1. How to perform calculation directly from terminal? Which command is used?? How to set limit of numbers to display after particular constant (say pi)?

Ans. The calculation in the terminal can be done by “bc” command. Any calculations can be performed by this command.

Eg:

bc

12+5

17

To set the limit of numbers to display after particular constant we use:

printf “%.2g” 3.14159265359

output: 3.14

2. Write a program to implement binary search using shell script?Write a program that takes arguments as command line and perform basic arithmetic operations?

Commands:

$gedit x.cpp

```
#include <stdio.h>
void binary_search();

int a[50], n, item, loc, beg, mid, end, i;
void main()
{
    printf("\nEnter size of an array: ");
    scanf("%d", &n);
    printf("\nEnter elements of an array in
sorted form:\n");
    for(i=0; i<n; i++)
        scanf("%d", &a[i]);
    printf("\nEnter ITEM to be searched: ");
    scanf("%d", &item);
    binary_search();
    getch();
}
void binary_search()
{
    beg = 0;
    end = n-1;
    mid = (beg + end) / 2;
```

```
    while ((beg<=end) && (a[mid]!=item))
    {
        if (item < a[mid])
            end = mid - 1;
        else
            beg = mid + 1;
        mid = (beg + end) / 2;
    }
    if (a[mid] == item)
        printf("\n\nITEM found at location %d",
mid+1);
    else
        printf("\n\nITEM doesn't exist");
}
```

$gcc –o test x.cpp

$ ./test

```
Enter size of an array: 5

Enter elements of an array in sorted form:
10 25 35 64 89

Enter ITEM to be searched: 35


ITEM found at location 3
```

3. Commands used for finding memory usage ?

1. free command

The free command is the most simple and easy to use command to check memory usage on linux. Here is a quick example

```
$ free -m
             total       used       free     shared    buffers     cache
          0         865        2248
-/+ buffers/cache:       3344       4631
Swap:          1951          0       1951
```

The m option displays all data in MBs. The total os 7976 MB is the total amount of RAM installed on the system, that is 8GB. The used column shows the amount of RAM that has been used by linux, in this case around 6.4 GB. The output is pretty self explanatory. The catch over here is the cached and buffers column. The second line tells that 4.6 GB is free.

2. /proc/meminfo

The next way to check memory usage is to read the /proc/meminfo file. Know that the /proc file system does not contain real files. They are rather virtual files that contain dynamic information about the kernel and the system.

It Check the values of MemTotal, MemFree, Buffers, Cached, SwapTotal, SwapFree.
They indicate same values of memory usage as the free command.

Ex:$ cat /proc/meminfo

3. vmstat

The vmstat command with the s option, lays out the memory usage statistics much like the proc command. Here is an example

```
$ vmstat -s
      8167848 K total memory
      7449376 K used memory
      3423872 K active memory
      3140312 K inactive memory
       718472 K free memory
      1154464 K buffer memory
```

The top few lines indicate total memory, free memory etc and so on.

4. top command

The top command is generally used to check memory and cpu usage per process. However it also reports total memory usage and can be used to monitor the total RAM usage. The header on output has the required information.

The buffer and cache information is present here too, like the free command.

5. htop

Similar to the top command, the htop command also shows memory usage along with various other details.

the header on top shows cpu usage along with RAM and swap usage with the corresponding figures.

RAM Information

To find out hardware information about the installed RAM, use the demidecode command. It reports lots of information about the installed RAM memory.

4. Write a command to find a file with particular extension and contains particular word(string) in the file?

1.grep command= we use grap command for finding a particular word in any file.

Syntax= grep ‘word’ filename

Ex=grep ‘ritu’ a.txt

Options= grep –i

Grep –w

2. ls command= it is used to find any file with particular extention.

ls a.txt

ls *.txt

ls filename.*

3. find command= it is used to find any file

Syntax=file<path> -name filename

Ex=file /home/user –name osocworkshop.

5. Create a directory and move in the directory.Create another directory inside this directory and move in it. write single command to come out in original directory.

$ mkdir ritu (directory created)

$ pwd

/home/user

$ cd ritu

$ pwd

/home/user/ritu

$ mkdir parmar (directory created)

$ cd parmar

$ pwd

/home/user/ritu/parmar

$ cd ../..

$ pwd

/home/user (back to original directory).

6. Why linux is more secured than other operating systems?Find certain parameters comparing with other operating systems??

Linux is an open operating system, the codes which can be read by everyone, but stillaccept more secure in comparison with other OS.

the important point is to install applications to ensure security in the selected system.These applications, especially in conjunction with Linux, you increase your chance that even the most experienced hackers will not be able to access your system.

1. **Privileges of accounts**
   In Windows users by default have access to everything in the system because they are given administrator rights. If the virus will be able to penetrate their system, they can quickly gain access to important parts of the system. On the other

hand, in Linux, theyhave a lower access rights, and, theoretically, the virus can only access local files and folders, the system will remain safe.

2. **Competent community**

social engineering Ltd compared to Linux. Incompetent users can easily download a virus by simply opening an attachment in e-mail. Of course, this is not the case of Linux, when users are more technically savvy, and are unlikely to access and download such suspicious attachments. They also need to give the rights to execution, so unlikely to happen real damage.

3. **IPtables**

An even higher level of security on Linux machines is implemented using IPtables. Thisfirewall that allows you to create a more secure environment for the execution of any command or access the network.

4. **Recording system events Linux**

Linux accesses to files and system accesses are written to a log file. If someone tries to enter safe system files, these system gaps can be viewed by the system administrator. Also are written to the disk failed login attempts and other security issues, and all this is available to study later.

5. Less users

The number of users using Linux is much less in comparison with Windows and Mac OS. As the number of users is smaller, less viruses will strive to hit their computers to gain access to important data.

The question is not which operating system will best meet your security requirements. It is clear that Linux is not only immune to

security problems - his virus scanners and firewalls make this operating system the best choice, for example, for a business than any other OS.

8. If you forget password how will you reset it ?

ANS= To change a password on behalf of a user, first sign on or "su" to the "root" account. Then type, ``passwd user'' (where user is the username for the password you are changing). The system will prompt you to enter a password. Passwords do not echo to the screen when you enter them.

$ passwd

(current)UNIX password:

Enter new UNIX password:

Retype new UNIX password:

You can also change your own password, by typing ``passwd'' (without specifying a username). You will be prompted to enter your old password for verification, and then a new password

9.(2).What is umask?

Ans ->umask command:

a)about umask->Return, or set, the value of the system's file mode creation mask.
b)description->On Linux and other Unix-like operating systems, new files are created with a default set of permissions. Specifically, a new file's permissions may be *restricted* in a specific way by applying a permissions "mask" called the **umask**. The **umask** command is used to set this mask, or to show you its current value.
c)syntax-> $umask –s[*mask]*

d)options-> **-S :**

Accept a symbolic representation of a *mask*, or return one.

mask:

If a valid *mask* is specified, the umask is set to this value. If no *mas* specified, the current umask value is returned.

(3). Write the syntax for the command to delete a non empty directory and simultaneously all

the files inside the directory must be deleted and write the syntax for moving file from anywhere to everywhere (general)?

Ans: Command to delete a non empty directory and simultaneously all the files inside the directory must be deleted :

$user-:~$ mkdir dir1

$user-:~$ cd dir1

$user-dir1:~$cat >new

Hdsjfhdjfh

$user-dir1:~$ cd ..

$user-:~$ rm –r dir1

Syntax for moving file from anywhere to everywhere:

$ mv –v new /home/user/dir1 /home/user/dir2.