Assignment -1

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1. What does CLI stand for, and how does it differ from GUI?

Ans. CLI stands for **Command Line Interface,** a text-based interface where users interact with the operating system or software by typing commands.

1. **Usage**: Users input specific commands to perform tasks such as file manipulation, software installation, and system configuration.
2. **Advantages**:
    - Efficiency: CLI is faster for experienced users who know the commands.
    - Resource-light: It consumes fewer system resources compared to GUI.
    - Powerful: Offers advanced features and functionalities, often not available in GUI.
3. Examples: Bash, PowerShell, and Command Prompt.

GUI stands for **Graphical User Interface**, a visual interface that allows users to interact with the system using graphical elements like icons, windows, and menus.

1. **Usage**: Users navigate the interface using input devices like a mouse, keyboard, or touchscreen to execute tasks.
2. **Advantages**:
    - User-friendly: Ideal for beginners with intuitive navigation.
    - Visual: Provides a graphical representation of files, folders, and programs.
    - Multitasking: Simplifies handling multiple tasks simultaneously.
3. Examples: Windows, macOS, and GNOME.

Key Differences:

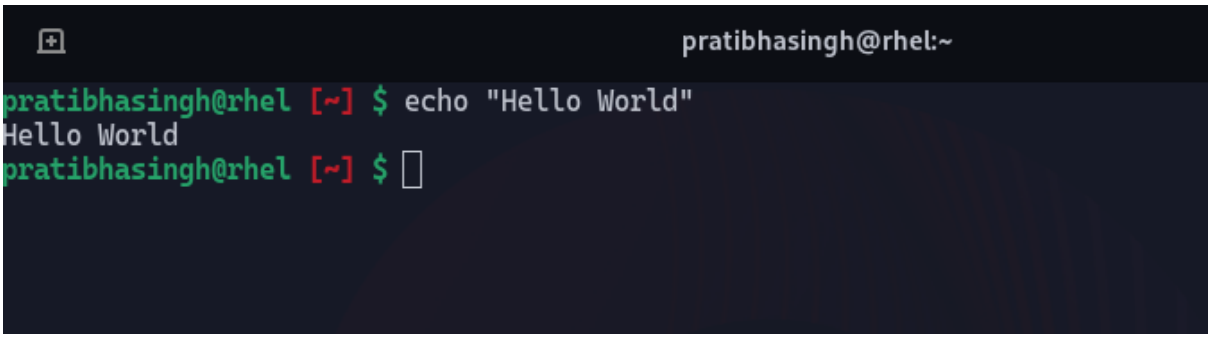
1. Interaction Mode: CLI uses commands; GUI uses graphical elements.
2. Learning Curve: CLI has a steeper learning curve; GUI is beginner-friendly.
3. Speed: CLI is faster for specific tasks; GUI may feel slower due to graphical overhead.

4. Resources: CLI is lightweight; GUI requires more memory and processing power.

Conclusion:
CLI is preferred by advanced users for precision and speed, while GUI is more accessible to general users. Both have unique advantages and are suited for different scenarios depending on the user's skill set and requirements.

2.Open a terminal and execute a simple command such as echo "Hello". Can you perform a similar action in a GUI? What are the advantages of using a CLI compared to a GUI?

Ans.



Performing a Similar Action in GUI:

1. Open a text editor (like GNOME Text Editor or any other).
2. Type the text "Hello" in the editor.
3. Save the file or display it on the screen.

Advantages of Using CLI Compared to GUI:

1. **Speed and Efficiency:**
    - CLI allows users to execute tasks quickly by typing commands directly.
    - GUI involves multiple steps, such as opening applications and navigating through menus, which may take longer.
2. **Resource Usage:**

- CLI consumes minimal system resources since it doesn't rely on graphical components.
- GUI requires more memory and processing power due to the graphical interface.

3. **Automation:**
   - CLI supports scripting to automate repetitive tasks, increasing productivity.
   - GUI lacks direct automation capabilities and often requires manual input.
4. **Precision and Control:**
   - CLI offers granular control over tasks and configurations.
   - GUI provides limited control, often restricting advanced functionalities to default options.
5. **Remote Access:**
   - CLI is ideal for remote system management via SSH or other protocols.
   - GUI requires additional tools like remote desktop applications, which may be slower.

Conclusion: While GUI is intuitive and visually appealing, CLI excels in speed, efficiency, and control, making it a powerful tool for advanced users and developers.

3. To convert a minimal CLI-based Linux interface into a GUI-based one, which packages are typically required? Find them

Ans. To convert a minimal CLI-based Linux interface into a GUI-based one, several packages and components are required. Here's a breakdown of the essential packages needed to set up a graphical user interface (GUI) on a Linux system:

Key Packages Required:

1. **Display Server:**

- A display server handles the graphical rendering.
- Example:
  - X.Org Server (xorg-server) – The most commonly used display server for Linux systems.
  - Wayland – A modern alternative to X.Org with improved performance and security.

2. **Desktop Environment (DE):**
   - A desktop environment provides a complete graphical interface with a window manager, file manager, and system utilities.
   - Popular Options:
     - GNOME: A modern, user-friendly desktop environment.
     - KDE Plasma: A highly customizable and visually appealing DE.
     - Xfce: Lightweight and ideal for older hardware.
     - LXDE/LXQt: Ultra-lightweight options for minimal resource usage.
3. **Window Manager (Optional if DE is installed):**
   - A window manager controls the appearance and behavior of windows.
   - Example:
     - Openbox: A lightweight window manager.
     - i3: A tiling window manager for advanced users.
4. **Login Manager (Display Manager):**
   - A login manager provides a graphical interface for user authentication.
   - Popular Options:
     - GDM: GNOME Display Manager.
     - SDDM: Simple Desktop Display Manager for KDE.
     - LightDM: A lightweight display manager compatible with various DEs.
5. **GUI Applications (Optional):**
   - For a functional GUI experience, basic GUI applications can be installed, such as:
     - Web Browser: Firefox or Chromium.
     - Text Editor: gedit (GNOME) or Kate (KDE).
     - File Manager: Nautilus (GNOME) or Dolphin (KDE).
6. **Drivers and Utilities:**

- Graphics Drivers: Install appropriate drivers for your hardware (e.g., Intel, NVIDIA, or AMD).
- Fonts: Install a package like fonts-dejavu or ttf-freefont for readable text.

Commands to Install GUI Components:

I. sudo apt update
II. sudo apt install xorg gnome gdm3
III. sudo apt update
IV. sudo apt install xorg xfce4 lightdm
V. sudo yum groupinstall "Server with GUI"

4. What are terminals in Linux? How many virtual terminals are available on your system, and which key combination is used to access them?
Ans. Terminals in Linux:

A terminal in Linux is an interface that allows users to interact with the system by typing commands. It is a powerful tool for performing administrative tasks, running programs, and managing files. Terminals can be physical (like a monitor and keyboard directly connected to a machine) or virtual, which are emulated within the operating system.

Virtual Terminals

Virtual terminals (VTs) are software-based terminals that provide multiple text-based interfaces on a single physical device. They allow users to switch between different sessions, enabling multitasking even in a command-line environment.

Number of Virtual Terminals:

- Most Linux distributions typically provide 6 virtual terminals by default for text-mode logins, and one graphical terminal if a GUI is installed.
- Virtual terminals are numbered as tty1 through tty6, while the GUI session runs on tty7 or higher.

Accessing Virtual Terminals:

- To switch between virtual terminals, use the key combinations:
  - Ctrl + Alt + F1 through Ctrl + Alt + F6 for text-mode terminals.
  - Ctrl + Alt + F7 (or F8) to return to the graphical interface.

Virtual terminals are especially useful for troubleshooting and managing multiple sessions without relying on a GUI.

5.Write the commands to check a file and a directory in a long listing format. How can you determine whether it is a file or a directory?

Ans. Commands to Check a File and Directory in Long Listing Format:-

A. To check a file in long listing format:-
   ls -l example.txt
B. To check a directory in long listing format:
   ls -ld folder

Determining if It's a File or a Directory

Using the Output of ls -l**:**

- The output will display the **file type** in the first character of the permissions string:
  - `d`: Indicates a directory (e.g., `drwxr-xr-x`).
  - `-`: Indicates a regular file (e.g., `-rw-r--r--`).
  - `l`: Indicates a symbolic link.

6.Which Linux commands are used to view the content of files and directories? Write the commands

Ans. Commands to View the Content of Files and Directories

Viewing Files

1. cat (Concatenate):
    - Displays the content of a file.

Example: cat filename.txt

2. less:
    - Opens a file for viewing one screen at a time.

Example:less filename.txt

3. more:
    - Similar to less but with fewer navigation features.

Example:more filename.txt

4. head:
    - Displays the first 10 lines of a file by default.

Example:head filename.txt
To specify a number of lines:head -n 5 filename.txt

5. tail:
    - Displays the last 10 lines of a file by default.
    - Example:tail filename.txt

Viewing Directories

1. ls:
    - Lists files and directories.

Example:ls

2. ls -l:
    - Lists files and directories in long format.

Example:ls -l

3. tree:
    - Displays directories and files in a tree-like structure (may need installation).
    - Example:tree

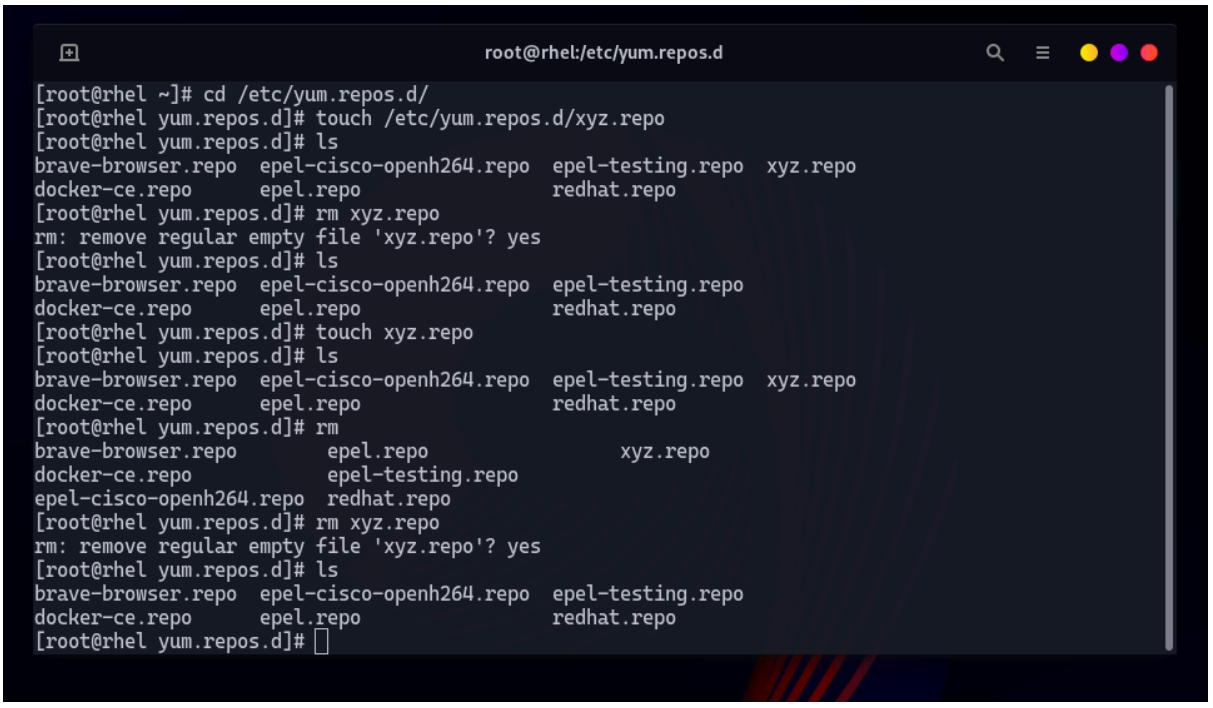
7.Change your current location to the /etc/yum.repos.d directory.

a. Using the relative path method, create a file named xyz.repo under the /etc/yum.repos.d/ directory.

b. Using the absolute path method, create a file named xyz.conf under the /etc/rsyslog.d/ directory.

c. What differences did you observe between using a relative path and an absolute path?

Ans.



Differences Between Relative Path and Absolute Path:

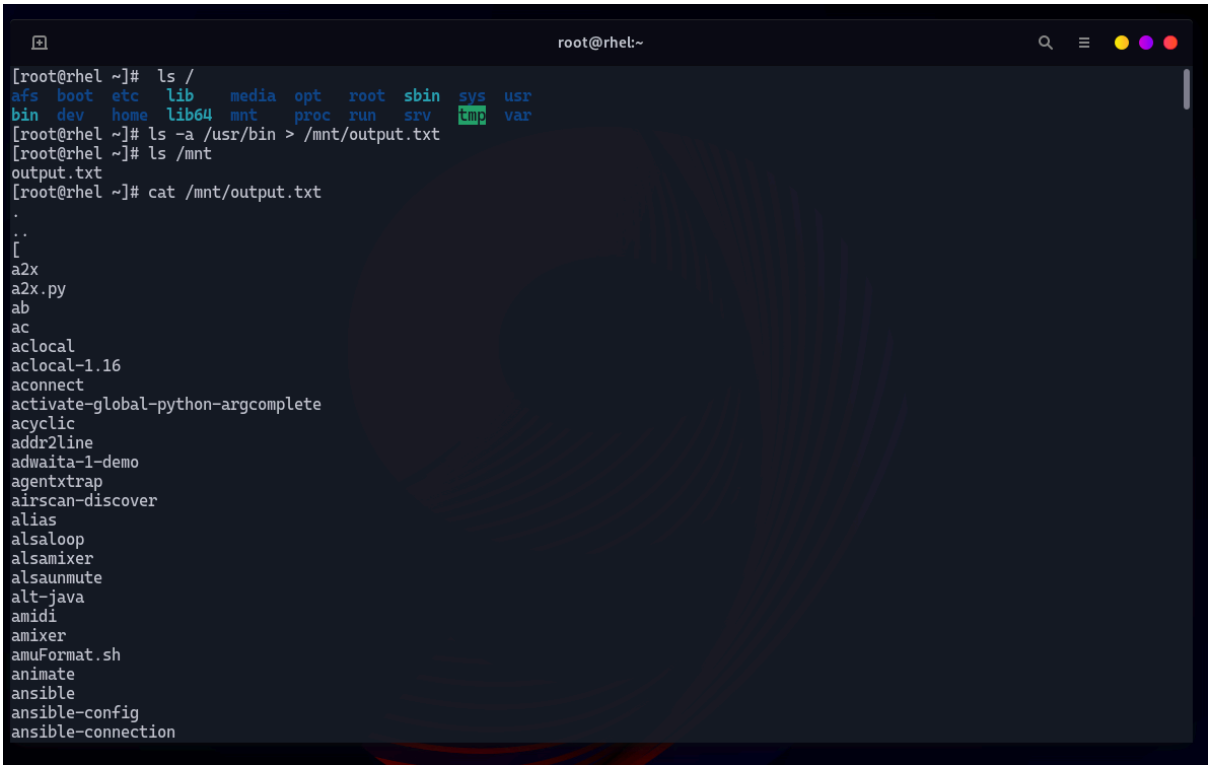
1. **Relative Path:**
    - Depends on the current working directory.
    - Shorter and simpler but requires you to be in or near the target location.
2. **Absolute Path:**
    - Specifies the full path starting from the root (`/`).
    - Independent of the current directory, always works.

Example:

- Relative: `touch xyz.repo` (from `/etc/yum.repos.d`).
- Absolute: `touch /etc/rsyslog.d/xyz.conf`.

8.List all files, including hidden ones, in the /usr/bin/ directory with details like file permissions. Save the output to a file named output.txt in the /mnt directory. Write the command.

Ans.



9.Create the parent directories /Techno/Udaipur/Rajasthan/India/Asia/Earth/Solar using one command. Then, check the full structure with details in a long listing format. Write the commands.

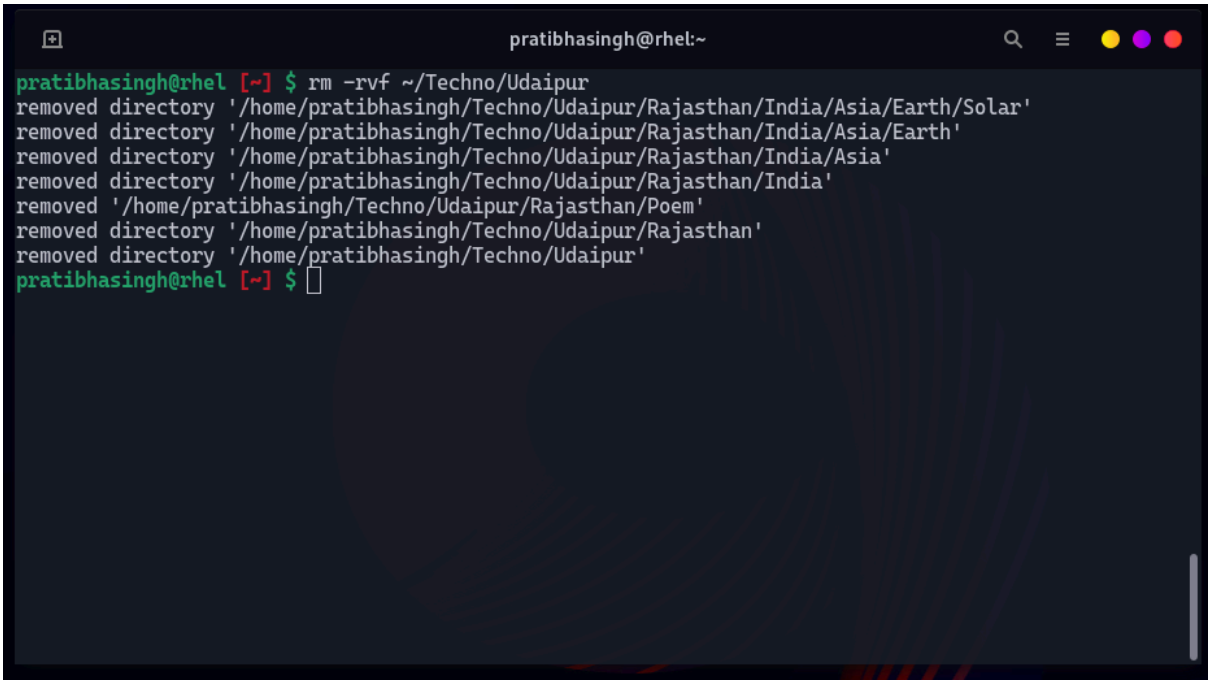
Ans.

10.Create a file named “Poem” under the /Techno/Udaipur/Rajasthan/ directory. Write the text "Twinkle Twinkle Little Star" into the file and save it. Perform all actions using the absolute path method.

Ans.

11.Delete the /Techno/Udaipur directory, including its contents, using a single Linux command. Write the command.

Ans.



12.How can you view the manual page for the useradd command? From the manual page, identify which files are important for user administration.(Hint: Check the 'Files' Section)

Ans. Viewing the Manual Page for useradd:

To view the manual page for the useradd command, use the following command in the terminal:man useradd

Important Files for User Administration (from the 'Files' section):

The useradd manual page lists several files important for user administration:

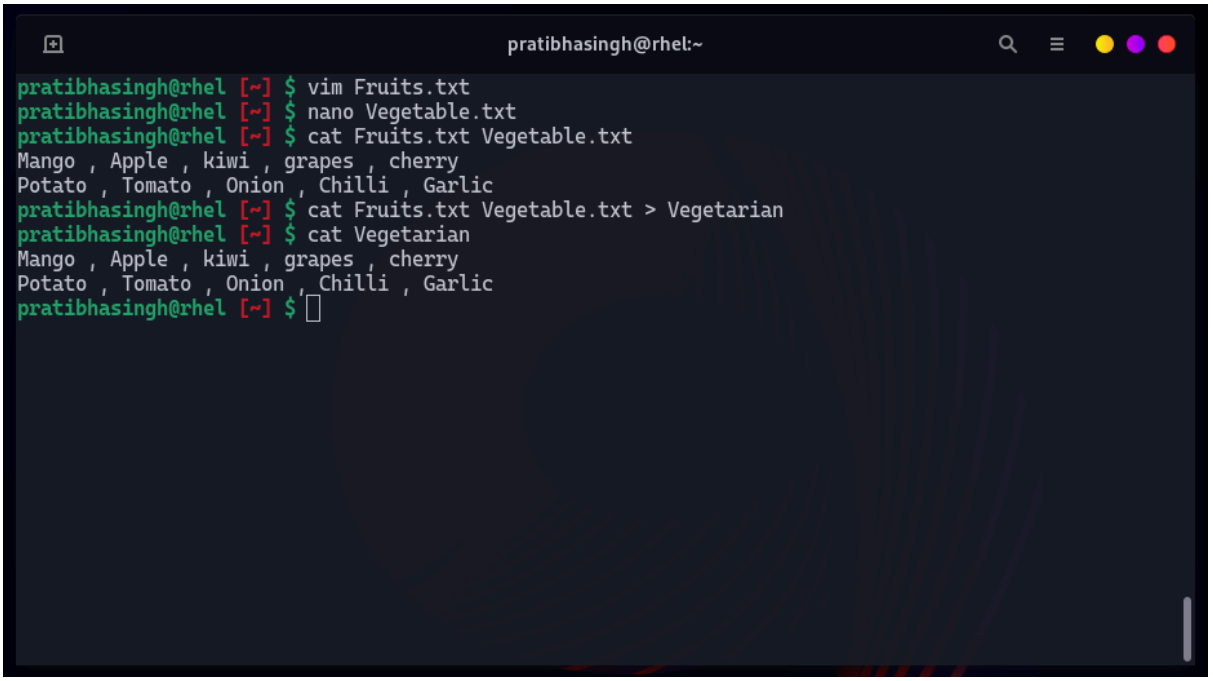
1. /etc/passwd:
    - Contains user account information.
2. /etc/shadow:
    - Stores secure user password information.
3. /etc/group:

- Contains group information.

4. /etc/default/useradd:
    - Default settings for the useradd command.
5. /etc/skel/:
    - Directory containing skeleton files that are copied to a new user's home directory.
6. /etc/login.defs:
    - Configuration file for login settings and defaults.

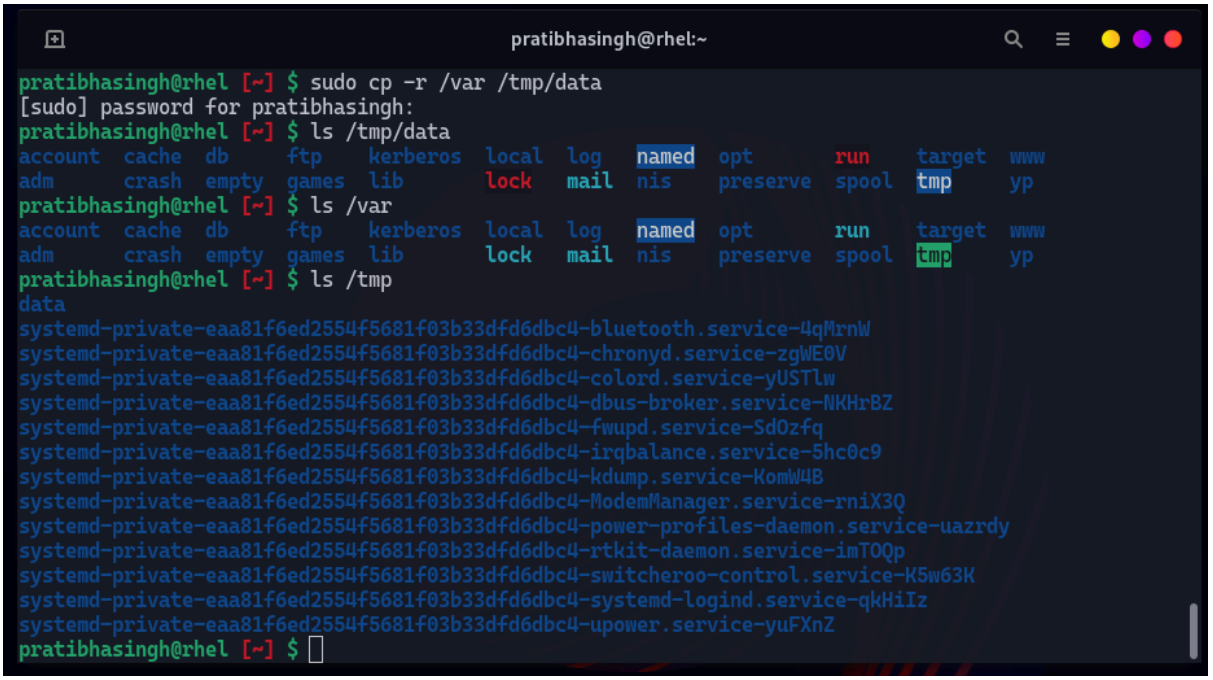
These files are critical for managing users, groups, and their authentication details.

13. You have two files: Fruits.txt and Vegetables.txt, each containing related content.
a. Write content in fruits.txt using vi. (EX: mango, apple, kiwi, grapes, cherry).
b. Write content in vegetables.txt using nano. (Ex: potato, tomato, onion, chilli, garlic).
c. Write the single command to Combine the contents of both files into a single file named vegetarian and display its content.
Ans.



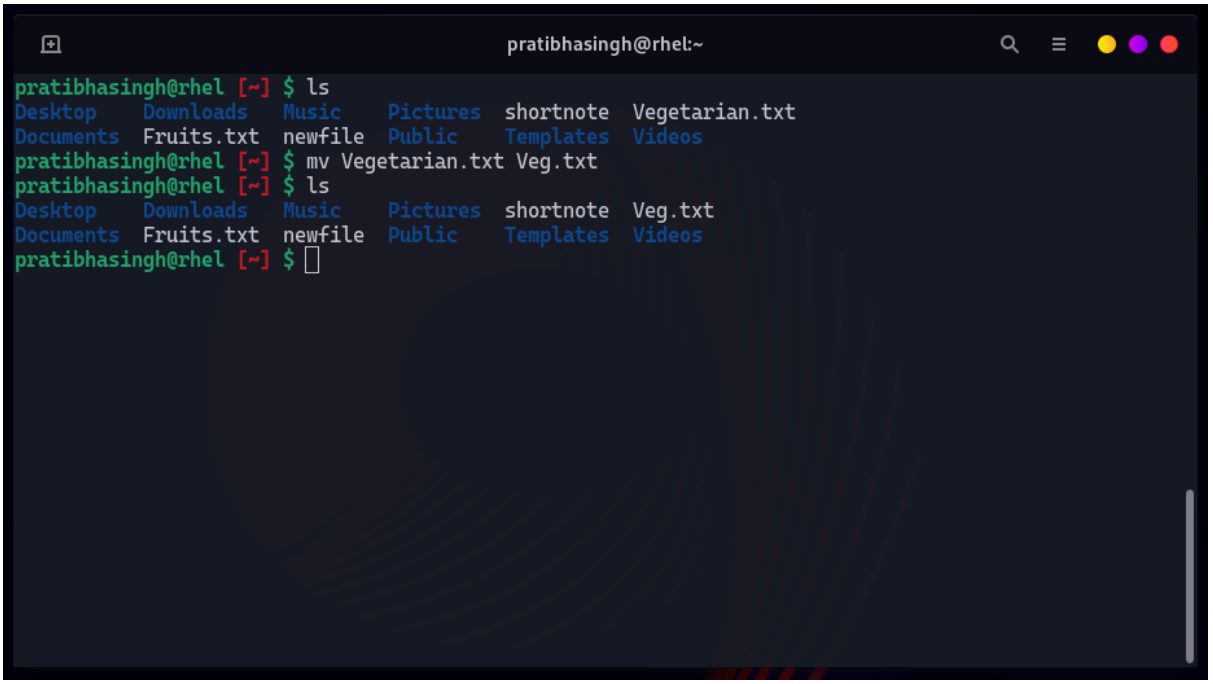
14.Write the command to copy all files, including related sub-files, from /var to a new location /tmp/data/. The output should be displayed during the copying process.

Ans.



15.Rename the file “Vegetrian.txt” to “Veg.txt”. Write the command

Ans.



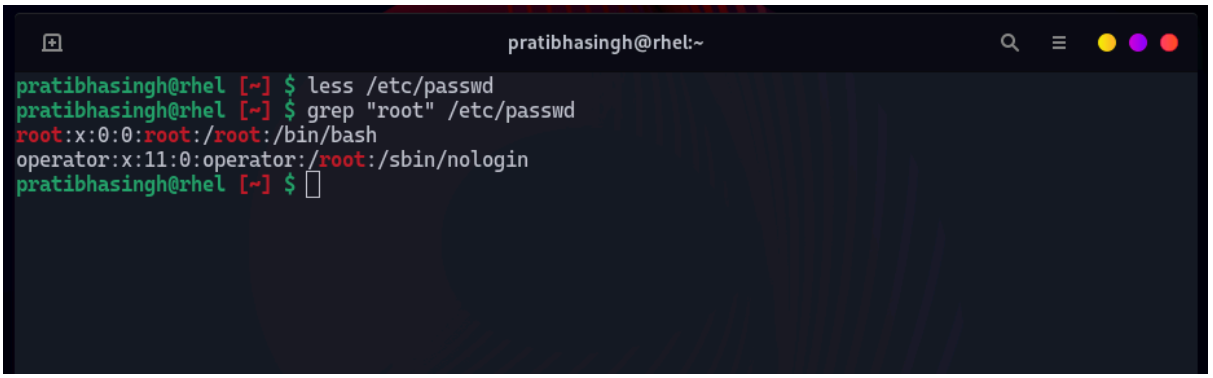
16.Open the file “/etc/passwd and locate the following lines using less and more:

a. Search for the text "Root" using the less command.

b. Search for the word "root" using the grep command.

c. What is the difference between more and less commands?

Ans.



Difference Between `more` and `less` Commands:

Feature	`more`	`less`
Navigation	Only forward navigation is supported.	Supports both forward and backward navigation.
Interactive	Simpler with limited features.	More interactive with advanced search and scrolling options.
Performance	Loads the entire file into memory.	Loads content dynamically, improving performance for large files.
Quitting	Exit by pressing `q`.	Exit by pressing `q`.

17.Perform the following tasks and write the commands to achieve them:

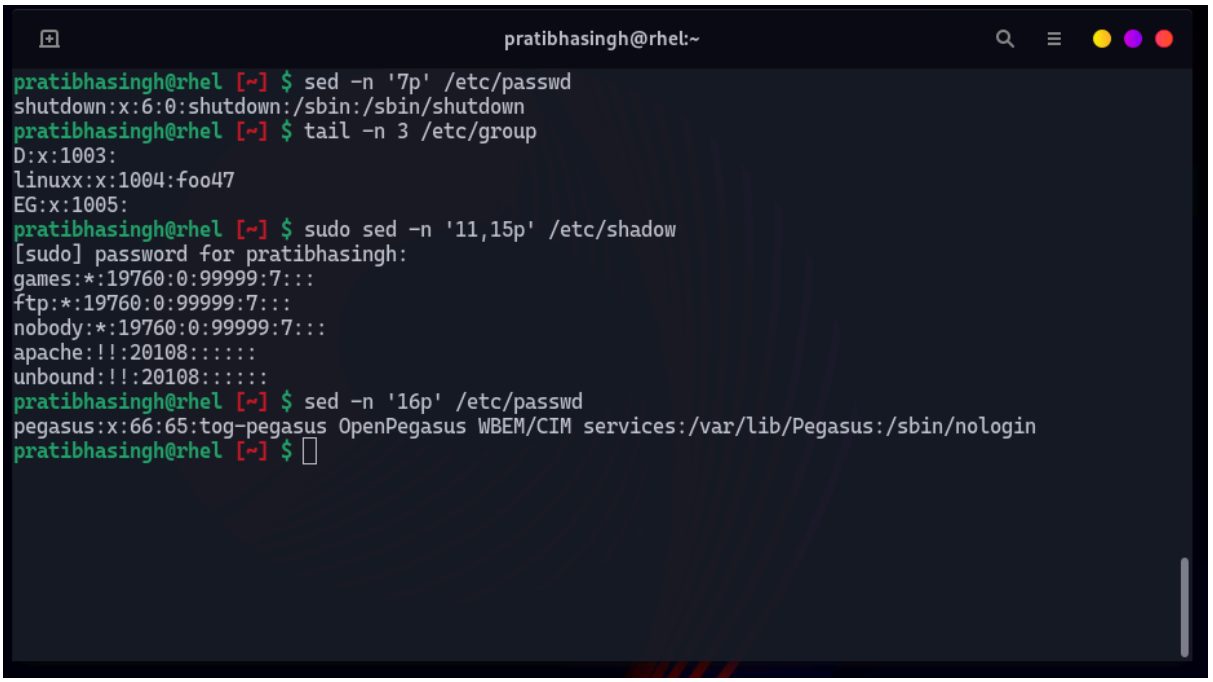
a. Display the top 7th line of the /etc/passwd file.

b. Display the last 3 lines of the /etc/group file.

c. Display the lines 11th to 15th from the /etc/shadow file using a pipeline.

d. Display only the 16th line of the /etc/passwd file

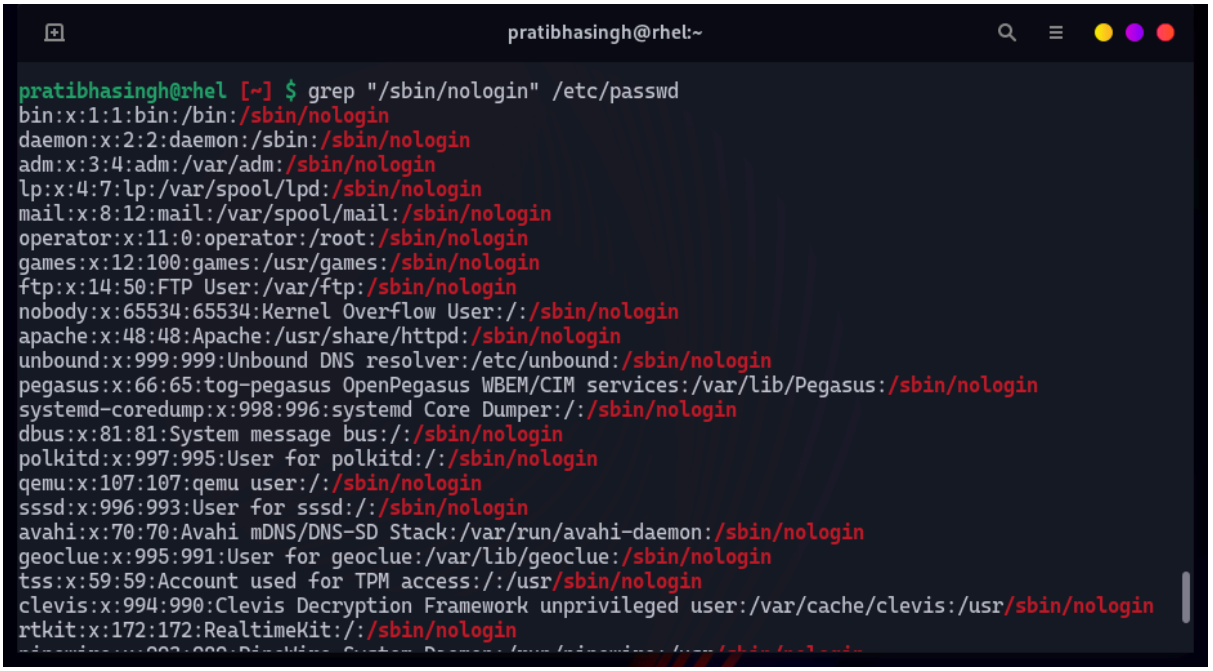
Ans.

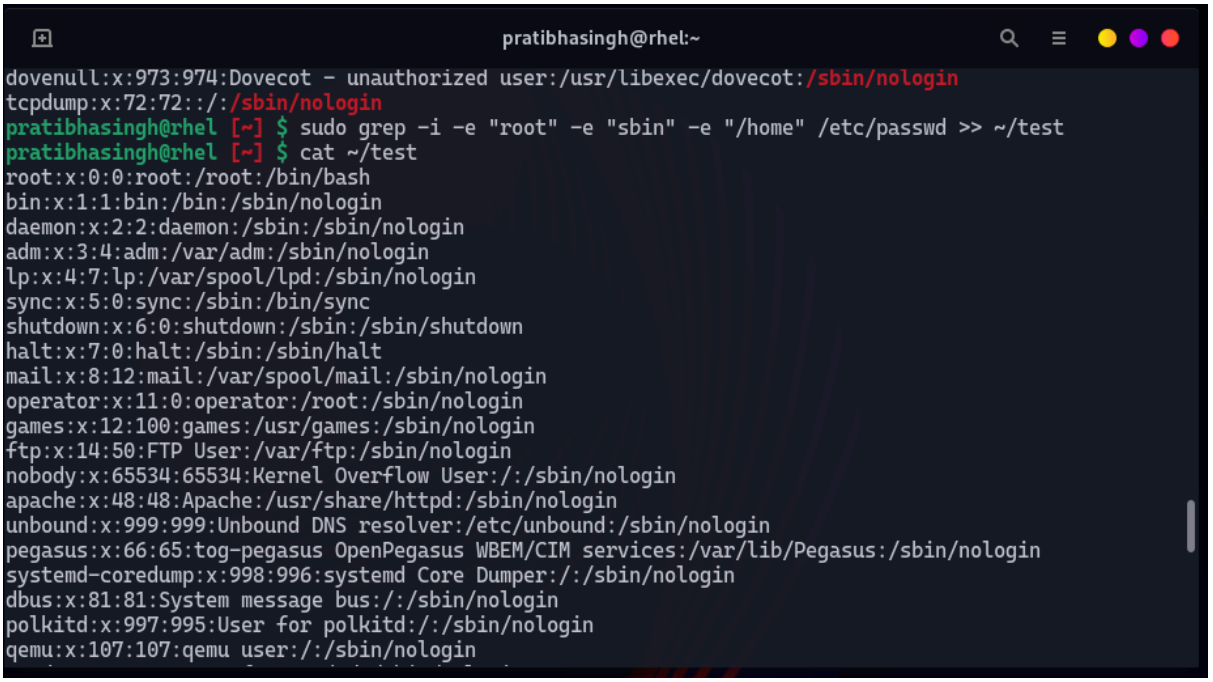


18.Perform the following tasks using the grep command on the /etc/passwd file:

- a. Write a command to match and display lines containing the word /sbin/nologin.
- b. Write a command to match and display lines containing the multiple words (root, sbin, and /home) simultaneously, ignoring typographical case errors. Save the output for all three matches into the file /root/test. Without loosing data

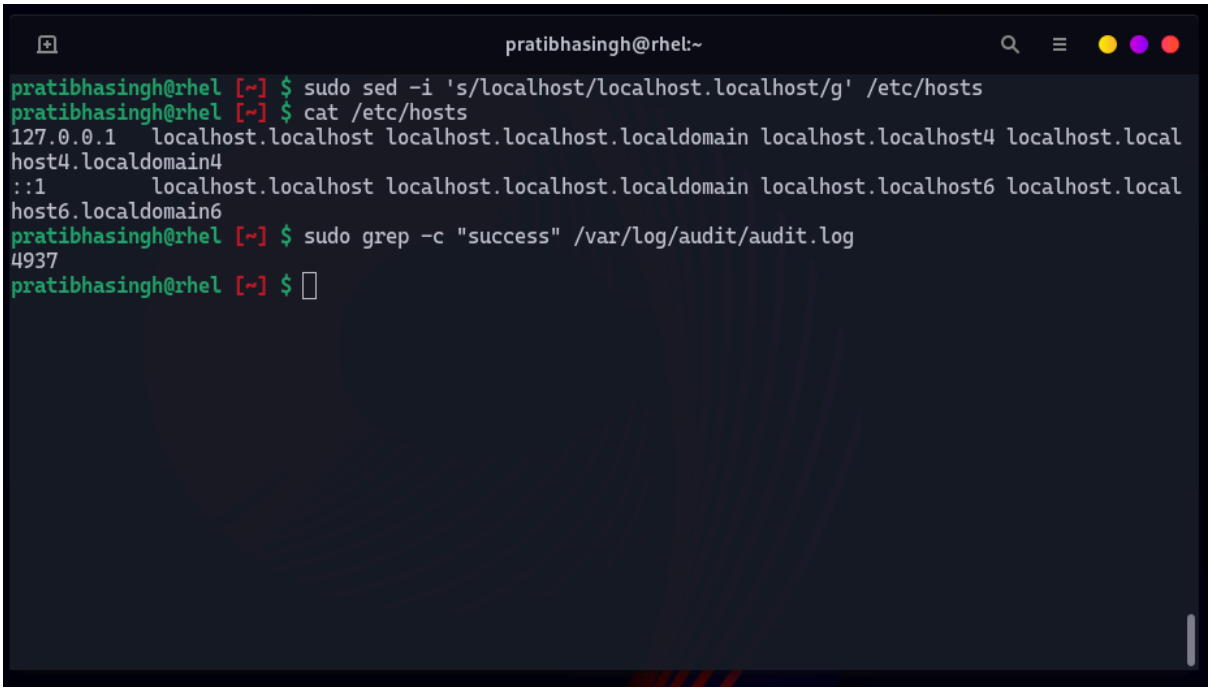
Ans.





19.Replace Text Using sed Linux Commands a. Write the command to replace the word localhost with localhost.localhost in the file /etc/hosts without opening the file in an editor. b. The /var/log/audit/audit.log file contains audit log messages, some of which include the word “success.” Write the command to count how many lines contain the word success.

Ans.



20.Create a directory named “demo” on “/root”.

a. Create a file “RedHat” under the “demo” directory.

b. Run the command “vimtutor” and save the output to the “RedHat” file.

c. Now create a soft link of “RedHat” to “/etc/” location.

d. Create a hard link of /var/log/messages to /etc/log.

Ans.