

# ***Operating System***

**Lab Manual**

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**UET Lahore Pakistan**

<b><u>VIRTUAL MACHINE INSTALLATION</u></b> .....	<b><u>1</u></b>
<b><u>SETTING UP UBUNTU WITH VIRTUALBOX</u></b> .....	<b><u>2</u></b>
<b><u>LINUX COMMANDS</u></b> .....	<b><u>10</u></b>

1. LS:.....	11
2. DATE:.....	11
3. CAL:.....	12
4. PWD:.....	13
5. CD: .....	13
6. MKDIR:.....	14
7. RM:.....	15
8. MV:.....	15
9. MAN: .....	16
10. HISTORY: .....	17
11. CLEAR: .....	18
12. DF: .....	19
13. ECHO:.....	20
14. FREE: .....	20
15. LOGNAME:.....	21
PARAMETERS:.....	21
16. WHOAMI: .....	21
17. UNAME:.....	22
18. FACTOR:.....	22
19. TOP:.....	23
20. PS:.....	23
21. HOSTNAME: .....	24
22. ARCH:.....	24
23. UPTIME:.....	25
24. CAT: .....	25
25. TTY: .....	26
26. TOUCH: .....	27
27. FIND:.....	27
28. CP:.....	28
29. DIR: .....	28
31. NANO: .....	29
32. BZIP2:.....	30
33. SERVICE: .....	31
34. VI: .....	31
35. VMSTAT: .....	32
36. SSH:.....	33

37.	EXIT: .....	34
38.	EXPR: .....	34
39.	KMOD:.....	35
40.	LSCPU:.....	35
41.	NPROC:.....	36
42.	STAT: .....	37
43.	W: .....	37
44.	WC: .....	38
45.	YES:.....	38
46.	DU:.....	39
47.	PMAP: .....	40
49.	REBOOT: .....	42
50.	PSTREE: .....	42

# **LAB 00**

## **Virtual Machine Installation**

# Setting up Ubuntu with VirtualBox

Following is an install guide for setting up VirtualBox with Ubuntu 16.04.3 on your system. If you have problems, more detailed instruction and troubleshooting tips can be found on the [Ubuntu site](#).

1. Download the version of [VirtualBox](https://www.virtualbox.org/wiki/Downloads) (<https://www.virtualbox.org/wiki/Downloads>) for your machine (under “VirtualBox platform packages”, choose the host package that corresponds to your operating system (i.e. if you’re installing on Mac, choose the package “VirtualBox 5.2.0 for OS X hosts”, if you’re installing on Windows, choose the package “VirtualBox 5.2.0 for Windows Hosts”).



2. Download the 64 bit version of Ubuntu Linux 18.04 LTS (<http://releases.ubuntu.com/releases/>).
3. If your system has less than 2GB RAM select the 32 bit version

## Ubuntu 18.04.1 LTS (Bionic Beaver)

### Select an image

Ubuntu is distributed on three types of images described below.

#### Desktop image

The desktop image allows you to try Ubuntu without changing your computer at all, and at your option to install it permanently later. This type of image is what most people will want to use. You will need at least 1024MiB of RAM to install from this image.

There is one image available:

##### 64-bit PC (AMD64) desktop image

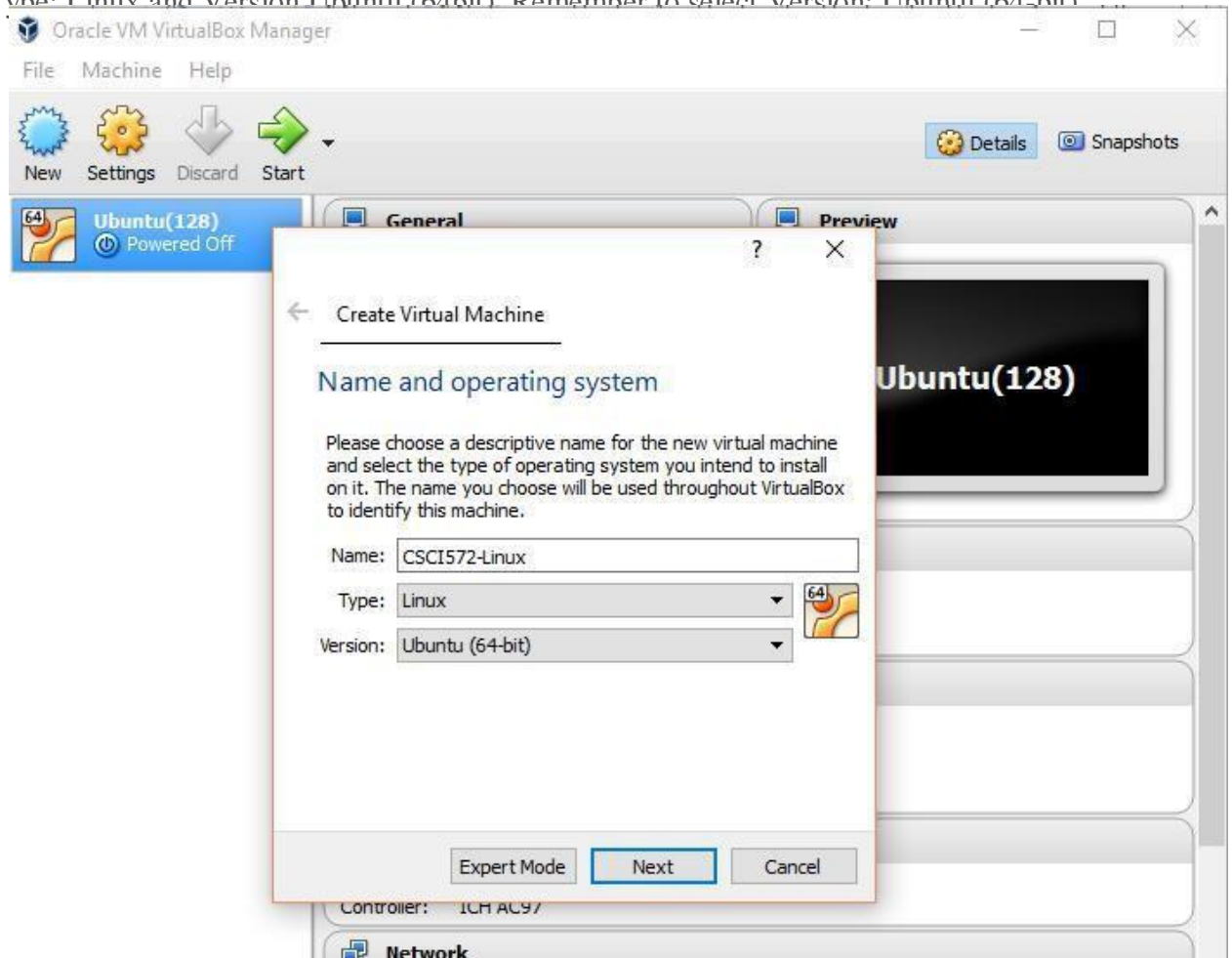
Choose this if you have a computer based on the AMD64 or EM64T architecture (e.g., Athlon64, Opteron, EM64T Xeon, Core 2). If you have a non-64-bit processor made by AMD, or if you need full support for 32-bit code, use the i386 images instead. Choose this if you are at all unsure.

#### Server install image

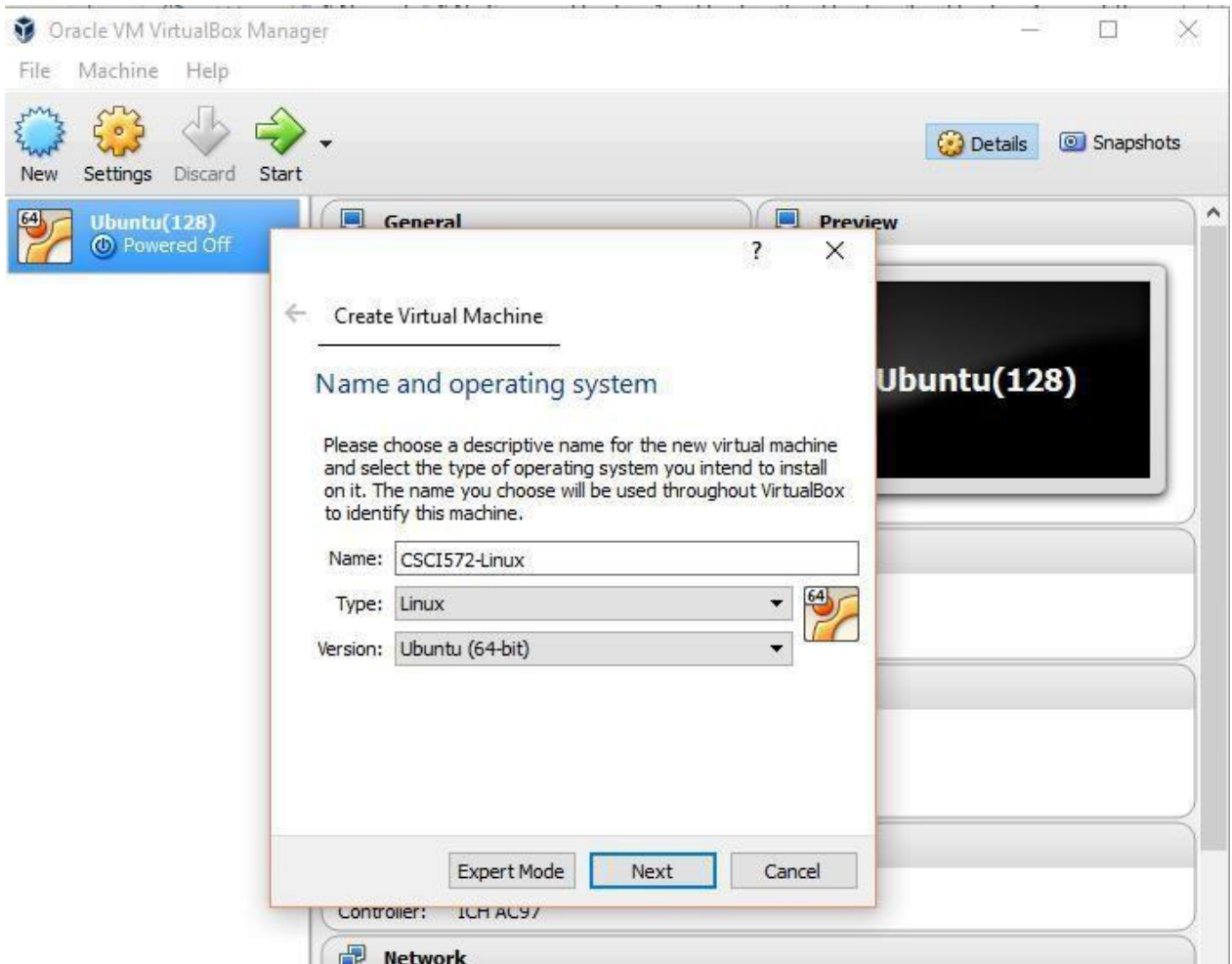
The server install image allows you to install Ubuntu permanently on a computer for use as a server. It will not install a graphical user interface.

There is one image available:

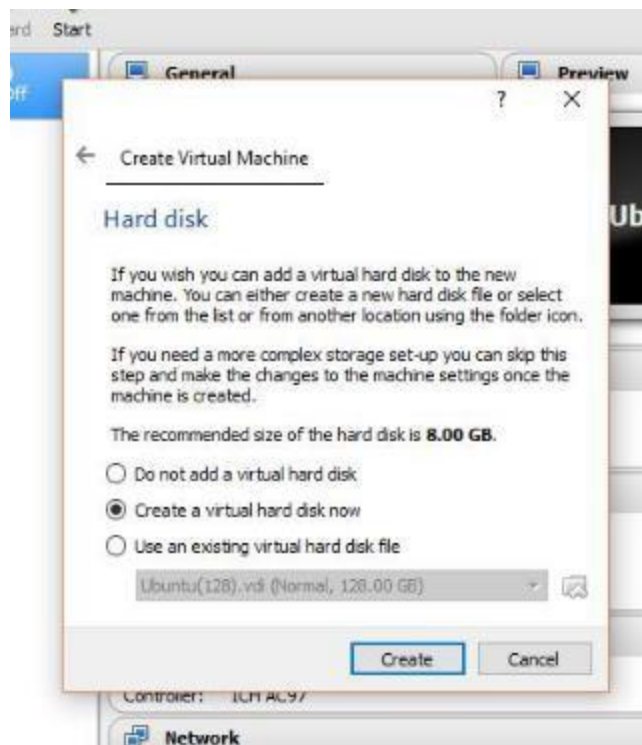
4. Run the [VirtualBox-5.2.0-118431-Win.exe](#) file and follow the Installer wizard
5. After the installation, open the VirtualBox applications
6. Select "New" from the application ribbon, choose a name for your system, and select Type: Linux and Version Ubuntu (64bit). Remember to select Version: Ubuntu (64-bit)



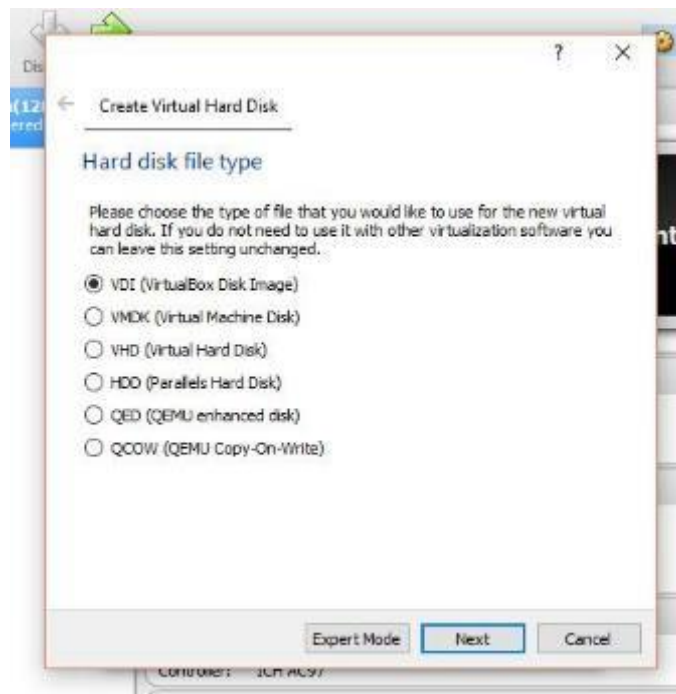
Select the amount of memory for your virtual machine (If you have 4GB of RAM or more, generally set this to 2048MB or half your system RAM, whichever is greater).



Select the “Create a virtual hard drive now” option: Note: your grayed area may say Empty

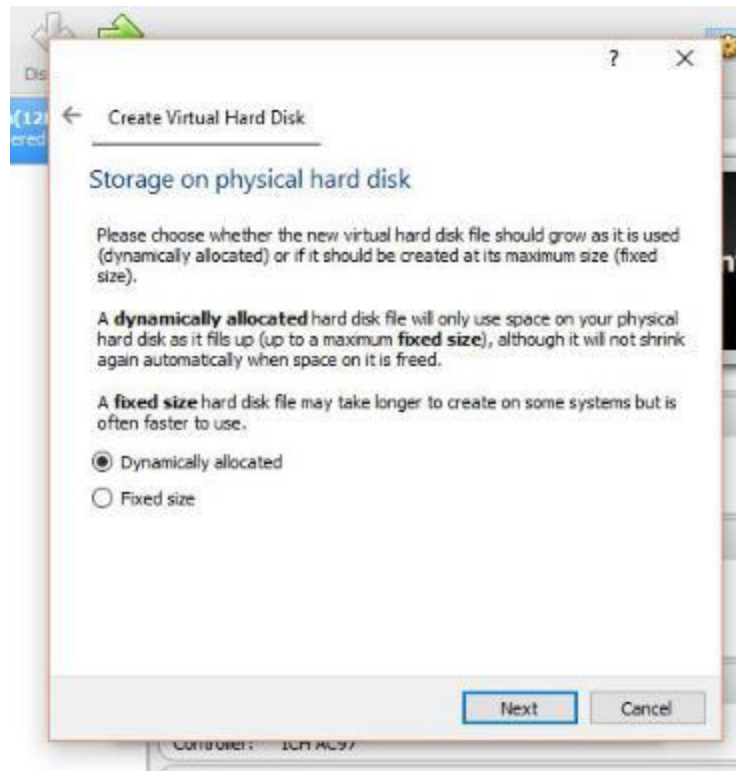


Select the “VDI (VirtualBox Disk Image)” option for Hard disk File Type

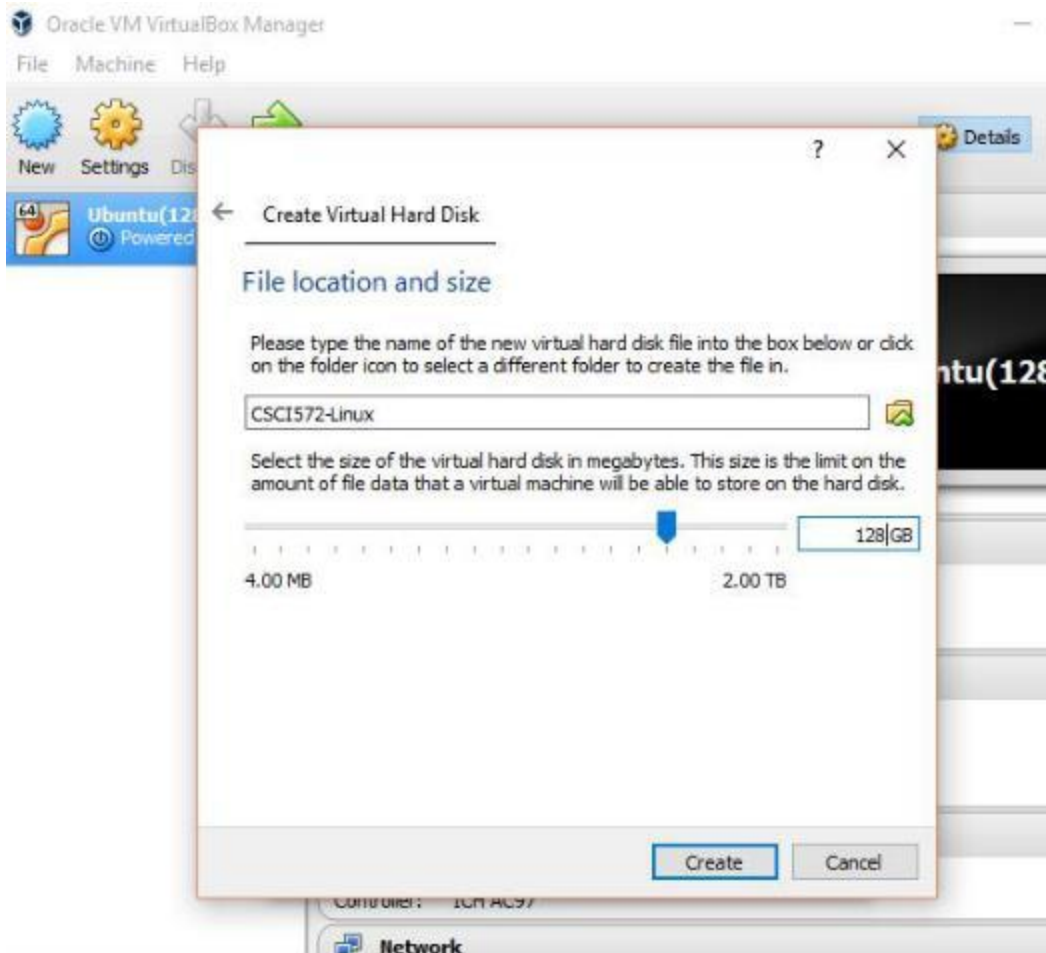


- Select “Dynamically allocated” for Storage on physical hard disk

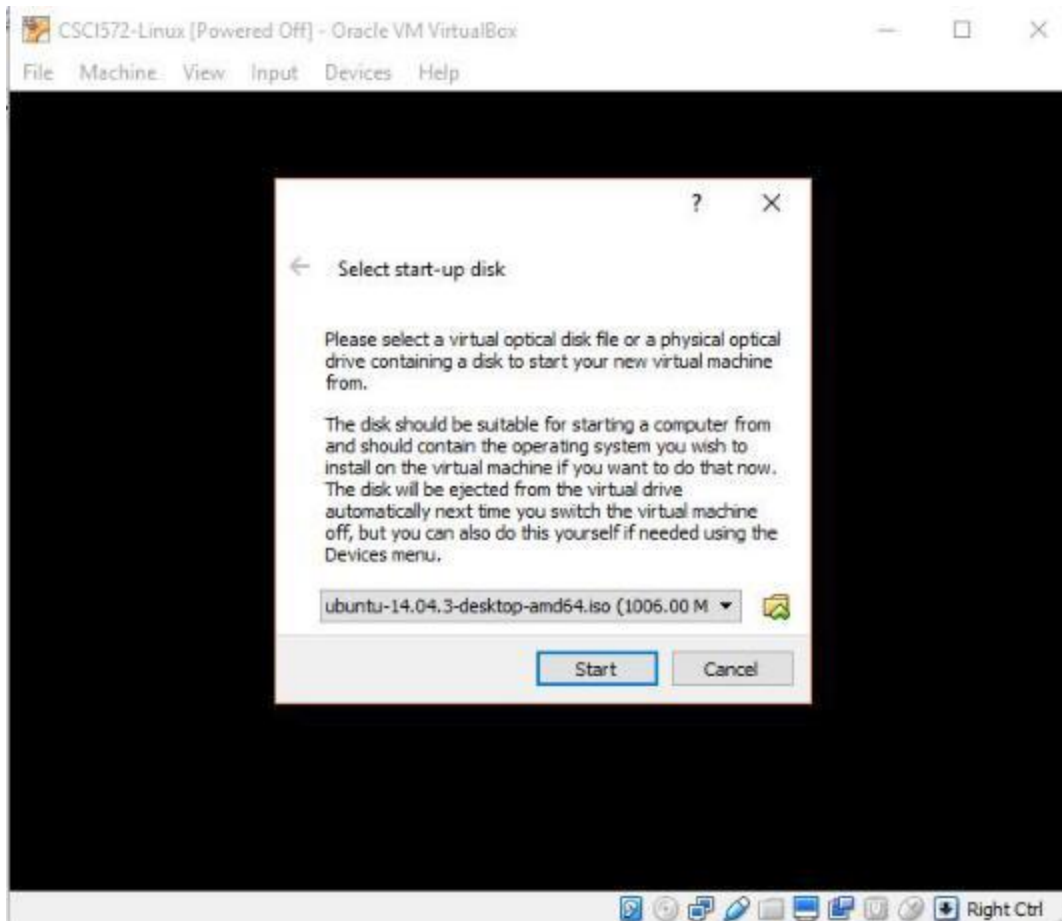




Select the starting drive size (it is recommended to allot at least 128GB). Note: you may be unable to get exactly 128GB.



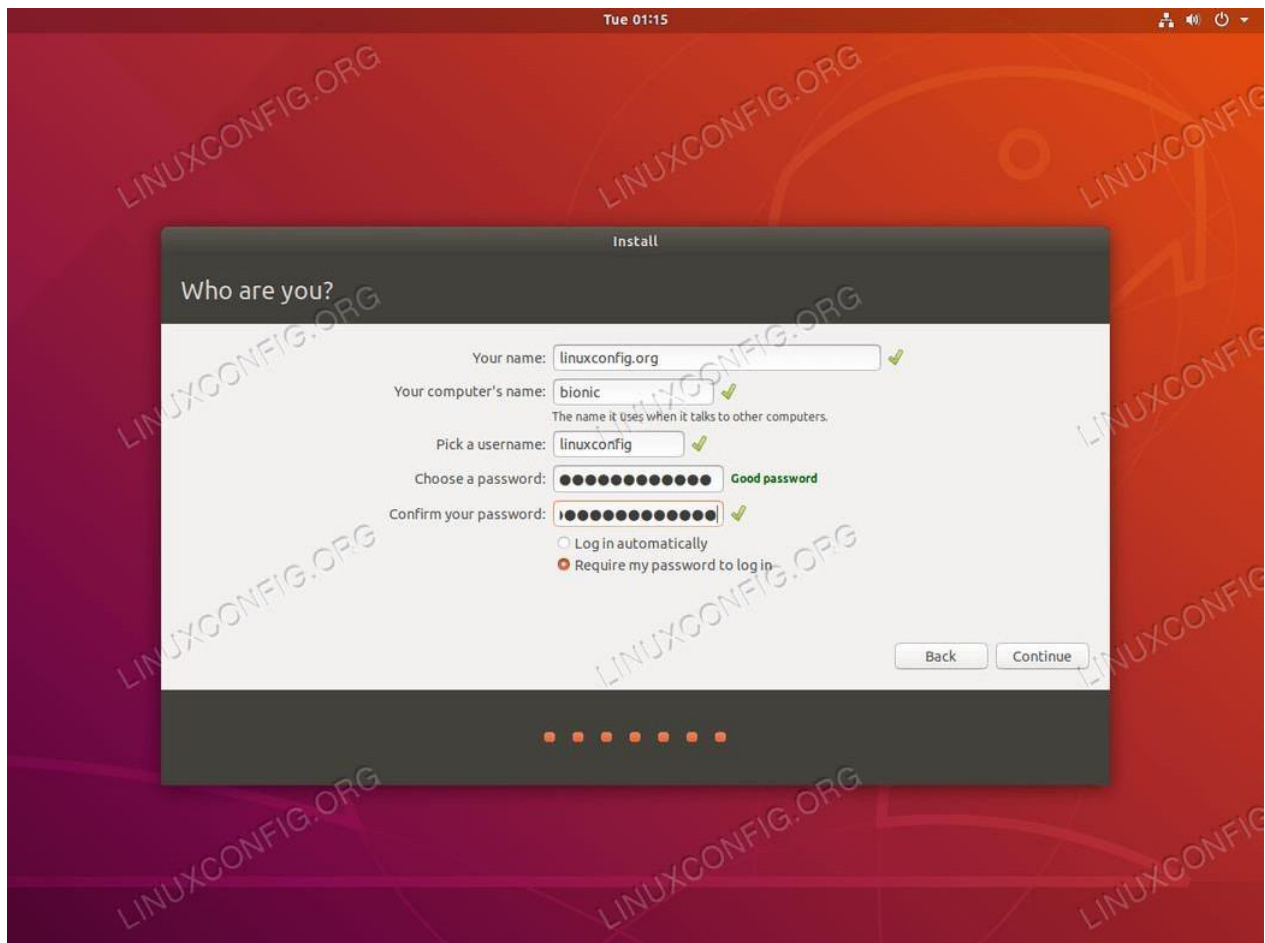
9. With your new instance selected, select start from the application ribbon.
10. When prompted, select the previously downloaded Ubuntu iso file as the virtual optical disk file by clicking on the folder icon and click on Start



11. Click on Install Ubuntu

Click on Continue and select Erase disk and install Ubuntu and click on Install Now. Messages may appear indicating Auto capture of keyboard and mouse pointer. The messages can be removed

12. Follow the prompts to install Ubuntu. Select Location and Language. Enter your username and Password for the Ubuntu system. Select either Log in automatically if you want to log in without password when the Ubuntu machine is started from VirtualBox



Ubuntu Installation will begin after you click on Continue. This will take a while, be patient

# ***LAB 01***

**Linux Commands**

## 1. *ls*:-

### Parameters:-

-a, -all, /

### Description:-

Without arguments, lists the files and directories names in the current directory.

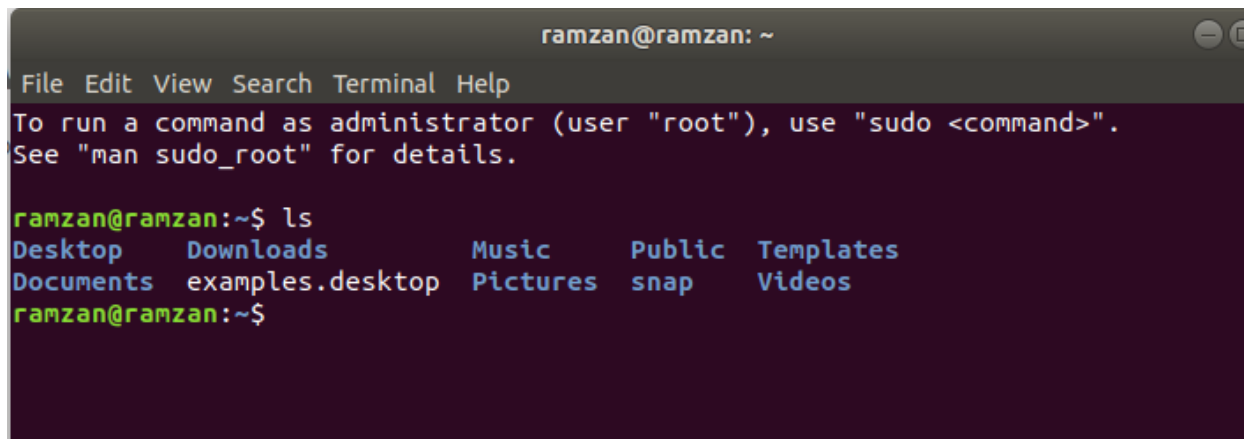
\$ ls / : Lists the contents of the directory given as an argument.

\$ ls -a /home/student : Includes so-called “hidden” files and directories whose names begin with a dot (.).

\$ ls [options] [files\_or\_directories]: Lists the contents of the current directory or a specified directory.

\$ ls -all: Lists files and directories with detailed information like permissions, size, owner, etc.

### Screenshot:-

A screenshot of a terminal window titled 'ramzan@ramzan: ~'. The window has a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. Below the menu bar, there is a message: 'To run a command as administrator (user "root"), use "sudo <command>". See "man sudo\_root" for details.' The terminal shows the command 'ramzan@ramzan:~\$ ls' and its output: 'Desktop Downloads Music Public Templates Documents examples.desktop Pictures snap Videos'. The prompt 'ramzan@ramzan:~\$' is shown at the bottom.

## 2. *date*:-

### Parameters:-

N.A.

### Description:-

Prints the system date and time.

### Screenshot:-

```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
ramzan@ramzan:~$ date  
پونك ات ارعمج 18 21:37:03 PKT 2018  
ramzan@ramzan:~$
```

### 3. *cal*:-

#### Parameters:-

N.A.

#### Description:-

Prints the ASCII calendar of the current month.

### Screenshot:-

```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ cal  
پونك ا 2018  
فہ مچ مچ ب نم پت ا  
1 2 3 4 5 6  
7 8 9 10 11 12 13  
14 15 16 17 18 19 20  
21 22 23 24 25 26 27  
28 29 30 31  
  
ramzan@ramzan:~$
```

#### **4. *pwd*:-**

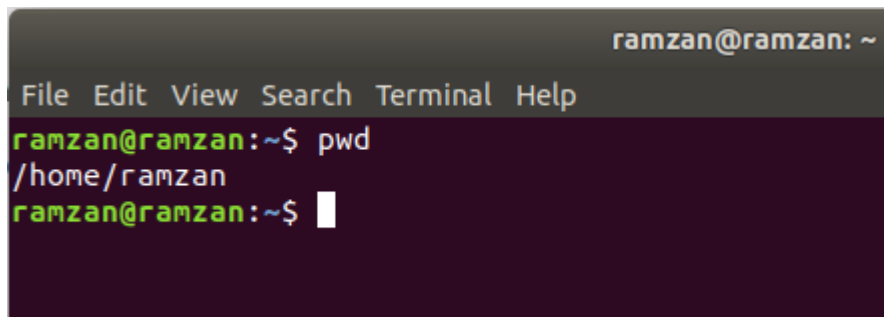
##### **Parameters:-**

N.A.

##### **Description:-**

Displays the absolute path to the current working directory.

##### **Screenshot:-**

A screenshot of a terminal window with a dark purple background. The title bar at the top right says "ramzan@ramzan: ~". Below the title bar is a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal shows the command "pwd" being executed, with the output "/home/ramzan" displayed on the next line. The prompt "ramzan@ramzan:~\$" is visible before and after the command.

```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ pwd  
/home/ramzan  
ramzan@ramzan:~$
```

#### **5. *cd*:-**

##### **Parameters:-**

..., ~, -

##### **Description:-**

\$ cd: Changes directories.

\$ cd /home/uet/cs: To an absolute path.

\$ cd project /docs: To a relative path.

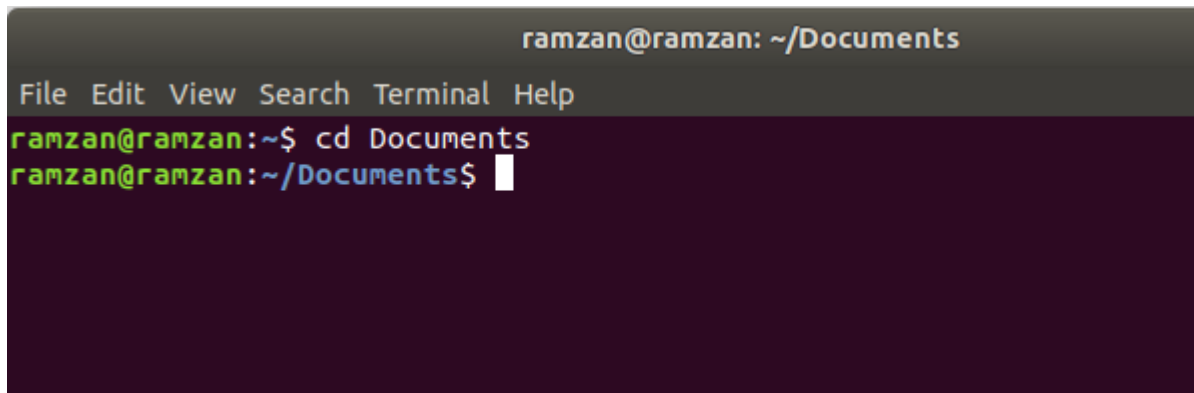
\$ cd .. : To a directory one level up.

\$ cd ~ : To a directory one level up.

\$ cd - : To your previous working directory.



### Screenshot:-



```
ramzan@ramzan: ~/Documents
File Edit View Search Terminal Help
ramzan@ramzan:~$ cd Documents
ramzan@ramzan:~/Documents$
```

## 6. *mkdir*:-

### Parameters:-

N.A.

### Description:-

Directories can be created on a Linux operating system using the following command:-

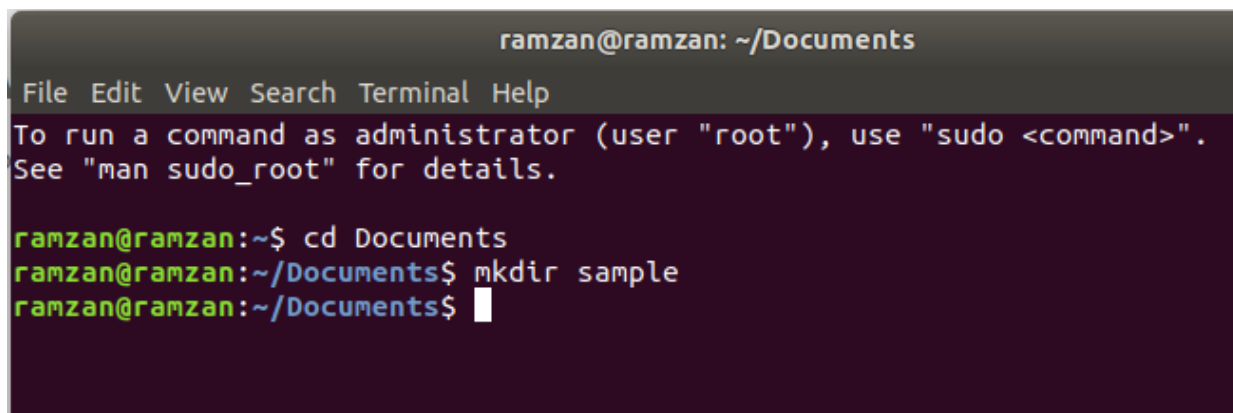
`mkdir directoryname`

This command will create a subdirectory in your present working directory, which is usually your "Home Directory".

For example,

`mkdir mydirectory`

### Screenshot:-



```
ramzan@ramzan: ~/Documents
File Edit View Search Terminal Help
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ramzan@ramzan:~$ cd Documents
ramzan@ramzan:~/Documents$ mkdir sample
ramzan@ramzan:~/Documents$
```

## 7. *rm*:-

### Parameters:-

N.A.

Description:-

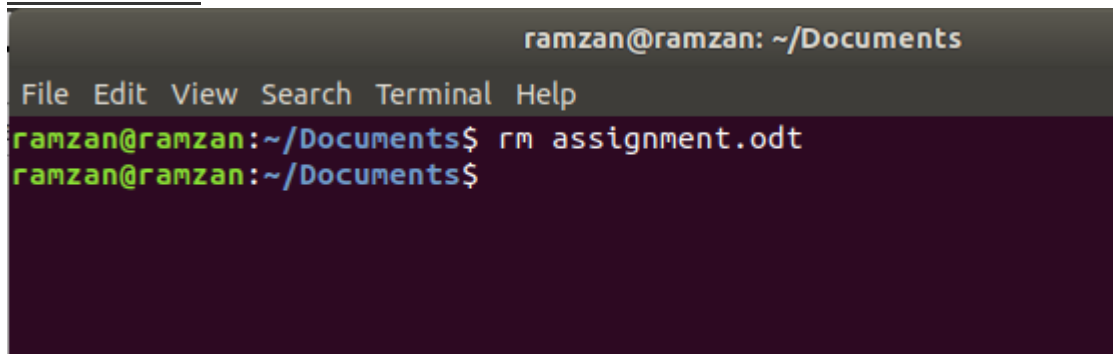
To remove a file, use the command -  
rm filename

Example

Rm assignment.odt

will delete the directory mydirectory

### Screenshot:-

A screenshot of a terminal window with a dark background. The title bar at the top reads 'ramzan@ramzan: ~/Documents'. Below the title bar is a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The terminal shows two lines of text: the first line is 'ramzan@ramzan:~/Documents\$ rm assignment.odt' and the second line is 'ramzan@ramzan:~/Documents\$'.

```
ramzan@ramzan: ~/Documents
File Edit View Search Terminal Help
ramzan@ramzan:~/Documents$ rm assignment.odt
ramzan@ramzan:~/Documents$
```

## 8. *mv*:-

### Parameters:-

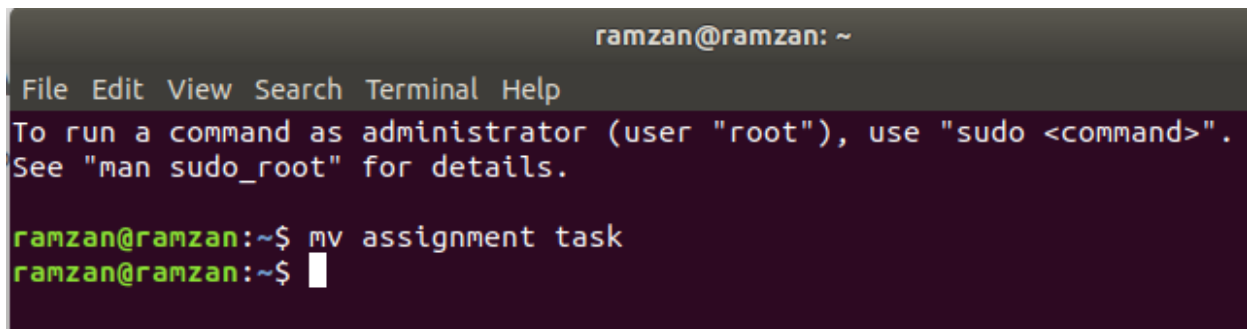
N.A.

### Description:-

The 'mv' (move) command can also be used for renaming directories. Use the below-given format:

mv directoryname newdirectoryname

### Screenshot:-



```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
ramzan@ramzan:~$ mv assignment task  
ramzan@ramzan:~$
```

### 9. *man*:-

#### Parameters:-

N.A.

#### Description:-

Man stands for manual which is a reference book of a Linux operating system. It is similar to HELP file found in popular software.

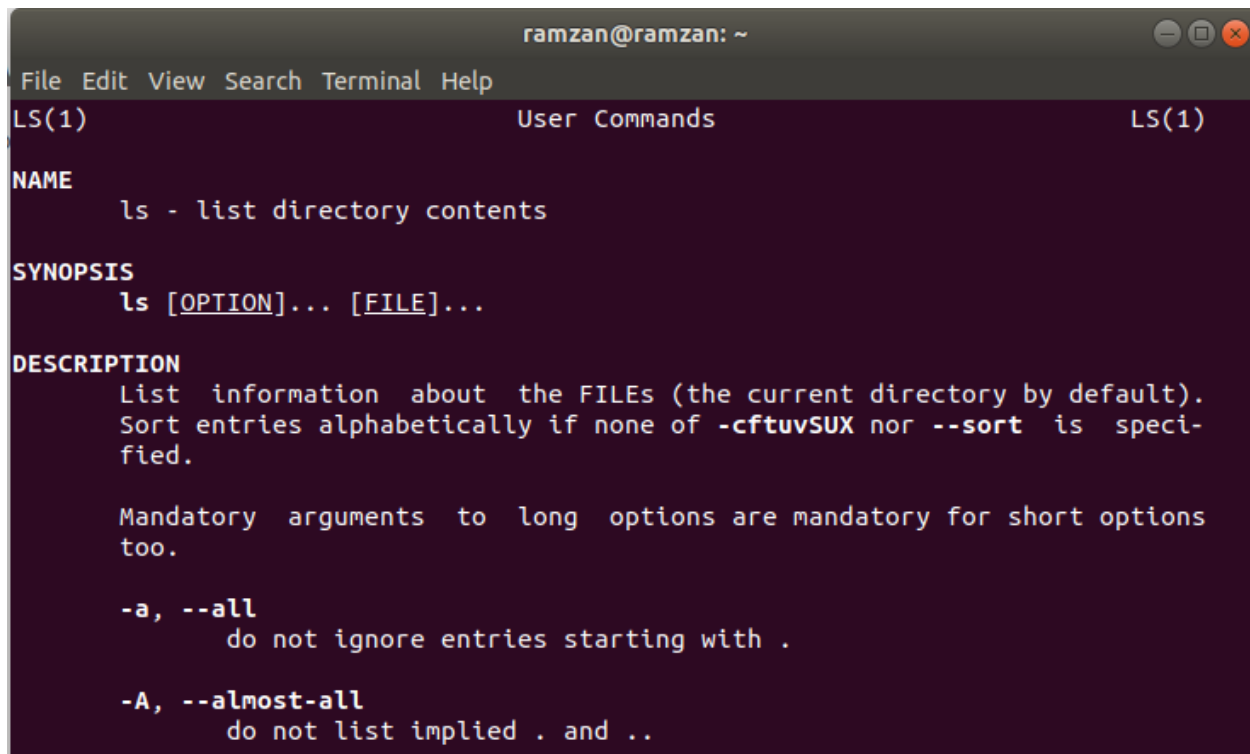
To get help on any command that you do not understand, you can type  
man

The terminal would open the manual page for that command.

For an example, if we type man man and hit enter; terminal would give us information on man command

\$ man man

## Screenshot:-



```
ramzan@ramzan: ~
File Edit View Search Terminal Help
LS(1)                                User Commands                                LS(1)

NAME
    ls - list directory contents

SYNOPSIS
    ls [OPTION]... [FILE]...

DESCRIPTION
    List information about the FILES (the current directory by default).
    Sort entries alphabetically if none of -cftuvSUX nor --sort is speci-
    fied.

    Mandatory arguments to long options are mandatory for short options
    too.

    -a, --all
        do not ignore entries starting with .

    -A, --almost-all
        do not list implied . and ..
```

## 10. history:-

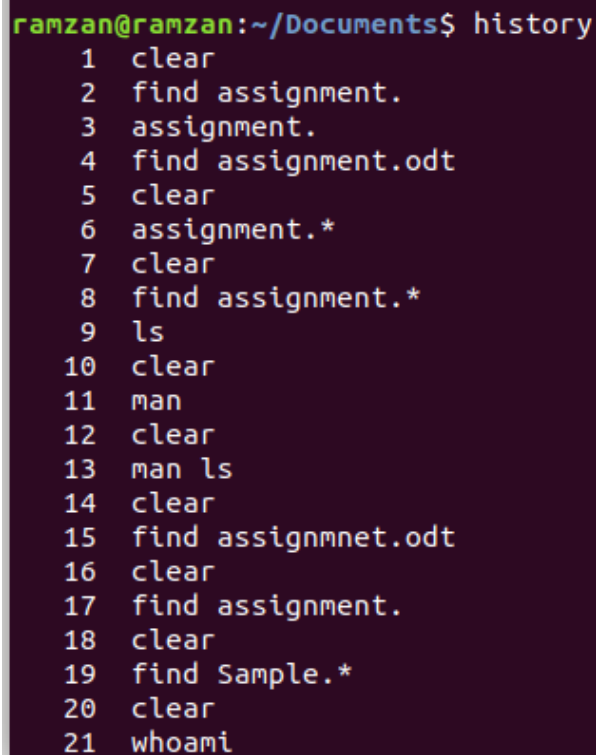
### Parameters:-

N.A.

### Description:-

History command shows all the commands that you have used in the past for the current terminal session. This can help you refer to the old commands you have entered and re-used them in your operations again.

### Screenshot:-

A terminal window with a dark purple background. The prompt is 'ramzan@ramzan:~/Documents\$'. The command 'history' has been entered, and the terminal displays a list of 21 commands in a light green monospace font. The commands are: 1 clear, 2 find assignment., 3 assignment., 4 find assignment.odt, 5 clear, 6 assignment.\*, 7 clear, 8 find assignment.\*, 9 ls, 10 clear, 11 man, 12 clear, 13 man ls, 14 clear, 15 find assignmnet.odt, 16 clear, 17 find assignment., 18 clear, 19 find Sample.\*, 20 clear, 21 whoami.

```
ramzan@ramzan:~/Documents$ history
 1 clear
 2 find assignment.
 3 assignment.
 4 find assignment.odt
 5 clear
 6 assignment.*
 7 clear
 8 find assignment.*
 9 ls
10 clear
11 man
12 clear
13 man ls
14 clear
15 find assignmnet.odt
16 clear
17 find assignment.
18 clear
19 find Sample.*
20 clear
21 whoami
```

### *11. clear:-*

#### Parameters:-

N.A.

#### Description:-

This command clears all the clutter on the terminal and gives you a clean window to work on, just like when you launch the terminal.

### Screenshot:-

```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$
```

## 12. df:-

### Parameters:-

N.A.

### Description:-

Display free disk space.

### Screenshot:-

```
ramzan@ramzan:~$ df  
Filesystem      1K-blocks    Used Available Use% Mounted on  
udev             1940376         0   1940376   0% /dev  
tmpfs             394128      1524    392604   1% /run  
/dev/sda1       26264764 6447076  18460428  26% /  
tmpfs            1970628         0   1970628   0% /dev/shm  
tmpfs             5120          4     5116   1% /run/lock  
tmpfs            1970628         0   1970628   0% /sys/fs/cgroup  
/dev/loop0        13312      13312         0 100% /snap/gnome-characters/103  
/dev/loop1        89088      89088         0 100% /snap/core/4917  
/dev/loop2         2432       2432         0 100% /snap/gnome-calculator/180  
/dev/loop5         3840       3840         0 100% /snap/gnome-system-monitor/51  
/dev/loop3        35584      35584         0 100% /snap/gtk-common-themes/319  
/dev/loop4       144384     144384         0 100% /snap/gnome-3-26-1604/70  
/dev/loop6       199936     199936         0 100% /snap/vlc/555  
/dev/loop7        14848      14848         0 100% /snap/gnome-logs/37  
tmpfs             394124         28    394096   1% /run/user/121  
tmpfs             394124         40    394084   1% /run/user/1000  
/dev/loop8        89984      89984         0 100% /snap/core/5662  
ramzan@ramzan:~$
```

### ***13. echo:-***

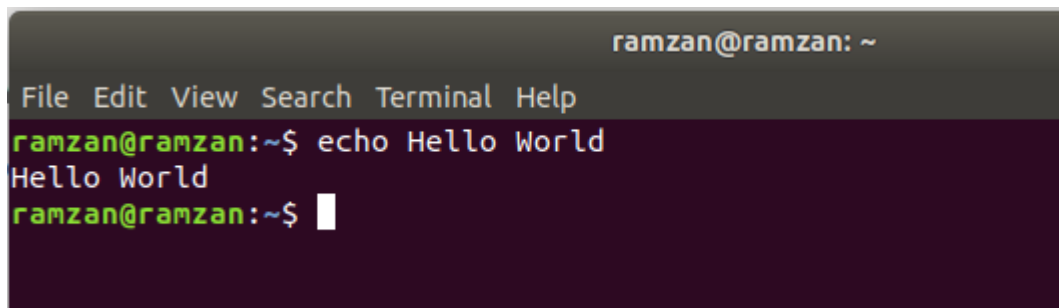
#### **Parameters:-**

N.A.

#### **Description:-**

Display message on screen.

#### **Screenshot:-**



A terminal window titled 'ramzan@ramzan: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). The prompt is 'ramzan@ramzan:~\$'. The command 'echo Hello World' has been entered and executed, resulting in the output 'Hello World' on the next line. The prompt is now 'ramzan@ramzan:~\$' with a cursor.

### ***14. free:-***

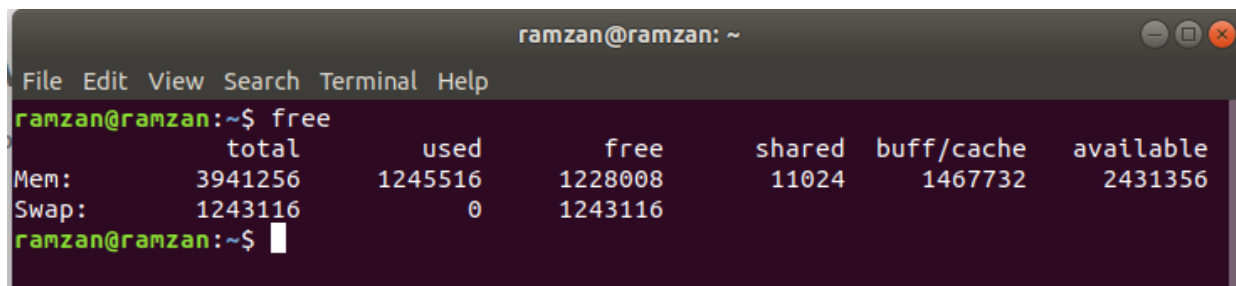
#### **Parameters:-**

-h, -m, -g

#### **Description:-**

Display memory usage.

#### **Screenshot:-**



A terminal window titled 'ramzan@ramzan: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). The prompt is 'ramzan@ramzan:~\$'. The command 'free' has been entered and executed, resulting in a table of memory usage statistics. The prompt is now 'ramzan@ramzan:~\$' with a cursor.

	total	used	free	shared	buff/cache	available
Mem:	3941256	1245516	1228008	11024	1467732	2431356
Swap:	1243116	0	1243116			

## ***15. logname:-***

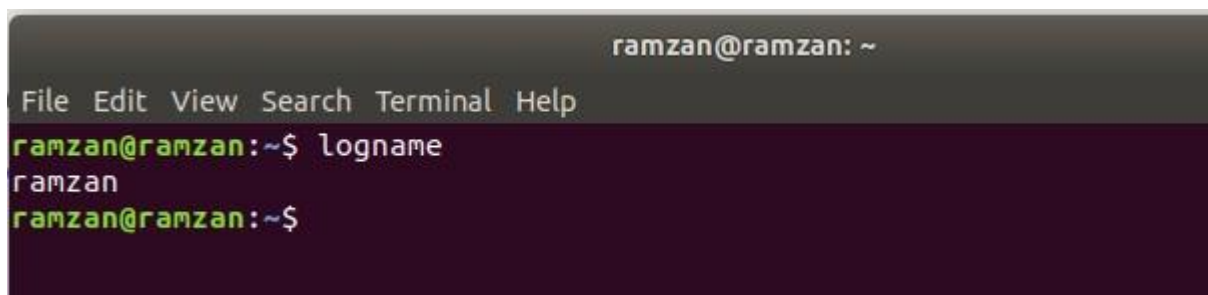
### ***Parameters:-***

N.A.

### ***Description:-***

Display memory usage.

### ***Screenshot:-***

A terminal window with a dark background and a menu bar at the top containing 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The title bar reads 'ramzan@ramzan: ~'. The terminal shows the command 'logname' being executed, with the output 'ramzan' displayed on the next line.

```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ logname  
ramzan  
ramzan@ramzan:~$
```

## ***16. whoami:-***

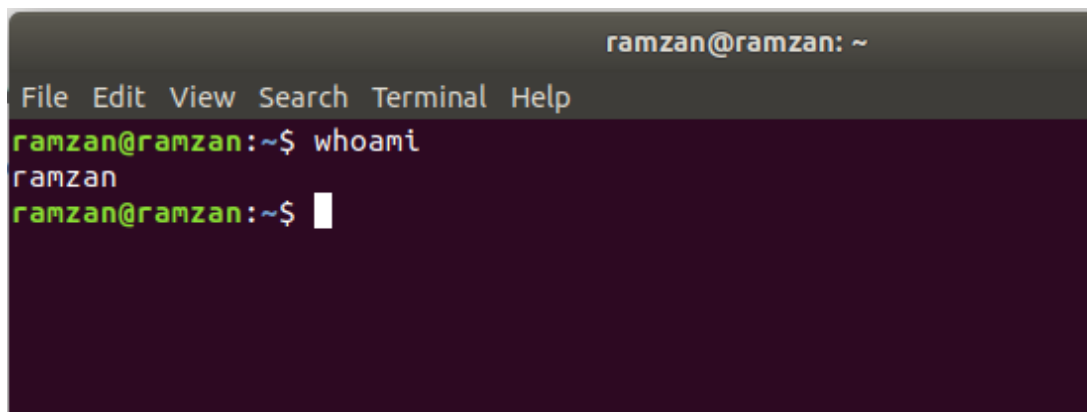
### ***Parameters:-***

N.A.

### ***Description:-***

Print the current user id and name.

### ***Screenshot:-***

A terminal window with a dark background and a menu bar at the top containing 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The title bar reads 'ramzan@ramzan: ~'. The terminal shows the command 'whoami' being executed, with the output 'ramzan' displayed on the next line.

```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ whoami  
ramzan  
ramzan@ramzan:~$
```



## ***17. uname:-***

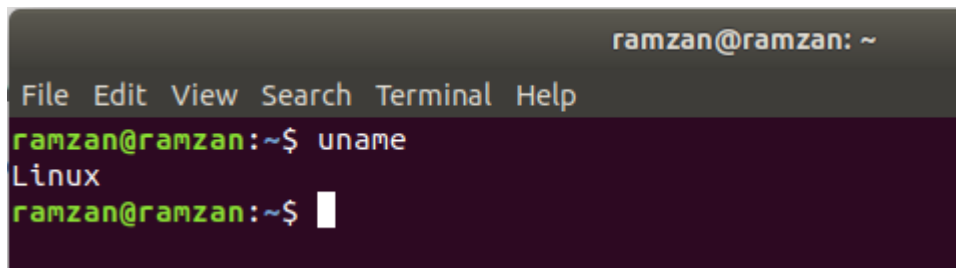
### **Parameters:-**

-a, -r

### **Description:-**

Print system information

### **Screenshot:-**



```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ uname  
Linux  
ramzan@ramzan:~$
```

## ***18. factor:-***

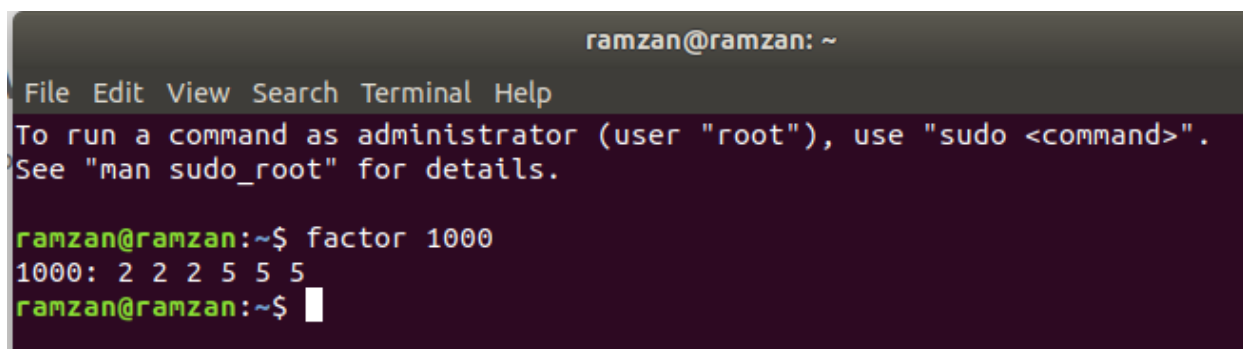
### **Parameters:-**

N.A.

### **Description:-**

Display prime factors of specified integer numbers.

### **Screenshot:-**



```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
ramzan@ramzan:~$ factor 1000  
1000: 2 2 2 5 5 5  
ramzan@ramzan:~$
```

## 19. top:-

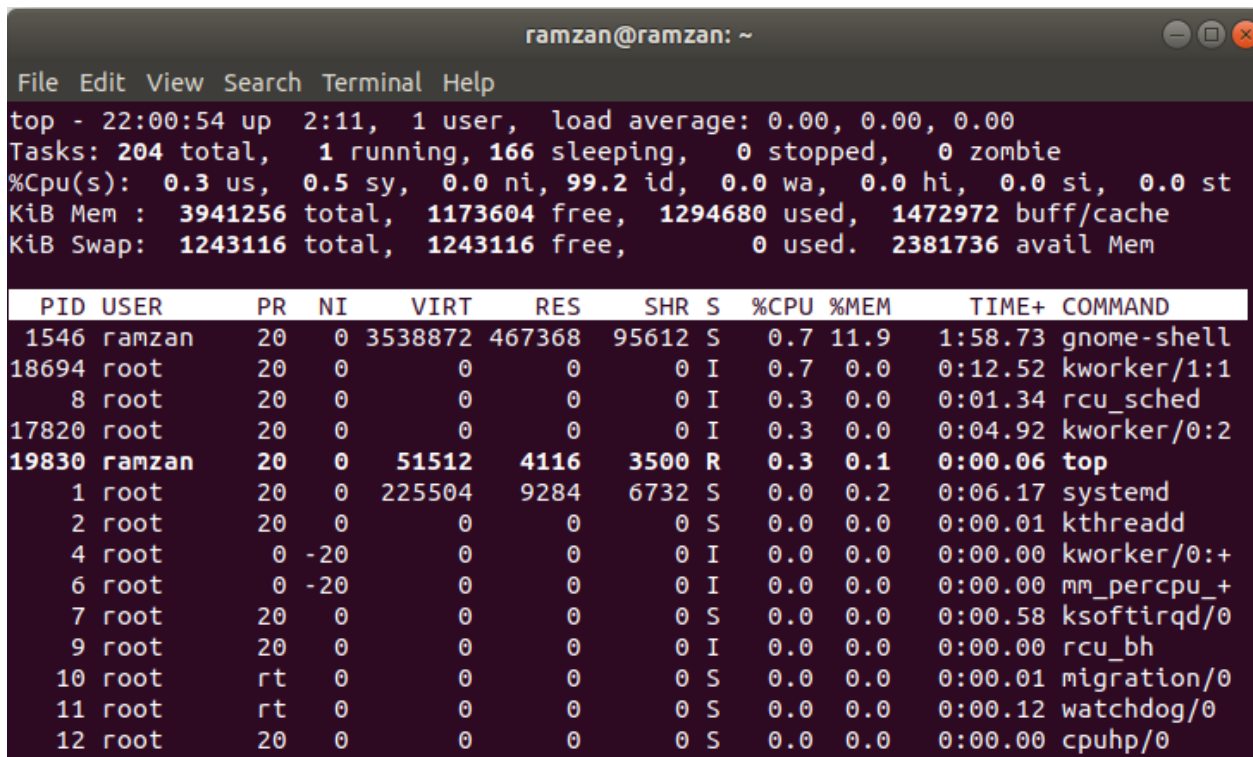
### Parameters:-

N.A.

### Description:-

Shows top consumers of memory and CPU.

### Screenshot:-



```
ramzan@ramzan: ~
File Edit View Search Terminal Help
top - 22:00:54 up 2:11, 1 user, load average: 0.00, 0.00, 0.00
Tasks: 204 total, 1 running, 166 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.3 us, 0.5 sy, 0.0 ni, 99.2 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 3941256 total, 1173604 free, 1294680 used, 1472972 buff/cache
KiB Swap: 1243116 total, 1243116 free, 0 used. 2381736 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM    TIME+  COMMAND
 1546 ramzan    20   0 3538872 467368 95612 S   0.7  11.9   1:58.73  gnome-shell
18694 root       20   0      0      0      0 I   0.7   0.0   0:12.52  kworker/1:1
      8 root       20   0      0      0      0 I   0.3   0.0   0:01.34  rcu_sched
17820 root       20   0      0      0      0 I   0.3   0.0   0:04.92  kworker/0:2
19830 ramzan    20   0  51512   4116   3500 R   0.3   0.1   0:00.06  top
      1 root       20   0 225504   9284   6732 S   0.0   0.2   0:06.17  systemd
      2 root       20   0      0      0      0 S   0.0   0.0   0:00.01  kthreadd
      4 root        0 -20      0      0      0 I   0.0   0.0   0:00.00  kworker/0:+
      6 root        0 -20      0      0      0 I   0.0   0.0   0:00.00  mm_percpu_+
      7 root       20   0      0      0      0 S   0.0   0.0   0:00.58  ksoftirqd/0
      9 root       20   0      0      0      0 I   0.0   0.0   0:00.00  rcu_bh
     10 root       rt    0      0      0      0 S   0.0   0.0   0:00.01  migration/0
     11 root       rt    0      0      0      0 S   0.0   0.0   0:00.12  watchdog/0
     12 root       20   0      0      0      0 S   0.0   0.0   0:00.00  cpuhp/0
```

## 20. ps:-

### Parameters:-

-ef

### Description:-

Shows processes running by user.

### Screenshot:-

```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
ramzan@ramzan:~$ ps  
  PID TTY          TIME CMD  
19959 pts/0    00:00:00 bash  
19970 pts/0    00:00:00 ps  
ramzan@ramzan:~$
```

## 21. *hostname*:-

### Parameters:-

-I

### Description:-

Use hostname to know your name in your host or network. Basically, it displays your hostname and IP address. Just typing “hostname” gives the output. Typing in “hostname -I” gives you your IP address in your network.

### Screenshot:-

```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ hostname  
ramzan  
ramzan@ramzan:~$
```

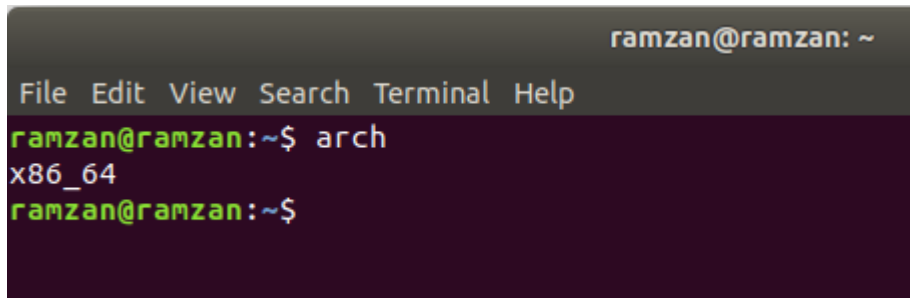
## 22. *arch*:-

### Parameters:-

N.A.

**Description:-**

The arch command is used to print the machine's architecture.

**Screenshot:-**A terminal window with a dark purple background and a grey title bar. The title bar contains the text 'ramzan@ramzan: ~'. Below the title bar is a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The terminal shows the command 'arch' being executed, which outputs 'x86\_64'. The prompt 'ramzan@ramzan:~\$' is visible before and after the command.

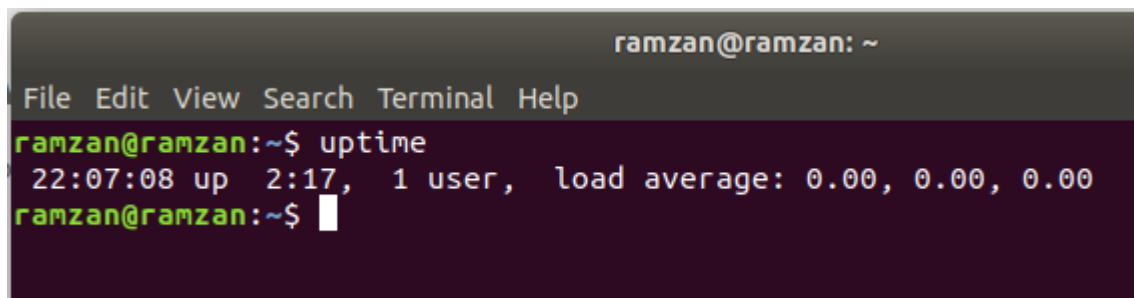
```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ arch  
x86_64  
ramzan@ramzan:~$
```

**23. uptime:-****Parameters:-**

N.A.

**Description:-**

Shows how long the system has been running + load.

**Screenshot:-**A terminal window with a dark purple background and a grey title bar. The title bar contains the text 'ramzan@ramzan: ~'. Below the title bar is a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The terminal shows the command 'uptime' being executed, which outputs '22:07:08 up 2:17, 1 user, load average: 0.00, 0.00, 0.00'. The prompt 'ramzan@ramzan:~\$' is visible before and after the command.

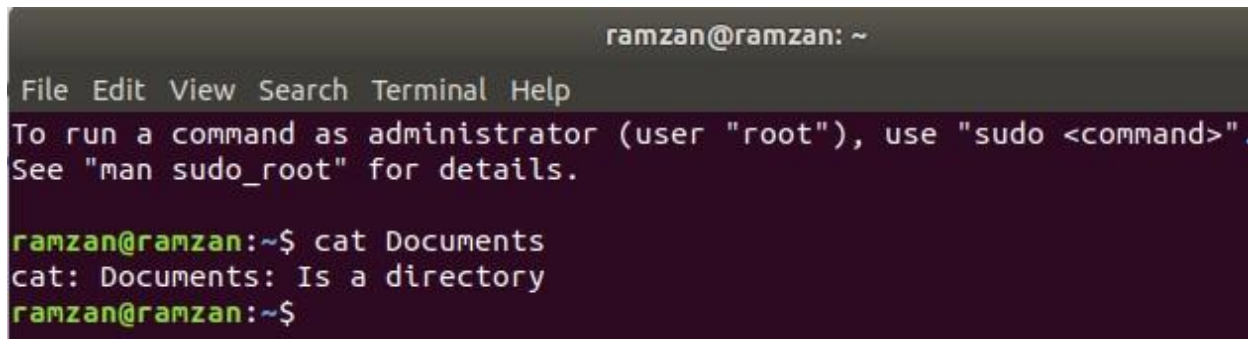
```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ uptime  
22:07:08 up 2:17, 1 user, load average: 0.00, 0.00, 0.00  
ramzan@ramzan:~$
```

**24. cat:-****Parameters:-**

N.A.

**Description:-**

View the contents of file.

**Screenshot:-**

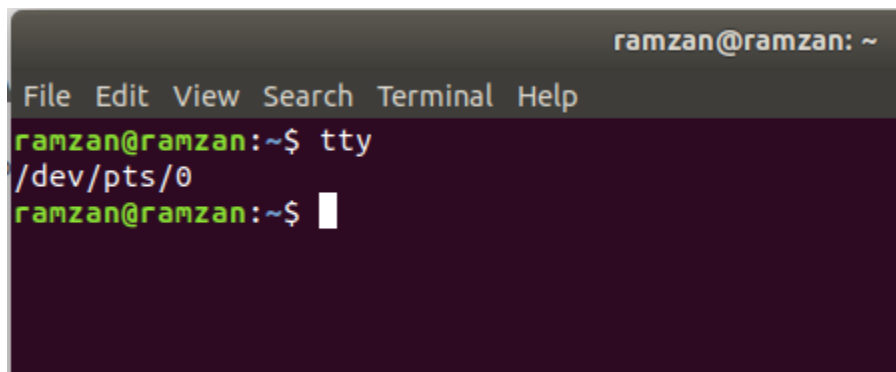
```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
ramzan@ramzan:~$ cat Documents  
cat: Documents: Is a directory  
ramzan@ramzan:~$
```

**25. tty:-****Parameters:-**

N.A.

**Description:-**

Displays current terminal.

**Screenshot:-**

```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ tty  
/dev/pts/0  
ramzan@ramzan:~$
```

## 26. *touch*:-

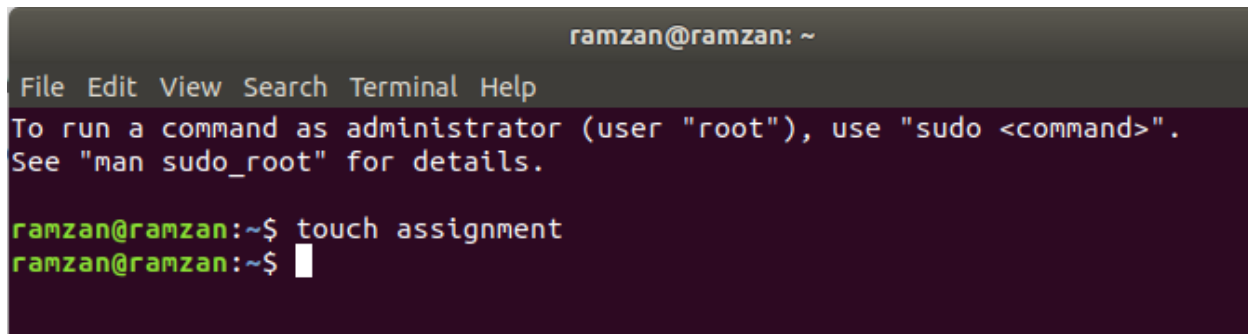
### Parameters:-

N.A.

### Description:-

Create an empty file.

### Screenshot:-

A terminal window titled 'ramzan@ramzan: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). It displays the command 'touch assignment' and the prompt 'ramzan@ramzan:~\$' followed by a cursor.

```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
ramzan@ramzan:~$ touch assignment  
ramzan@ramzan:~$
```

## 27. *find*:-

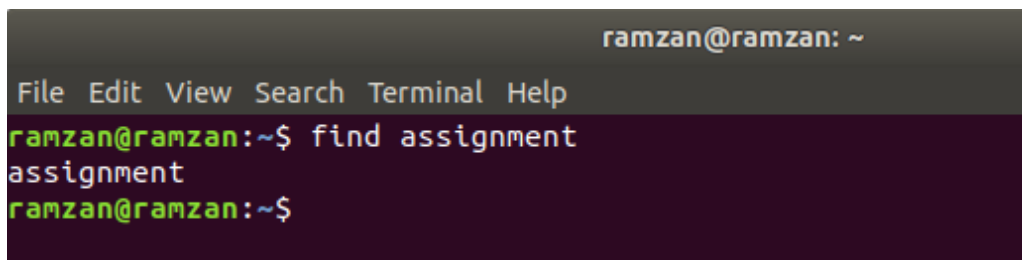
### Parameters:-

-name, -iname

### Description:-

To find a file by name.

### Screenshot:-

A terminal window titled 'ramzan@ramzan: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). It displays the command 'find assignment' and the output 'assignment', followed by the prompt 'ramzan@ramzan:~\$'.

```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ find assignment  
assignment  
ramzan@ramzan:~$
```

## 28. *cp*:-

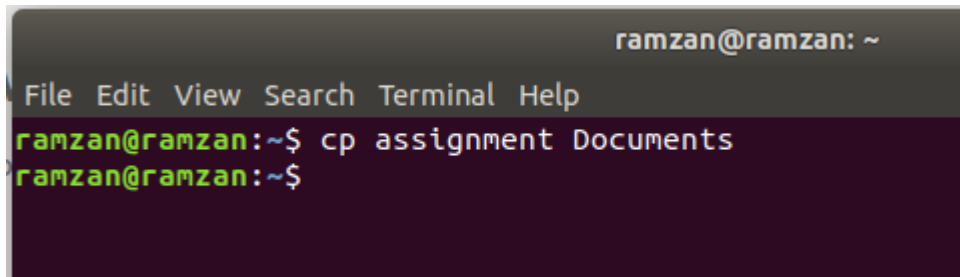
### Parameters:-

-a, -f, -i

### Description:-

To copy a file.

### Screenshot:-



```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ cp assignment Documents  
ramzan@ramzan:~$
```

## 29. *dir*:-

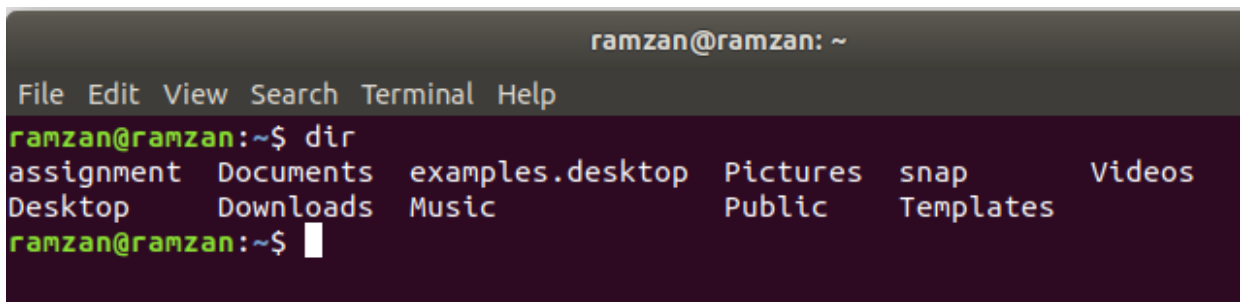
### Parameters:-

-a, -all, -l

### Description:-

To get a list of all the files and folders in the current directory, use the dir command.

### Screenshot:-



```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ dir  
assignment Documents examples.desktop Pictures snap Videos  
Desktop Downloads Music Public Templates  
ramzan@ramzan:~$
```

### 30. info:-

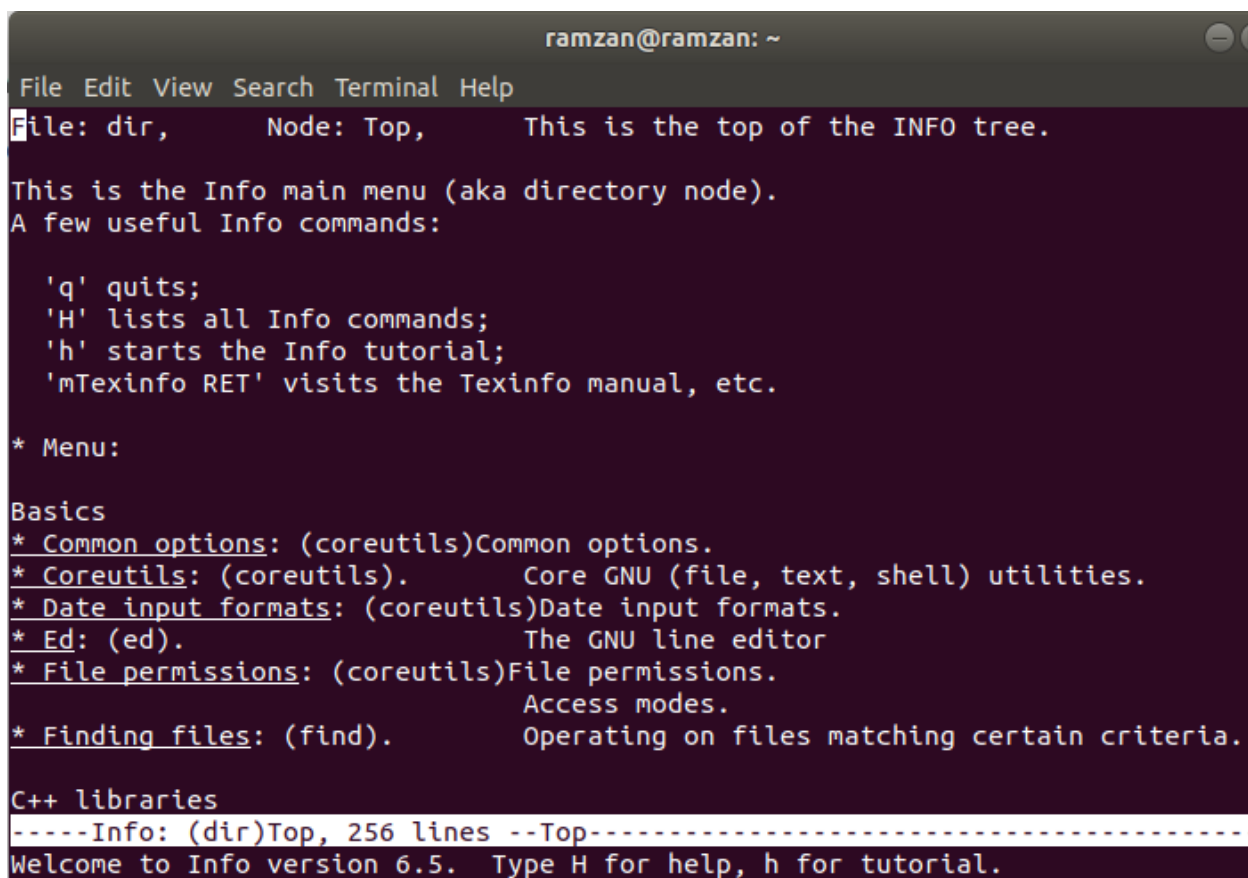
#### Parameters:-

N.A.

#### Description:-

Info gives more details about a specific command than by using the man command.

#### Screenshot:-

A screenshot of a terminal window titled 'ramzan@ramzan: ~'. The terminal shows the output of the 'info' command. It starts with a menu bar: 'File Edit View Search Terminal Help'. Below that, it says 'File: dir, Node: Top, This is the top of the INFO tree.' followed by 'This is the Info main menu (aka directory node). A few useful Info commands:'. Then it lists commands: ''q' quits;', ''H' lists all Info commands;', ''h' starts the Info tutorial;', and ''mTexinfo RET' visits the Texinfo manual, etc.'. Below this is '\* Menu:'. Then it shows 'Basics' and a list of topics: '\* Common options: (coreutils)Common options.', '\* Coreutils: (coreutils). Core GNU (file, text, shell) utilities.', '\* Date input formats: (coreutils)Date input formats.', '\* Ed: (ed). The GNU line editor', '\* File permissions: (coreutils)File permissions. Access modes.', '\* Finding files: (find). Operating on files matching certain criteria.'. Then it shows 'C++ libraries'. At the bottom, it says '-----Info: (dir)Top, 256 lines --Top-----' and 'Welcome to Info version 6.5. Type H for help, h for tutorial.'

```
ramzan@ramzan: ~
File Edit View Search Terminal Help
File: dir,      Node: Top,      This is the top of the INFO tree.

This is the Info main menu (aka directory node).
A few useful Info commands:

  'q' quits;
  'H' lists all Info commands;
  'h' starts the Info tutorial;
  'mTexinfo RET' visits the Texinfo manual, etc.

* Menu:

Basics
* Common options: (coreutils)Common options.
* Coreutils: (coreutils).      Core GNU (file, text, shell) utilities.
* Date input formats: (coreutils)Date input formats.
* Ed: (ed).                    The GNU line editor
* File permissions: (coreutils)File permissions.
                               Access modes.
* Finding files: (find).        Operating on files matching certain criteria.

C++ libraries
-----Info: (dir)Top, 256 lines --Top-----
Welcome to Info version 6.5.  Type H for help, h for tutorial.
```

### 31. nano:-

#### Parameters:-

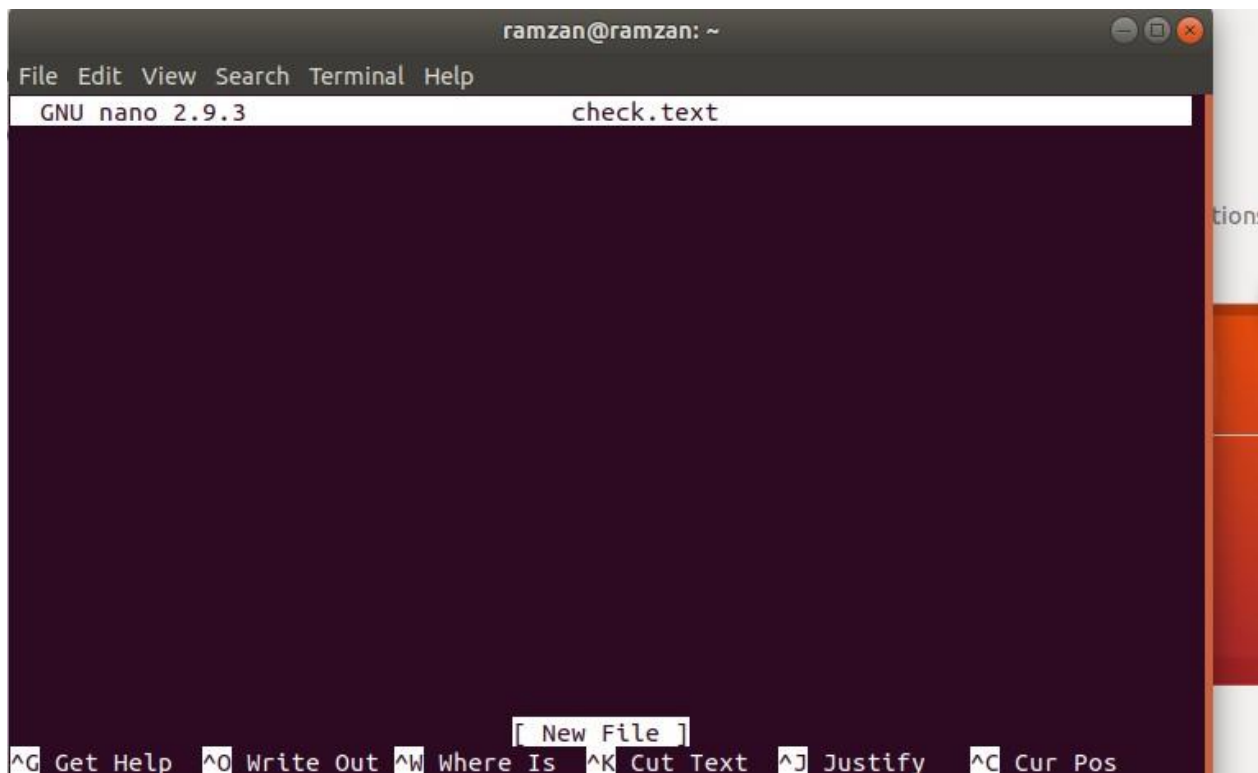
N.A.



### Description:-

nano is already installed text editor in the linux command line. The nano command is a good text editor that denotes keywords with color and can recognize most languages. You can create a new or modify a file using this editor. For example if you need to make a new file named “check.txt”, you can create it by using the command “nano check.txt”. You can save your files after editing by using the sequence Ctrl + X, then Y (or N for no).

### Screenshot:-



## 32. *bzip2*:-

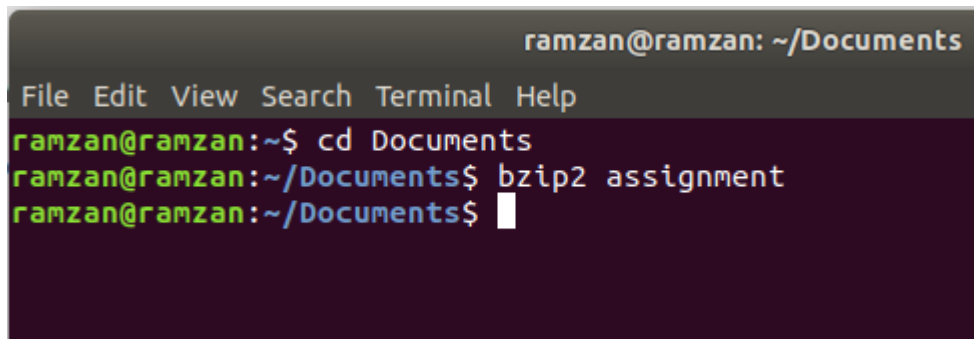
### Parameters:-

N.A.

### Description:-

A portable, fast, open source program that compresses and decompresses files at a high rate, but that does not archive them.

### Screenshot:-

A terminal window titled 'ramzan@ramzan: ~/Documents' with a menu bar (File, Edit, View, Search, Terminal, Help). The prompt is 'ramzan@ramzan:~\$'. The user enters 'cd Documents', and the prompt changes to 'ramzan@ramzan:~/Documents\$'. Then, the user enters 'bzip2 assignment', and the prompt returns to 'ramzan@ramzan:~/Documents\$' with a cursor.

```
ramzan@ramzan: ~/Documents
File Edit View Search Terminal Help
ramzan@ramzan:~$ cd Documents
ramzan@ramzan:~/Documents$ bzip2 assignment
ramzan@ramzan:~/Documents$
```

### 33. *service*:-

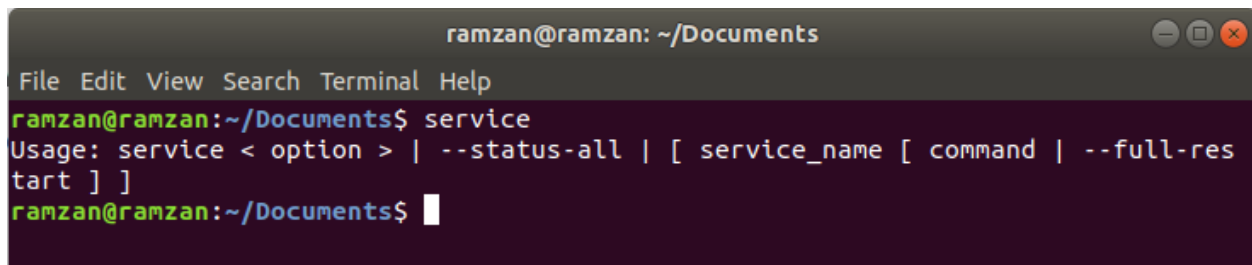
#### Parameters:-

N.A.

#### Description:-

This command is the quickest way to start or stop a service, such as networking.

### Screenshot:-

A terminal window titled 'ramzan@ramzan: ~/Documents' with a menu bar (File, Edit, View, Search, Terminal, Help) and window control buttons. The prompt is 'ramzan@ramzan:~/Documents\$'. The user enters 'service', and the terminal displays the usage: 'Usage: service < option > | --status-all | [ service\_name [ command | --full-res start ] ]'. The prompt returns to 'ramzan@ramzan:~/Documents\$' with a cursor.

```
ramzan@ramzan: ~/Documents
File Edit View Search Terminal Help
ramzan@ramzan:~/Documents$ service
Usage: service < option > | --status-all | [ service_name [ command | --full-res
start ] ]
ramzan@ramzan:~/Documents$
```

### 34. *vi*:-

#### Parameters:-

N.A.

#### Description:-

The vi environment is a text editor that allows a user to control the system with just the keyboard instead of both mouse selections and keystrokes.

### Screenshot:-



```
VIM - Vi IMproved

        version 8.0.1453
        by Bram Moolenaar et al.
Modified by pkg-vim-maintainers@lists.alioth.debian.org
Vim is open source and freely distributable


        Help poor children in Uganda!
type  :help iccf<Enter>          for information

type  :q<Enter>                  to exit
type  :help<Enter> or <F1>      for on-line help
type  :help version8<Enter>    for version info


        Running in Vi compatible mode
type  :set nocp<Enter>          for Vim defaults
type  :help cp-default<Enter>  for info on this
```

### 35. *vmstat*:-

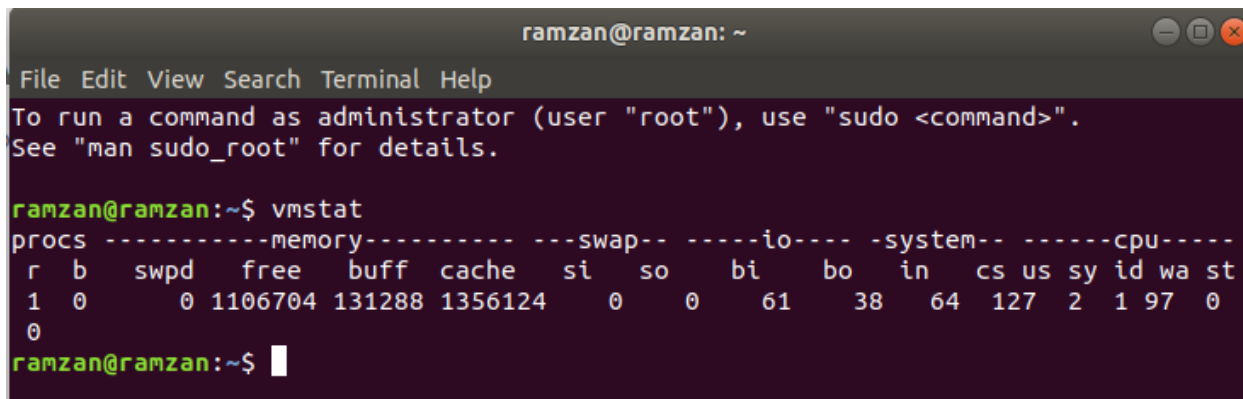
#### Parameters:-

N.A.

#### Description:-

The vmstat command snapshots everything in a system and reports information on such items as processes, memory, paging and CPU activity. This is a good method for admins to use to determine where issues/slowdown may occur in a system.

### Screenshot:-



```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
ramzan@ramzan:~$ vmstat  
procs -----memory----- --swap-- -----io----- -system-- -----cpu-----  
r b swpd free buff cache si so bi bo in cs us sy id wa st  
1 0 0 1106704 131288 1356124 0 0 61 38 64 127 2 1 97 0  
0  
ramzan@ramzan:~$
```

### 36. ssh:-

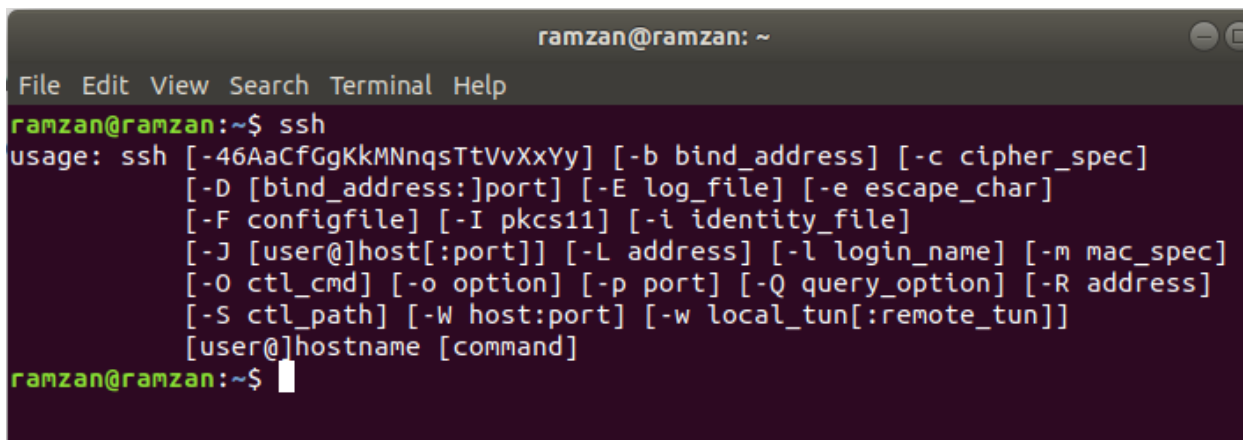
#### Parameters:-

N.A.

#### Description:-

SSH is a command interface for secure remote computer access and is used by network admins to remotely control servers.

### Screenshot:-



```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ ssh  
usage: ssh [-46AaCfGgKkMnqsTtVvXxYy] [-b bind_address] [-c cipher_spec]  
          [-D [bind_address:]port] [-E log_file] [-e escape_char]  
          [-F configfile] [-I pkcs11] [-i identity_file]  
          [-J [user@]host[:port]] [-L address] [-l login_name] [-m mac_spec]  
          [-O ctl_cmd] [-o option] [-p port] [-Q query_option] [-R address]  
          [-S ctl_path] [-W host:port] [-w local_tun[:remote_tun]]  
          [user@]hostname [command]  
ramzan@ramzan:~$
```

### 37. *exit*:-

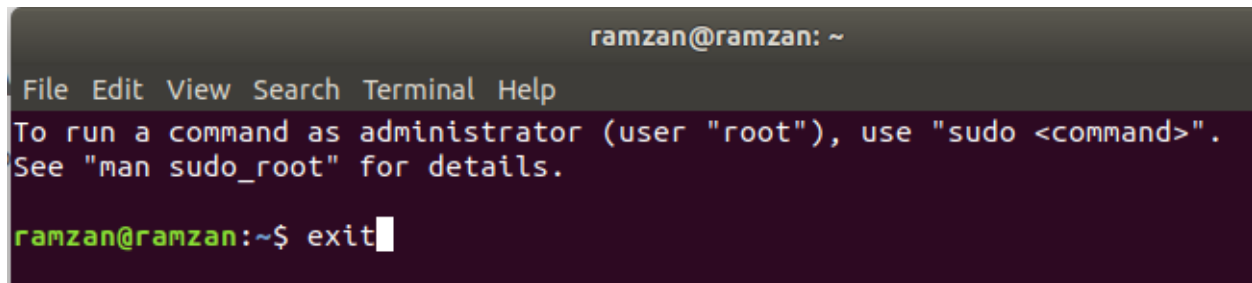
#### Parameters:-

N.A.

#### Description:-

exit command is used to exit a shell like so.

#### Screenshot:-

A screenshot of a terminal window with a dark background. The title bar at the top reads 'ramzan@ramzan: ~'. Below the title bar is a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The main text area shows a message: 'To run a command as administrator (user "root"), use "sudo <command>". See "man sudo\_root" for details.' Below this, the prompt 'ramzan@ramzan:~\$' is followed by the command 'exit' and a cursor.

### 38. *expr*:-

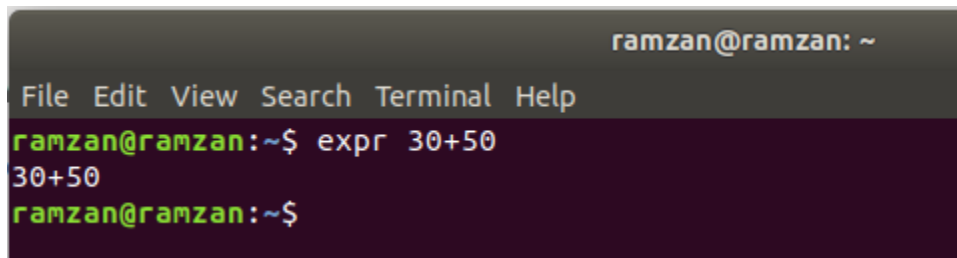
#### Parameters:-

N.A.

#### Description:-

expr command is used calculate an expression.

#### Screenshot:-

A screenshot of a terminal window with a dark background. The title bar at the top reads 'ramzan@ramzan: ~'. Below the title bar is a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The main text area shows the prompt 'ramzan@ramzan:~\$' followed by the command 'expr 30+50'. The output '30+50' is displayed on the next line. The prompt 'ramzan@ramzan:~\$' is shown again on the following line.

### 39. *kmod*:-

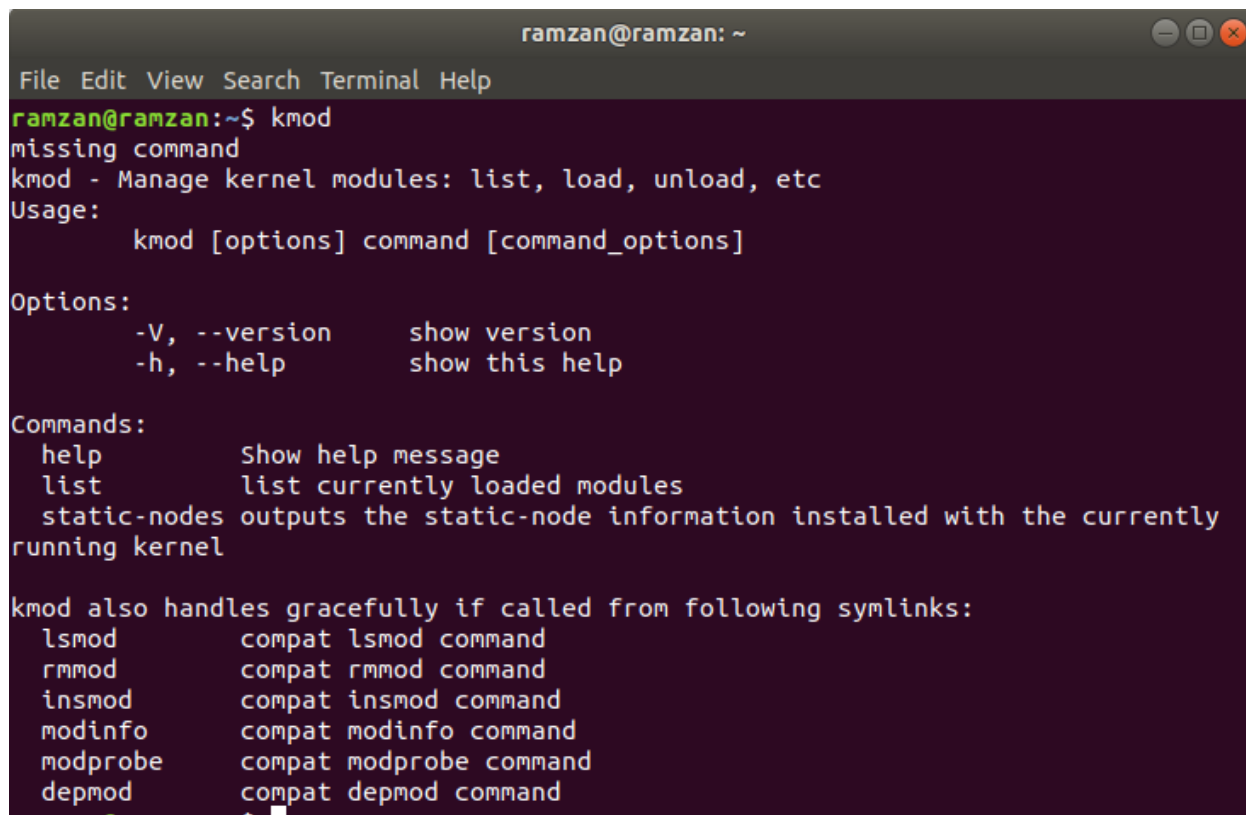
#### Parameters:-

N.A.

#### Description:-

kmod command is used to manage linux kernel modules and list all currently loaded modules.

#### Screenshot:-

A screenshot of a terminal window titled 'ramzan@ramzan: ~'. The terminal shows the command 'kmod' being executed, which displays a help message. The message includes the usage 'kmod [options] command [command\_options]', a list of options (-V, --version and -h, --help), and a list of commands (help, list, static-nodes). It also mentions that kmod handles symlinks like lsmod, rmmod, insmod, modinfo, modprobe, and depmod.

```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ kmod  
missing command  
kmod - Manage kernel modules: list, load, unload, etc  
Usage:  
    kmod [options] command [command_options]  
  
Options:  
    -V, --version      show version  
    -h, --help         show this help  
  
Commands:  
    help              Show help message  
    list              list currently loaded modules  
    static-nodes      outputs the static-node information installed with the currently  
                      running kernel  
  
kmod also handles gracefully if called from following symlinks:  
    lsmod             compat lsmod command  
    rmmod             compat rmmod command  
    insmod            compat insmod command  
    modinfo           compat modinfo command  
    modprobe          compat modprobe command  
    depmod            compat depmod command
```

### 40. *lscpu*:-

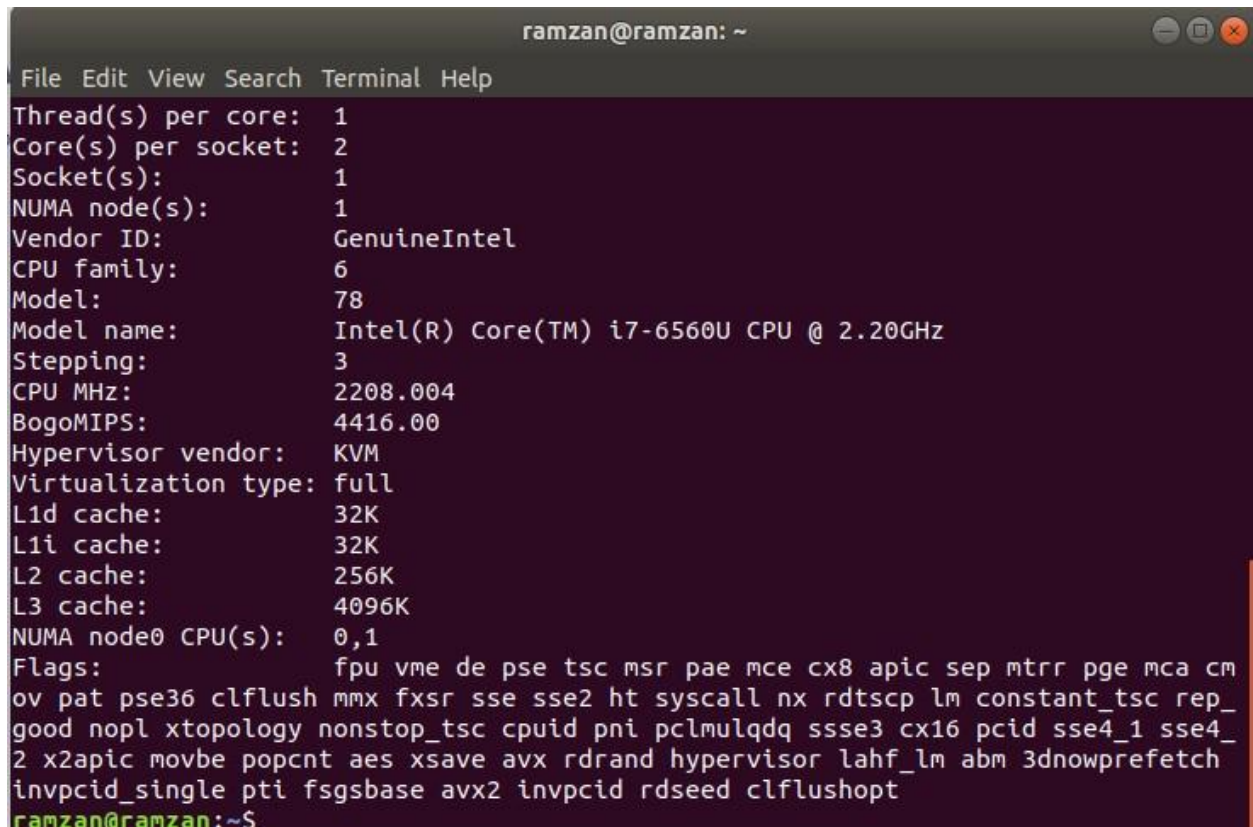
#### Parameters:-

N.A.

### Description:-

lscpu command displays system's CPU architecture information (such as number of CPUs, threads, cores, sockets, and more).

### Screenshot:-



```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
Thread(s) per core: 1  
Core(s) per socket: 2  
Socket(s): 1  
NUMA node(s): 1  
Vendor ID: GenuineIntel  
CPU family: 6  
Model: 78  
Model name: Intel(R) Core(TM) i7-6560U CPU @ 2.20GHz  
Stepping: 3  
CPU MHz: 2208.004  
BogoMIPS: 4416.00  
Hypervisor vendor: KVM  
Virtualization type: full  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 256K  
L3 cache: 4096K  
NUMA node0 CPU(s): 0,1  
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx rdtscp lm constant_tsc rep_good nopl xtopology nonstop_tsc cpuid pni pclmulqdq ssse3 cx16 pcid sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx rdrand hypervisor lahf_lm abm 3dnowprefetch invpcid_single pti fsgsbase avx2 invpcid rdseed clflushopt  
ramzan@ramzan:~$
```

### 41. nproc:-

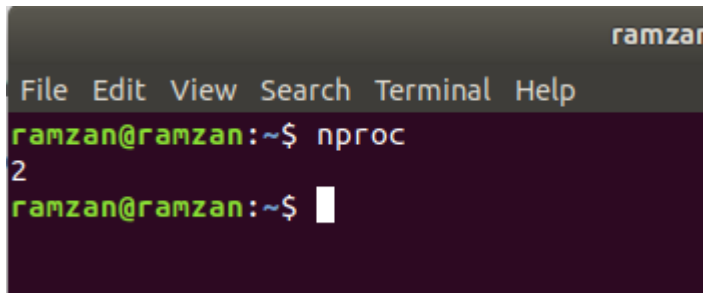
#### Parameters:-

N.A.

#### Description:-

nproc command shows the number of processing units present to the current process. It's output may be less than the number of online processors on a system

### Screenshot:-

A terminal window titled 'ramzan' with a menu bar (File, Edit, View, Search, Terminal, Help). The prompt is 'ramzan@ramzan:~\$'. The command 'nproc' has been entered, and the output '2' is displayed on the next line. The prompt 'ramzan@ramzan:~\$' is shown again with a cursor.

```
ramzan@ramzan:~$ nproc
2
ramzan@ramzan:~$
```

### 42. stat:-

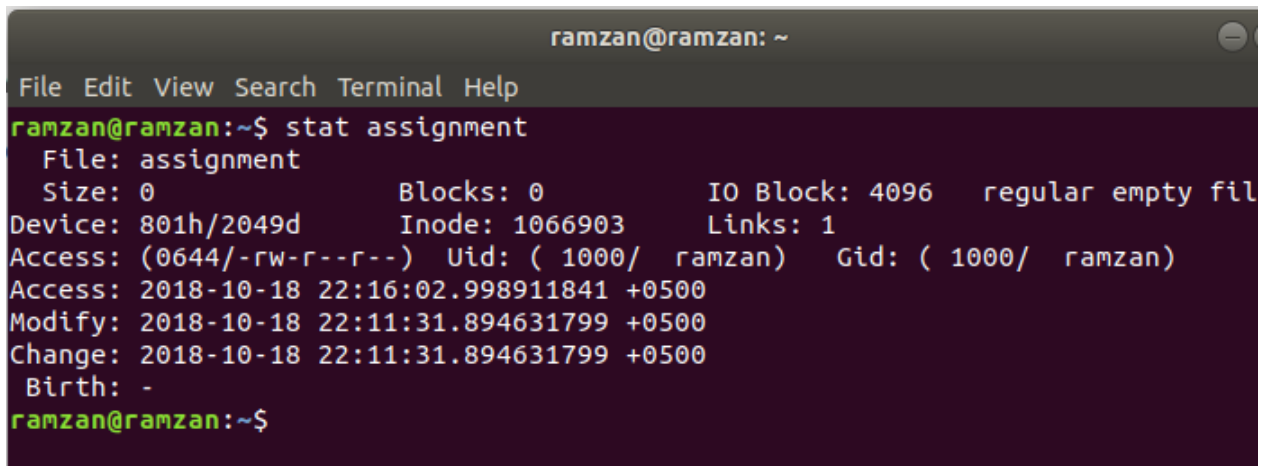
#### Parameters:-

N.A.

#### Description:-

stat command is used to show the statistics of a file.

### Screenshot:-

A terminal window titled 'ramzan@ramzan: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). The prompt is 'ramzan@ramzan:~\$'. The command 'stat assignment' has been entered, and the output is displayed on the next line. The output shows file statistics for 'assignment', including size, blocks, IO block, regular empty file, device, inode, links, access, modify, change, and birth information.

```
ramzan@ramzan:~$ stat assignment
  File: assignment
  Size: 0          Blocks: 0          IO Block: 4096   regular empty fil
Device: 801h/2049d Inode: 1066903    Links: 1
Access: (0644/-rw-r--r--)  Uid: ( 1000/  ramzan)   Gid: ( 1000/  ramzan)
Access: 2018-10-18 22:16:02.998911841 +0500
Modify: 2018-10-18 22:11:31.894631799 +0500
Change: 2018-10-18 22:11:31.894631799 +0500
 Birth: -
ramzan@ramzan:~$
```

### 43. w:-

#### Parameters:-

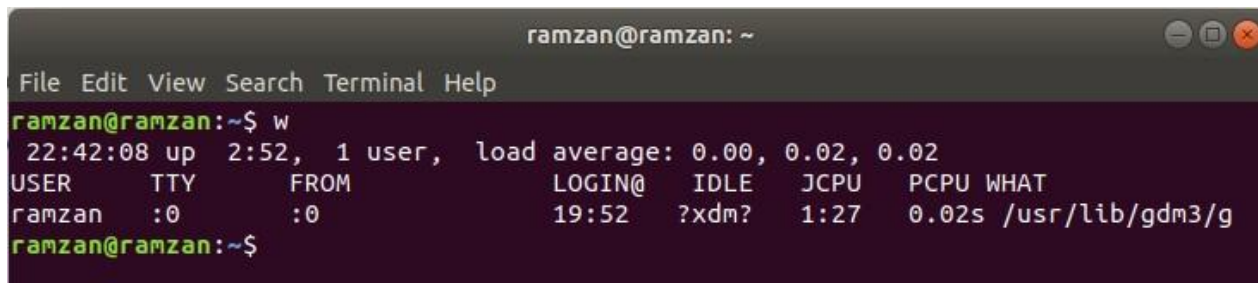
N.A.



### Description:-

w command displays system uptime, load averages and information about the users currently on the machine, and what they are doing (their processes).

### Screenshot:-



```
ramzan@ramzan: ~  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ w  
 22:42:08 up  2:52,  1 user,  load average: 0.00, 0.02, 0.02  
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT  
ramzan    :0        :0              19:52    ?xdm?  1:27   0.02s /usr/lib/gdm3/g  
ramzan@ramzan:~$
```

### 44. wc:-

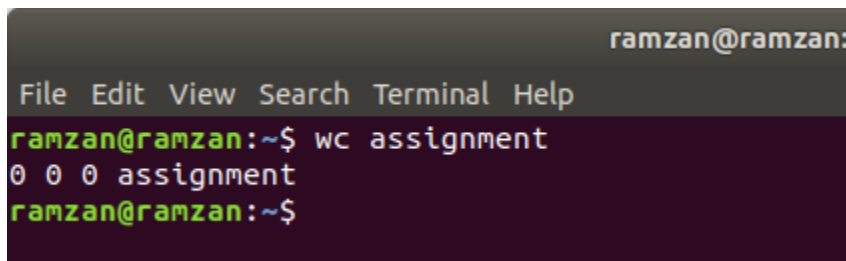
#### Parameters:-

N.A.

### Description:-

wc command is used to display newline, word, and byte counts for each file specified, and a total for many files.

### Screenshot:-



```
ramzan@ramzan:  
File Edit View Search Terminal Help  
ramzan@ramzan:~$ wc assignment  
0 0 0 assignment  
ramzan@ramzan:~$
```

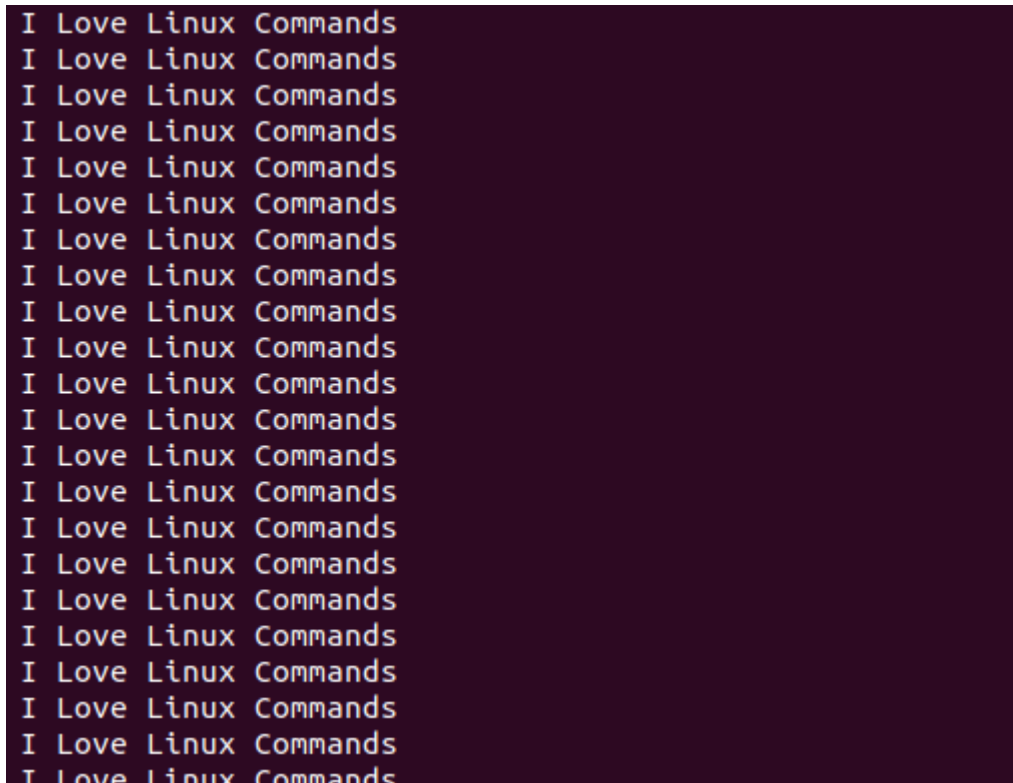
### 45. yes:-

#### Parameters:-

N.A.

**Description:-**

yes command is used to display a string repeatedly until when terminated or killed using Ctrl + C.

**Screenshot:-****46. du:-****Parameters:-**

-h, -s

**Description:-**

To retrieve more detailed information about which files use the disk space in a directory, you can use the du command

### Screenshot:-

```
ramzan@ramzan:~$ du
4      ./config/libreoffice/4/user/backup
12     ./config/libreoffice/4/user/pack/config
20     ./config/libreoffice/4/user/pack/database/biblio
28     ./config/libreoffice/4/user/pack/database
8      ./config/libreoffice/4/user/pack/autotext
16     ./config/libreoffice/4/user/pack/basic/Standard
28     ./config/libreoffice/4/user/pack/basic
92     ./config/libreoffice/4/user/pack
4      ./config/libreoffice/4/user/config/soffice.cfg/modules/swriter/popupmenu
4      ./config/libreoffice/4/user/config/soffice.cfg/modules/swriter/statusbar
4      ./config/libreoffice/4/user/config/soffice.cfg/modules/swriter/images/B
tmaps
8      ./config/libreoffice/4/user/config/soffice.cfg/modules/swriter/images
4      ./config/libreoffice/4/user/config/soffice.cfg/modules/swriter/toolbar
4      ./config/libreoffice/4/user/config/soffice.cfg/modules/swriter/menuubar
28     ./config/libreoffice/4/user/config/soffice.cfg/modules/swriter
32     ./config/libreoffice/4/user/config/soffice.cfg/modules
36     ./config/libreoffice/4/user/config/soffice.cfg
80     ./config/libreoffice/4/user/config
4      ./config/libreoffice/4/user/autocorr
1016   ./config/libreoffice/4/user/database/biblio
1024   ./config/libreoffice/4/user/database
```

### 47. *pmap*:-

#### Parameters:-

N.A.

#### Description:-

Display Memory map of process.

### Screenshot:-

```
ramzan@ramzan:~$ pmap

Usage:
pmap [options] PID [PID ...]

Options:
-x, --extended          show details
-X                      show even more details
                        WARNING: format changes according to /proc/PID/smaps
-XX                     show everything the kernel provides
-c, --read-rc           read the default rc
-C, --read-rc-from=<file> read the rc from file
-n, --create-rc         create new default rc
-N, --create-rc-to=<file> create new rc to file
                        NOTE: pid arguments are not allowed with -n, -N
-d, --device            show the device format
-q, --quiet             do not display header and footer
-p, --show-path         show path in the mapping
-A, --range=<low>[,<high>] limit results to the given range

-h, --help             display this help and exit
-V, --version          output version information and exit
```

### 48. shutdown:-

#### Parameters:-

-h, -r

#### Description:-

The shutdown command turns off the computer and can be combined with variables such as -h for halt after shutdown or -r for reboot after shutdown.

### Screenshot:-

```
ramzan@ramzan: ~
File Edit View Search Terminal Help
ramzan@ramzan:~$ shutdown
```

#### ***49. reboot:-***

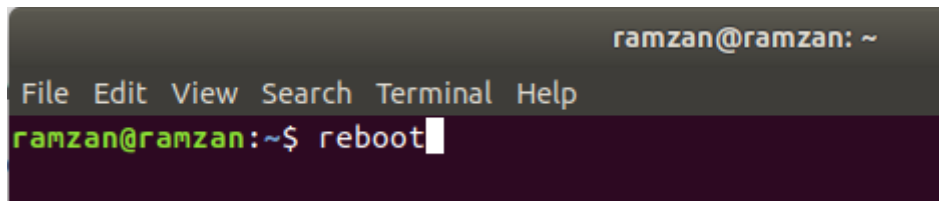
##### **Parameters:-**

N.A.

##### **Description:-**

Restart the system.

##### **Screenshot:-**

A screenshot of a terminal window. The title bar at the top right says 'ramzan@ramzan: ~'. Below the title bar is a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The terminal prompt is 'ramzan@ramzan:~\$' and the command 'reboot' is being entered, followed by a cursor.

#### ***50. pstree:-***

##### **Parameters:-**

N.A.

##### **Description:-**

This commands shows all the processes running currently along with associated child process, in a tree like format similar to 'tree' command output.

Screenshot:-

```
ramzan@ramzan:~$ pstree
systemd--ModemManager--2*[{ModemManager}]
        --NetworkManager--dhclient
                        2*[{NetworkManager}]
        --accounts-daemon--2*[{accounts-daemon}]
        --acpid
        --avahi-daemon--avahi-daemon
        --boltd--2*[{boltd}]
        --colord--2*[{colord}]
        --cron
        --cups-browsed--2*[{cups-browsed}]
        --cupsd
        --dbus-daemon
        --fwupd--4*[{fwupd}]
        --gdm3--gdm-session-wor--gdm-wayland-ses--gnome-session-
```

