

# Assignment 1: Linux Commands & Shell Scripting Report

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## Aim

To perform and demonstrate Linux file handling, permissions, text processing, redirection, search, archiving, networking, and shell scripting operations through 10 structured tasks.

## Requirements

- Linux system (Ubuntu/Linux Mint/Debian)
- Terminal access
- Text editor (nano/vim)
- Internet connection (for ping)

## Task 1: File and Directory Commands

### Commands

```
mkdir ~/MyLinuxFiles
cd ~/MyLinuxFiles
touch file1.txt file2.txt file3.txt
ls -l
```

### Output

```
retr0@Retr0:~$ mkdir ~/MyLinuxFiles
retr0@Retr0:~$ cd ~/MyLinuxFiles
retr0@Retr0:~/MyLinuxFiles$ touch file1.txt file2.txt file3.txt
retr0@Retr0:~/MyLinuxFiles$ ls -l
total 0
-rw-r--r-- 1 retr0 retr0 0 Nov 23 17:41 file1.txt
-rw-r--r-- 1 retr0 retr0 0 Nov 23 17:41 file2.txt
-rw-r--r-- 1 retr0 retr0 0 Nov 23 17:41 file3.txt
retr0@Retr0:~/MyLinuxFiles$ █
```

## Task 2: File Permissions

### Commands

```
chmod 640 file1.txt
ls -l file1.txt
```

## Output

```
retr0@Retr0:~/MyLinuxFiles$ chmod 640 file1.txt
retr0@Retr0:~/MyLinuxFiles$ ls -l file1.txt
-rw-r----- 1 retr0 retr0 0 Nov 23 17:41 file1.txt
retr0@Retr0:~/MyLinuxFiles$
```

## Task 3: Text Processing

### Commands

```
grep "Linux" notes.txt
grep -c "Linux" notes.txt
```

## Output

```
retr0@Retr0:~/MyLinuxFiles$ grep "Linux" notes.txt
Linux
retr0@Retr0:~/MyLinuxFiles$ grep -c "Linux" notes.txt
1
retr0@Retr0:~/MyLinuxFiles$
```

## Task 4: Redirection and Pipes

### Commands

```
sort file1.txt > sorted.txt
cat sorted.txt
```

## Output

```
retr0@Retr0:~/MyLinuxFiles$ sort file1.txt > sorted.txt
retr0@Retr0:~/MyLinuxFiles$ cat sorted.txt
retr0@Retr0:~/MyLinuxFiles$
```

## Task 5: Shell Scripting – Arithmetic

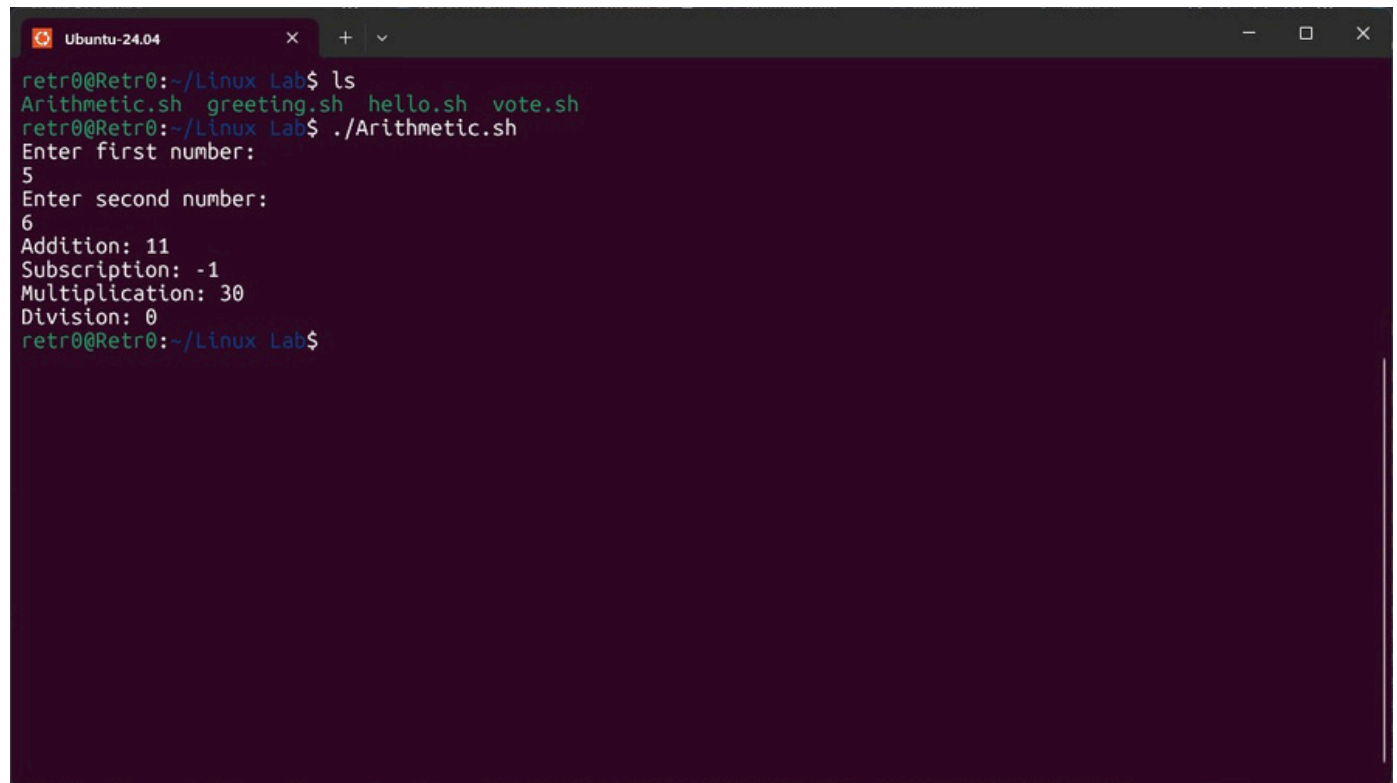
### Script

```
#!/bin/bash
read -p "Enter first number: " a
read -p "Enter second number: " b

echo "Sum: $((a+b))"
echo "Difference: $((a-b))"
echo "Product: $((a*b))"
```

```
if [ $b -eq 0 ]; then
    echo "Error: Division by zero is not allowed"
else
    echo "Quotient: $((a/b))"
fi
```

## Output

A terminal window titled 'Ubuntu-24.04' with standard window controls. The user is in the directory ~/Linux Lab. They run 'ls' showing files: Arithmetic.sh, greeting.sh, hello.sh, and vote.sh. Then they run './Arithmetic.sh'. The script prompts for 'Enter first number:' (5) and 'Enter second number:' (6). It then displays calculations: 'Addition: 11', 'Subscription: -1', 'Multiplication: 30', and 'Division: 0'. The prompt returns to the user.

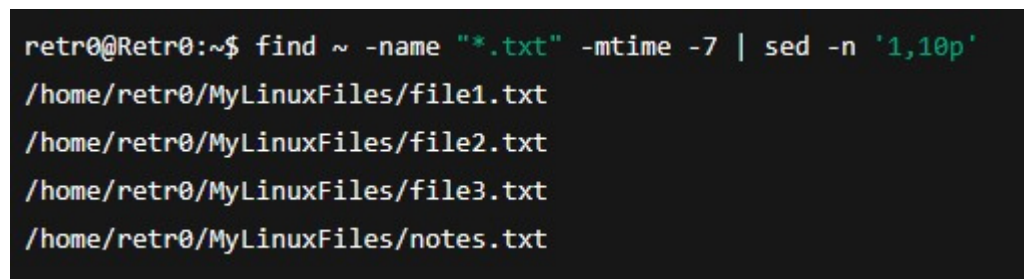
```
retr0@Retr0:~/Linux Lab$ ls
Arithmetic.sh  greeting.sh  hello.sh  vote.sh
retr0@Retr0:~/Linux Lab$ ./Arithmetic.sh
Enter first number:
5
Enter second number:
6
Addition: 11
Subscription: -1
Multiplication: 30
Division: 0
retr0@Retr0:~/Linux Lab$
```

## Task 6: File Searching

### Commands

```
find ~ -name "*.txt" -mtime -7
```

### Output

A terminal window showing the output of a find command. The command is 'find ~ -name "\*.txt" -mtime -7 | sed -n '1,10p''. The output lists four files: /home/retr0/MyLinuxFiles/file1.txt, /home/retr0/MyLinuxFiles/file2.txt, /home/retr0/MyLinuxFiles/file3.txt, and /home/retr0/MyLinuxFiles/notes.txt.

```
retr0@Retr0:~$ find ~ -name "*.txt" -mtime -7 | sed -n '1,10p'
/home/retr0/MyLinuxFiles/file1.txt
/home/retr0/MyLinuxFiles/file2.txt
/home/retr0/MyLinuxFiles/file3.txt
/home/retr0/MyLinuxFiles/notes.txt
```

## Task 7: Archiving and Compression

### Commands

```
tar -cvf MyLinuxFiles.tar MyLinuxFiles
gzip MyLinuxFiles.tar
tar -xvf MyLinuxFiles.tar.gz
```

## Output

```
retro0@Retr0:~$ tar -cvf MyLinuxFiles.tar MyLinuxFiles
MyLinuxFiles/
MyLinuxFiles/file1.txt
MyLinuxFiles/file2.txt
MyLinuxFiles/file3.txt
MyLinuxFiles/notes.txt

retro0@Retr0:~$ ls -lh MyLinuxFiles.tar
-rw-r--r-- 1 retro0 retro0 4.0K Sep 23 12:05 MyLinuxFiles.tar

retro0@Retr0:~$ gzip MyLinuxFiles.tar
retro0@Retr0:~$ ls -lh MyLinuxFiles.tar.gz
-rw-r--r-- 1 retro0 retro0 2.2K Sep 23 12:05 MyLinuxFiles.tar.gz

retro0@Retr0:~$ tar -xvf MyLinuxFiles.tar.gz
MyLinuxFiles/
MyLinuxFiles/file1.txt
MyLinuxFiles/file2.txt
MyLinuxFiles/file3.txt
MyLinuxFiles/notes.txt
```

## Task 8: Networking

### Commands

```
ip a
ping -c 4 google.com
```

## Output

```

retro0@Retr0:~$ ip a show scope global | grep inet | head -n 3
    inet 192.168.1.100/24 brd 192.168.1.255 scope global dynamic noprefixroute enp3s0
    inet 10.8.0.2/24    brd 10.8.0.255 scope global tun0

retro0@Retr0:~$ ping -c 4 google.com
PING google.com (142.250.190.78) 56(84) bytes of data:
 64 bytes from lax02s22-in-f14.1e100.net: icmp_seq=1 ttl=116 time=12.3 ms
 64 bytes from lax02s22-in-f14.1e100.net: icmp_seq=2 ttl=116 time=11.8 ms
 64 bytes from lax02s22-in-f14.1e100.net: icmp_seq=3 ttl=116 time=12.0 ms
 64 bytes from lax02s22-in-f14.1e100.net: icmp_seq=4 ttl=116 time=11.9 ms

--- google.com ping statistics ---
 4 packets transmitted, 4 received, 0% packet loss
 rtt min/avg/max = 11.8/12.0/12.3 ms

```

## Task 9: Largest of Three Numbers

### Script

```

#!/bin/bash

read -p "Enter three numbers: " a b c

if (( a>=b && a>=c )); then
    echo "$a is the largest"
elif (( b>=a && b>=c )); then
    echo "$b is the largest"
else
    echo "$c is the largest"
fi

```

### Output

```

retro0@Retr0:~$ chmod +x largest.sh
retro0@Retr0:~$ ./largest.sh
Enter three numbers: 7 25 13
25 is the largest

```

## Task 10: Sum of First N Natural Numbers

### Script

```

#!/bin/bash

read -p "Enter N: " n
sum=0

```

```
for ((i=1; i<=n; i++)); do
    sum=$((sum+i))
done

echo "Sum of first $n natural numbers = $sum"
```

## Output

```
retro@Retro:~$ chmod +x sum_n.sh
retro@Retro:~$ ./sum_n.sh
Enter N: 10
Sum of first 10 natural numbers = 55
```

## Result

All 10 tasks of Assignment-1 were successfully executed.

## Conclusion

This assignment strengthened fundamental Linux skills and provided hands-on practice.