Assignment 2: Linux & Shell Scripting Tasks

Name: Priyadarshi Prabhakar
Roll No.: 590029237
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Aim

To perform scripting and system tasks covering file renaming, searching, Fibonacci generation, permission checks, system info, monitoring, text statistics, sorting, GCD/LCM, palindrome checks, and string operations.

Requirements

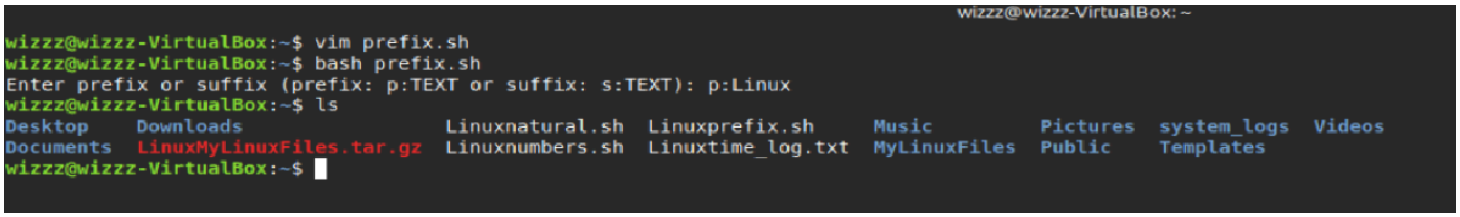
- Linux system with bash
- Terminal access
- Text editor (nano/vim)

Task 1: Add Prefix or Suffix to All Files in a Directory

Script

```bash
#!/bin/bash
read -p "Enter prefix or suffix (prefix: p:TEXT or suffix: s:TEXT): " opt
for f in *; do
  if [[ -f "$f" ]]; then
    if [[ "$opt" == p:* ]]; then
      p=${opt#p:}
      mv "$f" "${p}${f}"
    elif [[ "$opt" == s:* ]]; then
      s=${opt#s:}
      mv "$f" "${f}${s}"
    fi
  fi
done
```

Output



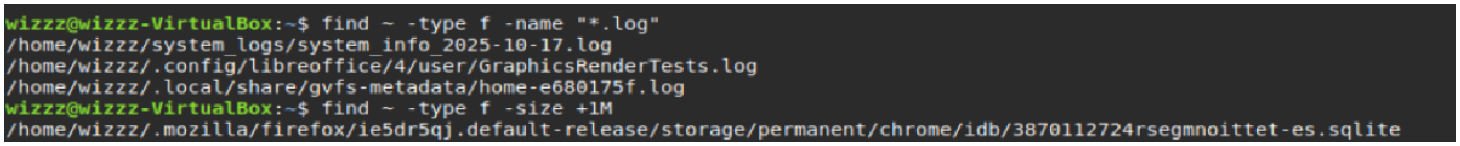
Task 2: Recursive File Search (by extension or size)

Commands

```bash
# Find by extension (e.g., .log)
find ~ -type f -name "*.log"

# Find files larger than 1MB
find ~ -type f -size +1M
```

Output



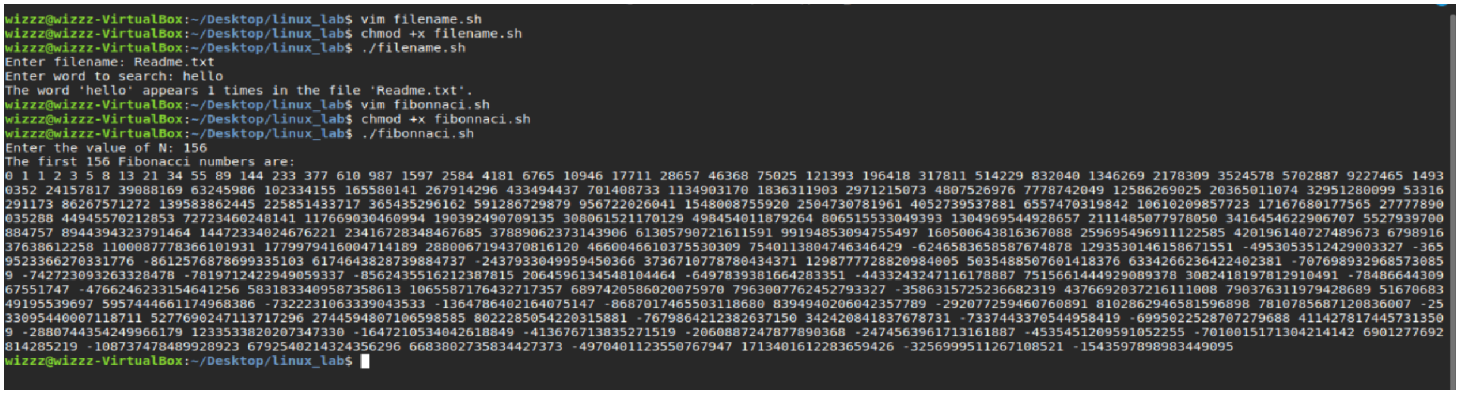
Task 3: Fibonacci Series up to N terms

Script

```
#!/bin/bash
read -p "Enter limit: " n
a=0; b=1
for ((i=0;i<n;i++)); do
  echo -n "$a "
  fn=$((a+b))
  a=$b
  b=$fn
done
echo
```

Example Output

```
Enter limit: 8
0 1 1 2 3 5 8 13
```

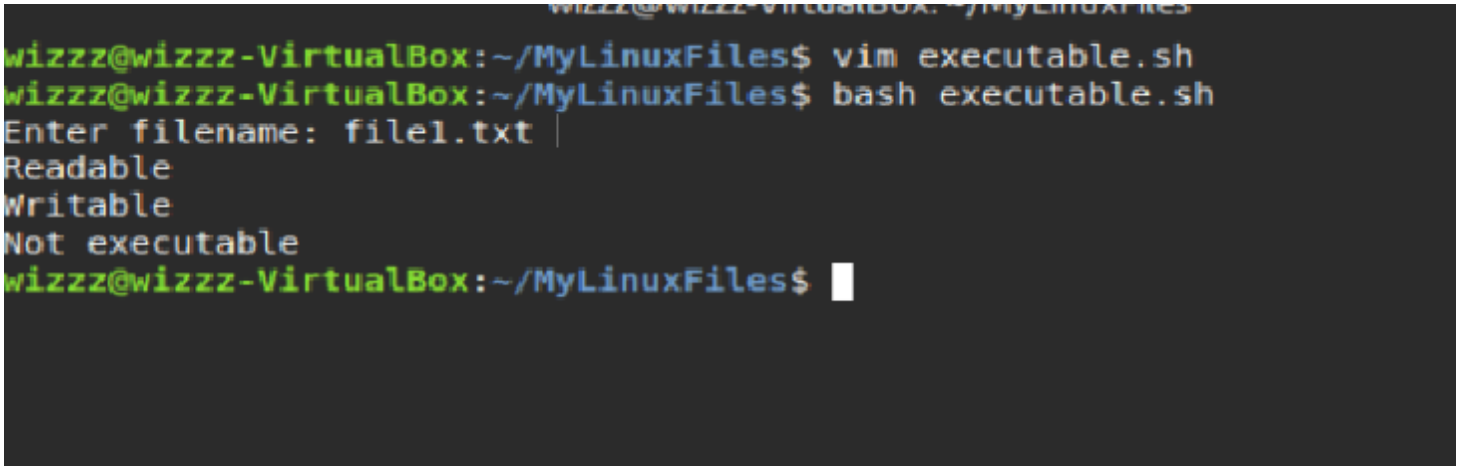


Task 4: Check File Readable/Writable/Executable

Commands

```
read -p "Enter filename: " f
[ -r "$f" ] && echo "Readable" || echo "Not readable"
[ -w "$f" ] && echo "Writable" || echo "Not writable"
[ -x "$f" ] && echo "Executable" || echo "Not executable"
```

Output

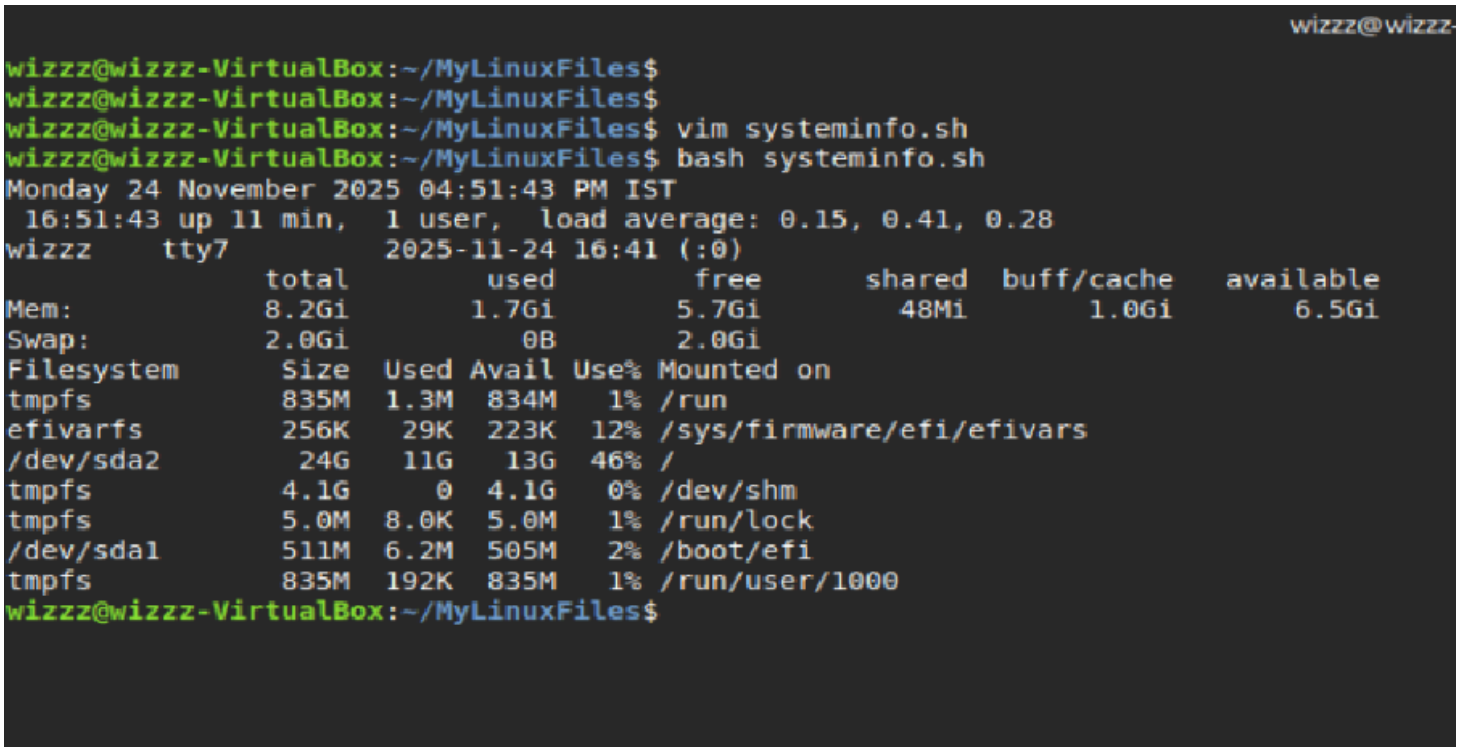


Task 5: Display System Information

Commands

```
date
uptime
who
free -h
df -h
```

Output



Task 6: Continuously Monitor and Log Top Memory-Consuming Processes

Script (one-shot)

```
top -b -o %MEM -n 1 | head -20
```

Script (continuous logging every minute)

```
#!/bin/bash
while true; do
  echo "--- $(date) ---" >> memlog.txt
  top -b -o %MEM -n 1 | head -20 >> memlog.txt
  sleep 60
done
```

Output

```
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ vim monitor.sh
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ bash monitor.sh
top - 16:53:24 up 12 min,  1 user,  load average: 0.18, 0.35, 0.27
Tasks: 235 total,   1 running, 234 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.0 us,  0.4 sy,  0.0 ni, 99.6 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :   8346.2 total,   5874.4 free,   1693.9 used,   1065.5 buff/cache
MiB Swap:   2048.0 total,   2048.0 free,      0.0 used.   6652.3 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
   2425 wizzz     20   0 2953588 427808 118080 S   0.0   5.0   1:08.04 Isolate+
   2127 wizzz     20   0   11.1g 388292 180456 S   0.0   4.5   1:19.61 firefox+
   1531 wizzz     20   0 5620584 255156 147912 S   0.0   3.0   1:44.75 cinnamon
   2232 wizzz     20   0 2517236 146360 106464 S  15.4   1.7   0:04.76 Privile+
    886 root      20   0  453472 138260  89588 S   0.0   1.6   0:37.22 Xorg
   2301 wizzz     20   0 2466836  95552  75312 S   0.0   1.1   0:01.06 WebExte+
   1875 wizzz     20   0  899888  95244  52316 S   0.0   1.1   0:00.63 mintUpd+
   2006 wizzz     20   0  496192  62224  35840 S   0.0   0.7   0:02.01 mintrep+
   1610 wizzz     20   0 1173840  61940  39168 S   0.0   0.7   0:02.37 nemo-de+
   1597 wizzz     20   0  631920  59252  33536 S   0.0   0.7   0:00.77 blueman+
   1594 wizzz     20   0  810592  58692  46816 S   0.0   0.7   0:00.43 evoluti+
   2702 wizzz     20   0 2422940  51124  38232 S   0.0   0.6   0:00.16 Web Con+
   2759 wizzz     20   0 2422956  51116  38228 S   0.0   0.6   0:00.17 Web Con+
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$
```

Task 7: Count Lines, Words, Characters of a File

Commands

```
read -p "Enter filename: " f
wc "$f"
```

Output

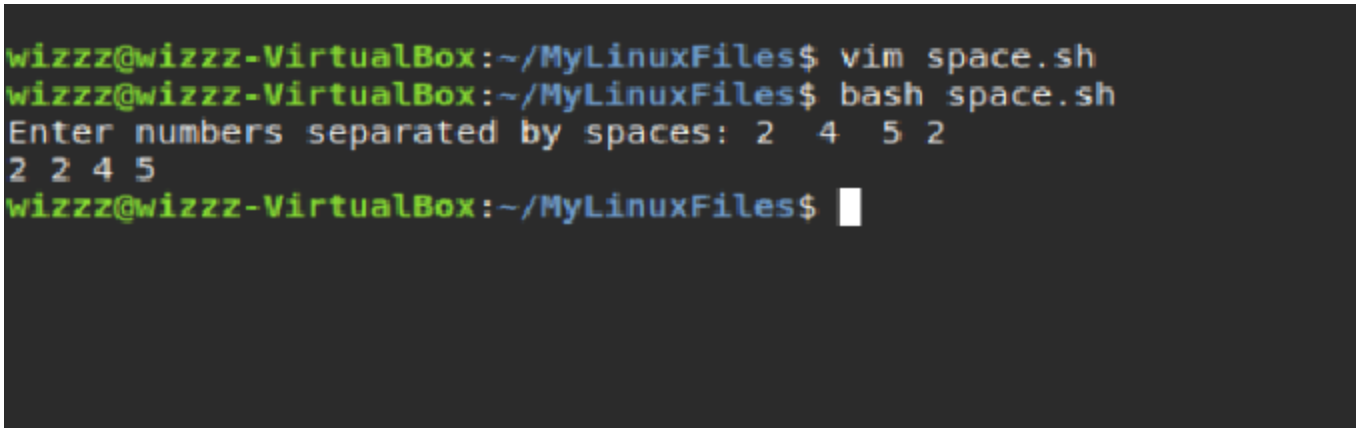
```
wizzz@wizzz-VirtualBox:~$
wizzz@wizzz-VirtualBox:~$ cd MyLinuxFiles/
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ vim lines.sh
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ bash lines.sh
Enter filename: file1.txt
0 0 0 file1.txt
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$
```

Task 8: Accept Multiple Numbers and Sort Ascending

Commands

```
read -p "Enter numbers separated by spaces: " nums
echo $nums | tr ' ' '
' | sort -n | tr '\n' ' '
echo
```

Output

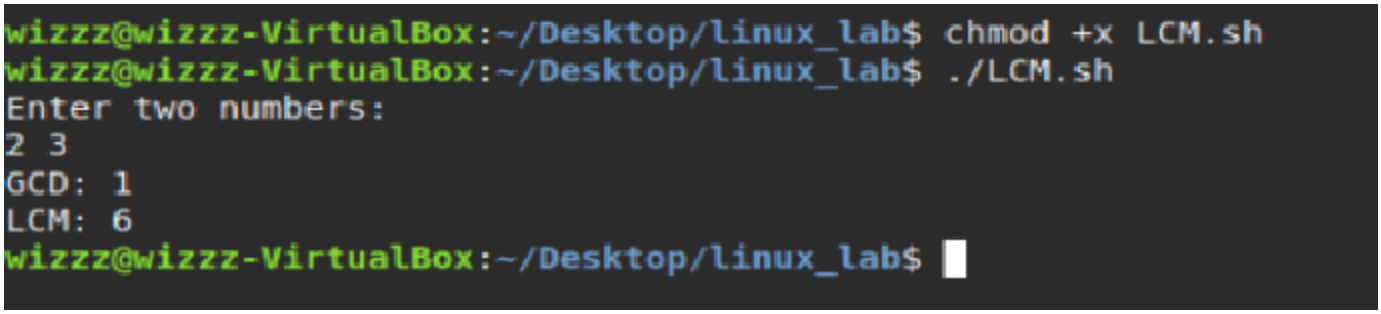


Task 9: Calculate GCD and LCM of Two Numbers

Script

```
#!/bin/bash
read -p "Enter two numbers: " a b
gcd() {
  local x=$1 y=$2 r
  while [ $y -ne 0 ]; do
    r=$(( x % y ))
    x=$y
    y=$r
  done
  echo $x
}
g=$(gcd $a $b)
l=$(( (a / g) * b ))
echo "GCD = $g"
echo "LCM = $l"
```

Output



Task 10: Check Palindrome String

Commands

```
read -p "Enter string: " s
rev=$(echo "$s" | rev)
if [[ "$s" == "$rev" ]]; then
  echo "Palindrome"
else
  echo "Not palindrome"
fi
```

Output

```
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ vim palindrome.sh
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ bash palindrome.sh
Enter string: Priyadarshi
Not palindrome
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$
```

Task 11: Length of a String

Commands

```
read -p "Enter string: " s
echo "Length: ${#s}"
```

Output

```
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ vim string.sh
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ bash string.sh
Enter string: Priyadarshi Prabhakar
Length: 21
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$
```

Task 12: Reverse a Given String

Commands

```
read -p "Enter string: " s
echo "Reverse: $(echo "$s" | rev)"
```

Output

```
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ vim reverse.sh
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ bash reverse.sh
Enter string: Priyadarshi
Reverse: ihsradayirP
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$
```

Task 13: Concatenate Two Input Strings

Commands

```
read -p "Enter first string: " s1
read -p "Enter second string: " s2
echo "Concatenated: ${s1}${s2}"
```

Output

```
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ vim concatenation.sh
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ bash concatenation.sh
Enter first string: Linux
Enter second string: Assignment 2
Concatenated: LinuxAssignment 2
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$
```

Result

All tasks cover common scripting patterns, file operations, monitoring, and string/number processing useful for system administration and scripting practice.

Conclusion

Assignment 2 provides practical tasks to strengthen shell scripting and Linux command-line proficiency.