K.R. MANGALAM UNIVERSITY

THE COMPLETE WORLD OF EDUCATION

LINUX BASH SCRIPTING LAB

(ENCS356)

Lab file Submitted to

K.R. MANGALAM UNIVERSITY

For

Bachelor Of Technology

In

Computer Science Engineering Specialization

(Cyber Security)

Submitted By :

Srishti Mishra (2301410005)

Faculty:

Dr. Rajesh Kumar

Experiment No. 1

Exploring Linux System Commands, Run Levels (Targets), and Help Utilities.

Problem Statement

Efficient use of the Linux operating system requires a strong understanding of basic system commands, system states, and built-in help mechanisms. Unlike graphical operating systems, Linux relies heavily on command-line utilities for system interaction, administration, and automation.

The problem is to explore and practice essential Linux system commands, understand system run levels / targets, and effectively use Linux help utilities such as man, *--help*, and *auto*- completion to access command documentation and usage information.

Aim

To study and execute basic Linux system commands, understand Linux run levels (systemd targets), and use Linux help utilities such as `man`, `--help`, and tab auto-completion.

Theory

Linux Command Line Interface (CLI)

The Linux Command Line Interface allows users to interact with the operating system by typing commands. It provides better control, flexibility, and efficiency compared to graphical interfaces, especially for system administration and automation.

System Run Levels / Targets

- Modern Linux systems use **systemd**, where traditional run levels are replaced by **targets**.

Common systemd targets:

- `graphical.target` – Multi-user mode with GUI
- `multi-user.target` – Multi-user mode without GUI
- `rescue.target` – Single-user rescue mode
- `poweroff.target` – Shutdown system
- `reboot.target` – Reboot system

Linux Help Utilities

Linux provides built-in help tools for learning commands:

- `man` – Displays complete manual pages
- `--help` – Shows brief command usage
- **Tab auto-completion** – Completes commands and file names automatically

Commands Used

Commands	Description
`pwd`	Display present working directory
`ls`	List files and directories
`cd`	Change directory
`whoami`	Display current user
`date`	Show system date and time
`uptime`	Show system running time
`man`	Display manual pages
`--help`	Display help for a command
`systemctl`	Manage system services and targets
`runlevel`	Display previous and current run level
`clear`	Clear terminal screen

Procedure / Steps

Step 1: Login:

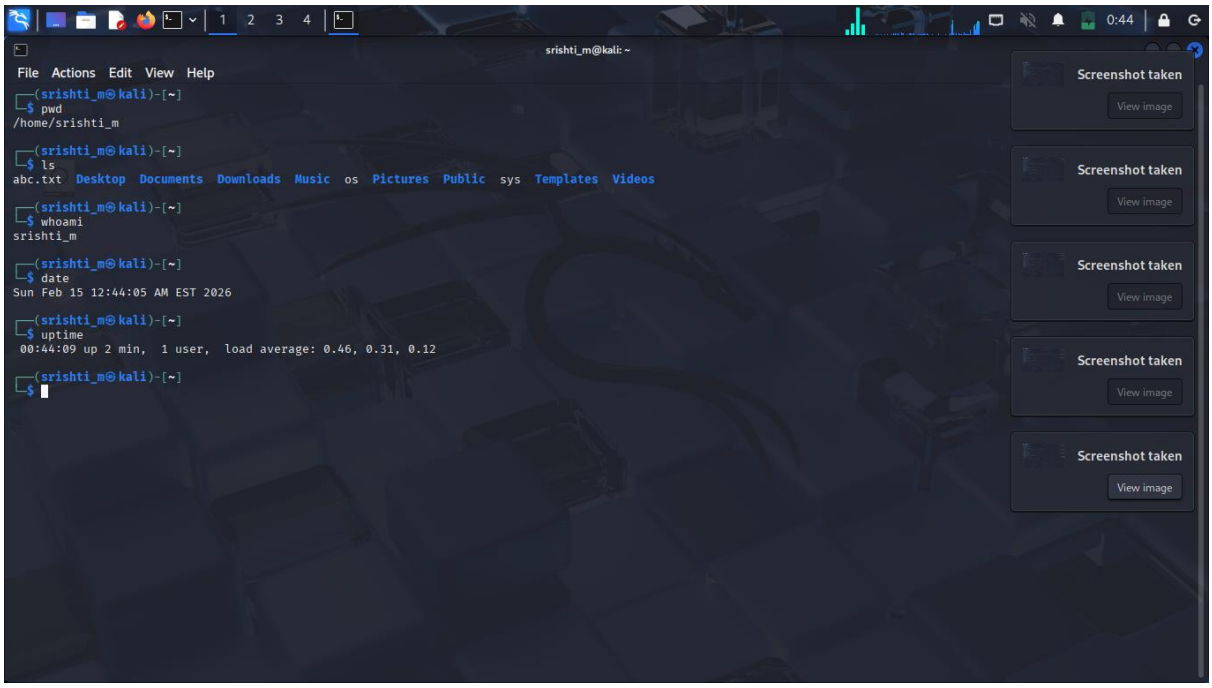
Log in to the Linux virtual machine and open the Terminal.

Step 2: Execute Basic Linux Commands in the Terminal.

Commands:

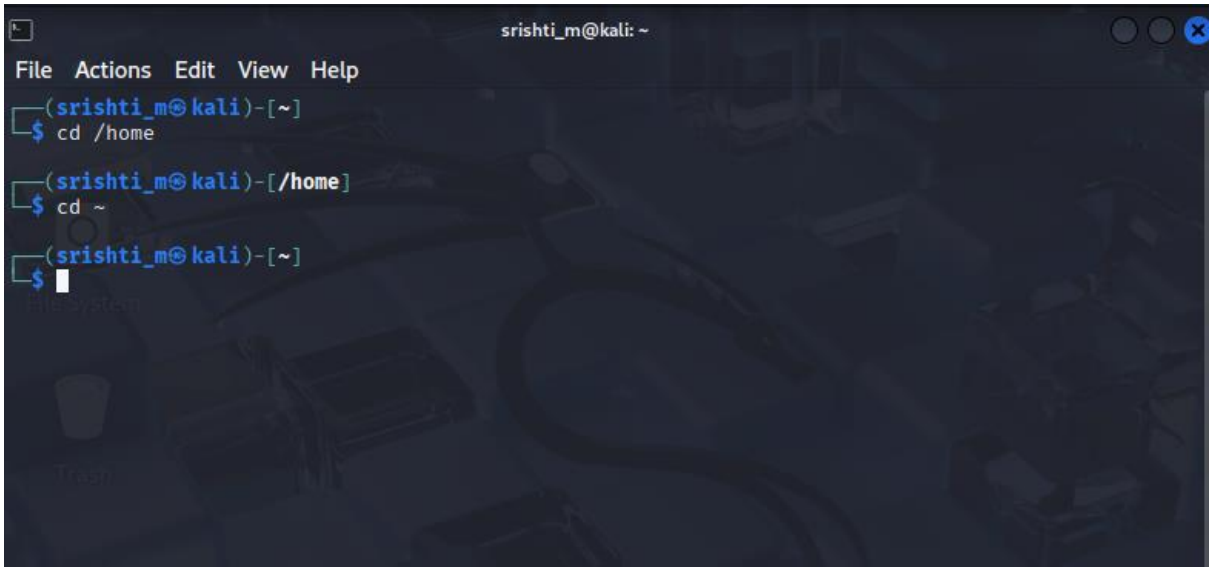
- `pwd` shows current directory
- `ls` lists files
- `whoami` displays logged-in user
- `date` shows system date/time

- `uptime` shows how long system is running



Step 3: Directory Navigation using:

- `cd /home` moves to home directory.
- `cd ~` returns to user's home directory.

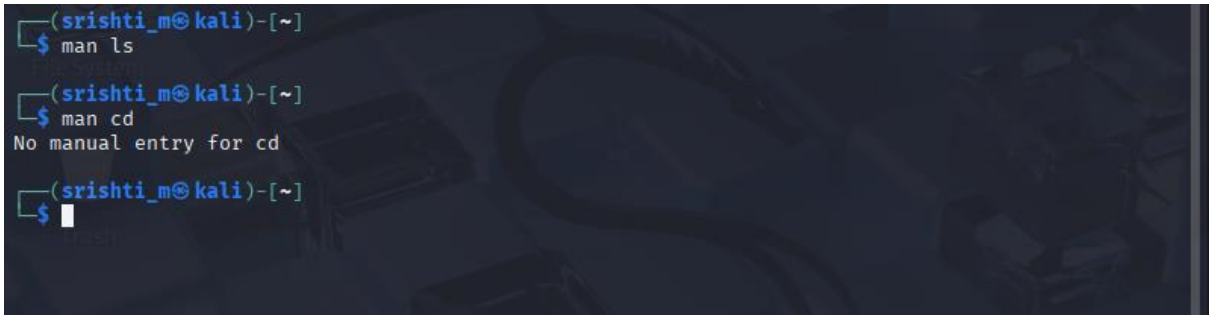


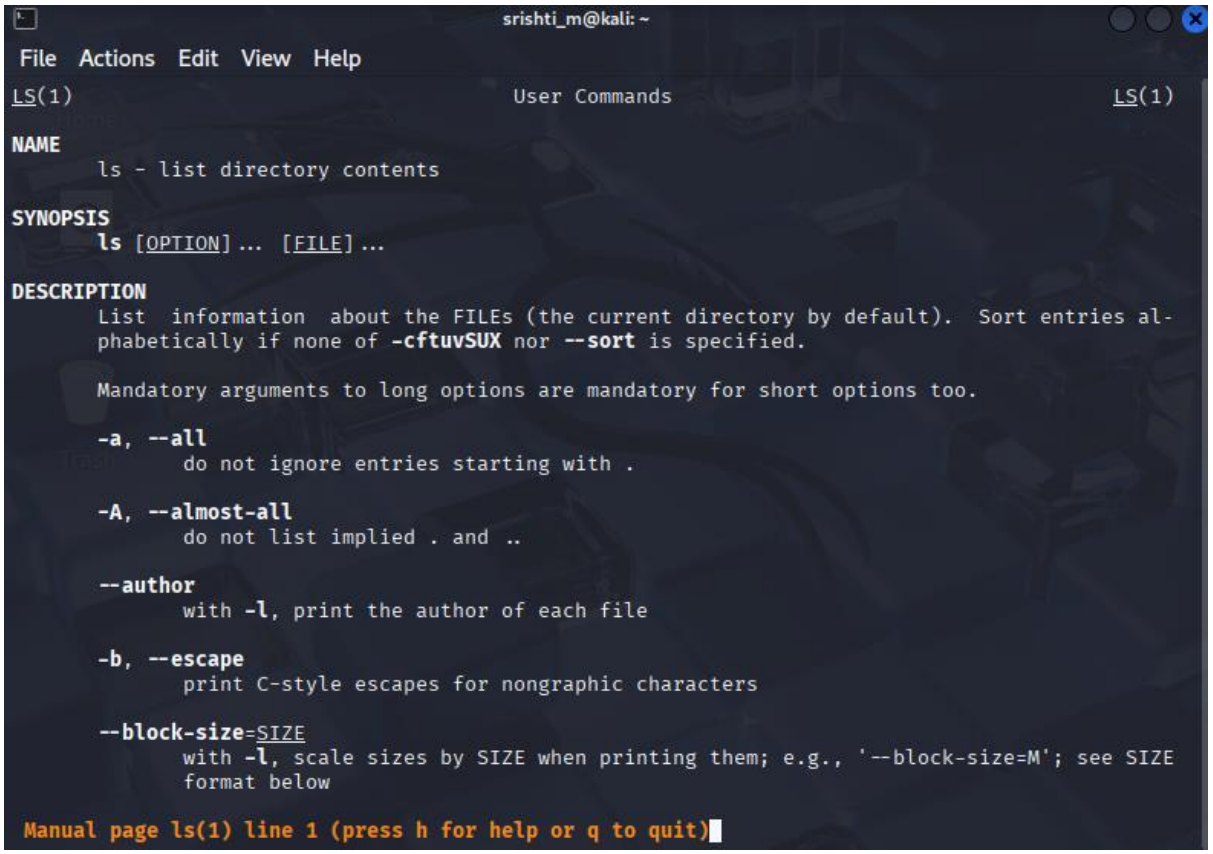
Step 4: Using Manual Pages

- `man ls`
- `man cd`

It Read command details.

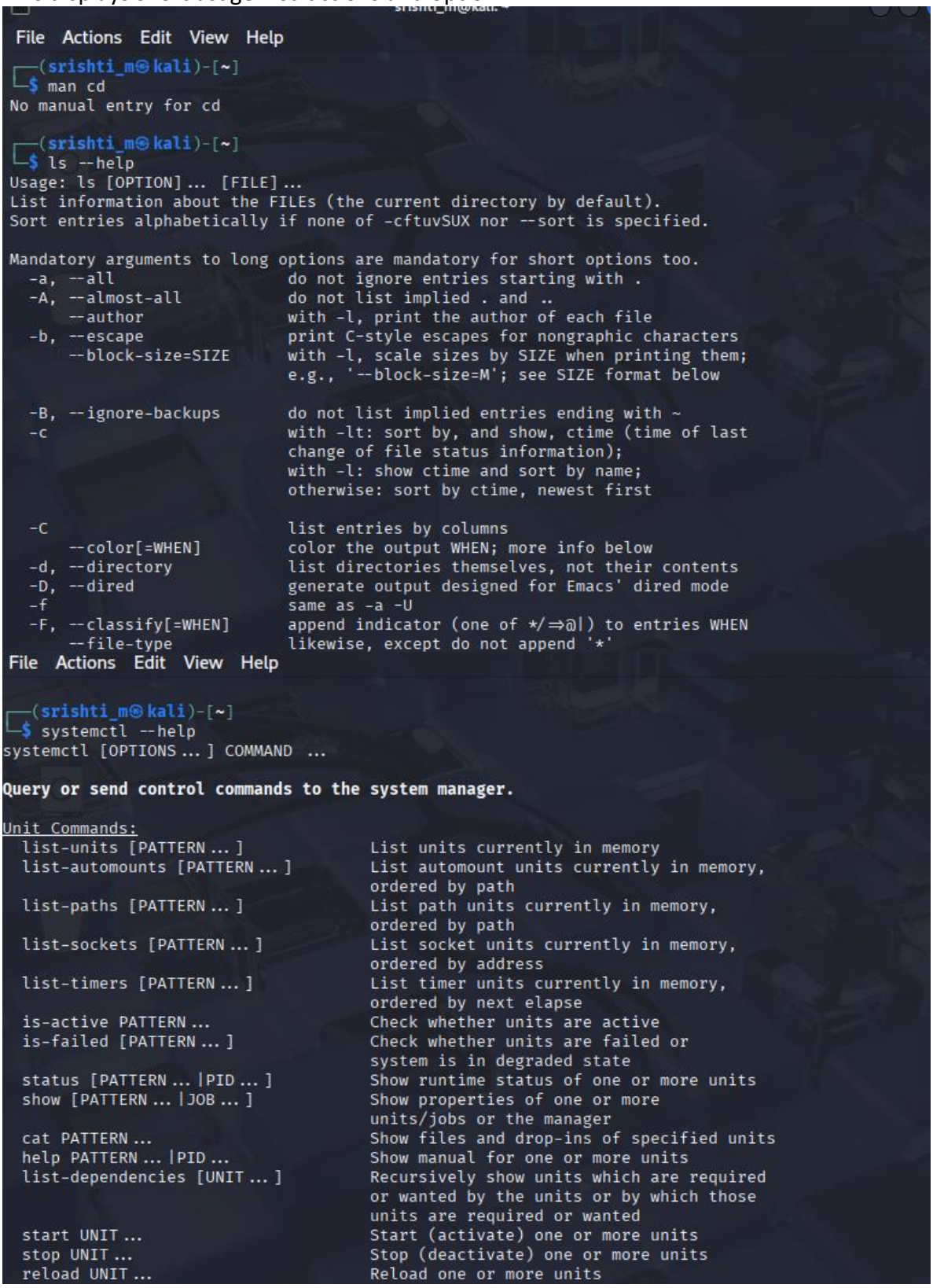
- Press `q` to exit the manual.





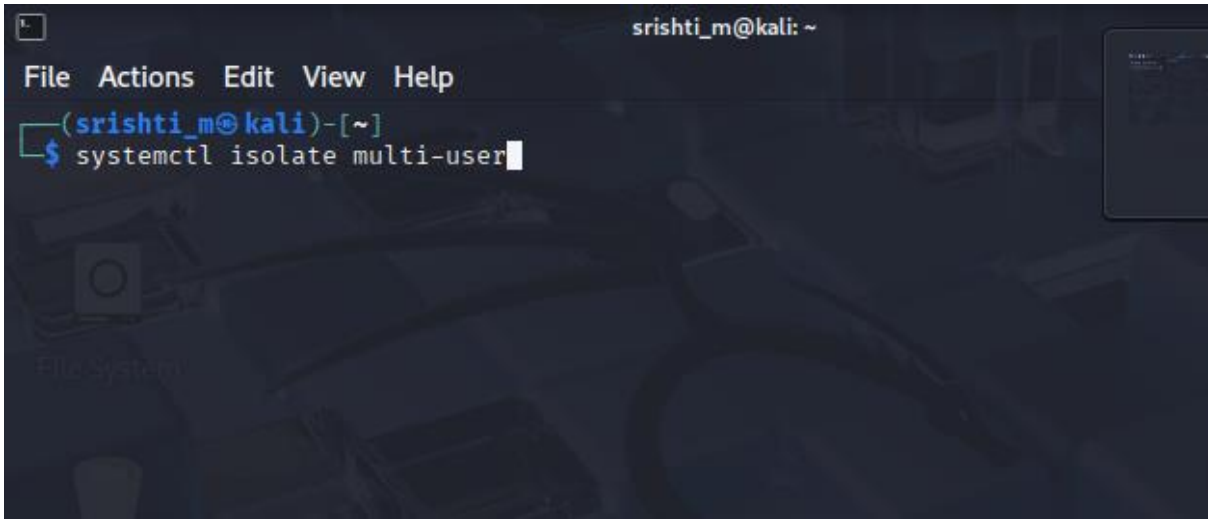
Step 5: Using Help Option:

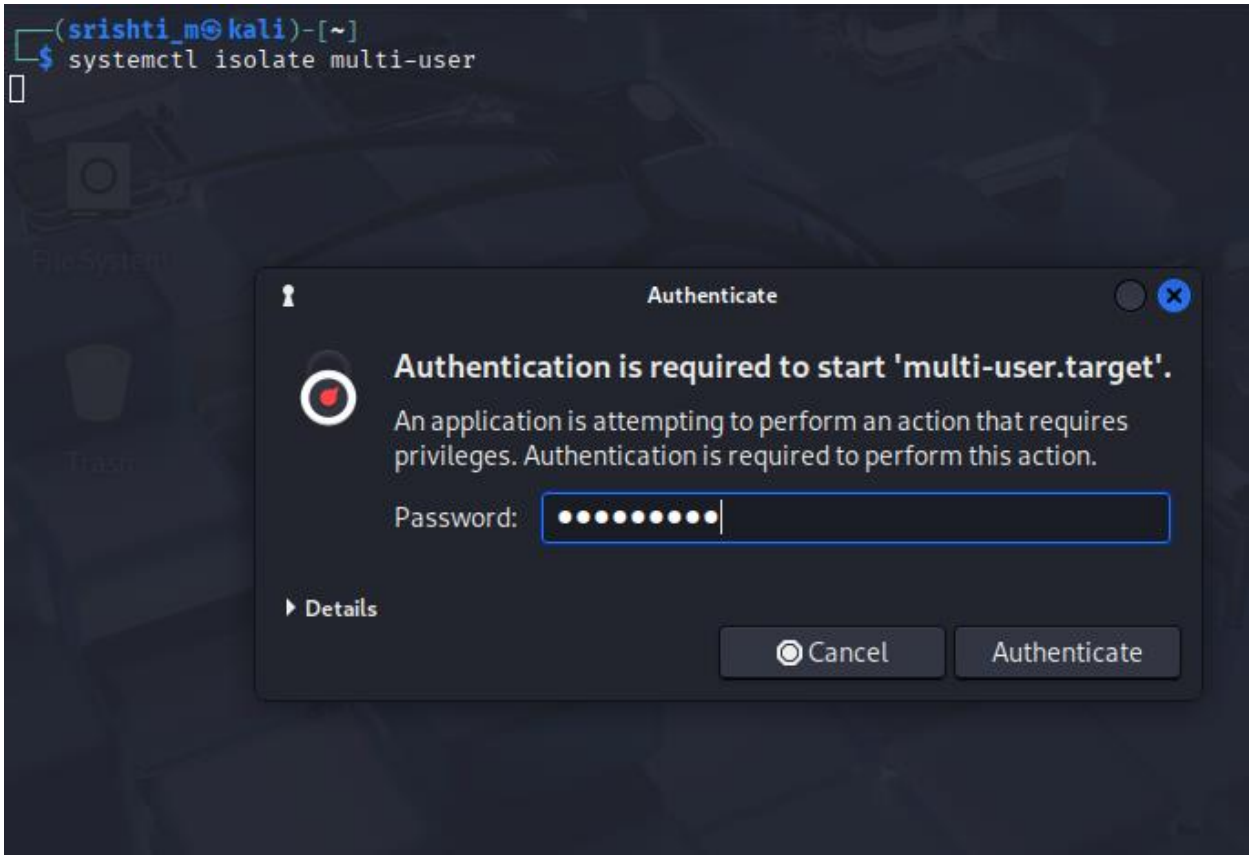
- `ls –help`
- `systemctl –help`
  This displays short usage instructions and optio

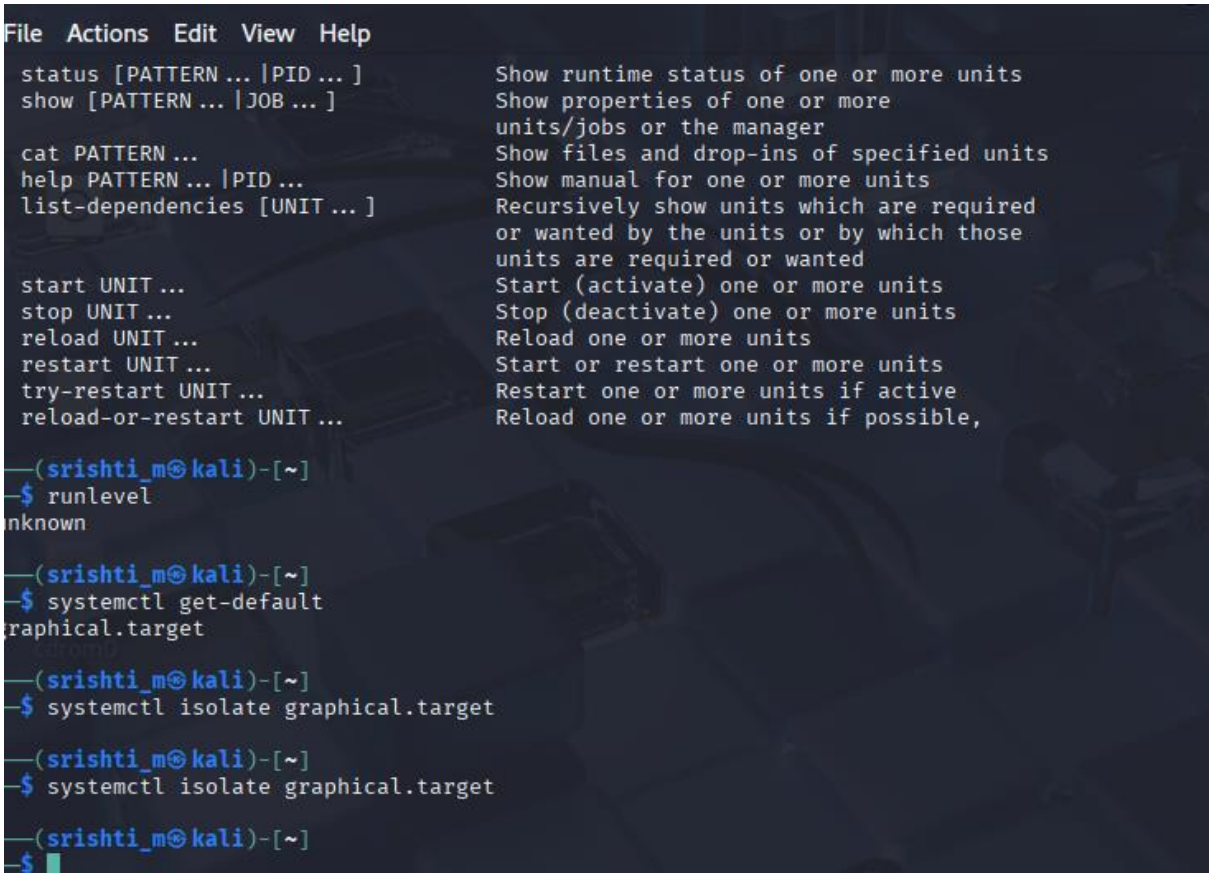


Step 6: Check System Run Level / Target

- `runlevel`- "Kali Linux uses systemd, so traditional runlevel commands are deprecated and `systemctl` targets are used instead."
- `systemctl get-default` shows default system target.




(srishti_m㉿kali)-[~]
$ systemctl isolate multi-user
Authenticate
Authentication is required to start 'multi-user.target'.
An application is attempting to perform an action that requires privileges. Authentication is required to perform this action.
Password:
Details
Cancel
Authenticate


File Actions Edit View Help
status [PATTERN ... |PID ...] Show runtime status of one or more units
show [PATTERN ... |JOB ...] Show properties of one or more units/jobs or the manager
cat PATTERN ... Show files and drop-ins of specified units
help PATTERN ... |PID ... Show manual for one or more units
list-dependencies [UNIT ...] Recursively show units which are required or wanted by the units or by which those units are required or wanted
start UNIT ... Start (activate) one or more units
stop UNIT ... Stop (deactivate) one or more units
reload UNIT ... Reload one or more units
restart UNIT ... Start or restart one or more units
try-restart UNIT ... Restart one or more units if active
reload-or-restart UNIT ... Reload one or more units if possible,
(srishti_m㉿kali)-[~]
$ runlevel
nknown
(srishti_m㉿kali)-[~]
$ systemctl get-default
raphical.target
(srishti_m㉿kali)-[~]
$ systemctl isolate graphical.target
(srishti_m㉿kali)-[~]
$ systemctl isolate graphical.target
(srishti_m㉿kali)-[~]
$

Step 7:- Practice auto-completion by typing partial command names and pressing Tab.

Step 8 :- Clear the terminal screen: Clear

Outcomes

- Successful execution of basic Linux commands
- Display of manual pages and help options
- Identification of current run level/target
- Improved command-line efficiency

Result

Thus, basic Linux system commands, system run levels, and help utilities were successfully explored. The student gained practical understanding of Linux command-line interaction and Linux documentation tools.