Lab Exercises for UNIX Administration

Lab 1

1. Obtain the following results

(i) To print the name of operating system
(ii) To print the login name
(iii) To print the host name

2. Find out the users who are currently logged in and find the particular user too.

3. Display the calendar for

(i) Jan 2000
(ii) Feb 1999
(iii) 9th month of the year 7 A.D
(iv) For the current month
(v) Current Date Day Abbreviation , Month Abbreviation along with year

4. Display the time in 12-Hour and 24 Hour Notations.

5. Display the Current Date and Current Time.

6. Display the message "GOOD MORNING" in enlarged characters.

7. Display the name of your home directory.

8. Create a directory SAMPLE under your home directory.

9. Create a sub-directory by name TRIAL under SAMPLE.

10. Change to SAMPLE.

11. Change to your home directory.

12. Change from home directory to TRIAL by using absolute and relative pathname.

13. Remove directory TRIAL.

14. Create a directory TEST using absolute pathname.

15. Using a single command change from current directory to home directory.

16. Remove a directory using absolute pathname.

17. Create files myfile and yourfile under Present Working Directory.

18. Display the files myfile and yourfile.

19. Append more lines in the myfile and yourfile files.

20. How will you create a hidden file?.

21. Copy myfile file to emp.

22. Write the command to create alias name for a file.

23. Move yourfile file to dept.

24. Copy emp file and dept file to TRIAL directory

25. if you compare a file with itself.

26. Compare myfile file and emp file.

27. Append two more lines in emp file existing in TRIAL directory.

28. Compare employee file with emp file in TRIAL directory.

29. Find the difference between the above file.
30. Remove the files in the TRIAL directory.
31. Can you remove a directory with files by using a single command.
32. Is there any command available to get back a deleted file?
33. Rename TRIAL as DATA.
34. Copy DATA to another directory by name TRIAL.
35. Create a file called dummy in TRIAL and link it to another file by name star.
36. Link the dummy file in TRIAL to another file by name power in DATA.

Lab 2

1. Which command is used to print "Hello Welcome to shell Programming" ?
2. Which command is used to get the value from the user ?
3. Which command is used to make a variable as global ?
4. Which command is used to perform numeric operation ?
3. How to make use of command substitution ?

Lab 3

1. Write a menu- driven program for the following options
   - List of files
   - Processes of Users
   - Today's Date
   - Quit out of Unix

2. Write a shell program which accepts the name of a file from the standard input and then performs the following test on it.

   - File Existence
   - File Readable and Writable

3. Write a shell program to perform a simulated cp command. Proceed this program using positional parameter and the usage will be on the form of copy <s.file> <target file> and ensure that parameters are properly used.

4. Write a shell program to convert all lowercase letters in a file to uppercase letter.

5. Write a shell program for file contains records ith each record containing name and city, name of state and name of country. How would you sort this file with country as the primary key and state the secondary sort key.

Lab 4

1. Login in multi-user mode.
2. Identify the current run level.
3. Identify the default run level of the system.
4. Change the default run level to 2.
5. Check the difference between the run level 3 and single user mode
6. Create run control scripts and execute them at the time of system startup in the default run level.
7. Write a script to execute at the time when the in system enter to run level 0.
8. Change run level to start X windows at the time of bootup.
9. Restart the system.
10. Bring the system to single user mode for system maintenance.
11. Shutt down the system without delay.

Lab 5

1. Login as root and create groups as dba with id 501 & stud with id 555
2. Create the following list of users

User name	UID	GID	Working Shell	Secondary	Comments Group
Mac1	501	501	Bourne shell	555	Mac1 user
Mac2	502	501	C shell	NULL	Mac2user
Mac3	503	501	BASH Shell	555	Mac3 user
User1	504	555	Bourne shell	NULL	User1 user
User2	505	555	Bash Shell	NULL	User2 user
Shut	??????	???????	??????	NULL	Shutdown the system using the user id shut

3. Examine the content of the /etc/passwd file.
4. Examine the content of the /etc/shadow file. Name the text that is found in the second field for the users created.
5. Set password for the users mac1, mac2, mac3 & shut.
6. Select user2 from the list of users. Change the passwd aging information for user2 so that it matches the following information.

   Max inactive 2 days

   Expiry 4 days

   Now change the system date increase by 5 days
7. Logout of login session. Attempt to log as user2. What happens?
8. Change the shell for the user2 to Bourne shell.
9. Delete user2 including his home directory and his comments.
10. Lock the user1 with the help of a single command.

Lab 6

1. Identify the available memory in the system.
2. Display the list of devices connected to your system including the physical names and its instance number.
3. Identify the number of hard disks connected to the system.
4. Format a floppy and create a UFS file system in the floppy.

Lab 7

1. Create a new file system by using *mkfs* command.
2. Create a directory called */kishore* directory as the mount point for the file system that has been just created.
3. Mount the new file system to the */kishore* directory.
4. Add a line to */etc/fstab* to make the mount for */kishore* and test what happens when the system is booted.
5. Reboot the system. Verify if */kishore* is mounted or not.

Lab 8

1. Share a file system called */home/kishore* permanently
2. Check if the file system is shared or not.
3. Mount the remote file system by using *the mount* command.
4. Mount the remote file system permanently

Lab 9

1. Create a swap file system by using *touch* and *mkfile* .
2. Mount the swap file system by using *swapon & swap* commands.
3. Delete the swap file system

Lab 10

1. Login as a normal user
2. Create file test
3. Find the permissions of file test
4. Change the ownership of the file to usr1
5. Find the current umask setting
6. Change the umask setting
7. Create file test1
8. Find out the difference
9. Switch to Super User Account
10. Change group of file test
11. Change ownership and group of file test1 with a single command
12. Change the ownership of all the files in user1's home directory with a single command
13. Create a file abc and turn the execute bit on
14. Set setuid permission on the file abc
15. Determine if the setuid permission is enabled on the file abc
16. Create a directory testdir
17. Set setgid permission on the testdir

18. Logout and login as user1
19. Create a file testfile in testdir
20. Verify the ownership and the group of the testfile
21. Switch to Superuser account
22. Create a public directory dir1
23. Set stickybit (save text attribute) on dir1
24. Logout and login as a normal user user1
25. Create a file userfile1 in dir1
26. Login as a different user user2
27. Try to edit or remove the file
28. Temporarily disable user logins

Lab 11

1. Check whether the printer scheduler is running.
2. Configure the printer in Linux by editing the file */etc/printcap.*
3. Send */kishore* file to the printer.
4. To ensure that request was recieved.
5. Cancel the print job.

Lab 12

1. Create three sample directories with some files to use with the tar command.
2. Use the tar command to backup all three directories into single tar file.
3. Use the tar command to verify that the files are on the tape and in a single tar file.
4. Use the tar command to backup the sample directories into four different files.
5. Verify the number of tar files using the tar command.
6. Backup a directory using cpio.
7. Restore the files which are backuped in the floppy.
8. Back up a floppy to a floppy using dd.
9. Restore from floppy to home directory using dd.

Lab 13

1. Create a file under the user's home directory in the name of *quota.user*(linux).
2. Change the ownership of the file.
3. Make an entry in *usrquota* in the */etc/fstab.*
4. Create a file under user home direcoty in the name of *quotas.* (Sun Solaris)
5. Change the ownership of the file.
6. Make an entry in *rq* in the */etc/vfstab.*
7. Turnon the quotas by using *quotaon* command.
8. Assign the quota for user by using *edquota* command.
9. Check the quota for the file system.
10. Turn off the quota.

Lab 14

1. Login as root
2. Deny a user ***user1*** from using at command
3. Display "WELCOME TO RADIANT " at 11.30 AM on console
4. Remove an at job
5. Display the at jobs waiting to be executed
6. Delete an at job
7. Allow only an user ***user1*** to use ***at*** command other than Superuser
8. Remove a file at midnight using ***at*** command
9. Using ***crontab*** execute a command at 6.30 AM everyday
10. Delete a user crontab file
11. Display a user crontab file
12. Restrict a user ***user1*** from using crontab
13. Allow ***only user1, user2, user3*** to use crontab

Lab 15

1. List the processes for the current shell.
2. Display information about processes.
3. Display the global priority of a process and find out the column that provides.
4. Change the priority of a process with default arguments.
5. Display Virtual Memory Statistics.
6. Display System Event Information.
7. Display Swapping Statistics.
8. Check File Access statistics.
9. Check Buffer Activity statistics.
10. Check Disk Activity statistics.
11. Check Inter process Communication statistics.
12. Check Unused Memory in the server.
13. Check Swap Activities.

Lab Solutions for UNIX Administration

Lab 1

1. (i) uname
   (ii) logname
   (iii) hostname
2. who
   who am I
3. (i) cal jan 2000
   (ii)cal feb 1999
   (iii)cal sep 7
   (iv)cal
   (v) date '+%d/%m/%y'
4. date '+24Hour:%T 12Hour:W%1:%M;%S'
5. date'+currentdate: %D %n TIME: %t'
6. BANNER –W "good Morning"
7. pwd
8. mkdir sample
9. cd sample
   mkdir Trial
10. cd sample
11. cd
12. cd $home/Trial
13. cd
    cd sample
    rmdir Trial
14. mkdir./ sample/Trial
15. cd/sample/Trial
16. rmdir ./sample/Trial
17. cat>myfile
    This is myfile
    ^d
    cat >yourfile
    This is yourfile
    ^d
18. cat myfile
    cat yourfile
19. cat >> myfile
    Add
    ^d
    cat>>yourfile
    Append
    ^d
20. cat>.hide
    hidden
    ^d
21. copy myfile emp
22. ln yourfile aliasname
23. mv yourfile aliasname
24. cp emp dept../ Trial
25. if there is no difference no output
26. cmp myfile emp

27. cd/sample/Trial
    cat>>emp
28. cmp employee emp
29. diff employee emp
30. rm *
31. rm –r Trial
32. undelete (SCO)
33. rename Trial Data
34. cp Data/same/Trial
35. ln Trial star
36. ln –s/sample/Trial/sample/Data/filename

Lab 2

1. echo “Hello welcome to shell programming”
2. read
3. export
4. expr
5. x=’date’
   echo$x

Lab 3

1.

```
# vi menu
echo “Enter the options between [1-4] to execute commands:”
read choice
case $choice in
   i.  ls –1;;
  ii.  ps;;
 iii.  date;;
  iv.  exit;;
     *) echo “choose option between 1-4”
             break;;
       esac

#sh menu
Enter the options between [1-4] to execute commands : 1
Total 36
drwxr-xr-x   5 unix       dba    4096   May 23 14:21 Desktop
-rwxr-xr-x   1 unix dba    11972  May 23 15:54 a.out
-rw-r-r-     1 unix       dba    36     May 23 15:17 hai
-rw-r-r-     1 unix       dba    189    May 23 16:01 menu
-rw-r-r-     1 unix       dba    107    May 23 15;25 srini
-rw-r-r-     1 unix       dba    108    May 23 15:45 srini.c
-rw-r-r-     1 unix       dba    107    may 23 15:54 srinil.c
```

2.

```
# vi exist
echo “Enter the filename:”
read fname
if [-f $fname –a –r $fname –a –w $fname ]
then
        echo “$fname is Exist”
        echo “$fname is readable”
```

```
        echo “$fname is writable”
    else
        echo “$fname is not Exist “
    fi

    # sh exist
    Enter the filename : menu
    Menu is Exist
    Menu is Readable
    Menu is Writable
```

3.
```
    #vi copy
    sfile =$1
    tfile =$2
    if    [     $#    -eq    2     ]
    then
        cp $sfile $tfile
    else
        echo “ USAGE: copy source-file target-file”
    Fi

    # sh coy new
    echo “Usage: copy source-file target-file

    # sh copy menu new
    To verify whether it is copied or not
    # cat new
    echo “Enter the options between [1-4] to execute commands:”
    read choice
    case $choice in
       i.  ls -1;;
      ii.  ps;;
     iii.  date;;
      iv.  exit;;
       v.  echo “Choose options between 1-4”
      vi.  break;;
    esac
```

4.
```
    # vi conv
    echo “Enter the file name to convert:”
    read fname
    if [-f       $fname  ]
    then
        echo “File Exist”
        echo
        tr “[a-z]””[A-Z]” < $fname
    else
        echo “File not Exist”
    fi

    # sh abc
    File not Exist
    # sh new
```

```
echo “Enter the options between [1-4] to execute commands:”
read choice

case $choice in
   i.  LS –L;;
  ii.  PS;;
 iii.  DATE;;
  iv.  EXIT;;
     *)  ECHO “ CHOOSE OPTIONS BETWEEN 1-4 “
     ESAC
```

5.
```
# cat > database
Murali:chennai;tamilnadu:India
Sivam:wasington:Washington:usa
Natty:gobi:tamilnadu:India

# vi psort
echo “Enter the primary field key to sort:[field number]”
read pkey
echo “Enter the secondary field key ot sort: [field number]”
read skey
echo “Enter the Filename”
if     [ -f   $fname ]
then
       echo “File Exist”
       cut –d “:” –f $pkey,$skey | sort
else
       echo “File Does not Exist”
fi

# sh old
File Does not Exist

# sh psort
2
4
# cat database
chennai:india
gobi: india
washington:usa
```

Lab 4

1. Press Enter
2. # runlevel
3. # grep init default/etc/rc.d/inittab
4. # vi/etc/rc.d/inittab
   then change the runlevel to S in the second field where you find the initdefault command in the third field
5. Check the service started and file system mounted in the run level 3 and in single user Mode
   For eg NFS service is not in single user mode while it is done in run level3
6. #cd /etc/rc.d/rc3/d

cat S1—abc
sleep500
This will execute at the time of system startup in the default runlevel3. When this script executes the sleep command keeps the system wait until 500 seconds and go for the next process.

7. # cd /etc/rc.d/rc0.d
   cat K 10abc
   sleep 500
   This will execute at the time of system shutdown using init0

8. # vi/etc/rc.d/inittab
   then change the runlevel to 5 in the second field, where you find the initdefault command in the third field. Ensure you have installed all components to start X windows
9. # init 6 or shutdown –r now
10. # init 1 or init S
11. # shutdown –h now

Lab 5

1. # groupadd -g dba 501
   # groupadd -g stud 555
2. useradd –u 501 –g 501 -c “mac1 user” –d /home/mac1-m –s /bin/sh –G 555 mac1
   useradd –u 502 –g 501-c “mac2 user” –d/home/mac2 –m –s /bin/csh mac2
   useradd –u 503 -g 501 –c “mac3 user” –d/home/mac3 –m –s/bin/bash –G 555 mac3
   useradd –u 504 –g 555 –c “user1 user” –d/home/user1 –m –s/bin/sh user1
   useradd –u 505 –g 555 –c “user2 user” –d/home/user2 –m –s/bin/bash user2
   useradd –u 0 –g 0 –c “user to shutdon the system” –d/shut –m –s/bin/sh –0 shut
3. # vi/etc/passwd
   mac1 /bin/sh
   mac2 /bin/csh
   mac3 /bin/bash
   There you can see the full pathnames of the shell for the new users created
4. # vi/etc/shadow
   mac1:!!::
   mac2:!!::
   mac3:!!::
   user2:!!::
   This is because you we have not set password for the users mac1,mac2 and mac3
5. # passwd mac1
   # passwd mac2
   # passwd mac3
   setting password for these users
6. # usermod –f 2 –e 04/19/01
   Modifying the users expired by next
7. The user cannot able to login becaus5t his account is expired only administrator can make the user exist one again
8. # usermod –s /bin/sh user2

Modifying the user2 working shell environment form bash to sh

9. # userdel –r user2
   Deleting the users along with his home directory and files
10. # passwd –l mac3
    Locking the user temporally by root users and only root can unlock this user.

Lab 6

1. dmesg lgrep Memory
2. dmesg
3. cfdisk
4. FdFormat/dev/Fd0H1440

Lab 7

1. Creating a new file system in Linux:
   # mkfs –t ext2 –c /dev/hda*
2. # mkdir /kishore
3. # mount /dev/hda* /kishore
4. Adding entry in /etc/fstab
   /dev/device /dir/to/mount ftype parameters fs_freq fs_passno
   Ex:
   /dev/hda2 /kishore ext2 rw 0 0
5. Reboot your system. Verify that /kishore is mounted

Lab 8

1. Sharing a file system in Linux
   # vi /etc/exports
   /home/kishore host1 (rw) host2 (ro) host3 (ro)

   Sharing a file system in Sun Solaris
   # vi /etc/dfs/dfstab
   share –F nfs –o rw: radiant1:radiant2 /home/kishore –d “only ofr Admin.pupils”

2. Checking the file system is shared or not in Lunux
   # exportfs
   /home/kishore radiant1

   Checking the file system is shared or not in Sun Solaris
   # share
   /home /kishore ro radiant1

3. Mounting the NFS file system
   #mount –t [file system type] –o [option] [hostname of NFS server : remote dir] [mountpoint]
   Example:
   # mount –t nfs –o rw radiant1 : /home /kishore /mnt

   mounting remote file system in Sun Solaris
   Mounting the NFS file system (Sun Solaris)

```
   # mount –F [file system type] –o [option] [hostname of NFS server :
   remote dir]  [mountpoint]
   Example:
   #mount –F nfs –o rw radiant1 : /home/kishore/mnt
4. mounting remote file system by using /etc/fstab in Linux
   #vi /etc/fstab
   # Remote mount
   /dev/device/dir/to/mount   ftype  parameters   fs_freq_passno
   Example
   Lambent:/home/kishore/     mntfsrw      0       0
5. mounting remote file system by using /etc/vfstab in Sun Solaris
   # vi /etc/vfstab
   <device to mount> <device to fsck>  <mount point> <fs type> <fsck
   pass> <mount at boot> <mount options>
   # remote mount
   lambent: /home/kishore     -      /mnt   nfs    - yes  -
```

Lab 9

```
1. Create a swap file by using mkswap (linux)
   Example to create a swap file:
   # mkswap [device] [block]
   # mkswap /dev/hda9 2000

   Create a swap file by using mkfile (Sun Solaris)
   Example to create a swap file:
   # mkfile nnn[k/b/m] filename
   # mkfile 24m/opt/abc

2. Activate swap file:
   # swapon [device]
   # swapon /dev/hda9

   Activate the swap file
   # swap –a [filename]
   #swap –a /opt/kishore
3. Example for deleting the swap file:
   # swapoff [device]
   # swapoff /dev/hda9

   Example for deleting the swap file:
   # swap –d /opt/kishore
```

Lab 10

```
2. cat >test
3. ls –l test
4. chown user1 /home/user1/test
5. umask
9. su
10. chgrp <newgroup> /home/user1/test
11. chown <new user>: <new group> file name
12. chown –R <new user> directory name
13. cat /abc
```

14. chmod 777 /abc
15. chmod 4777 /abc
16. ls –l
17. mkdir /testdir
18. chmod 777/testdir
19. chmod g+s /testdir
20. cat > /testdir/testfile
21. su
22. mkdir/dir1
23. chmod1777 /dir1
24. create /etc/nologin ifle

Lab 11

1. Checking t/whether the printer schedular is running in Linux
   # lpc status {all 1 printer….}

2. # vi /etc/printcap

   Local Printer
   Hp|Our printer:\
   :sd=/var/spool/lpd/hp:\
   :mx#0:\
   :sh:\
   :hp=/dev/lp0:\

3. Sending a print request in Linux
   # lpq [-l] [-Pprinter] [job #….]
   Example to print a file
   # lpq –P hp /radiant/kishore

4. Restarting the deamon in Linux
   # /etc/rc.d/init.d/lpd stop
   # /etc/rc.d/init.d/lpd start

5. Cancel the print job in Linux
   Lprm [-Pprinter] [-l] [job #…..] [user…..]

Lab 12

1. mkdir dir1 dir2 dir3
   cd dir1 : touch file1
   cd dir2 : touch file 2
   cd dir3 : touch file 3
2. tar cvf /dev/fd0 dir1 dir2 dir3
3. tar tvf /dev/fd0
4. tar cvf /dev/fdo dir1
   tar cvf /dev/fdo dir2
   tar cvf /dev/fdo dir3
5. tar tvf /dev/fd0
6. cd dir2
   ls –l |cpio –o c> /dev/fd0
7. cpio –l c< /dev/fd0

8. dd if = ./ of= /dev/fd0
9. dd if = /dev /fd0of=/home

Lab 13

1. Configuring quotas for user in Linux
   # touch [filename]
   # touch /home/quota.user
2. Change the permission
   # chmod 600 /home/quota.user
3. Make an entry in /etc/fstab
   # vi /etc/fstab
   /dev/device /dir/to/mount ftype parameters fs_freq fs_paano
   /dev/hda6 home ext2 defaults,usrquota 1 1

4. Configuring quotas for users in Sun Solaris
   Examples- Configuring quotas for user
   # touch [filename]
   # touch /export /home /quotas
5. Change the permission
   # chmod 600 /export/home/quotas
6. Make an entry in /etc/vfstab
   # vi /etc/vfstab

```
deviceamount   devicetofsck     mountpoint  fstype  fsckpass  mountatboot  mounoptions
/dev/dsk/c0td0s7 /dev rdsk/c0t3d0s7 /export/home ufs  2       yes            rq
```

7. Turn on the quotas
   # quotaon [options] [filesystems]
   # quotaon –va /home
   /dev/hda6-quota turned on
8. Assigning quota for a user
   # edquota –u kishore
   Quotas for user kishore
   /dev/hda6: blocks in use : 0, limits (soft=0, hard=0)
   inodes in use:0,limits (soft=0,hard=0)
9. Checking quota for the file system
   # repquota [options] [file system]
   # repquota –va /home
   *** Report for user quotas on /dev/hda6(/home)

	Block limits			File limits		
User	used	soft	hard	used	soft	hard
Root	10224	0	0	1648	0	0
Kishore	184	1	4	46	1	5

10. Turn off the quotas:
    To turn off quotas:
    # quotaoff [options] [filesystem]
    # quotaoff –va /home
    /dev/hda6 –quota turned off

Lab 14

2. # vi /etc/at.deny
   …… enter the login name of the user to be denied
   user1
   :wq!

3. # at 11:30
   at> echo WELCOME TO RADIANT>/dev/console
4. get the jobs information
   #atq
   #atrm <at job number>
5. #atq
6. /var/spool/at
7. atrm <at job number>
8. at –d
9. # vi /etc/at.allow
   …….. enter the login name……
   user1
   wq!
10. # at midnight
    at> rm <filename>
    wq!
11. # crontab –e
    ……enter the values like this……
    3006 *** <command to be executed>
    :wq!
12. # crontab –u <user name> -r
13. # crontab –u <user name> -l
    /var/spool/cron/<user name>
    # vi /etc/cron.deny
    ……..enter the username to be restricted
    user1
    :wq!
    # vi /etc/cron.allow
    ……..enter the user names to be allowed
    user1
    user2
    user3
    :wq!

Lab 15

1. # ps
2. # ps –ef
3. # ps –ecl
4. # sleep –500 &
   # ps –f –pid
   # /usr/bin/nice +4 (default four units)
5. #VMSTAT
6. #vmstat –s
7. # vmstat –S
8. # sar –a
9. # sar –b
10. # sar –d
11. # sar –m
12. # sar -r
13. # sar -r