

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

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

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
```

Output:

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

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

Commands

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

```
wc "$f"
```

Output

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

Task 11: Length of a String

Commands

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

Output

Task 12: Reverse a Given String

Commands

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

Output

Task 13: Concatenate Two Input Strings

Commands

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

Output

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.