

CS-233: Exercise 24a (Shell Scripting)

Beginner

April 10, 2025

Instructions

Complete the following Bash scripting tasks on your Kali Linux system. Each task builds real-world skills for managing files, inspecting logs, and working with users. Use **grep**, **sed**, and **awk** to complete each assignment.

Exercises

1. Use **ls -l /var/log** and **grep** to list all files modified in April of the current year.
2. Use **awk** to print the filenames and sizes (5th column) of files in **/var/log**.
3. Use **awk** and **sort** to print a list of all file owners in **/var/log**, sorted by number of files owned.
4. Use **sed** to remove the time column (8th field) from each line of **ls -l /var/log** output.
5. Use **awk** to list all unique login shells from **/etc/passwd**.
6. Use **grep** to find users with home directories under **/home** in **/etc/passwd**.
7. Use **sed** to replace all colons **:** in **/etc/passwd** with pipes **|**.
8. Use **awk** to print the usernames and UIDs from **/etc/passwd**.
9. Use **grep -E** to find all lines in **/etc/passwd** that end in **/bin/bash**.
10. Use **awk** to calculate the average UID (3rd field) in **/etc/passwd**.

Why These Exercises Matter

- **List April-modified files in /var/log:** Helps identify what logs are active or updated for audit trails.
- **Print filenames and sizes:** Useful for monitoring log growth and storage usage.
- **Sort files by owner:** Helps assess which users or daemons are generating logs.
- **Remove time column:** Demonstrates parsing and formatting text output for analysis or reporting.
- **List unique shells:** Reveals interactive shell configurations across user accounts.
- **Find home directory users:** Identifies real user accounts (vs system users).
- **Replace colons with pipes:** Prepares flat files for custom parsing or display.
- **Print usernames and UIDs:** Important for account audits and script automation.
- **Match /bin/bash logins:** Used to find interactive users.
- **Calculate average UID:** Helps distinguish system UIDs from user UIDs.

Answers

1. `ls -l /var/log | grep "Apr"`
2. `ls -l /var/log | awk '{print $9, $5}'`
3. `ls -l /var/log | awk '{print $3}' | sort | uniq -c | sort -nr`
4. `ls -l /var/log | sed -E 's/([^\]+){7}/'`
5. `awk -F: '{print $7}' /etc/passwd | sort -u`
6. `grep "/home" /etc/passwd`
7. `sed 's:/|/g' /etc/passwd`
8. `awk -F: '{print $1, $3}' /etc/passwd`
9. `grep -E "/bin/bash$" /etc/passwd`
10. `awk -F: '{sum+=$3} END {print sum/NR}' /etc/passwd`