

# Assignment 2: Linux & Shell Scripting Tasks

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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

```

#!/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

```
wizzz@wizzz-VirtualBox:~$ vim prefix.sh
wizzz@wizzz-VirtualBox:~$ bash prefix.sh
Enter prefix or suffix (prefix: p:TEXT or suffix: s:TEXT): p:Linux
wizzz@wizzz-VirtualBox:~$ ls
Desktop  Downloads          Linuxnatural.sh  Linuxprefix.sh   Music       Pictures  system_logs  Videos
Documents  LinuxMyLinuxFiles.tar.gz  Linuxnumbers.sh  Linuxtime_log.txt  MyLinuxFiles  Public    Templates
wizzz@wizzz-VirtualBox:~$
```

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

## Commands

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

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

## Output

```
wizzz@wizzz-VirtualBox:~$ find ~ -type f -name "*.log"
/home/wizzz/system_logs/system_info_2025-10-17.log
/home/wizzz/.config/libreoffice/4/user/GraphicsRenderTests.log
/home/wizzz/.local/share/gvfs-metadata/home-e680175f.log
wizzz@wizzz-VirtualBox:~$ find ~ -type f -size +1M
/home/wizzz/.mozilla/firefox/ie5dr5qj.default-release/storage/permanent/chrome/idb/3870112724rsegmnoittet-es.sqlite
```

# 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
```

```
wizzz@wizzz-VirtualBox:~/Desktop/linux_labs$ vim filename.sh
wizzz@wizzz-VirtualBox:~/Desktop/linux_labs$ chmod +x filename.sh
wizzz@wizzz-VirtualBox:~/Desktop/linux_labs$ ./filename.sh
Enter filename: Readme.txt
Enter word to search: hello
The word 'hello' appears 1 times in the file 'Readme.txt'.
wizzz@wizzz-VirtualBox:~/Desktop/linux_labs$ ./fibonacci.sh
wizzz@wizzz-VirtualBox:~/Desktop/linux_labs$ chmod +x fibonacci.sh
wizzz@wizzz-VirtualBox:~/Desktop/linux_labs$ ./fibonacci.sh
Enter the value of N: 156
The first 156 Fibonacci numbers are:
0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765 10946 17711 28657 46368 75025 121393 196418 317811 514229 832040 1346269 2178309 3524578 5702887 9227465 1493
0352 24157817 39088169 63245986 102334155 165580141 267914291 433494437 701408733 1134993170 1836311903 2971215073 4807526976 7778742049 12586269023 20365011074 32951280099 53316
291173 86267571272 139583862445 225851433717 365435296162 591286729879 956722826041 1548008755926 2584730781961 4652739537881 6557479319842 16610209857723 17167688177565 27777899
035288 44945570212851 7723460248141 117669030460994 19039249070913 308061521170129 498454011879264 80651553049933 1304969544928657 2111485077978050 3416454622906707 5527939700
884757 8944394323791464 14472334024676221 23416728348467685 37889062373143961 61305790721611591 99194853094755497 160500643816367088 259695496911122585 420196140727489673 6798916
37638612258 1100087778366101931 1779979416004714189 2880067194370816120 4660046610375530309 540113804746346429 -6246583658587674878 1293530146158671551 -4953053512429003327 -365
9523366270931778 -861257687869935183 6174643828739884737 2437933049959450366 3736710778780434371 1298777728820984605 5635488567601418376 6334266236422402381 -707698932968573885
9 -742723693263328478 -7819712422949059337 -8562435516212387815 2064596134548104464 -6497839381664283351 -4433243247116178887 751566144929089378 3082418197812910491 -78486644309
67551747 -4766246233154641256 5831833409587358613 1065587176432717357 6897420586020075970 7963087762452793327 -3586315725236682319 4376952037216111008 798376311979428689 51670683
49195539697 959744466174968386 -73223106339043533 -1364786402164075147 -8687017465503118680 8394940206042357789 -292077259460760891 8102862946581596898 7810785687120836007 -25
33095446007118711 5277690247113717296 274594807106598585 8022285054220315881 -7679864212382637156 342420841837678731 -7337443370544958419 -6995022528707279688 411427817445731350
9 -2880744354249966179 1233533820207347330 -1647210534042618849 -413676713835271519 -2060887247877890368 -2474563961713161887 -4535451209591052255 -7010015171304214142 6901277692
814285219 -108737478489928923 6792540214324356296 668380273534427373 -4970401123550767947 1713401612283659426 -3256999511267108521 -154359789893449095
wizzz@wizzz-VirtualBox:~/Desktop/linux_labs$
```

# 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

```
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ vim executable.sh
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ bash executable.sh
Enter filename: file1.txt |
Readable
Writable
Not executable
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ █
```

# Task 5: Display System Information

## Commands

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

## Output

```
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ vim systeminfo.sh
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ bash systeminfo.sh
Monday 24 November 2025 04:51:43 PM IST
 16:51:43 up 11 min,  1 user,  load average: 0.15, 0.41, 0.28
wizzz    tty7        2025-11-24 16:41 (:0)
              total        used        free      shared  buff/cache   available
Mem:       8.2Gi       1.76i      5.76i       48Mi       1.06i       6.56i
Swap:      2.0Gi          0B      2.0Gi
Filesystem  Size  Used Avail Use% Mounted on
tmpfs       835M  1.3M  834M   1% /run
efivars     256K   29K  223K  12% /sys/firmware/efi/efivars
/dev/sda2    24G   11G   13G  46% /
tmpfs       4.1G     0  4.1G   0% /dev/shm
tmpfs       5.0M   8.0K  5.0M   1% /run/lock
/dev/sdal    511M   6.2M  505M   2% /boot/efi
tmpfs       835M  192K  835M   1% /run/user/1000
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$
```

# 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

```
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ vim space.sh
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ bash space.sh
Enter numbers separated by spaces: 2 4 5 2
2 2 4 5
wizzz@wizzz-VirtualBox:~/MyLinuxFiles$ █
```

## 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

```

wizzz@wizzz-VirtualBox:~/Desktop/linux_lab$ chmod +x LCM.sh
wizzz@wizzz-VirtualBox:~/Desktop/linux_lab$ ./LCM.sh
Enter two numbers:
2 3
GCD: 1
LCM: 6
wizzz@wizzz-VirtualBox:~/Desktop/linux_lab$ █

```

# 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.