# Introduction

In Linux, a **process** is an instance of a running program. The operating system manages processes to ensure efficient resource allocation and multitasking. Processes can be listed, monitored, and controlled using various commands.

# Common Practical Examples

## 1. Listing Processes

### View all running processes

ps aux

### View processes for a specific user

ps -u username

### View processes in a hierarchical tree format

ps axjf

### Display real-time process monitoring (similar to Task Manager)

top

### Interactive real-time process monitoring with enhanced UI

htop

## 2. Managing Processes

### Kill a process by PID

kill PID

### Kill a process by name

pkill process\_name

### Forcefully kill a process

kill -9 PID

### Terminate all instances of a process

killall process\_name

### Suspend a process (send it to the background)

CTRL + Z

### Resume a suspended process in the background

bg

### Bring a background process to the foreground

fg

## 3. Monitoring and Debugging Processes

### Display detailed information about a process

ps -p PID -o pid,ppid,%cpu,%mem,cmd

### Show open files by a process

lsof -p PID

### Show processes listening on network ports

netstat -tulnp

### Monitor system resource usage per process

sar -u 5 10

### Find the top memory-consuming processes

ps aux --sort=-%mem | head -10

# Additional Notes

* **SIGTERM (kill -15)** is the default signal used to terminate a process gracefully.
* **SIGKILL (kill -9)** forcefully terminates a process without allowing cleanup.
* **jobs** command lists background and suspended processes.
* **nice & renice** commands adjust process priority levels.