

**AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY**

**AMITY UNIVERSITY , NOIDA**



**BACHELOR OF TECHNOLOGY  
IN  
COMPUTER SCIENCE AND ENGINEERING**

**OPERATING SYSTEM LAB FILE**

**Submitted by:**

Ayushi Srivastava

A2305219817

B.Tech CSE

**Submitted to:**

Dr. Madhulika Bhatia

Associate Professor,

CSE , DEPT

# INDEX

[illegible]

## EXP 1 – My options to access Linux OS terminal for unix commands

Date : 22/12/2020


? ×


← Create Virtual Machine

### Name and operating system

Please choose a descriptive name and destination folder for the new virtual machine and select the type of operating system you intend to install on it. The name you choose will be used throughout VirtualBox to identify this machine.

Name:

Machine Folder:  C:\Users\HP\VirtualBox VMs ▼

Type: Microsoft Windows ▼ 

Version: Windows 7 (64-bit) ▼

Expert Mode Next Cancel

← Create Virtual Machine

## Memory size

Select the amount of memory (RAM) in megabytes to be allocated to the virtual machine.

The recommended memory size is **2048 MB**.



Next

Cancel

← Create Virtual Machine

## Hard disk

If you wish you can add a virtual hard disk to the new machine. You can either create a new hard disk file or select one from the list or from another location using the folder icon.

If you need a more complex storage set-up you can skip this step and make the changes to the machine settings once the machine is created.

The recommended size of the hard disk is **32.00 GB**.

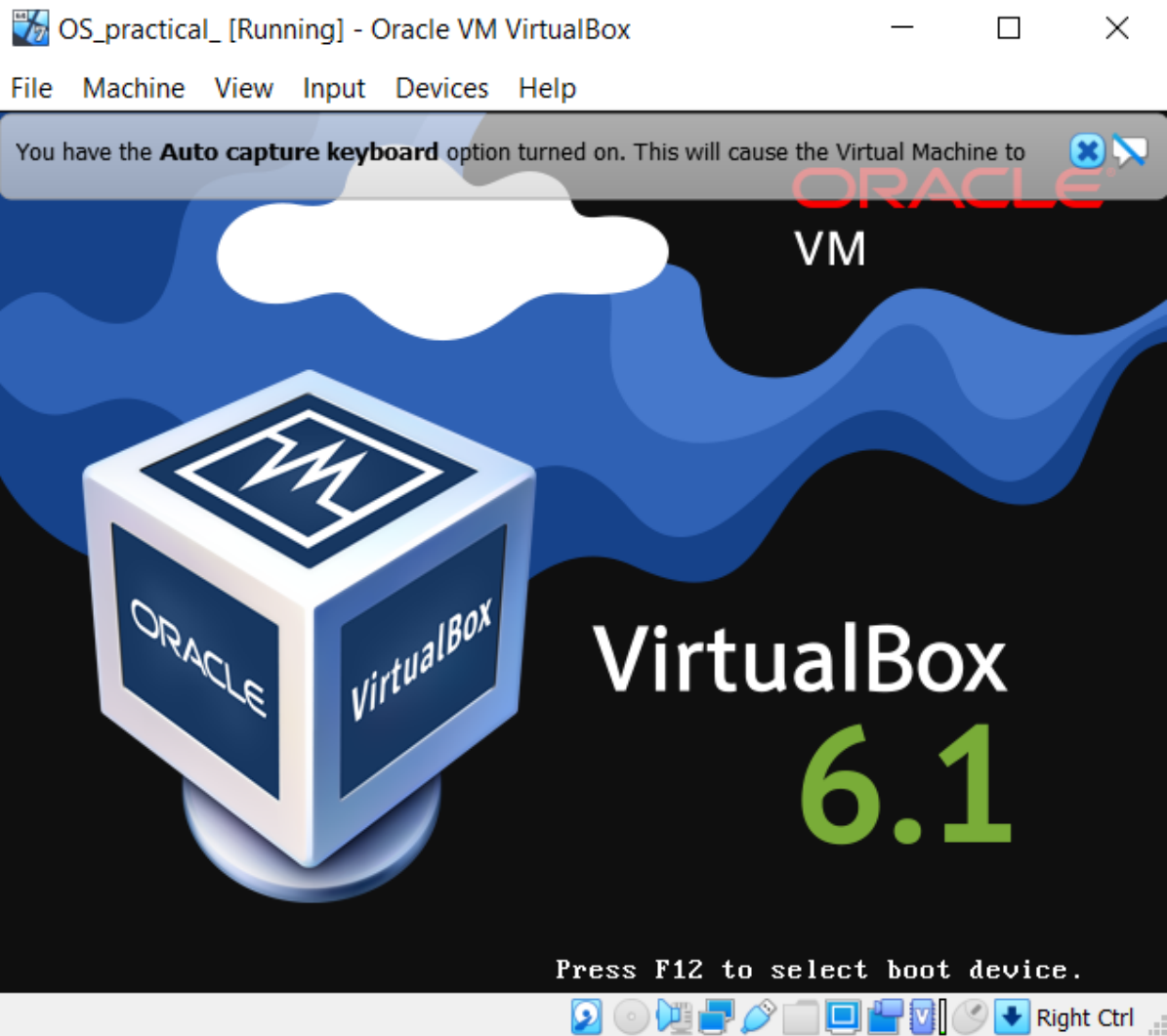
- ☐ Do not add a virtual hard disk
- ☐ Create a virtual hard disk now
- ☒ Use an existing virtual hard disk file

Kali VM.vdi (Normal, 32.00 GB)



Create

Cancel



# EXP 2 – INTRODUCTION –UNIX OPERATING SYSTEM AND DIRECTORY STRUCTURE

Date 05/01/2021

The UNIX operating system has for many years formed the backbone of the Internet, especially for large servers and most major university campuses. However, a free version of UNIX called **Linux** has been making significant gains against Macintosh and the Microsoft Windows 95/98/NT environments, so often associated with personal computers. Developed by a number of volunteers on the Internet such as the Linux group and the GNU project, much of the open-source software is copyrighted, but available for free. This is especially valuable for those in educational environments where budgets are often limited.

UNIX commands can often be grouped together to make even more powerful commands with capabilities known as **I/O redirection** ( < for getting input from a file input and > for outputting to a file ) and **piping** using | to feed the output of one command as input to the next. Please investigate manuals in the lab for more examples than the few offered here. The following charts offer a summary of some simple UNIX commands. These are certainly not all of the commands available in this robust operating system, but these will help you get started.

. The UNIX operating system is made up of three parts; the kernel, the shell and the programs.

## The kernel

The kernel of UNIX is the hub of the operating system: it allocates time and memory to programs and handles the filestore and communications in response to system calls.

As an illustration of the way that the shell and the kernel work together, suppose a user types **rm myfile** (which has the effect of removing the file **myfile**). The shell searches the filestore for the file containing the program **rm**, and then requests the kernel, through system calls, to execute the program **rm** on **myfile**. When the process **rm myfile** has finished running, the shell then returns the UNIX prompt % to the user, indicating that it is waiting for further commands.

## The shell

The shell acts as an interface between the user and the kernel. When a user logs in, the login program checks the username and password, and then starts another program called the shell. The shell is a command line interpreter (CLI). It interprets the commands the user types in and arranges for them to be carried out. The commands are themselves programs: when they terminate, the shell gives the user another prompt (% on our systems).

The adept user can customise his/her own shell, and users can use different shells on the same machine. Staff and students in the school have the **tcsh shell** by default.

The tcsh shell has certain features to help the user inputting commands.

Filename Completion - By typing part of the name of a command, filename or directory and pressing the [Tab] key, the tcsh shell will complete the rest of the name automatically. If the shell finds more than one name beginning with those letters you have typed, it will beep, prompting you to type a few more letters before pressing the tab key again.

History - The shell keeps a list of the commands you have typed in. If you need to repeat a command, use the cursor keys to scroll up and down the list or type history for a list of previous commands.

## Files and processes

Everything in UNIX is either a file or a process.

A process is an executing program identified by a unique PID (process identifier).

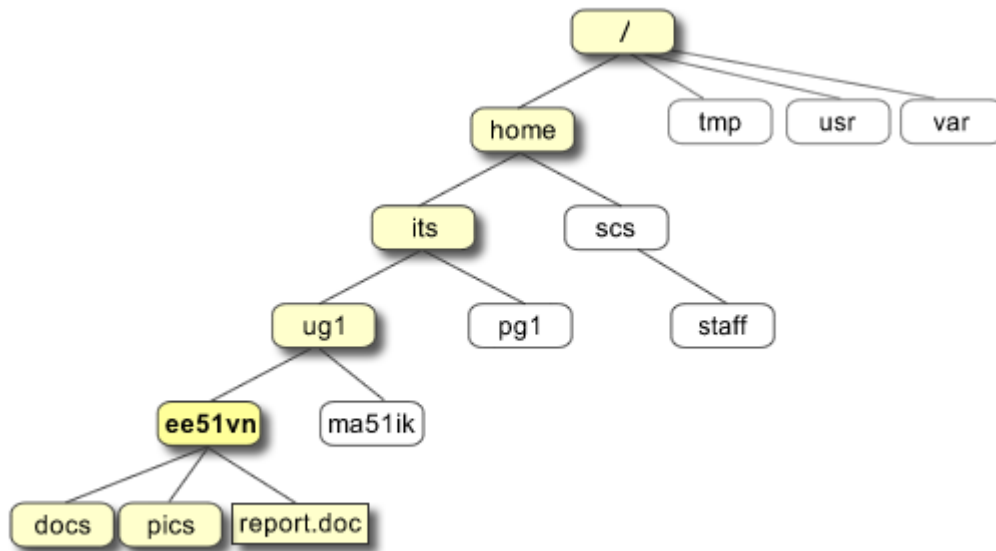
A file is a collection of data. They are created by users using text editors, running compilers etc.

Examples of files:

- a document (report, essay etc.)
- the text of a program written in some high-level programming language
- instructions comprehensible directly to the machine and incomprehensible to a casual user, for example, a collection of binary digits (an executable or binary file);
- a directory, containing information about its contents, which may be a mixture of other directories (subdirectories) and ordinary files.

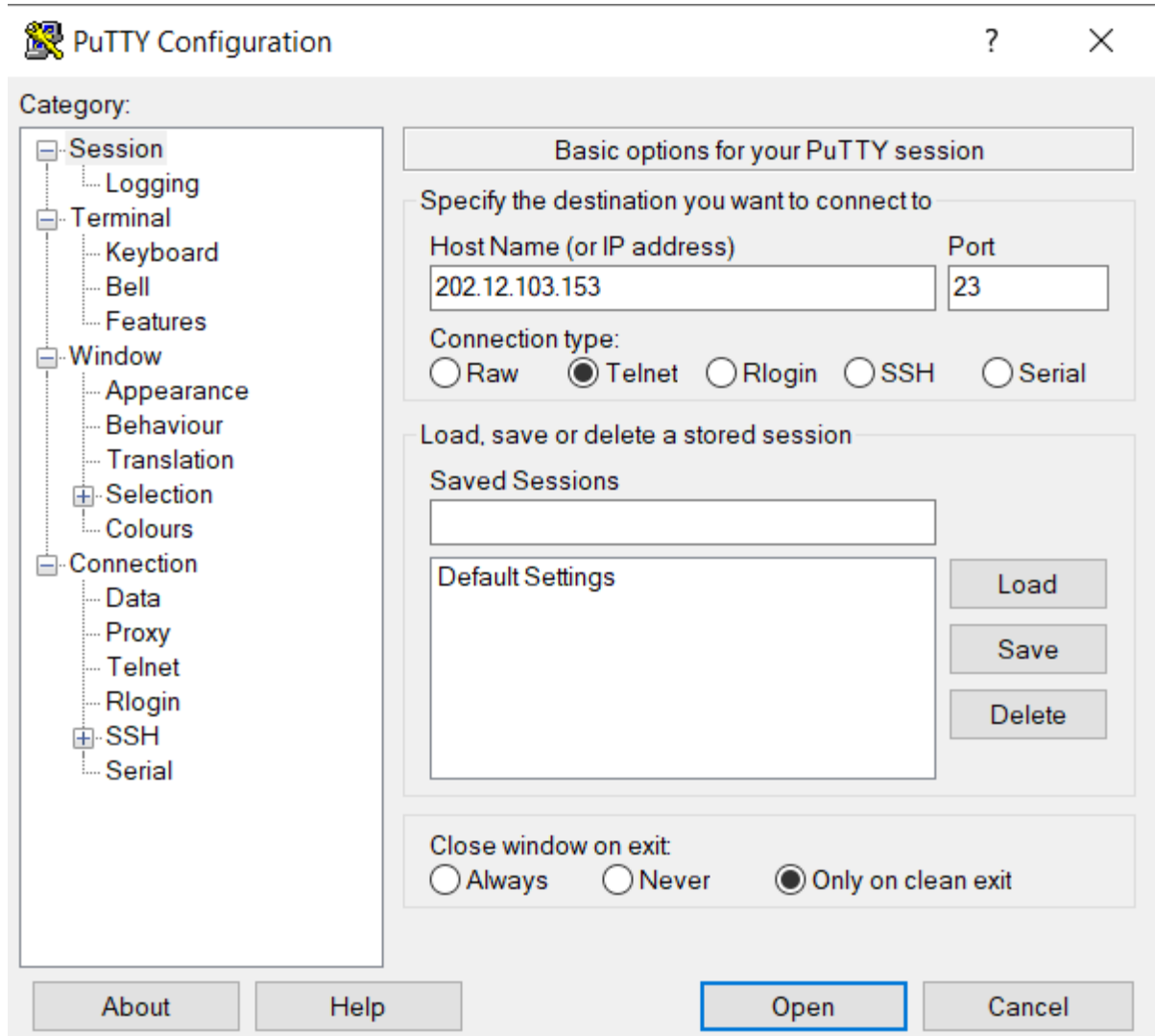
## The Directory Structure

All the files are grouped together in the directory structure. The file-system is arranged in a hierarchical structure, like an inverted tree. The top of the hierarchy is traditionally called **root** (written as a slash /)



## EXP 3 - Executing basic commands on linux server accesing amity virtual lab

Date 12/01/2021



The image shows the PuTTY Configuration window. On the left is a tree view under 'Category:' with the following items: Session, Logging, Terminal, Keyboard, Bell, Features, Window, Appearance, Behaviour, Translation, Selection, Colours, Connection, Data, Proxy, Telnet, Rlogin, SSH, and Serial. The 'Session' category is selected. The main area is titled 'Basic options for your PuTTY session'. It contains a section 'Specify the destination you want to connect to' with a 'Host Name (or IP address)' field containing '202.12.103.153' and a 'Port' field containing '23'. Below this is a 'Connection type:' section with radio buttons for 'Raw', 'Telnet' (which is selected), 'Rlogin', 'SSH', and 'Serial'. Another section 'Load, save or delete a stored session' contains a 'Saved Sessions' list with 'Default Settings' and buttons for 'Load', 'Save', and 'Delete'. At the bottom of the main area is a 'Close window on exit:' section with radio buttons for 'Always', 'Never', and 'Only on clean exit' (which is selected). At the very bottom are buttons for 'About', 'Help', 'Open' (highlighted with a blue border), and 'Cancel'.

PuTTY Configuration

Category:

- Session
- Logging
- Terminal
  - Keyboard
  - Bell
  - Features
- Window
  - Appearance
  - Behaviour
  - Translation
  - Selection
  - Colours
- Connection
  - Data
  - Proxy
  - Telnet
  - Rlogin
  - SSH
  - Serial

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address) Port

202.12.103.153 23

Connection type:

☐ Raw ☒ Telnet ☐ Rlogin ☐ SSH ☐ Serial

Load, save or delete a stored session

Saved Sessions

Default Settings


Load Save Delete

Close window on exit:

☐ Always ☐ Never ☒ Only on clean exit

About Help Open Cancel



 PuTTY (inactive)

```
* Management:      https://landscape.canonical.com
* Support:         https://ubuntu.com/advantage

System information disabled due to load higher than 4.0

* Introducing self-healing high availability clusters in MicroK8s.
  Simple, hardened, Kubernetes for production, from RaspberryPi to DC.

  https://microk8s.io/high-availability

* Canonical Livepatch is available for installation.
  - Reduce system reboots and improve kernel security. Activate at:
    https://ubuntu.com/livepatch

41 packages can be updated.
7 updates are security updates.

New release '20.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

*** System restart required ***
aib@pamoli-virtual-machine:~$ tput clear
aib@pamoli-virtual-machine:~$ who
tanvis pts/0      2021-01-08 15:31 (106.207.128.227)
anirudhd pts/2      2021-01-08 15:54 (103.84.81.65)
merugun pts/3      2021-01-08 15:15 (49.37.152.215)
rishabhk pts/4      2021-01-08 15:15 (59.99.161.144)
aib pts/7      2021-01-08 15:57 (49.36.169.148)
aib pts/6      2021-01-08 15:43 (45.251.42.233)
aib pts/9      2021-01-08 15:51 (103.57.85.246)
aib pts/12     2021-01-08 15:38 (abts-north-dynamic-102.199.69.182.airtel
broadband.in)
rishabhk pts/25     2021-01-08 16:04 (59.99.161.144)
saras pts/16     2021-01-08 16:04 (223.230.163.126)
aib pts/21     2021-01-08 15:50 (49.37.81.244)
aib pts/17     2021-01-08 15:52 (49.36.165.214)
aib pts/18     2021-01-08 15:23 (157.44.172.66)
aib pts/24     2021-01-08 15:54 (47.29.52.116)
aib pts/23     2021-01-08 15:54 (106.214.64.114)
aib pts/26     2021-01-08 15:49 (223.181.54.121)
aib pts/20     2021-01-08 15:48 (abts-kk-static-ilp-054.78.181.122.airtel
.in)
khitiza pts/14     2021-01-08 15:16 (103.87.57.149)
manavp pts/13     2021-01-08 15:15 (abts-north-dynamic-154.50.177.122.airtel
broadband.in)
aib pts/15     2021-01-08 15:15 (49.36.143.0)
vishalc pts/28     2021-01-08 15:27 (117.212.35.38)
aib pts/30     2021-01-08 15:37 (49.36.135.220)
aib pts/32     2021-01-08 15:35 (103.50.146.189)
```

\$ps

```
aib@pamoli-virtual-machine:~$ ps
  PID TTY          TIME CMD
 26068 pts/90    00:00:00 bash
 26134 pts/90    00:00:00 ps
```

\$ls

```
aib@pamoli-virtual-machine:~$ ls
1                mehak.c.14923.17166
123.c.14923.17166 Message.c.14923.17166
1.sh            mihir
2              mridul123
56             music
a1             mydir
a2             naman.c.14923.17166
aayush         naman.txt.14923.17166
aayushi        name
abc            name.14923.17166
abcdefghijkltanya.c namrata
abdur          natasha
abhi.c.14923.17166 natashall
abhi_dir1      Newl
abhimanyu      newbase
abhimanyuv2.txt.14923.17166 new.c
abhimanyuv.txt.14923.17166 new.c.14923.17166
abhiv2.txt.14923.17166 newdir
addy           '[Newdir]'
ADITI          newdr1
aditi9120      newdr2
Aditya         newfile
aditya.c.14923.17166 newfile.txt
aditya.cpp.14923.17166 newprog.c
AdityaGoyal    newprog.out
adityaj        newpython.py
adityarenamed.txt.14923.17166 nidhish
akshat         nik.c
aku            nikh.c
aman           nikhil.c
Amisha         ninad
anand          nisarg
```

\$ls>list

```
aib@pamoli-virtual-machine:~$ ls>list
```

\$x=5

\$echo x

```
aib@pamoli-virtual-machine:~$ x=5
aib@pamoli-virtual-machine:~$ echo x
x
aib@pamoli-virtual-machine:~$ echo $x
5
```

\$echo hello world

```
aib@pamoli-virtual-machine:~$ echo hello world
hello world
```

\$ls -l

```
aib@pamoli-virtual-machine:~$ ls -l
total 1600
drwxrwxr-x  2 aib aib  4096 Jan  4 16:19  1
-rw-rw-r--  1 aib aib    67 Jan  4 16:40 123.c.14923.17166
-rw-rw-r--  1 aib aib   149 Jan  8 16:09  1.sh
drwxrwxr-x  2 aib aib  4096 Jan  5 09:45  2
drwxrwxr-x  2 aib aib  4096 Jan  4 14:31  56
drwxrwxr-x  2 aib aib  4096 Jan  5 22:30  a1
drwxrwxr-x  2 aib aib  4096 Jan  5 22:30  a2
drwxrwxr-x  5 aib aib  4096 Jan  6 12:20  aayush
drwxrwxr-x  2 aib aib  4096 Jan  8 16:10  aayushi
drwxrwxr-x  2 aib aib  4096 Jan  4 16:59  abc
-rw-rw-r--  1 aib aib   197 Jan  7 22:48 abcdefghijtanya.c
drwxrwxr-x  2 aib aib  4096 Jan  6 11:47  abdur
-rw-rw-r--  1 aib aib    94 Jan  4 16:20 abhi.c.14923.17166
drwxrwxr-x  2 aib aib  4096 Jan  5 21:07  abhi_dir1
drwxrwxr-x  3 aib aib  4096 Jan  4 16:38  abhimanyu
-rw-rw-r--  1 aib aib    51 Jan  4 16:48 abhimanyuv2.txt.14923.17166
-rw-rw-r--  1 aib aib    51 Jan  4 16:11 abhimanyuv.txt.14923.17166
-rw-rw-r--  1 aib aib    17 Jan  4 16:16 abhiv2.txt.14923.17166
drwxrwxr-x  5 aib aib  4096 Jan  6 12:37  addy
drwxrwxr-x  3 aib aib  4096 Jan  5 10:54  ADITI
drwxrwxr-x  4 aib aib  4096 Jan  8 12:45  aditi9120
drwxrwxr-x  5 aib aib  4096 Jan  6 12:24  Aditya
-rw-rw-r--  1 aib aib    68 Jan  4 16:44 aditya.c.14923.17166
-rw-rw-r--  1 aib aib     1 Jan  4 16:34 aditya.cpp.14923.17166
drwxrwxr-x  2 aib aib  4096 Jan  8 16:11  AdityaGoyal
drwxrwxr-x  5 aib aib  4096 Jan  4 19:33  adityaj
-rw-rw-r--  1 aib aib    43 Jan  4 16:18 adityarenamed.txt.14923.17166
drwxrwxr-x  2 aib aib  4096 Jan  4 16:35  akshat
drwxrwxr-x  5 aib aib  4096 Jan  6 12:44  aku
drwxrwxr-x  2 aib aib  4096 Jan  7 12:48  aman
drwxrwxr-x  6 aib aib  4096 Jan  7 21:58  Amisha
```

\$ cal month year

```
aib@pamoli-virtual-machine:~$ cal 02 2009
    February 2009
Su Mo Tu We Th Fr Sa
 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
```

\$ cal | less

```
    February 2009
Su Mo Tu We Th Fr Sa
 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

aib@pamoli-virtual-machine:~$ cal | less
```

\$whoami

```
aib@pamoli-virtual-machine:~$ whoami
aib
```

\$ uname ; \$uname -r ; \$uname -n;

```
aib@pamoli-virtual-machine:~$ uname
Linux
aib@pamoli-virtual-machine:~$ uname -r
4.15.0-128-generic
aib@pamoli-virtual-machine:~$ uname -n
pamoli-virtual-machine
```

\$ tty

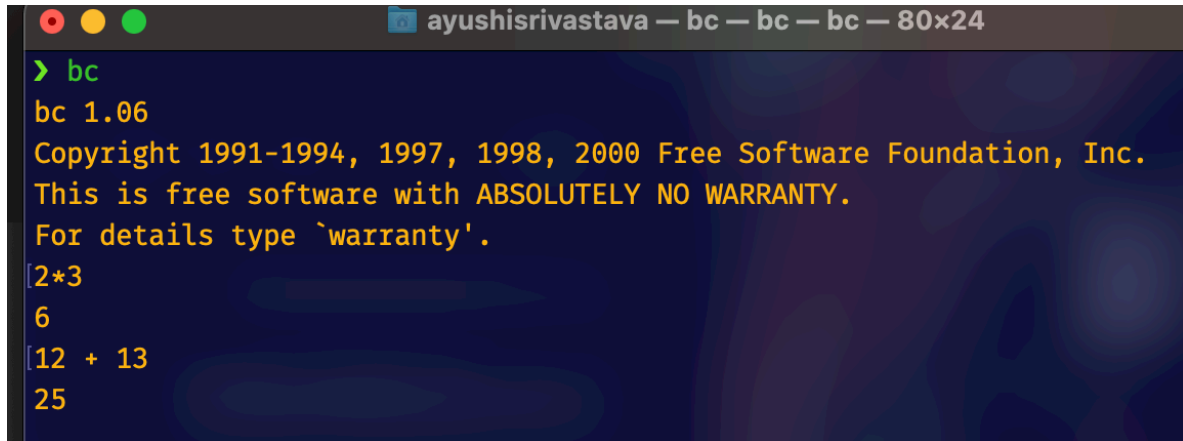
```
aib@pamoli-virtual-machine:~$ tty  
/dev/pts/90
```

## Exp 4 Executing Commands on my choice ubuntu / Linux Server

```
Hello — ayushisrivastava@AYUSHI — ~/Desktop/Hello — zsh — 148x44
Last login: Tue Jan 19 09:03:48 on console
> cd Desktop
> mkdir Hello
> cd Hello
> ls -alf
total 0
drwxr-xr-x  2 ayushisrivastava  staff   64 Jan 19 11:34 .
drwx-----@ 26 ayushisrivastava  staff  832 Jan 19 11:34 ..
> cd ..
> cd Hello
> cp mad.txt hello
cp: mad.txt: No such file or directory
> touch m1.txt
> ls
m1.txt
> cp m1.txt hello
> mv m1.txt m2.txt
> xcalc
zsh: correct 'xcalc' to 'cal' [nyae]? y
  January 2021
Su Mo Tu We Th Fr Sa
                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
> DF
zsh: correct 'DF' to 'df' [nyae]? y
Filesystem      512-blocks    Used Available Capacity iused      ifree %iused  Mounted on
/dev/disk1s5s1  236363688    29389232  60077504    33%   567557 1181250883    0%    /
devfs           380          380           0   100%    658           0  100%    /dev
/dev/disk1s4    236363688    2097288   60077504     4%        1 1181818439    0%    /System/Volumes/VM
/dev/disk1s2    236363688    637128   60077504     2%     1167 1181817273    0%    /System/Volumes/Preboot
/dev/disk1s6    236363688      4232   60077504     1%        14 1181818426    0%    /System/Volumes/Update
/dev/disk1s1    236363688   142712824  60077504    71%  1261718 1180556722    0%    /System/Volumes/Data
map auto_home      0           0           0  100%        0           0  100%    /System/Volumes/Data/home
>
> du
0      .
~/Desktop/Hello
```

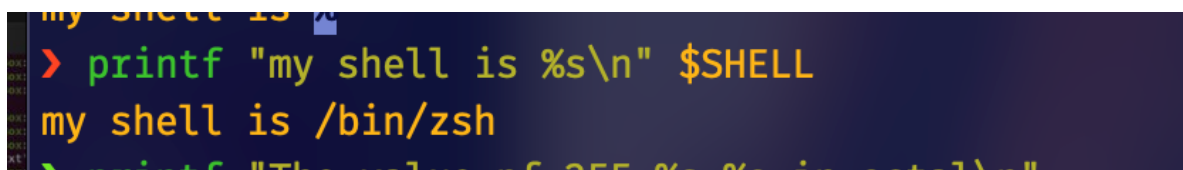
## EXP : 5 EXPLORING UNIX COMMANDS

\$bc



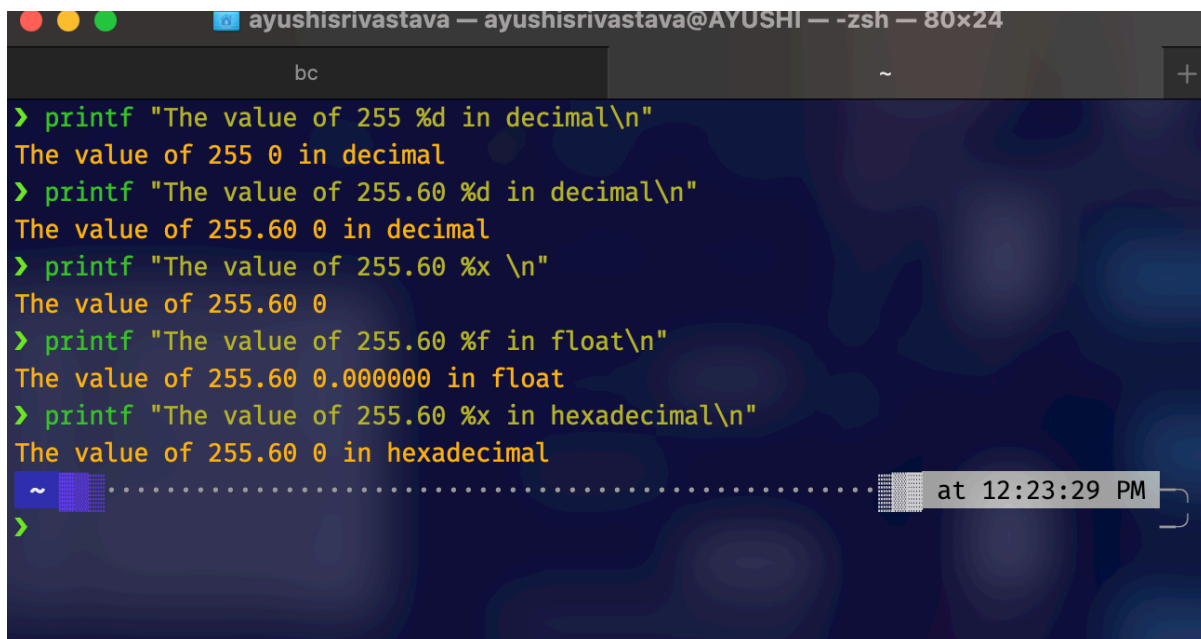
```
ayushisrivastava — bc — bc — bc — 80x24
> bc
bc 1.06
Copyright 1991-1994, 1997, 1998, 2000 Free Software Foundation, Inc.
This is free software with ABSOLUTELY NO WARRANTY.
For details type `warranty'.
2*3
6
12 + 13
25
```

**Printf “my shell is %s\n” \$SHELL**



```
> printf "my shell is %s\n" $SHELL
my shell is /bin/zsh
```

**Printf “The value of 255 is %d in decimal \n”**

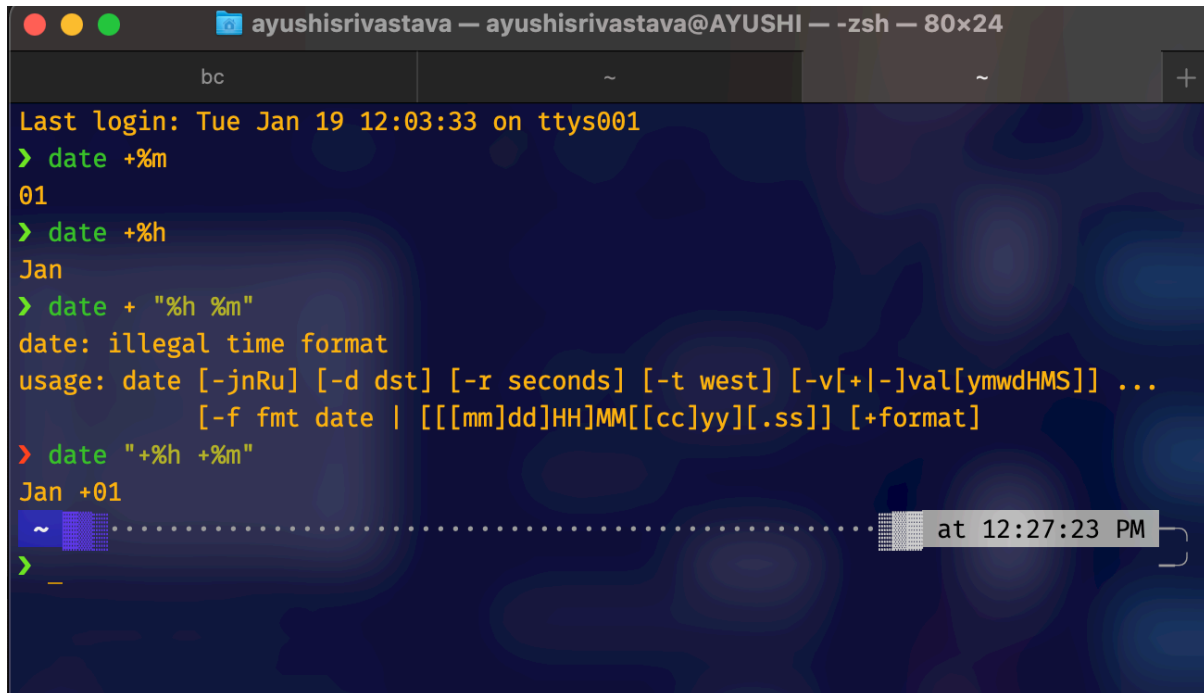


```
ayushisrivastava — ayushisrivastava@AYUSHI — -zsh — 80x24
bc
> printf "The value of 255 %d in decimal\n"
The value of 255 0 in decimal
> printf "The value of 255.60 %d in decimal\n"
The value of 255.60 0 in decimal
> printf "The value of 255.60 %x \n"
The value of 255.60 0
> printf "The value of 255.60 %f in float\n"
The value of 255.60 0.000000 in float
> printf "The value of 255.60 %x in hexadecimal\n"
The value of 255.60 0 in hexadecimal
~ ..... at 12:23:29 PM
>
```

**\$date +%m**

**\$date +%h**

**\$date +%h +%m**

A terminal window titled 'ayushisrivastava — ayushisrivastava@AYUSHI — zsh — 80x24'. The window shows the output of the 'date' command with various format specifiers. The first command 'date +%m' returns '01'. The second command 'date +%h' returns 'Jan'. The third command 'date +%h +%m' results in an error message: 'date: illegal time format' followed by usage instructions. The fourth command 'date +%h +%m' returns 'Jan +01'. The terminal has a dark blue background with a subtle pattern. A status bar at the bottom right shows 'at 12:27:23 PM'.

```
ayushisrivastava — ayushisrivastava@AYUSHI — zsh — 80x24
bc ~ ~ +
Last login: Tue Jan 19 12:03:33 on ttys001
> date +%m
01
> date +%h
Jan
> date +%h +%m
date: illegal time format
usage: date [-jnRu] [-d dst] [-r seconds] [-t west] [-v[+|-]val[ymwdHMS]] ...
        [-f fmt date | [[[mm]dd]HH]MM[[cc]yy][.ss]] [+format]
> date +%h +%m
Jan +01
~ ..... at 12:27:23 PM
> _
```



