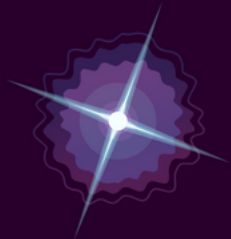
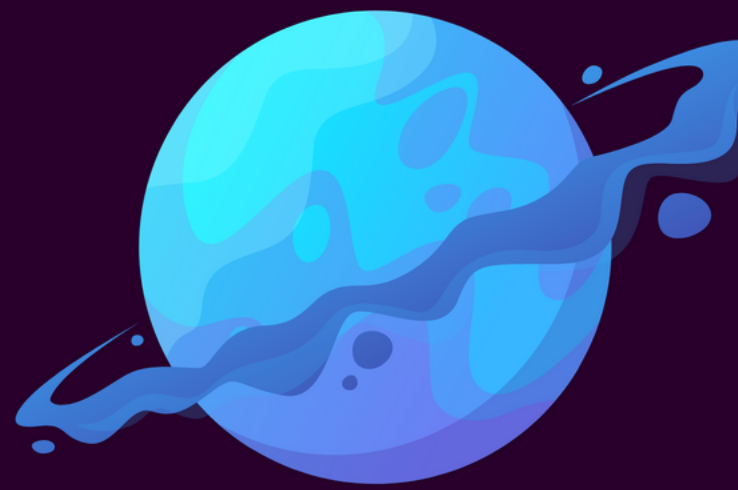


WLUG PRESENTS

LinuxDiary 3.0



LinuxDiary

3.0

Day 1
Session 2

Kalash Patil

Sahil Otari

Hrushikesh Bhosale

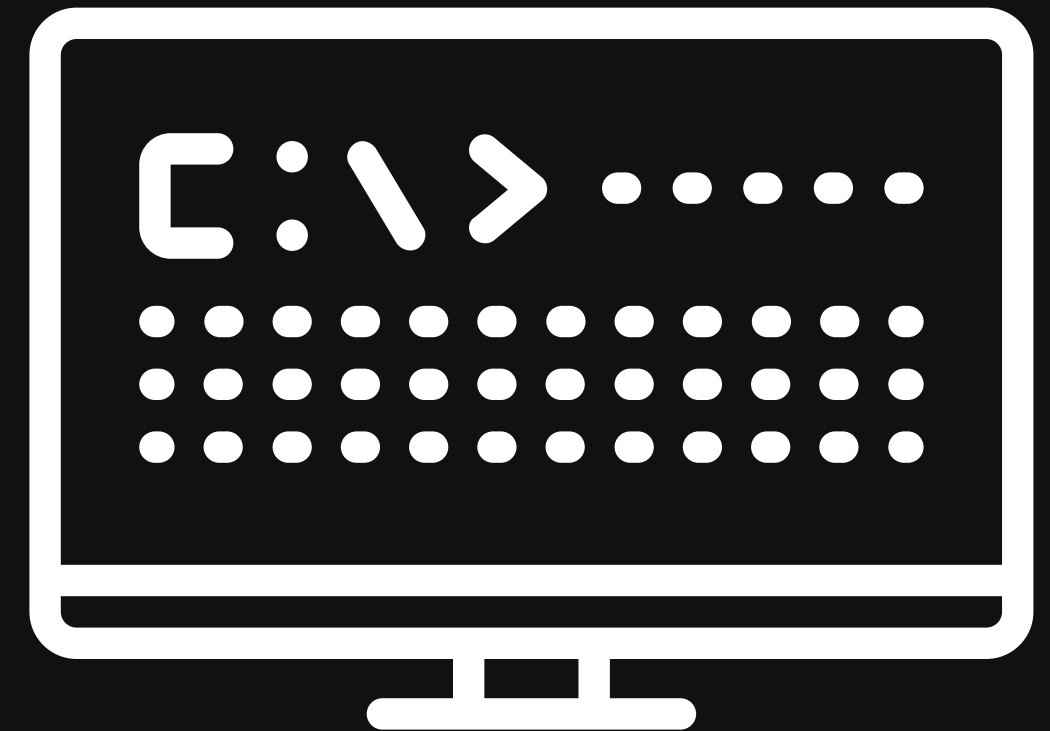
Summarising

- Introduction to Linux
- What is software and its types.
- Working of Linux kernel.
- Applications of Linux.
- Linux Distributions

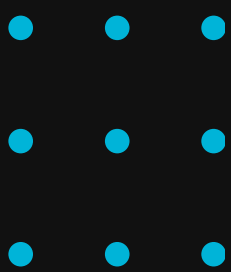
Today's Agenda

- Basic Linux Commands.
- Keyboard shortcuts.
- Booting Process.
- Text Editors.
- Process Management.
- Pipelining on Linux.

BASIC COMMANDS IN LINUX



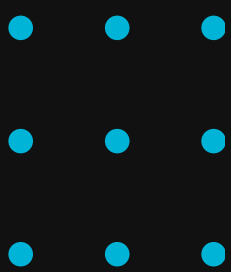
Commands	Description	Flags
pwd	print working directory	--
cd	change directory	--
ls	list the contents of a current directory	-l,-lh,-a.



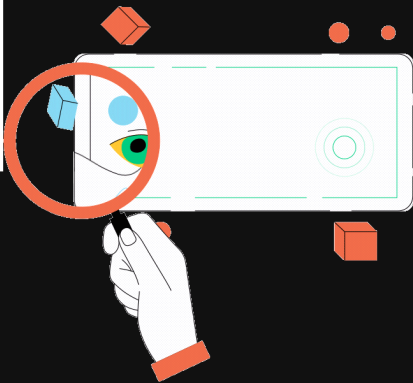
Commands	Description	Flags
mkdir	To make a directory.	--help,-v,-p,-m
rmdir	To delete a empty directory.	--help,-v,-p.
rm	To delete a directory and file.	-i,-r

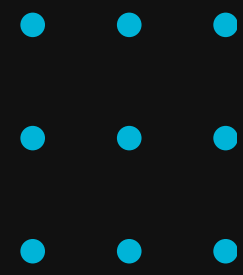


Commands	Description	Flags
touch	To modify timestamps	-a , -m, -d.
cat	to create, display, concatenate files	-E,-n
history	view previously used commands	

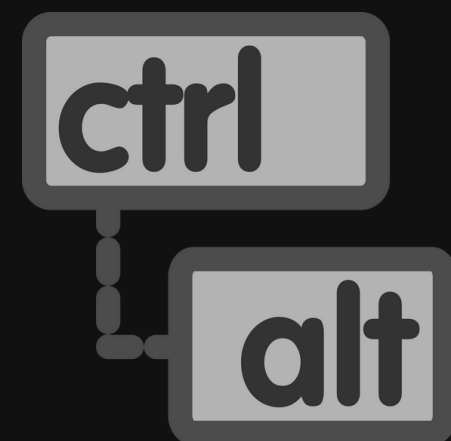


Commands	Description	Flags
man	display the user manual of any command	-f, -w.
apropos	find command if keyword is know.	-e





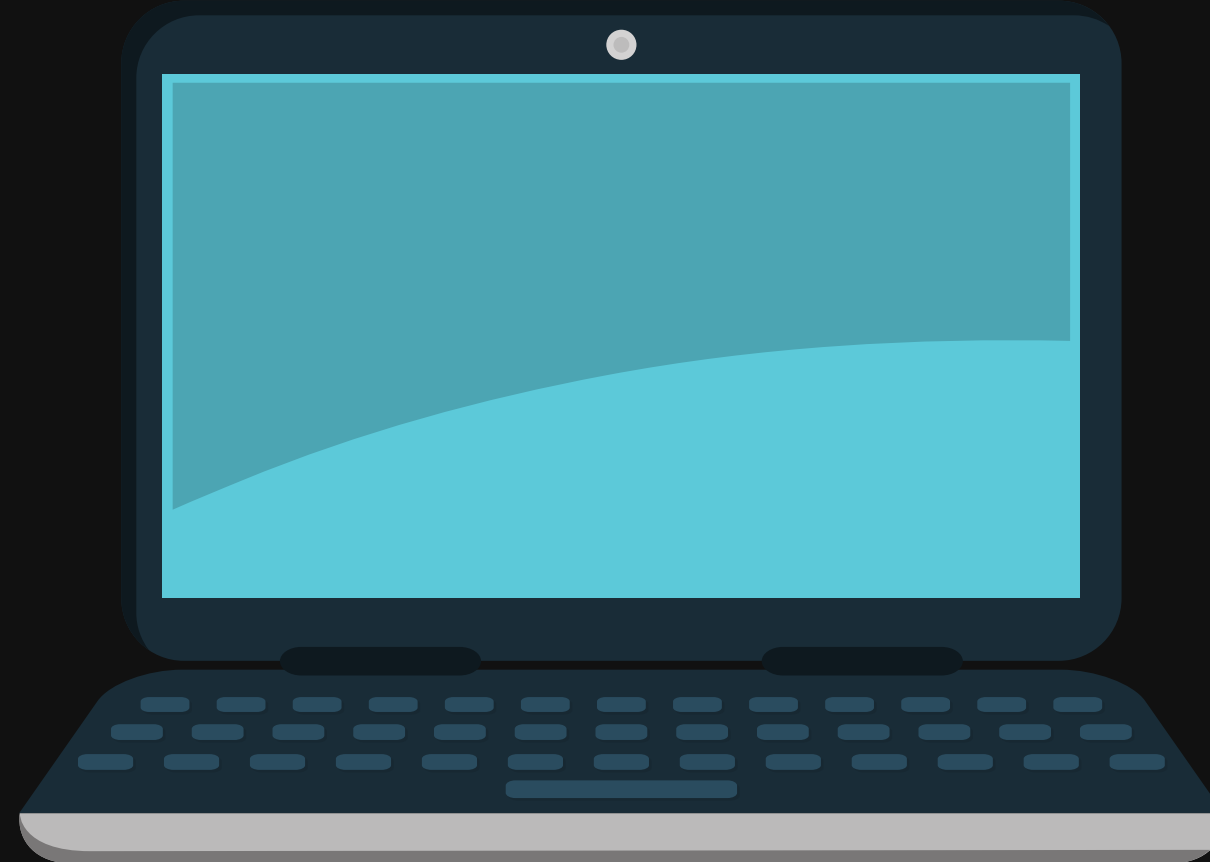
SHORTCUTS USED IN LINUX:



ctrl+a	Brings the cursor to the begin of a line
ctrl+e	Brings the cursor to the end of line
ctrl+w	To erase one word from the line
ctrl+u	To erase the current line

ctrl+l	Clears the displayed terminal window
tab	To autocomplete a long directory name
!!	Repeats the previous command
ctrl+d	Log out from current session

WHAT IS BOOTING ?



BOOTING PROCESS

Loading Operating System from bootable device (HDD / SSD / pen drive) to main memory (RAM).



6 STAGES OF BOOTING:

- BIOS
- MBR
- GRUB
- Kernel
- Init
- Runlevel Programs

BIOS:

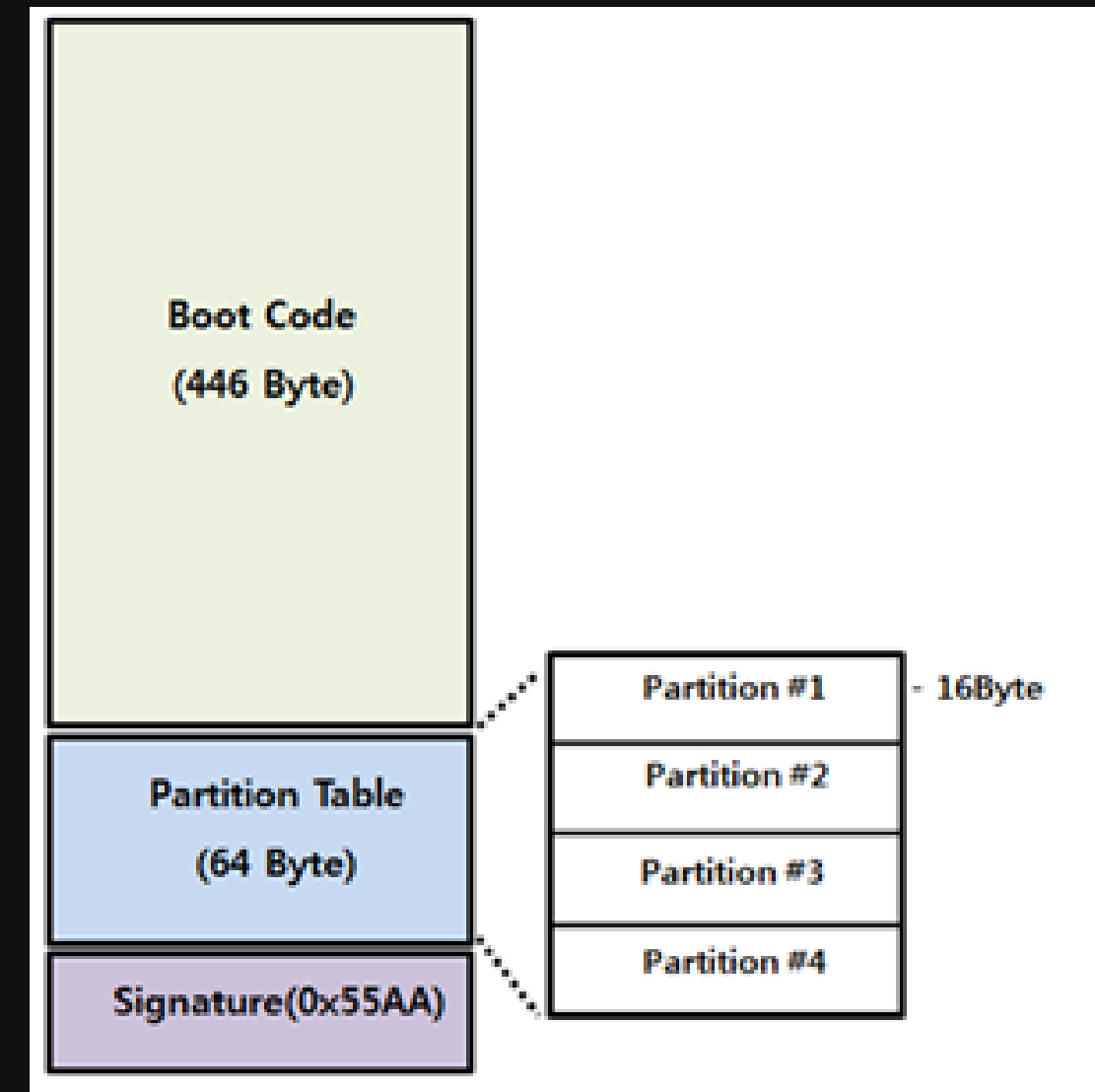
- BIOS – Basic Input Output System.
- Performs POST process.
- Searches, Loads and Executes the bootloader program (MBR).
- After bootloader is detected and loaded into main memory, BIOS gives control of the system to it.

BIOS:

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Boot	Exit	
<div>CD-ROM Drive</div> <div>+Hard Drive</div> <div>+Removable Devices</div> <div>Network boot from Intel E1000</div>				Item Specific Help	
				<div>Keys used to view or configure devices:</div> <div><Enter> expands or collapses devices with a + or -</div> <div><Ctrl+Enter> expands all</div> <div><+> and <-> moves the device up or down.</div> <div><n> May move removable device between Hard Disk or Removable Disk</div> <div><d> Remove a device that is not installed.</div>	
F1	Help	↑↓	Select Item	-/+	Change Values
Esc	Exit	↔	Select Menu	Enter	Select ► Sub-Menu
F9	Setup Defaults				
F10	Save and Exit				

MBR:

- MBR stands for Master Boot Record.
- Located in first sector of bootable disk, typically at `/dev/sda` or `/dev/hda`.
- Contains info about GRUB.
- Loads and executes the GRUB.



GRUB:

- GRUB stands for Grand Unified Bootloader.
- If we have multiple kernel images, we can choose one to execute.
- GRUB configuration file is located at `/boot/grub/grub.cfg`.
- GRUB has knowledge of filesystem.
- GRUB just loads and executes kernel and initrd images.

GRUB:

```

Ubuntu 8.04, kernel 2.6.24-16-generic
Ubuntu 8.04, kernel 2.6.24-16-generic (recovery mode)
Ubuntu 8.04, memtest86+
Other operating systems:
Windows Vista/Longhorn (loader)
    
```

Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the
commands before booting, or 'c' for a command-line.

The highlighted entry will be booted automatically in 4 seconds.

KERNEL:

- Mounts the root file system specified in grub.conf file.
- The kernel establishes a temporary root filesystem using initrd (Initial RAM Disk) until the real file system is mounted.
- It executes /sbin/init program, which is the first program to be executed with PID 1.

INIT:

- First process to start when the computer boots up.
- The system looks for an init file, usually found at `/etc/inittab` to decide run level.
- There are total 7 run levels.

3 – Multi-user Mode (Network support).

5 – Graphical X11 (GUI).

RUN LEVEL PROGRAMS:

- Various services get started when the system boots up.
- Those services are called run level programs.
- If our run level is 5, then the programs from `/etc/rc5.d` will be executed.
- Program names start with S and K.
S for startup.
K for kill.
- Numbers next to S or K denotes the sequence in which programs are started or killed.

TYPES OF BOOTING:

Cold Booting:

- Starting a computer which was switched off.
- Involves Power on Self Test (POST).

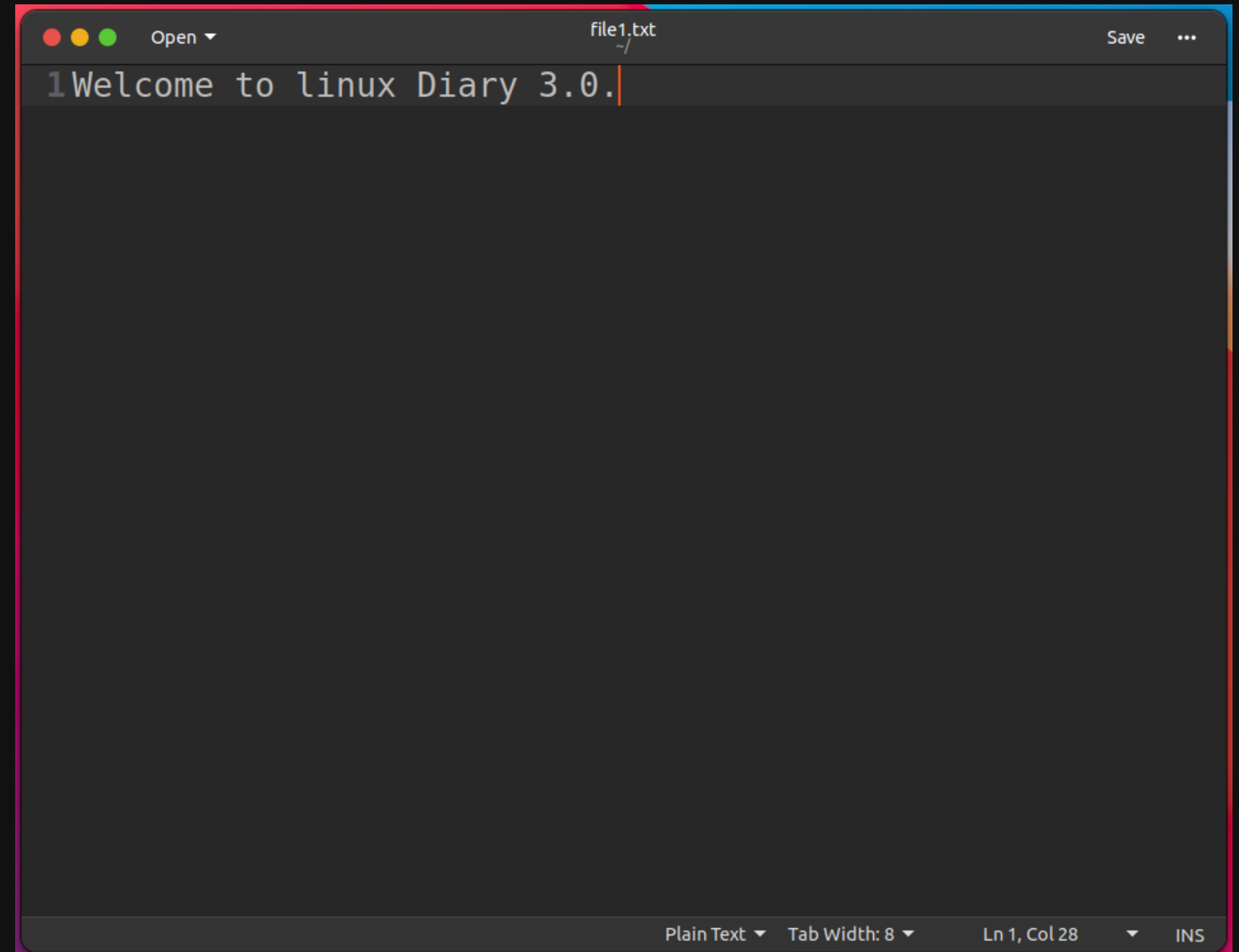
Warm Booting:

- Restarting a computer without interrupting power.
- Doesn't involve Power on Self Test (POST).

TEXT EDITORS

GEDIT :

- GUI Based Text Editor
- Default text editor for GNOME desktop environment
- Using gedit, we can create as well as update/edit text files



NANO :

- Terminal Based Text Editor
- Designed for both beginners and advanced users
- Using nano, we can create as well as update/edit text files

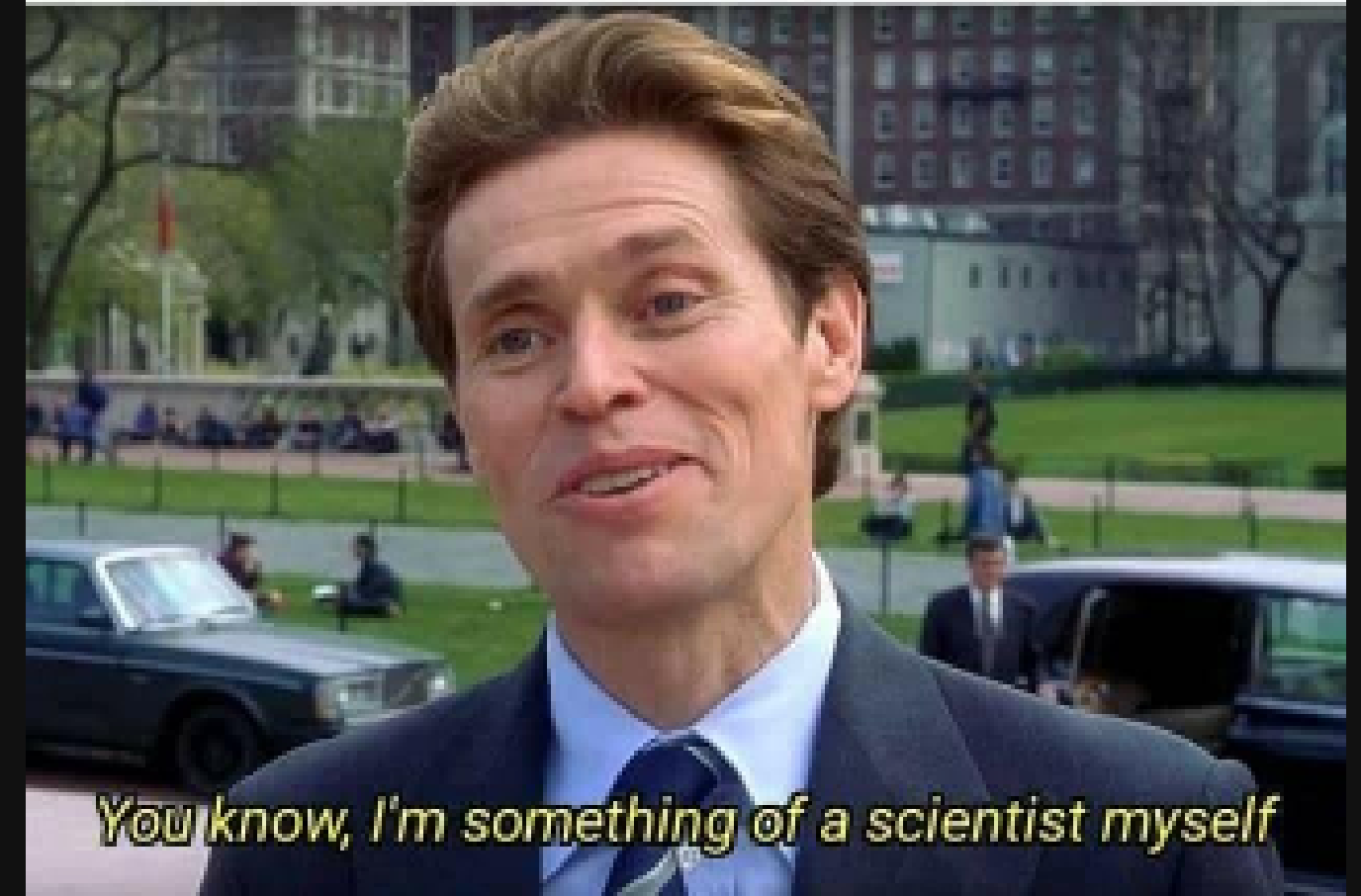
```
File Edit View Search Terminal Help
GNU nano 2.9.3 New Buffer

^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit      ^R Read File ^\ Replace  ^U Uncut Text ^T To Spell  ^_ Go To Line
```

VI / VIM:

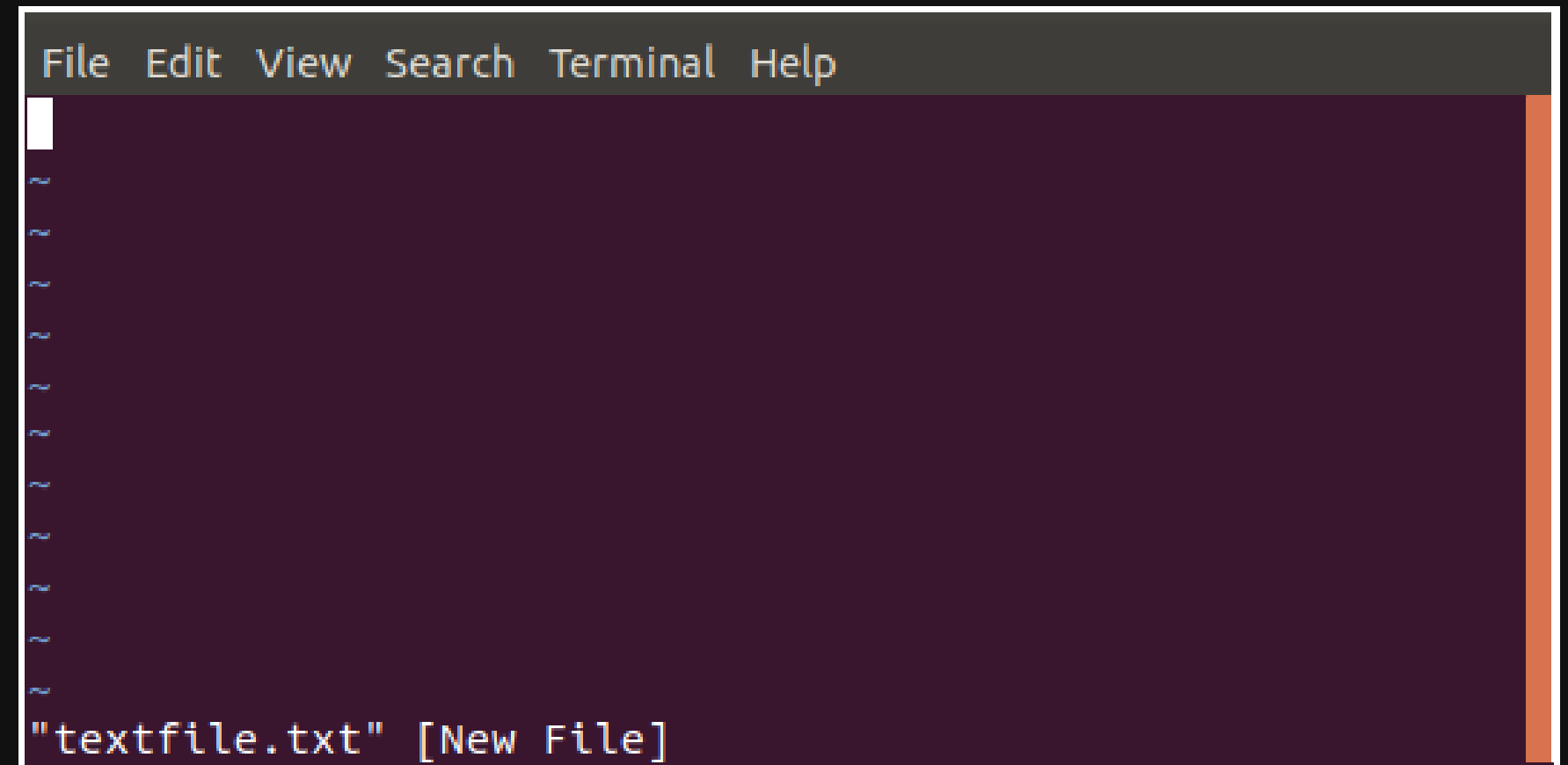
- Terminal Based Text Editor
- Most used and powerful.
- Supported by most of the Linux Distributions
- **Command Mode**
- **Insert Mode**

When you finally exit vim



VI / VIM:

- i – Insert Mode.
- Esc – Command Mode.
- :q! – Quit without saving.
- :w – Save file but don't exit.
- :wq – To write, save and exit.



PROCESS MANAGEMENT IN LINUX



WHAT IS PROCESS?

- On Linux, a process is any active (running) instance of a program.
- Processes exist in parent-child hierarchies.

PROCESS TREE

- Processes exist in parent-child hierarchies.
- **Command for Printing Process tree- `ps tree`**

HOW DOES LINUX IDENTIFY PROCESSES?



FOREGROUND AND BACKGROUND PROCESSES

- Processes that require a user to start them or to interact with them are called Foreground processes
- Processes that are run independently of a user are referred to as background processes

MANAGING THE PROCESSES

- Process management on Linux is nothing but manipulating (resume, stop or kill) a command which is already in progress, about to start, or already killed.
- On Linux, we can prioritise or manage the processes by using command-line tools.

LET'S MOVE TO COMMAND LINE TOOLS



COMMANDS FOR PROCESSES

top	It provides a dynamic real-time view of the running system.	-u
ps	The ps command is used to list the currently running processes and their PIDs along with some other information depending on different options.	-A, [PID],-T
jobs	Jobs command is used to list the jobs that your running in foreground or background.	-l

bg	1. It resumes suspended jobs in the background, returning the user to the shell prompt while the job runs.	
fg	Command that moves a background process on your current Linux shell to the foreground.	

pidof	pidof finds the process IDs (PIDs) of the named programs. It prints those IDs on the standard output.	
kill	List all killing signals for killing process on Linux	-1

PIPELINING IN LINUX

- Connecting data flow from one process to another. Output of one command is given to input for second command, this is done through pipe '|'.

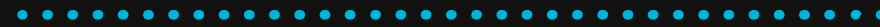
SYNTAX -

```
COMMAND_1 | COMMAND_2 | COMMAND_3 | .... |  
COMMAND_N
```


EXAMPLE

cat [filename] | sort

- Original file will not modify
- Sort -r will sort in reverse order.



EXAMPLE

```
ps -u [username] | grep "process_name"
```

- gives you process related information of particular user

THANK YOU