

LINUX PROGRAMMING

ASSIGNMENT-5

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Q1. What is a shell in Linux OS? How many categories of shell exist? Why is Bash popular?

Ans:

A **shell** is a command-line interpreter that provides a user interface to access the services of the Linux operating system.

It reads user commands, interprets them, and passes them to the kernel for execution.

Categories of Shells:

1. Bourne Shell (sh)
2. C Shell (csh)
3. Korn Shell (ksh)
4. Bourne Again Shell (bash)
5. Z Shell (zsh)

Why Bash is popular:

- It is default in most Linux distributions.
- Supports command history, aliases, and scripting.
- Compatible with older Bourne shell scripts.
- Open-source and highly customizable.

Q2. What does the ls -Z command display?

Ans:

ls -Z displays **SELinux security context** information for each file.

Example:

```
ls -Z /home/user
```

Output shows user, role, type, and level (security labels) for each file.

Q3. Write a command to list all hidden files in the current directory.

Ans:

```
ls -a
```

The -a option lists **all files**, including hidden ones (which start with a dot .).

Q4. Explain the difference between hard links and soft (symbolic) links.

Ans:

Feature	Hard Link	Soft Link (Symbolic Link)
Points to	Actual data on disk (inode)	Original file path
Across filesystems	✗ Not allowed	☑ Allowed
Deletion of original file	Data still accessible	Link becomes broken
Command	ln file1 file2	ln -s file1 file2

Q5. A file has permissions -rwxr-x--x. Explain who can read, write, and execute it.

Ans:

User Type	Permissions	Meaning
Owner	rwx	Read, write, execute
Group	r-x	Read and execute
Others	--x	Execute only

Q6. Write the command to change the group ownership of a file data.txt to group staff.

Ans:

```
chgrp staff data.txt
```

Q7. Why is it dangerous to give 777 permissions to a file?

Ans:

777 means **read, write, and execute** access for **everyone**.

Example:

```
chmod 777 secret.txt
```

→ Any user can **modify** or **delete** the file, posing a **security risk**

Q8. What is the difference between apropos and whatis?

Ans:

Command	Function	Example
whatis	Shows one-line description of a command	whatis ls
apropos	Searches manual pages by keyword	apropos list

Q9. Write a command to redirect the error output of a command to a file named error.log.

Ans:

```
command_name 2> error.log
```

Here, 2> redirects **stderr (error output)** to a file.

Q10. How can you use the tee command to append output to a file instead of overwriting it?

Ans:

```
command_name | tee -a output.txt
```

The -a option appends data to output.txt rather than overwriting it

