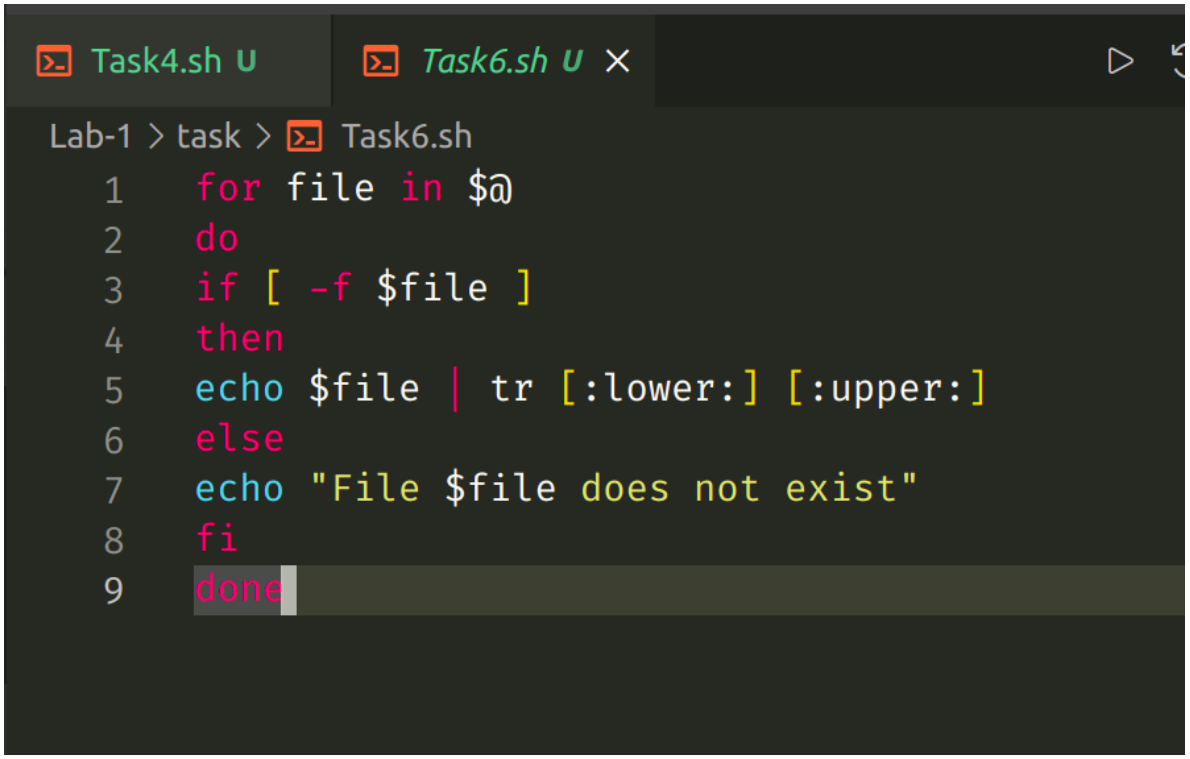
echo $file | tr [:lower:] [:upper:]

else

echo "File $file does not exist"

fi

done



```
alpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$ ./Task6.sh ok.txt
OK.TXT
alpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$
```

7a)

echo "Enter a string"

read str

echo "Enter a substring"

read sub

echo "Substring is: ${str#"$sub"}"

Task4.sh U × Task7.sh U ×

Lab-1 > task > Task7.sh

```
1  # 7a) To extract a substring
2  echo "Enter a string"
3  read str
4  echo "Enter a substring"
5  read sub
6  echo "Substring is: ${str#"$sub"}"
```

```
alpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$ ./Task7.sh
Enter a string
adarsh
Enter a substring
a
Substring is: darsh
```

b)

To find the length of a given string

echo "Enter a string"

read str

len=${#str}

echo "Length of the string is $len"

```
# b) To find the length of a given string
echo "Enter a string"
read str
len=${#str}
echo "Length of the string is $len"
```

```
alpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$ bash "/home/alpha/Documen
ts/GitHub/CS310-OS/Lab-1/task/Task7.sh"
Enter a string
Adarsh Anand
Length of the string is 12
alpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$
```

8) Implementing cat and mv in C.

```
// cat

#include <sys/types.h>

#include <sys/stat.h>

#include <stdio.h>

#include <fcntl.h>

int main(int argc, char *argv[3])

{

 int fd, i;                          // file descriptor

 char buf[2];                        // buffer for reading

 fd = open(argv[1], O_RDONLY, 0777); // open file

 if (fd == -argc)

 {

   printf("file open error\n"); // error

 }
```

```
 else
 {
   while ((i = read(fd, buf, 1)) > 0)
   {
     printf("%c", buf[0]); // print
   }
   printf("\n"); // new line
   close(fd);
 }
}
// mv
#include <sys/types.h>
#include <sys/stat.h>
#include <stdio.h>
#include <fcntl.h>
int main(int argc, char *argv[])
{
 int i, fd1, fd2;                          // file descriptors
 char *file1, *file2, buf[2];              // file names and buffer
 file1 = argv[1];                          // source file
 file2 = argv[2];                          // destination file
 printf("file1=%s file2=%s", file1, file2); // print file names
 fd1 = open(file1, O_RDONLY, 0777);        // open source file
 fd2 = creat(file2, 0777);                 // create destination file
 while (i = read(fd1, buf, 1) > 0)         // read source file
   write(fd2, buf, 1);                     // write to destination file
 remove(file1);                            // remove source file
```

```
close(fd1);

close(fd2);

}
```

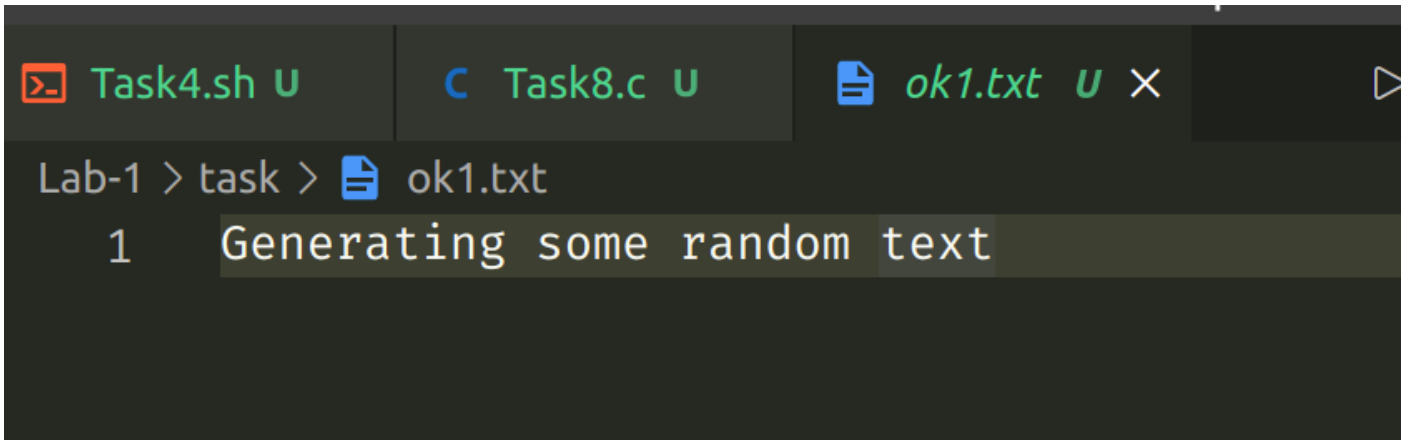
cat

```
alpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$ ./a.out
file open error
alpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$
```

```
alpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$ ./a.out ok.txt
Generating some random text
alpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$
```

mv - move file ok.txt to ok1.txt

```
alpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$ ./a.out ok.txt ok1.txt
file1=ok.txt file2=ok1.txtalpha@alpha-HP:~/Documents/GitHub/CS310-OS/Lab-1/task$
```



REFERENCES

- Dr Sharad Sir Slides
- Input-output system calls in C | Create, Open, Close, Read, Write - GeeksforGeeks
- Linux man pages
- Bash manual

END OF REPORT