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

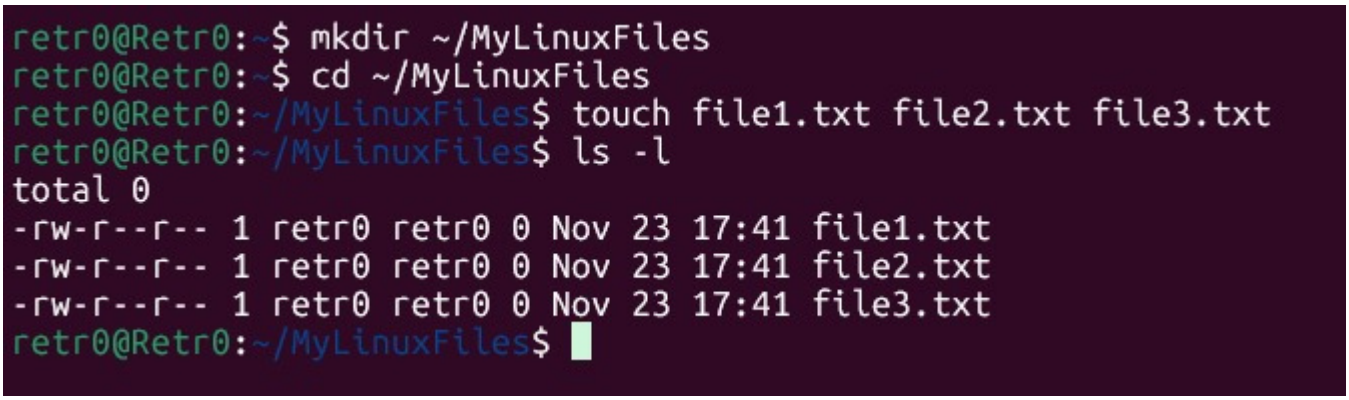
- Linux system (Ubuntu/Linux Mint/Debian)
- Terminal access
- Text editor (nano/vim)
- Internet connection (for ping)

Task 1: File and Directory Commands

Commands

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

Output



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

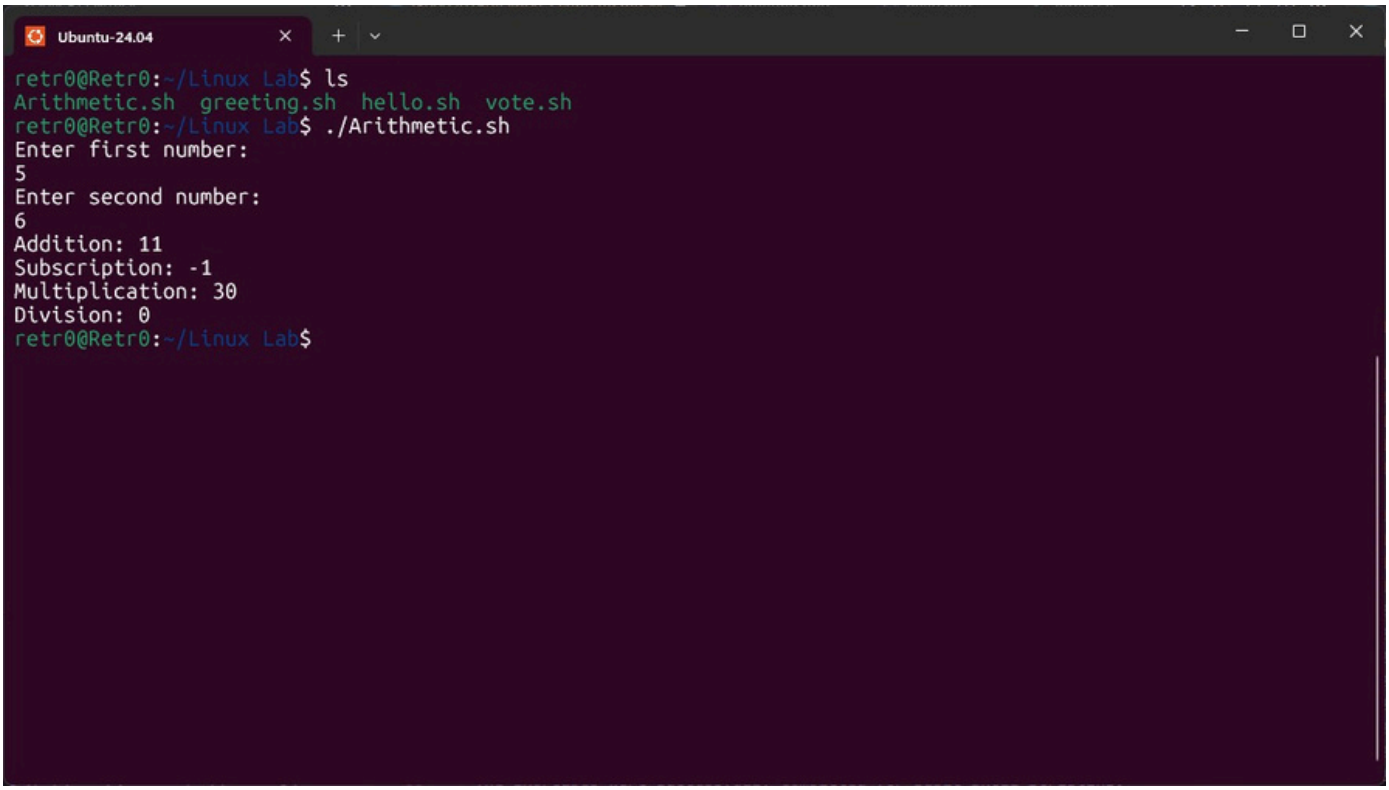
Script

```
#!/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



Task 6: File Searching

Commands

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

Output

```
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

```
retr0@Retr0:~$ tar -cvf MyLinuxFiles.tar MyLinuxFiles
MyLinuxFiles/
MyLinuxFiles/file1.txt
MyLinuxFiles/file2.txt
MyLinuxFiles/file3.txt
MyLinuxFiles/notes.txt

retr0@Retr0:~$ ls -lh MyLinuxFiles.tar
-rw-r--r-- 1 retr0 retr0 4.0K Sep 23 12:05 MyLinuxFiles.tar

retr0@Retr0:~$ gzip MyLinuxFiles.tar
retr0@Retr0:~$ ls -lh MyLinuxFiles.tar.gz
-rw-r--r-- 1 retr0 retr0 2.2K Sep 23 12:05 MyLinuxFiles.tar.gz

retr0@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

```
retr0@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

retr0@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

```bash
#!/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

```
retr0@Retr0:~$ chmod +x largest.sh
retr0@Retr0:~$ ./largest.sh
Enter three numbers: 7 25 13
25 is the largest
```

Task 10: Sum of First N Natural Numbers

Script

```bash
#!/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

```
retr0@Retr0:~$ chmod +x sum_n.sh
retr0@Retr0:~$ ./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.