

Assignment : 4

Linux Programming

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1. Extract usernames from /etc/passwd using grep + tee (CO4)

- `grep -o '^[^:]*' /etc/passwd | tee users.txt`
- This takes the part before ':' (the username), shows it on screen, and saves it to users.txt.

2. Binary not found in \$PATH (CO3)

- If a command isn't found:
 - Use 'which commandname' → checks if it's in \$PATH.
 - Use 'find / -name commandname 2>/dev/null' → searches entire system.
 - Use 'locate commandname' → faster search if database is updated.
- Once found, add its directory to \$PATH:
`export PATH=$PATH:/usr/local/bin`

3. Find .log files modified in last 24 hours (CO4)

- `find /var/log -name "*.log" -mtime -1 | tee log_report.txt`
- Finds recent .log files, shows them, and saves to log_report.txt.

4. Difference between shutdown -r now and reboot (CO1)

- shutdown -r now: Shuts down the system safely and immediately reboots.
 - reboot: Directly reboots the system.
- Shutdown is more graceful (warns users, stops services properly).

5. Using tee to debug a script with output + errors (CO4)

- `./myscript.sh 2>&1 | tee debug.log`
- Captures both normal output and error messages, shows them, and saves into debug.log for later checking.

6. Real-world applications of Linux (CO2)

1. Servers → Linux powers most web servers (Google, Facebook, Amazon).
2. Networking & Security → Used in firewalls, routers, and penetration testing.
3. Embedded Systems → Runs in Android, smart TVs, IoT devices.

7. Application, System, and Utility software in Linux (CO2)

- Application software → Programs for users (Firefox, LibreOffice).
- System software → The operating system kernel and drivers that manage hardware.
- Utility software → Tools for system tasks (grep, find, tar, top).

8. Open-source vs Proprietary OS (CO2)

- Open-source (Linux): Free, code is public, customizable, strong community support.
- Proprietary (Windows, macOS): Paid, closed-source, controlled by a company, official support but less flexibility.

9. Display system's kernel version (CO3)

- `uname -r`

10. Difference between head and tail (CO1)

- head: Shows the first lines of a file (default 10).
- tail: Shows the last lines of a file (default 10).