

# Unix And Shell Programming

## Assignment - 1

- 1) List & Explain Salient Features of Unix operating System.

Features of Unix are

- 1) multiprogramming
- 2) multiuser
- 3) multi tasking
- 4) pattern matching
- 5) portable
- 6) Unix Toolkit
- 7) Documentation.

- 1) multiprogramming.

Unix is a multiprogramming system it permits multiple programs to run & compete for the attention of the CPU.

- 2) multi user:

It is also has multi user system, the resources are actually shared between all users.

- 3) multi tasking:

In Unix you can do multi tasking, a user sees one job running in the foreground the rest in the background

- 4) pattern Matching
- Unix has very sophisticated pattern matching feature
- Regular expressions are a feature of Unix
  - Regular expressions describe a pattern to match,
  - Regular expressions describe a pattern to match,  
a sequence of characters, not words, within a line of text

5) Portable

- Unix can be installed on many hardware platforms
- Unix is written in C language. hence it is more portable than other operating systems.

6) Unix Toolkit.

Unix offers facility to add & remove many applications as & when required.

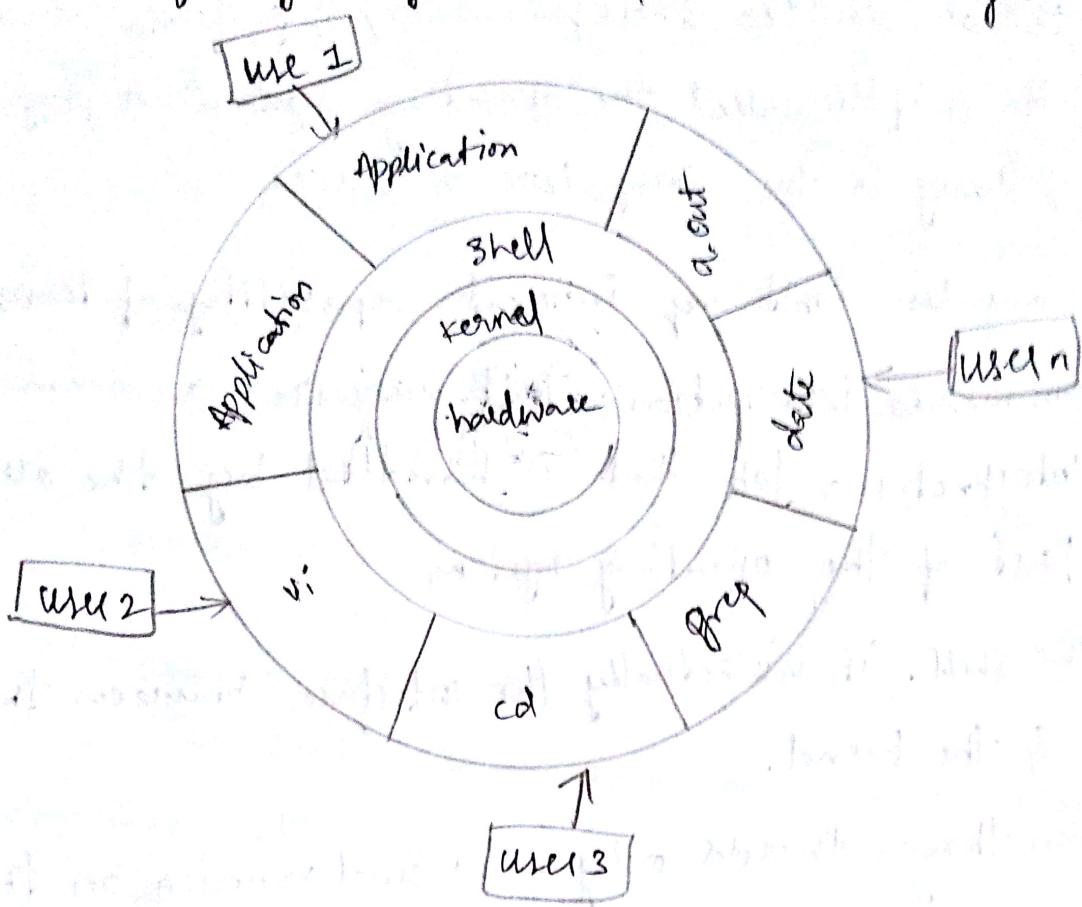
Tools included

- general purpose tools
- text manipulation tools
- compilers/interpreters

7) Documentation

The principle on-line facility available in the Man Command, which remains most important references for Commands & their configuration files.

- 2) Explain briefly the Unix architecture explaining the role played by kernel & shell in sharing the workload



Unix Architecture.

- A kernel is the heart of the Unix operating System.
- it interacts with the machine's hardware.
- Collections of routines mostly written in C. It is loaded into memory when system is booted & communicates directly with the hardware.
- User program that need to access the hardware use the services of the kernel.
- These program access the kernel through set of functions called **System calls**.

- The kernel manages the system's memory, schedules processes, decides their priorities, & performs other tasks
- it is often called the operating system - a program's gateway to the computer's resources.
- Computer don't have any inherent capability of translating commands into actions. That requires a command interpreter a job that is handled by the outer part of the operating system
- The shell. It is actually the interface between the user & the kernel.
- Even though there's only one kernel running on the system there could be several shells in action - one for each who is logged in.
- When you enter a command through the keyboard, the shell thoroughly examines the keyboard input for special characters
- If it finds any, it rewrites a simplified command line & finally communicates with the kernel to see that the command is executed.

3) Name the command used for listing file attributes?

\$ ls -l Command is used for listing file attributes

Explain the significance of each field of the output.

Ex:- \$ls -l

Total 90

-rw-rw-r-- 1 abdul 116481 Nov 26 15:08 'co.pdf'  
-rwxrwxr-x 1 abdul 214671 Nov 26 15:08 'Assignment'

\* File type & permissions:

- The first column shows the type & permissions associated with each file
- You can see series of rwx, in Unix these refer to as read(r), write(w) & execute(x).

\* links

- The second Column represents links associated with the file

\* ownership

The third column indicates the owner of the file / creator of the file.

\* file size

Fourth column indicates the size of the file

### \* Modification time

The fifth column represents the when the file was modified at what time the file has been modified.

### \* filename

The last field indicates file name.

3b) Illustrate reasons for failure of command mkdir.

- when you have No rights to create directory
- No Space
- Conflicting names.
- giving wrong path when trying to create directory through relative path etc

4) list the different types of files supported by unix system

- ordinary files (Regular files) it contains stream of characters
- Directory files → It Contains files & other sub directories
- Device files → all devices & peripherals are represented by files

### \* Character files

### \* hidden files

File Creation Command.

touch ~~xxx~~

\$ cat /home/abdul/Desktop/OSP/new.txt

5) What is shell Variable? Explain at least two shell Variables & demonstrate with an example how values of a shell variables can be changed.

- A Variable is a character string to which we assign a value .
- The value assigned could be a number, text, filename, device or any other type of data .
- The Shell enables you to create, assign & delete Variables.
- The \$HOME Variables is a special Variables that is set by Shell & is required by shell in order to function correctly.

### Home:

This Home Variable contains the Home path for the current user

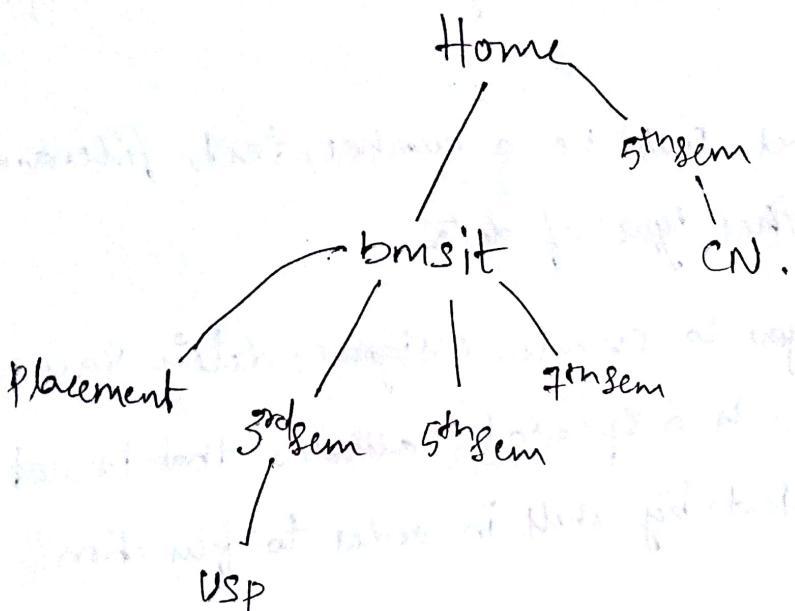
### USERNAME:

This Variable indicates the Username of the user.

### Changing Shell Variable

\$set \$HOME = /USER1 <

6) Draw the tree structure of the file system created by the following commands (assume you are in the directory /home/bmsit)



6b) Explain the following commands with syntax, options & example.

i) rm

rm command remove files or directory

If you want to delete file or directory are some

Syntax \$rm -option filename

Example: \$rm -i USP.d

options

-i → prompt before every removal

-r → remove directory & their contents  
recursively

## ii) cp

This command is used to copy files & directory.

Syntax: \$cp -option source destination

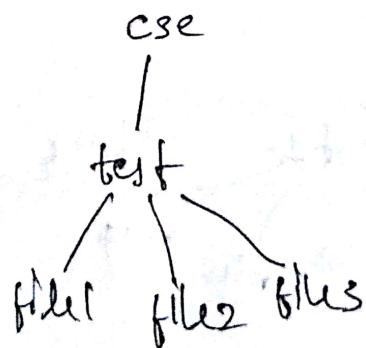
Example \$cp file1 file2

This command copy the file1 contents to file2 options

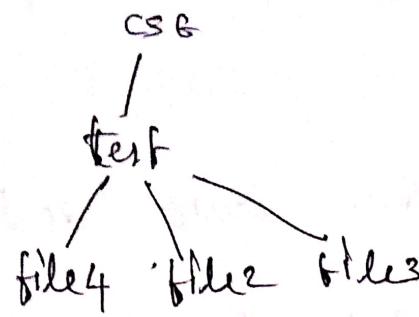
- i → prompt before overwriting
- l → hard link files instead of copying,

7) write pictorial representation (directory status) for the following assume you are in a /cse/test directory

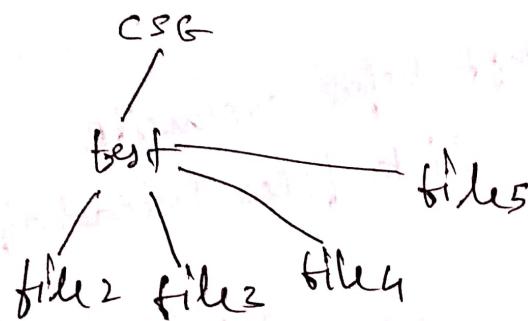
i) touch file1 file2 file3



ii) mv file1 file4

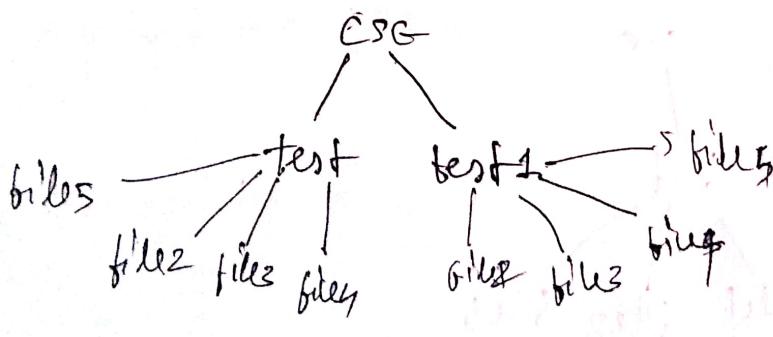


iii) cp file4 files



iv) cd ..

v) cp test test1 (test1 doesn't exist)



vi) rm test

Can't remove the folder since it contains files,  
in if [non empty directory can't be deleted with -r option]

Q) Consider an user Unix System with a name BMSIT.  
What is the absolute pathname of BMSIT.  
Assuming that if an user's present working directory is  
BMSIT  
list & explain, at least 6 directory listed in the  
following command \$ ls .. / .

\$ pwd ← used to print present working directory.  
/home/BMSIT ← absolute pathname.

\$ ls .. / .

bin dev root mnt var boot etc lib sbin  
home usr temp

→ root/bin

This contains common programs, shared by system  
the system administrator & the user.

/dev

This contains references to all CPU peripheral hardware  
which are represented as files with special properties.

/etc

This contains system configuration files

/home

Contains home directories of common user

/lib

This contains libraries files, including files for all kinds of programs needed by system & users.

/usr

This contains programs, libraries, documentation etc for all user-related programs.