

DAYANANDA SAGAR UNIVERSITY

Subject: Linux Programming

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LINUX PROGRAMMING: ASSIGNMENT – 1

1. What is Linux Operating System (OS)? List three pros and cons of it.

Linux is an open-source operating system based on Unix. It manages hardware resources and provides a stable environment for applications.

Pros:

- Highly secure
- Free and open-source
- Strong community support

Cons:

- Some applications do not support Linux
- Requires technical knowledge
- Hardware drivers may need manual setup

2. Differentiate between Linux, Mac, Android, and Windows OS (six unique features).

Linux – Open-source, customizable, secure, supports servers, free distributions, strong terminal usage.

Mac – Closed-source, optimized for Apple hardware, highly stable, professional UI, strong multimedia performance.

Android – Based on Linux kernel, open-source for OEMs, touchscreen-based, app-focused environment.

Windows – Closed-source, widely supported, user-friendly interface, strong gaming support, enterprise tools.

3. 3. Why is Linux preferred for Mainframe Servers?

- High reliability and uptime
- Excellent performance under heavy workloads
- Strong built-in security controls

4. 4. Explain the structure of the Linux File System.

The Linux filesystem uses a hierarchical (tree-like) structure starting from root (/).

```
/  
|—— bin – Essential commands  
|—— etc – Configuration files  
|—— home – User files  
|—— var – Logs and spooled files  
|—— usr – Applications and utilities  
|—— root – Superuser home  
|—— boot – Bootloader files
```

5. 5. How do companies like Red Hat earn money if Linux is open-source?

They earn through:

- Paid technical support subscriptions
- Enterprise-grade solutions
- Training and certifications
- Cloud and managed services

6. 6. Command to display today's date and time:

`date`

7. 7. Command to check system uptime:

uptime

8. 8. Difference between shutdown -h now and halt.

shutdown -h now → Gracefully shuts down and powers off.

halt → Stops the system but may not power off depending on hardware.

9. 9. Compare init 0 and shutdown -h. Which is safer? Why?

init 0 → Directly switches system to runlevel 0, abrupt for services.

shutdown -h → Safely terminates services before powering down.

Shutdown is safer because it handles processes properly.

10.10. What happens if a server is powered off without proper shutdown?

- Filesystem corruption may occur
- Incomplete writes can cause data loss
- Processes may crash abruptly
- System may fail to boot properly later