

Department of Cybersecurity

Linux Programming(24CY23XX)

ASSIGNMENT -4

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1. Use grep + tee to extract usernames from /etc/passwd and display/save.

bash

```
grep "^[^:]*" /etc/passwd | cut-d:-f1 | tee usernames.txt
```

This extracts usernames (first field in /etc/passwd), displays them on terminal, and saves to usernames.txt.

2. Troubleshoot binary not found in \$PATH using which, find, locate.

- which <binary> shows if binary exists in PATH.
- If not found, find /-name <binary> searches the filesystem.
- locate <binary> quickly checks prebuilt filename database.

Example:

bash

```
which mybinary
```

```
find /-name mybinary
```

```
locate mybinary
```

Use results to add binary path to \$PATH.

3. Pipeline to find .log files modified last 24 hours in /var/log and save to log_report.txt.

bash

```
find /var/log -name "*.log" -mtime -1 | tee log_report.txt
```

-mtime -1 finds files modified in last 24 hours .

4. Difference shutdown -r now and reboot.

- shutdown -r now schedules an orderly shutdown and restart immediately.
 - reboot immediately restarts without graceful shutdown.
shutdown is safer to avoid data loss .
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5. Use tee to debug script generating output and errors.

```
bash
```

```
./script.sh 2>&1 | tee debug.log
```

Captures both stdout and stderr, views on terminal, and writes to debug.log.

6. Three real-world Linux applications in industries.

- Web hosting servers (e.g., Apache, NGINX).
- Embedded systems in automotive and IoT devices.
- Cloud infrastructure and container orchestration (e.g., Kubernetes).

Linux's stability, security, and flexibility suit diverse industrial needs.

7. Differentiate application, system, and utility software in Linux.

- Application software: Programs performing user tasks (e.g., browsers).
 - System software: OS components managing hardware (e.g., kernel).
 - Utility software: Tools for system maintenance (e.g., chmod, ls).
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8. Key differences between open-source and proprietary OS.

- Open-source OS (Linux): source code available, free use, community-driven.

- Proprietary OS (Windows): closed source, paid licenses, vendor supported.
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9. Command to display system kernel version.

bash

uname-r

Outputs kernel release version.

10. Difference between head and tail commands.

- head shows beginning lines of a file.
 - tail shows last lines.
Typical usage is to preview log files or outputs quickly.
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