Assignment-1: Linux Commands & Shell Scripting Report

Name: Priyadarshi Prabhakar
Roll No.: 590029237
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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

```
wizzz@wizzz-VirtualBox:~/Desktop/linuxlab$ mkdir ~/MyLinuxFiles
wizzz@wizzz-VirtualBox:~/Desktop/linuxlab$ cd ~/MyLinuxFiles
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ touch file1.txt file2.txt file3.txt
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ ls -l
total 0
-rw-rw-r-- 1 wizzz wizzz 0 Nov 23 22:12 file1.txt
-rw-rw-r-- 1 wizzz wizzz 0 Nov 23 22:12 file2.txt
-rw-rw-r-- 1 wizzz wizzz 0 Nov 23 22:12 file3.txt
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$
```

Task 2: File Permissions

Commands

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

Output

```
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ chmod  640 file1.txt
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ ls -l file1.txt
-rw-r----- 1 wizzz wizzz 0 Nov 23 22:12 file1.txt
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$
```

Task 3: Text Processing

Commands

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

Output

```
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ touch notes.txt
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ grep "Linux" notes.txt
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ grep -c "Linux" notes.txt
0
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ 
```

Task 4: Redirection and Pipes

Commands

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

Output

```
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ sort file1.txt > sorted.txt
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ cat sorted.txt
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ nano sorted.txt
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ cat sorted.txt
Linux
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ 
```

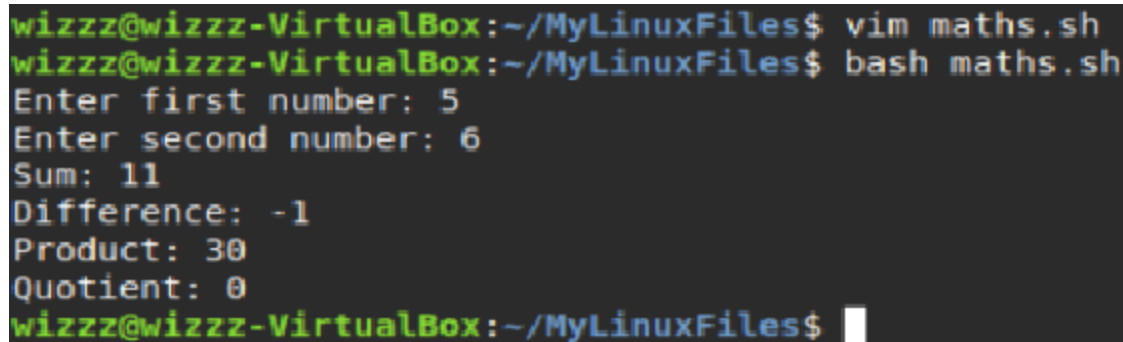# Task 5: Shell Scripting – Arithmetic

Script

```bash
#!/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

```
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ find ~ -name "*.txt" -mtime -7
/home/wizzz/MyLinuxFiles/file3.txt
/home/wizzz/MyLinuxFiles/file1.txt
/home/wizzz/MyLinuxFiles/sorted.txt
/home/wizzz/MyLinuxFiles/notes.txt
/home/wizzz/MyLinuxFiles/file2.txt
/home/wizzz/.mozilla/firefox/ie5dr5qj.default-release/serviceworker.txt
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$
```

Task 7: Archiving and Compression

Commands

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

Output

```
wizzz@wizzz-VirtualBox:~$ tar -cvf MyLinuxFiles.tar MyLinuxFiles
MyLinuxFiles/
MyLinuxFiles/file3.txt
MyLinuxFiles/file1.txt
MyLinuxFiles/MyLinuxFiles.tar
MyLinuxFiles/maths.sh
MyLinuxFiles/sorted.txt
MyLinuxFiles/notes.txt
MyLinuxFiles/file2.txt
wizzz@wizzz-VirtualBox:~$ gzip MyLinuxFiles.tar
wizzz@wizzz-VirtualBox:~$ tar -xvf MyLinuxFiles.tar.g
tar: MyLinuxFiles.tar.g: Cannot open: No such file or directory
tar: Error is not recoverable: exiting now
wizzz@wizzz-VirtualBox:~$ ls
Desktop  Documents  Downloads  Music  MyLinuxFiles  MyLinuxFiles.tar.gz  Pictures  Public  system_logs  Templates  time_log.txt  Videos
wizzz@wizzz-VirtualBox:~$ tar -xvf MyLinuxFiles.tar.gz
MyLinuxFiles/
MyLinuxFiles/file3.txt
MyLinuxFiles/file1.txt
MyLinuxFiles/MyLinuxFiles.tar
MyLinuxFiles/maths.sh
MyLinuxFiles/sorted.txt
MyLinuxFiles/notes.txt
MyLinuxFiles/file2.txt
wizzz@wizzz-VirtualBox:~$
```

Task 8: Networking

Commands

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

Output

```
wizzz@wizzz-VirtualBox:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:20:45:83 brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
       valid_lft 84714sec preferred_lft 84714sec
    inet6 fd17:625c:f037:2:52d3:2373:70fc:464e/64 scope global temporary dynamic
       valid_lft 86396sec preferred_lft 14396sec
    inet6 fd17:625c:f037:2:977:e491:3832:1980/64 scope global dynamic mngtmpaddr noprefixroute
       valid_lft 86396sec preferred_lft 14396sec
    inet6 fe80::8d11:f074:9a5b:643d/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
wizzz@wizzz-VirtualBox:~$ ping -c 4 google.com
PING google.com (142.250.182.238) 56(84) bytes of data.
64 bytes from tzdelb-bd-in-f14.1e100.net (142.250.182.238): icmp_seq=1 ttl=255 time=12.3 ms
64 bytes from tzdelb-bd-in-f14.1e100.net (142.250.182.238): icmp_seq=2 ttl=255 time=1123 ms
64 bytes from tzdelb-bd-in-f14.1e100.net (142.250.182.238): icmp_seq=3 ttl=255 time=20.2 ms
64 bytes from tzdelb-bd-in-f14.1e100.net (142.250.182.238): icmp_seq=4 ttl=255 time=19.9 ms

--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3378ms
rtt min/avg/max/mdev = 12.309/293.777/1122.726/478.604 ms
wizzz@wizzz-VirtualBox:~$ ^C
wizzz@wizzz-VirtualBox:~$
```

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

```
wizzz@wizzz-VirtualBox:~$ vim numbers.sh
wizzz@wizzz-VirtualBox:~$ bash numbers.sh
Enter three numbers: 2 6 9
9 is the largest
wizzz@wizzz-VirtualBox:~$
```

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

```
wizzz@wizzz-VirtualBox:~$
wizzz@wizzz-VirtualBox:~$ vim natural.sh
wizzz@wizzz-VirtualBox:~$ bash natural.sh
Enter N: 10
Sum of first 10 natural numbers = 55
wizzz@wizzz-VirtualBox:~$
```

Result

All 10 tasks of Assignment-1 were successfully executed.

Conclusion

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