1. List of regular expressions and meaning

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| **Symbol** | **Description** | **Example** |
| . | Matches any single character except newline | a.b matches acb, axb, etc. |
| ^ | Anchors the match at the start of a line or string | ^abc matches abc at the start |
| $ | Anchors the match at the end of a line or string | abc$ matches abc at the end |
| \* | Matches 0 or more occurrences of the preceding element | a\*b matches b, ab, aaab |
| + | Matches 1 or more occurrences of the preceding element | a+b matches ab, aaab |
| ? | Matches 0 or 1 occurrence of the preceding element | a?b matches b or ab |
| {n} | Matches exactly n occurrences of the preceding element | a{3} matches aaa |
| {n,} | Matches n or more occurrences of the preceding element | a{2,} matches aa, aaa, etc. |
| {n,m} | Matches between n and m occurrences of the preceding element | a{2,4} matches aa, aaa, aaaa |
| [] | Denotes a character class (set) | [abc] matches a, b, or c |
| [^] | Denotes a negated character class (set) | [^abc] matches any character except a, b, or c |
| () | Groups expressions for applying quantifiers or alternation | (abc)+ matches abc, abcabc |
| \ | Escapes a special character to treat it as a literal | \. matches a literal dot . |

1. Features of linux

* Linux is open source and free
* Is secure as it has strong built in protection against treats
* Requires less ram consumption
* Simplified updates for all installed softwares
* stability and reliability as linux can run for years without reboots and crashing

1. What is Kernal? can you explain about it in your words.

* Kernal is the core part of OS as it has complete control over everything in the system.
* It is responsible for managing system resources such as CPU, memory, and input/output devices.
* it acts as bridge between hardware and software applications
* It ensures that one misbehaving program doesn't crash the entire computer

1. BASH

Bourne again Shell

* Bash acts as a translator between you and the computer
* It's also a powerful **scripting language**, meaning you can write lists of commands in a file and have BASH run them automatically

1. Linux and windows difference

1. Linux is open-source; Windows is proprietary and closed-source.

2. Linux is free to use; Windows usually requires a paid license.

3. Linux is highly customizable; Windows has limited customization options.

4. Linux is preferred for servers and development; Windows dominates the desktop market.

5. Linux uses terminals like Bash; Windows uses Command Prompt and PowerShell.

6. Linux updates are user-controlled; Windows updates are often automatic.

7. Linux is less targeted by viruses; Windows is more vulnerable to malware.

Examples for linux include Firefox, LibreOffice, GIMP, and many free tools that users can customize or improve.

Examples for windows include Microsoft Office, Adobe Photoshop, AutoCAD, and many popular games.

Basic components of Linux

Kernel – The core part of Linux that talks to the hardware.

Example: When we open a file, the kernel helps the program read it from the hard drive.

Shell – Lets you type and run commands to control the system.

Example: You type ls to list files — the shell sends this command to the kernel.

File System – Organizes how files and folders are stored.

Example: /home/user/file.txt is a file path in the file system.

System Libraries – Help programs run by providing ready-made functions.

Example: A program uses a library to display text on the screen.

System Utilities – Small tools for tasks like copying, moving, or deleting files.

Example: cp to copy, rm to delete, top to monitor running processes.

User Space – Where user applications and programs run.

Example: Firefox, LibreOffice, VS Code run in user space.

* Is it legal to edit Kernal? when do you think we have to in case?

Yes, as the linux kernel In GNU permits us to use, modify and distribute the kernel and its source code

What is LILO? Explain

LILO is the Linux loader which helps the computer to startup by loading the operating system

Just like bridge between your computer's hardware and the operating system, ensuring everything gets up and running smoothly

What is shell? How many shells are there and what are they ? can you explain.

a shell in Linux is a program that allows you to communicate with your computer's operating system by typing text commands. It acts as an intermediary between you (the user) and the system's core, known as the kernel

Types of shell

Bash- The default shell on many Linux distributions, known for its scripting capabilities and user-friendly features

Zsh- An extended version of Bash with additional features like improved autocompletion and customization options

Fish- Designed for user-friendliness, offering features like syntax highlighting and autosuggestions.

Csh- Offers a syntax similar to the C programming language, with features like job control and command history

Ksh- combine features from bourne and c for advance scripting

What is swap space?

Swap space acts as extra memory when your RAM is full

What is Mount ? how do you mount and unmount file system in Linux?

mounting in Linux means connecting a storage device to a specific folder in your system so you can access its files. Unmounting is the process of safely disconnecting that device when you're done using it.

sudo umount /mnt/mydrive

What is chmod command ? how to use it?

command in Linux is used to change the permissions of files and directories, determining who can read, write, or execute them

chmod [user][operator][permission] [file]

Can you add a new user account? Crate a new user in different ways

sudo passwd newuser

Process: A process is like a complete program running on your computer, such as a web browser or a word processor. It has its own memory space and resources, so it operates independently from other processes.

Thread: A thread is a smaller unit within a process that performs a specific task. Multiple threads can exist within a single process, sharing the same memory space, which allows them to work together efficiently.