Assignment-3

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1. Difference between man and whatis commands:

Feature	man	whatis
Meaning	Shows full manual page	Shows one line description
Detail level	Detailed (syntax, options, etc.)	Very brief
Usage	Deep understanding of command	Quick check of purpose
Example	man grep → long manual	whatis grep → one line

Justification:

- Use man when you want to study a command in detail.
- Use whatis when you only need to know quickly what a command does.

  Example:
- man grep → long manual
- whatis grep→ one line

2. To save the output of ls -l into a file while simultaneously displaying it on the terminal, use the tee command with a pipe.
   Command:
   - ls -l | tee output.txt

   Explanation:
   - ls -l: This command lists the contents of the current directory in a long format, providing details like permissions, owner, size, and modification date.
   - |: This redirects the standard output of the ls -l command to the standard input of the tee command.
   - tee output.txt: The tee command reads its standard input and writes it to both standard output.
   - This command will display the detailed directory listing on your terminal and save the same output to a file named output.txt in the current directory.
   - Output.txt already exists, its contents will be overwritten by default.

3. The tee command in Linux enables the redirection of standard output from a command to both the standard output and simultaneously to one or more files. This functionality is particularly useful in logging scenarios where a user needs to monitor the output of a command in real-time while also saving it for later review or analysis.
   Example:
   Consider a scenario where a user is performing a system update and wants to observe the progress on the terminal while also maintaining a log of the entire process.

Command:

- sudo apt update && sudo apt upgrade -y | tee -a system_update.log

Explanation:

- sudo apt update && sudo apt upgrade -y: This part of the command initiates a system update and then upgrades all installed packages without requiring user confirmation.
- tee -a system_update.log: The tee command receives the output from apt upgrade.

  It displays this output on the terminal, allowing the user to see the update progress.

  The -a flag instructs tee to append the output to the specified file, system_update.log

  If the file does not exist, tee will create it. Without the -a flag, tee would overwrite the file's contents each time it is executed.

4. There are several steps involved now step by step we will discuss.

Step-1: Download VirtualBox (Windows).

- Open a browser and go the virtual website.
- Choose the windows hosts installer and download the .exe

Step-2: Run the VirtualBox Installer.

- Click the downloaded https://www.virtualbox.org/wiki/Downloads
- Click Next → choose features and installation folder → Next
- Confirm network interface warnings and click Install

- Allow driver installs if Windows prompts.

Step-3: Run: VirtualBox.

- Open VirtualBox from Start Menu
- Familiarize yourself with the Manager UI: New, Settings, Start, Snapshots.

Step-4: Download Ubuntu ISO.

- Go to https://ubuntu.com/download/desktop
- Download the ubuntu.

Step-5: Create a new virtual machine.

- **Click 'New'** in VirtualBox Manager
- **Name**: If you include the word Ubuntu in your name the Type and Version will auto-update.
- **Machine Folder**: This is where your virtual machines will be stored so you can resume working on them whenever you like.
- **ISO Image**: Here you need to add a link to the ISO you downloaded from the Ubuntu website.

Step-6: Configure VM Settings.

Step-7: Start VM & Begin Ubuntu Installer.

5. During Ubuntu OS installation if we face a kernel panic error use this tips.
    - Turnoff windows defender and antivirus.
    - Assign more RAM/CPUs if VM is slow; avoid starving the host.
    - Use snapshots before major changes so you can revert.

6. To display the system's hostname, execute the following command in the terminal.
    - Hostname
      This command will output the current hostname of the system.

While sysctl can be used to view and temporarily modify kernel parameters, including the hostname, it is not the recommended or standard method for changing the system's hostname permanently in modern Linux distributions. The standard and recommended command for changing the hostname is hostnamectl.

To change the hostname using sysctl execute the following command.

- sudo sysctl kernel.hostname="new_hostname"

Replace "new_hostname" with the desired hostname. This change is typically transient and might not persist across reboots unless configured .

For persistent changes to the hostname, use the hostnamectl command.

- sudo hostnamectl set-hostname new_hostname

This command will set the static hostname permanently and update relevant configuration files. It is the preferred method for managing hostnames on systems using systemd.

7. The command to show the calendar for the month of August in the year 1984 is cal 8 1984. This command uses the cal command, common on Unix-like systems, and provides the month 8 for August and the full year 1984 as arguments to display the specific month and year calendar.
   Command:
    - cal 8 1984

8. To display system uptime and logged-in users together in a single command, use the w command.

Command:

- w

Example output:

- **11:25:32 up 3:42, 2 users, load average: 0.05, 0.10, 0.12**
  USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
  jagadeesh pts/0 :0 08:00 2:15 0.10s 0.05s bash
  admin pts/1 192.168.1.10 09:30 0.00s 0.20s 0.01s sshd
- **The first line shows uptime, number of users, and load average.**

9. To list all ".c" files within the /home/user directory and its subdirectories, use the find command with the -name option and a wildcard.

Command:

- find /home/user -name "*.c"

This command performs the following actions:

- find /home/user: Specifies the starting directory for the search as /home/user.
- -name "*.c": Filters the search results to include only files whose names end with the .c extension.
- The asterisk * acts as a wildcard, matching any sequence of characters before .c

This will list all .c files present inside /home/user and its subdirectories.

10. To allow only the owner to read and write you set the permission to 600.

Command:

- chmod 600 filename

Explanation:

- **u=rw → give user (owner) read + write**
- **g= → remove all permissions for group**
- **o= → remove all permissions for others**

Only the current owner or superuser can use the chmod command to change file permissions on a file or directory. Change permissions in absolute mode by using the chmod command.