OS LAB 3

23K-0594 (sec-4F)

Q1.

```
maham@maham:~/Desktop/scripting$ ./23k-0594.sh /home/maham/Desktop/task1 file
File Renaming Program
Renamed: /home/maham/Desktop/task1/lab3.txt → file1.txt
Renamed: /home/maham/Desktop/task1/os.txt → file2.txt
Renamed: /home/maham/Desktop/task1/work.txt → file3.txt
File renaming completed successfully!
```

```bash
#!/bin/bash

echo "File Renaming Program"

#exactly 2 arguments
if [ "$#" -ne 2 ];then
echo "Correct Usage: $0 <directory_path> <prefix>"
exit 1
fi

dir_path="$1"
newname="$2"

#checking existance of directory
if [ ! -d "$dir_path" ];then
    echo "Error: Directory '$dir_path' does not exist."
    exit 1
fi

counter=1


for file in "$dir_path"/*;do
    #skipping if not a file
    if [ ! -f "$file" ];then
        continue
    fi

#extracting the file extension
    extension="${file##*.}"

#renaming
    new_file="${newname}${counter}.${extension}"

    new_file="${newname}${counter}.${extension}"

#feedback
     echo "Renamed: $file → $new_file"

     ((counter++))
done

echo "File renaming completed successfully!"
```

Q2.

```
maham@maham:~/Desktop/scripting$ ./23k-0594q2.sh /home/maham/Desktop 10
Directory Cleanup Script
Cleanup Summary:
Files deleted: 0
Empty Directories Removed: 3
maham@maham:~/Desktop/scripting$
```

```bash
#!/bin/bash

echo "Directory Cleanup Script"
#making sure we take directly path and days as args
if [ $# -ne 2 ];then
    echo "Correct Usage: $0 <directory_path> <days>"
    exit 1
fi

dir_path=$1
days=$2

if [ ! -d "$dir_path" ];then
    echo "Error: Directory '$dir_path' does not exist!"
    exit 1
fi

#removing files according to days
files_to_delt=$(find "$dir_path" -type f -mtime +"$days" -print -delete | wc -l)

#empty directory deletion
dir_to_delt=$(find "$dir_path" -type d -empty -print -delete | wc -l)

#feedback
echo "Cleanup Summary: "
echo "Files deleted: $files_to_delt"
echo "Empty Directories Removed: $dir_to_delt"
```

Q3.

```
maham@maham:~/Desktop/scripting$ ./23k-0594q3.sh -t 5 -i 1 -f txt
Monitoring system for 5 seconds (every 1 seconds)...
Report saved as system_report.txt
maham@maham:~/Desktop/scripting$
```

```bash
#!/bin/bash

#setting default values so that script can run without user input values too
monitor_time=10       #10 secs
interval=1
output_format="txt"
final_report="system_report.$output_format"

#(-t for time,-i for interval,-f for format) - user inputs
while getopts "t:i:f:" option;do
    case ${option} in
        t)monitor_time=$OPTARG ;;
        i)interval=$OPTARG ;;
        f)output_format=$OPTARG ;;
        *)echo "Invalid option!"; exit 1 ;;
    esac
done

#temp file made for storing data initially and then making calculations and storing in final report
temp="/tmp/system_monitor.log"
> "$temp"  #clearing file


echo "Monitoring system for $monitor_time seconds (every $interval seconds)..."
echo "System Report" > "$final_report"

cpu_sum=0
mem_sum=0
disk_sum=0
counter=0
```

```bash
#collecting system data
for ((i = 0; i < monitor_time; i += interval));do
    cpu_usage=$(top -bn1 | grep "Cpu(s)" | awk -F',' '{print 100 - $4}' | awk '{print $1}')
    mem_usage=$(free -m | awk 'NR==2{print $3*100/$2}')
    disk_usage=$(df -h / | awk 'NR==2{print $5}' | tr -d '%')
    network_traffic=$(awk 'NR>2 {print $1 ": Received: " $2 " bytes, Sent: " $10 " bytes"}' /proc/net/dev)

    echo "Time: $(date)" >> "$temp"
    echo "CPU Usage: ${cpu_usage}%" >> "$temp"
    echo "Memory Usage: ${mem_usage}%" >> "$temp"
    echo "Disk Usage: ${disk_usage}%" >> "$temp"
    echo "Network: $network_traffic" >> "$temp"

    #summing values together
    cpu_sum=$(echo "$cpu_sum + $cpu_usage" | bc)
    mem_sum=$(echo "$mem_sum + $mem_usage" | bc)
    disk_sum=$(echo "$disk_sum + $disk_usage" | bc)
    ((counter++))

    sleep $interval
done
```

```
#avg calculation
#scale=2 for getting ans in 2 deci places
cpu_avg=$(echo "scale=2; $cpu_sum / $counter" | bc)
mem_avg=$(echo "scale=2; $mem_sum / $counter" | bc)
disk_avg=$(echo "scale=2; $disk_sum / $counter" | bc)

echo "Average CPU Usage: $cpu_avg%" >> "$temp"
echo "Average Memory Usage: $mem_avg%" >> "$temp"
echo "Average Disk Usage: $disk_avg%" >> "$temp"

#copying to final
mv "$temp" "$final_report"
echo "Report saved as $final_report"

```

Open

system_report.txt
~/Desktop/scripting

```
Time: Sun Feb  9 03:16:45 AM PKT 2025
CPU Usage: 19.4%
Memory Usage: 37.673%
Disk Usage: 11%
Network: lo:: Received: 103894 bytes, Sent: 103894 bytes
enp0s3:: Received: 129802333 bytes, Sent: 3314668 bytes
Time: Sun Feb  9 03:16:47 AM PKT 2025
CPU Usage: 1.6%
Memory Usage: 37.673%
Disk Usage: 11%
Network: lo:: Received: 103894 bytes, Sent: 103894 bytes
enp0s3:: Received: 129802458 bytes, Sent: 3314742 bytes
Time: Sun Feb  9 03:16:48 AM PKT 2025
CPU Usage: 0%
Memory Usage: 37.673%
Disk Usage: 11%
Network: lo:: Received: 103894 bytes, Sent: 103894 bytes
enp0s3:: Received: 129802458 bytes, Sent: 3314742 bytes
Time: Sun Feb  9 03:16:49 AM PKT 2025
CPU Usage: 1.7%
Memory Usage: 37.673%
Disk Usage: 11%
Network: lo:: Received: 103894 bytes, Sent: 103894 bytes
enp0s3:: Received: 129802458 bytes, Sent: 3314742 bytes
Time: Sun Feb  9 03:16:51 AM PKT 2025
CPU Usage: 2%
Memory Usage: 37.5326%
Disk Usage: 11%
Network: lo:: Received: 103894 bytes, Sent: 103894 bytes
enp0s3:: Received: 129802458 bytes, Sent: 3314742 bytes
Average CPU Usage: 4.94%
Average Memory Usage: 37.64%
```