

# 1. Distinguish between `man` and `whatis` commands? Justify with proper example.

Distinguish between `man` and `whatis` commands:

## 1. Purpose:

- `man`: Shows the **manual page** of a command with detailed information about usage, options, and examples.
- `whatis`: Shows a **short, one-line description** of a command.

## 2. Detail Level:

- `man`: Very detailed; can span multiple pages.
- `whatis`: Very brief; only one line.

## 3. Usage Scenario:

- `man`: Use when you want to **learn full details** of a command.
- `whatis`: Use when you want a **quick idea** about a command.

## 4. Syntax:

- `man <command>`
- `whatis <command>`

```
grep -o '^[^:]+ ' /etc/passwd | tee usernames.txt
```

2.A binary isn't found in \$PATH. How would you use commands (which, find, locate) to troubleshoot and fix the issue?

```
which mybinary || find / -name mybinary
```

```
2>/dev/null || locate mybinary
```

```
export PATH=$PATH:/path/to/binary
```

3.Write a command pipeline that finds all .log files modified in the last 24 hours in /var/log and saves results into log\_report.txt.

```
find /var/log -name "*.log" -mtime -1 | tee log_report.txt
```

4.What is the difference between shutdown -r now and reboot?

shutdown -r now → Gracefully stops all processes, notifies users, unmounts filesystems, then reboots. reboot → Immediately reboots (may skip user warning and some shutdown scripts). shutdown -r now is safer, while reboot is faster.

5.How can you use the tee command to debug a script that generates both standard output and error messages?

```
./myscript.sh 2>&1 | tee debug.log
```

## 6.Explain any three real-world applications of Linux in industries. Three real-world applications of Linux in industries:

1. Web & Cloud Servers – Most web servers (like Apache, Nginx) and cloud platforms (AWS, Google Cloud, Azure) run on Linux for stability and scalability.
2. Embedded Systems – Linux powers devices like smart TVs, routers, automotive infotainment, and IoT gadgets due to its lightweight and customizable nature.
3. Cybersecurity & Networking – Tools like Kali Linux, firewalls, and penetration testing environments rely on Linux for monitoring, securing, and troubleshooting networks.

## 7.Differentiate application, system and utility software in the context of Linux environment.

1. Application Software Purpose: Helps users perform specific tasks. Examples in Linux: LibreOffice (documents), Firefox (browsing), GIMP (image editing).
2. System Software Purpose: Manages hardware and provides a platform for applications. In Linux: The Linux kernel + operating system components that control CPU, memory, file system.
3. Utility Software Purpose: Provides system maintenance and support tools. Examples in Linux: tar, grep, top, fdisk, rsync (backup, monitoring, compression, etc.).

## 8.What are the key differences between open-source and proprietary operating systems?

Key Differences between Open-Source and Proprietary Operating Systems:

1. Source Code Access Open-Source: Source code is freely available (e.g., Linux). Proprietary: Source code is hidden and controlled by the vendor (e.g., Windows, macOS).
2. Cost Open-Source: Usually free to use and modify. Proprietary: Requires paid licenses.
3. Customization Open-Source: Highly customizable by users and developers. Proprietary: Limited customization, restricted by vendor.
4. Support & Updates Open-Source: Community-driven support, frequent collaborative updates. Proprietary: Official vendor support with structured updates.
5. Security Open-Source: More transparent, issues fixed quickly by community. Proprietary: Relies on vendor patches, slower disclosure.

## 9.Write the command to display the system's kernel version.

```
uname -r
```

This displays the system's kernel version.

## 10.What is the difference between head and tail commands in text processing?

head → Displays the first lines of a file (default: first 10).

`head filename.txt`

`tail` → Displays the last lines of a file (default: last 10).

`tail filename.txt` So, head = beginning of file, tail = end of file.