

Department of Cybersecurity

Linux Programming

ASSIGNMENT 5

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Class: 3-A

Roll no: 22

1. What is a shell in Linux OS? How many categories of shell is currently exists in Linux? Why bash shell is very popular in Linux distribution?

A **shell** is a command-line interface that allows users to interact with the Linux kernel by typing commands.

There are **two main categories** of shells:

- **Command-line shells** (e.g., bash, sh, zsh, csh, ksh)
- **Graphical shells** (used in GUIs like GNOME or KDE)

Bash (Bourne Again Shell) is popular because it's **default in most distributions**, supports **scripting, history, aliases, and command completion**, and is **POSIX-compatible**.

2. What does the ls -Z command display?

It shows **SELinux security context labels** (user, role, type, and level) for each file and directory.

3. Command to list all hidden files in the current directory:

ls -a

4. Explain the difference between hard links and soft links (symbolic links) in Linux.

Feature	Hard Link	Soft Link
Points to	File's inode	File's path
Works after deleting original	Yes	No
Cross-filesystem support	No	Yes
Created using	ln file linkname	ln -s file linkname

5. A file has permissions -rwxr-x--x. Explain who can read, write, and execute it.

- Owner: rwx → can read, write, and execute
- Group: r-x → can read and execute
- Others: --x → can only execute

So, the owner has full access, group can read & execute, and others can only execute.

6. Write the command to change the group ownership of a file data.txt to group staff. (CO1)

chgrp staff data.txt

7. Why is it dangerous to give 777 permissions to a file? Explain with an example. (CO1)

Permission 777 means **read, write, and execute** access for everyone (owner, group, and others).

8. What is the difference between apropos (i.e., man -k) and whatis (i.e., man -f)? (CO1)

apropos (or man -k) searches for **commands related to a keyword** in the manual page descriptions.

whatis (or man -f) shows a **one-line summary** about a specific command.

9. Write a command to redirect the error output of a command to a file named error.log. (CO1)

command 2> error.log

10. How can you use the tee command to append output to a file instead of overwriting it? (CO4)

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command | tee -a output.txt
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