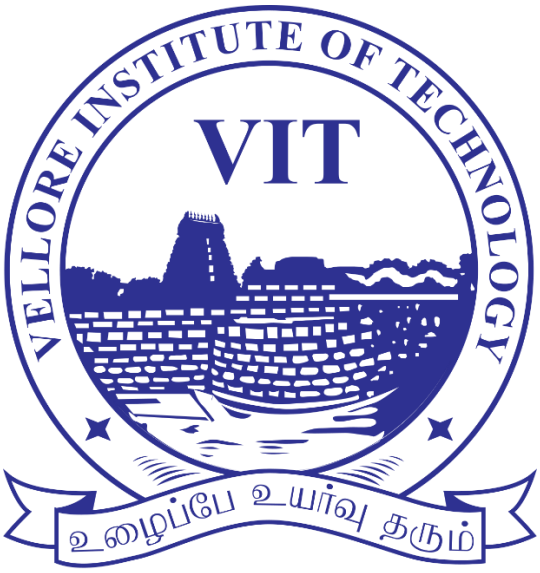

OPERATING SYSTEMS

LAB ASESSMENT – 1

Name: **VIBHU KUMAR SINGH**
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Q1) Study of basic Linux commands.

A1)

TERMINAL:

```
vibhu@Vibhu-VirtualBox:~$ uname
Linux
vibhu@Vibhu-VirtualBox:~$ cd Desktop
vibhu@Vibhu-VirtualBox:~/Desktop$ ls
'All Files OS'    HelloWorld.odt   OS_Lab2     OSS            Sample_fork.c
 file.txt         OS               OS_Lab2.c   Sample_fork
vibhu@Vibhu-VirtualBox:~/Desktop$ mkdir new
vibhu@Vibhu-VirtualBox:~/Desktop$ rmdir new
vibhu@Vibhu-VirtualBox:~/Desktop$ find file.txt
file.txt
vibhu@Vibhu-VirtualBox:~/Desktop$ grep blue file.txt
vibhu@Vibhu-VirtualBox:~/Desktop$ grep yellow file.txt
vibhu@Vibhu-VirtualBox:~/Desktop$ locate OS
/home/vibhu/.local/share/Trash/files/OS_Lab3Q2.sh
/home/vibhu/.local/share/Trash/info/OS_Lab3Q2.sh.trashinfo
/home/vibhu/Desktop/All Files OS
/home/vibhu/Desktop/OS LAB 1
/home/vibhu/Desktop/OS LAB 2
/home/vibhu/Desktop/OS_LAB_1
/home/vibhu/Desktop/OS_Lab2
/home/vibhu/Desktop/OS_Lab2.c
/home/vibhu/Desktop/All Files OS/Hello.txt
/home/vibhu/Desktop/All Files OS/Q10.sh
/home/vibhu/Desktop/All Files OS/Q11.sh
/home/vibhu/Desktop/All Files OS/Q12
/home/vibhu/Desktop/All Files OS/Q12.c
/home/vibhu/Desktop/All Files OS/Q13
/home/vibhu/Desktop/All Files OS/Q13.c
/home/vibhu/Desktop/All Files OS/Q14a
/home/vibhu/Desktop/All Files OS/Q14a.c
/home/vibhu/Desktop/All Files OS/Q14b
/home/vibhu/Desktop/All Files OS/Q14b.c
/home/vibhu/Desktop/All Files OS/Q14c
/home/vibhu/Desktop/All Files OS/Q14c.c
/home/vibhu/Desktop/All Files OS/Q15a
/home/vibhu/Desktop/All Files OS/Q15a.c
/home/vibhu/Desktop/All Files OS/Q15b
/home/vibhu/Desktop/All Files OS/Q15b.c
```

```
vibhu@Vibhu-VirtualBox:~/Desktop$ cp file.txt OS
vibhu@Vibhu-VirtualBox:~/Desktop$ cd OS
vibhu@Vibhu-VirtualBox:~/Desktop/OS$ ls
file.txt  Q2.sh  Q3.sh  Q4.sh  Q5.sh  Q6.sh  Q7.sh  Q8.sh
vibhu@Vibhu-VirtualBox:~/Desktop/OS$ cd ~
vibhu@Vibhu-VirtualBox:~$ cp file.txt OS
vibhu@Vibhu-VirtualBox:~$ mv file.txt ~
mv: 'file.txt' and '/home/vibhu/file.txt' are the same file
vibhu@Vibhu-VirtualBox:~$ cat file.txt
Hi! I am Vibhu.
vibhu@Vibhu-VirtualBox:~$ cat ~OS
cat: '~OS': No such file or directory
vibhu@Vibhu-VirtualBox:~$
```

Q2) Write a shell script to swap two numbers without using 3rd variable.

A2)

CODE:

```
#!/bin/bash
echo -ne "Enter first number: "
read a
echo -ne "Enter second number: "
read b
echo "Before swapping: "
echo "a=$a          b=$b"
#swapping
a=$((a+b))
b=$((a-b))
a=$((a-b))
echo "After swapping: "
echo "a=$a          b=$b"
```

OUTPUT:

```
vibhu@Vibhu-VirtualBox:~/Desktop/OS LAB 1$ bash Q2.sh
Enter first number: 5
Enter second number: 10
Before swapping:
        a=5             b=10
After swapping:
        a=10            b=5
vibhu@Vibhu-VirtualBox:~/Desktop/OS LAB 1$
```

Q3) Write a shell script using while loop to print the structure.

1 0
2 1 0
3 2 1 0
4 3 2 1 0
5 4 3 2 1 0
6 5 4 3 2 1 0
7 6 5 4 3 2 1 0
8 7 6 5 4 3 2 1 0
9 8 7 6 5 4 3 2 1 0

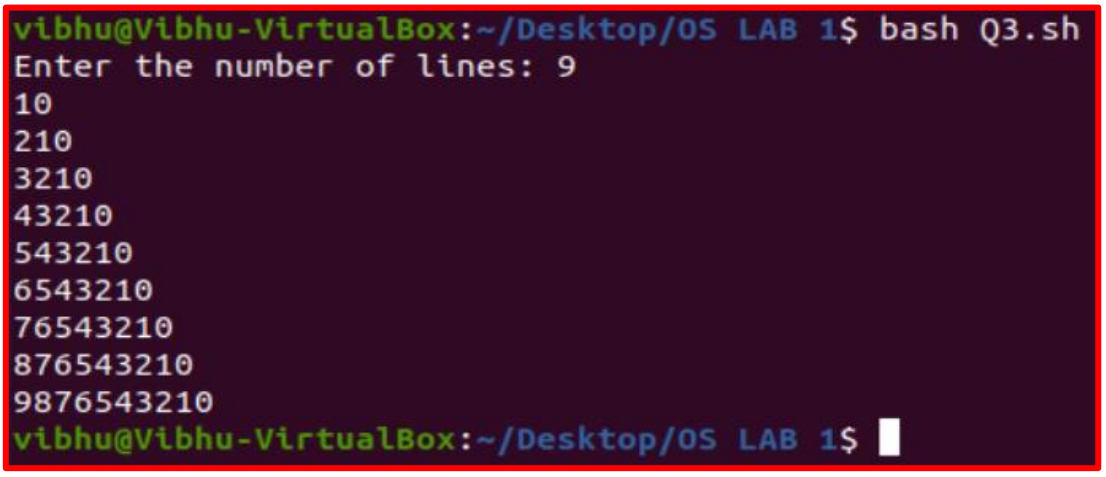
A3)

CODE:

```
#!/bin/bash
echo -ne "Enter the number of lines: "
read n
```

```
for((i=1;i<=n;i++))
do
        for((j=i;j>=0;j--))
        do
                echo -ne "$j"
        done
        echo;
done
```

OUTPUT:



Q4) Write a shell script to find the sum of first 'N' numbers in Fibonacci series (use for loop).

A4)

CODE:

```
#!/bin/bash
echo -ne "Enter the number of terms: "
read n
a=0
b=1
sum=0
for((i=0;i<n;i++))
do
        sum=$((sum+a))
        fn=$((a+b))
        a=$b
        b=$fn
done
echo "The sum of first $n terms in the Fibonacci Series is: $sum"
```

OUTPUT:

```
vibhu@Vibhu-VirtualBox:~/Desktop/OS LAB 1$ bash Q4.sh
Enter the number of terms: 10
The sum of first 10 terms in the Fibonacci Series is: 88
vibhu@Vibhu-VirtualBox:~/Desktop/OS LAB 1$
```

Q5) Write a shell script to print a given number in reverse order and sum of the individual digits.

A5)

CODE:

```
#!/bin/bash
echo -ne "Enter the number: "
read n
Num=$n
sum=0
echo -ne "The reversed number is: "
while [ $n -gt 0 ]
do
   dig=$(( $n % 10 ))
   echo -ne "$dig"
   n=$(( $n / 10 ))
   sum=$(( $sum + $dig ))
done
echo;
echo  "The sum of digits of $Num is: $sum"
```

OUTPUT:

```
vibhu@Vibhu-VirtualBox:~/Desktop/OS LAB 1$ bash Q5.sh
Enter the number: 12345
The reversed number is: 54321
The sum of digits of 12345 is: 15
vibhu@Vibhu-VirtualBox:~/Desktop/OS LAB 1$
```

Q6) Write a shell script to read two strings and display whether it is equal, not equal, null strings or string with special characters.

A6)

CODE:

```
#!/bin/bash
read -p "Enter the first string: " str1
read -p "Enter the second string: " str2
if [ $str1 = $str2 ]
```

```
then
        echo "The strings are equal."
else
        echo "The strings are not equal."
fi
if [ -z $str1 ]
then
        echo "The first string is null."
fi
if [ -z $str2 ]
then
        echo "The second string is null."
fi
if [[ $str1 =~ ['!@#$%^&*()_+'] ]]
then
   echo "The first string contains a special character."
fi
if [[ $str2 =~ ['!@#$%^&*()_+'] ]]
then
   echo "The second string contains a special character."
fi
```

OUTPUT:

```
vibhu@Vibhu-VirtualBox:~/Desktop/OS LAB 1$ bash Q6.sh
Enter the first string: Hi
Enter the second string: Hi!
The strings are not equal.
The second string contains a special character.
vibhu@Vibhu-VirtualBox:~/Desktop/OS LAB 1$
```

Q7) Write a shell script to accept one integer argument and print its multiplication table.

A7)

CODE:

```
#!/bin/bash
echo -ne "Enter the Integer: "
read n
echo "The multiplication table for $n is: "
for((i=1;i<=10;i++))
do
        result=$(($n * $i))
        echo "$n X $i = $result"
done
```

OUTPUT:

```
vibhu@Vibhu-VirtualBox:~/Desktop/OS LAB 1$ bash Q7.sh
Enter the Integer: 8
The multiplication table for 8 is:
8 X 1 = 8
8 X 2 = 16
8 X 3 = 24
8 X 4 = 32
8 X 5 = 40
8 X 6 = 48
8 X 7 = 56
8 X 8 = 64
8 X 9 = 72
8 X 10 = 80
vibhu@Vibhu-VirtualBox:~/Desktop/OS LAB 1$
```

Q8) Write a Shell Script that makes use of grep to isolate the line in /etc/passwd that contains your login details.

A8)

CODE:

```
#!/bin/bash
grep -F “Vibhu” /etc/passwd
```

OUTPUT:

```
vibhu@Vibhu-VirtualBox:~/Desktop/OS LAB 1$ bash Q8.sh
vibhu:x:1000:1000:Vibhu Kumar Singh,,,:/home/vibhu:/bin/bash
vibhu@Vibhu-VirtualBox:~/Desktop/OS LAB 1$
```

Q9) Write a shell script to display all files in the /home/YourLoginName subdirectory as well as display the type of all files.

A9)

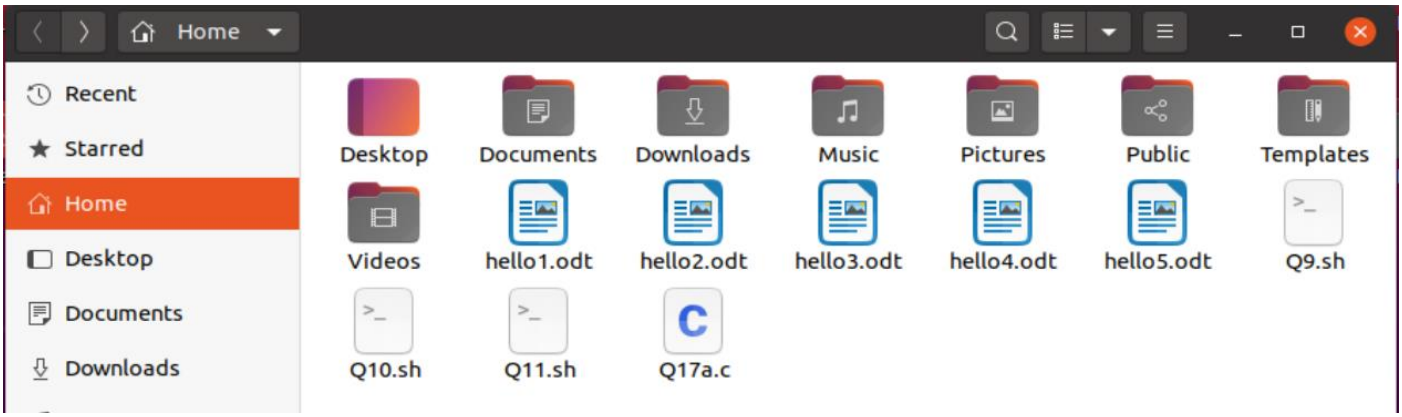
CODE:

```
#!/bin/bash
echo "File names: "
for File in *
do
```

```
        if [ -r $File -a -w $File -a -x $File ]
        then
                echo $File
      fi
done
echo;
echo "File types: "
ls -l
```

OUTPUT:

DIRECTORY:




```
vibhu@Vibhu-VirtualBox:~$ bash Q9.sh
File names:
Desktop
Documents
Downloads
Music
Pictures
Public
Q10.sh
Q11.sh
Q9.sh
Templates
Videos

File types:
total 100
drwxr-xr-x 4 vibhu vibhu 4096 Sep  9 23:57 Desktop
drwxr-xr-x 2 vibhu vibhu 4096 Jul 23 03:11 Documents
drwxr-xr-x 3 vibhu vibhu 4096 Sep 10 09:31 Downloads
-rw-rw-r-- 1 vibhu vibhu 8221 Sep 10 00:06 hello1.odt
-rw-rw-r-- 1 vibhu vibhu 8246 Sep 10 00:06 hello2.odt
-rw-rw-r-- 1 vibhu vibhu 8289 Sep 10 00:07 hello3.odt
-rw-rw-r-- 1 vibhu vibhu   12 Sep  9 23:53 hello4.odt
-rw-rw-r-- 1 vibhu vibhu 8249 Sep 10 00:08 hello5.odt
drwxr-xr-x 2 vibhu vibhu 4096 Jul 23 03:11 Music
drwxr-xr-x 2 vibhu vibhu 4096 Jul 23 03:11 Pictures
drwxr-xr-x 2 vibhu vibhu 4096 Jul 23 03:11 Public
-rwxrwxr-x 1 vibhu vibhu  170 Sep  9 23:48 Q10.sh
-rwxrwxr-x 1 vibhu vibhu  110 Aug 25 22:36 Q11.sh
-rw-rw-r-- 1 vibhu vibhu 1053 Sep 10 11:53 Q17a.c
-rwxrwxr-x 1 vibhu vibhu  157 Sep 11 19:21 Q9.sh
drwxr-xr-x 2 vibhu vibhu 4096 Jul 23 03:11 Templates
drwxr-xr-x 2 vibhu vibhu 4096 Jul 23 03:11 Videos
vibhu@Vibhu-VirtualBox:~$
```

Q10) Using shell script, display the contents of the present working directory. If it is an ordinary file print its permission and change the permissions to r--r--r—

A10)

CODE:

```
#!/bin/bash/sh
cd Desktop
ls -l
chmod -wr-wr-r "HelloWorld.odt"
chmod +r+r+r "HelloWorld.odt"
ls -l
#changing the file permission of the file named DBMS DA refined 1.odt
```

OUTPUT:

```
vibhu@Vibhu-VirtualBox:~$ bash Q10.sh
total 60
-rw-rw-r-- 1 vibhu vibhu    12 Sep  9 23:53  HelloWorld.odt
drwxrwxr-x 2 vibhu vibhu  4096 Sep 11 19:15 'OS LAB 1'
-rwxrwxr-x 1 vibhu vibhu 16864 Jul 30 09:17  OS_Lab2
drwxrwxr-x 2 vibhu vibhu  4096 Sep 10 12:36 'OS LAB 2'
-rw-rw-r-- 1 vibhu vibhu  1559 Jul 30 09:10  OS_Lab2.c
-rwxrwxr-x 1 vibhu vibhu 16736 Aug 25 02:54  Sample_fork
-rw-rw-r-- 1 vibhu vibhu   456 Aug 25 05:12  Sample_fork.c
total 60
-r--r--r-- 1 vibhu vibhu    12 Sep  9 23:53  HelloWorld.odt
drwxrwxr-x 2 vibhu vibhu  4096 Sep 11 19:15 'OS LAB 1'
-rwxrwxr-x 1 vibhu vibhu 16864 Jul 30 09:17  OS_Lab2
drwxrwxr-x 2 vibhu vibhu  4096 Sep 10 12:36 'OS LAB 2'
-rw-rw-r-- 1 vibhu vibhu  1559 Jul 30 09:10  OS_Lab2.c
-rwxrwxr-x 1 vibhu vibhu 16736 Aug 25 02:54  Sample_fork
-rw-rw-r-- 1 vibhu vibhu   456 Aug 25 05:12  Sample_fork.c
vibhu@Vibhu-VirtualBox:~$
```

Q11) Use find, grep and sort to display a sorted list of all files in the /home/YourLoginName subdirectory that contains the word “hello” somewhere inside them.

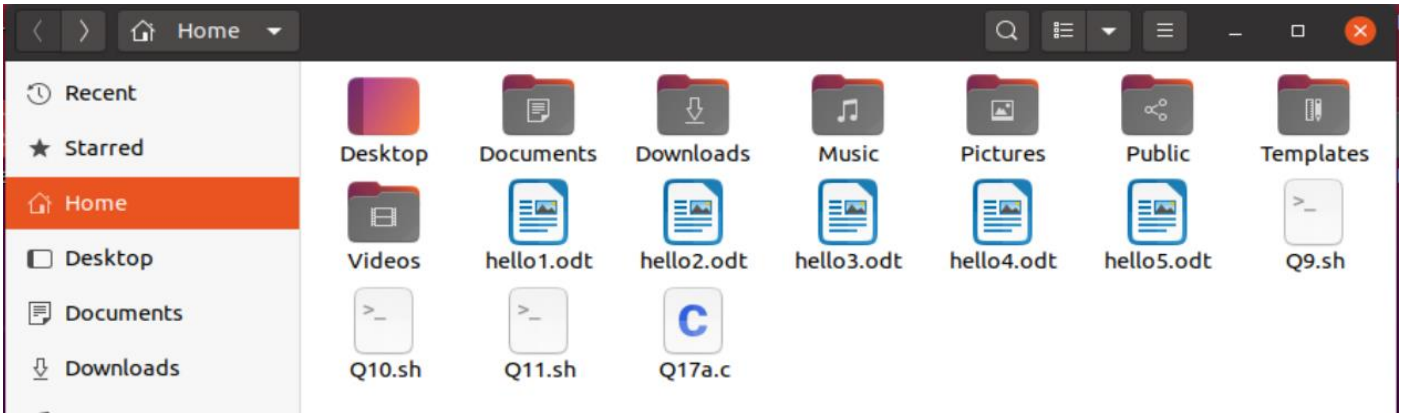
A11)

CODE:

```
#!/bin/bash/sh
#searching for only odt type for smaller output
find . -name '*' | exec grep -H "hello" | sort
```

OUTPUT:

DIRECTORY:




```
vibhu@Vibhu-VirtualBox:~$ bash Q11.sh
(standard input):./Hello/hello1.odt
(standard input):./Hello/hello2.odt
(standard input):./Hello/hello3.odt
(standard input):./Hello/hello4.odt
(standard input):./Hello/hello5.odt
vibhu@Vibhu-VirtualBox:~$
```