

COLLEGE OF ENGINEERING, CHENGANNUR
20MCA136 NETWORKING & SYSTEM ADMINISTRATION LAB
LAB CYCLES

Lab cycle-1

Experiment No.1

Familiarisation with Computer Hardware

Experiment No.2

Familiarisation of OS installation

Lab cycle-2

Experiment No.3

Study of a terminal based text editor such as Vim or Emacs.

- a) Cursor operations
- b) Manipulate text
- c) Search for patterns
- d) Global search and replace

Experiment No.4

Basic Linux commands, familiarity with following commands/operations expected

1. man
2. ls, echo, read
3. more, less, cat,
4. cd, mkdir, pwd, find
5. mv, cp, rm ,tar
6. wc, cut, paste
7. head, tail, grep, expr
- 8 chmod, chown
9. Redirections & Piping
10. useradd, usermod, userdel, passwd
11. df,top, ps
- 12 ssh, scp, ssh-keygen, ssh-copy-id

Basic Linux commands activity questions

1. Command to display the following message as such (Use " and Newline).
"God! Bless us..
We are starting Shell Scripting"

2. Get the manual page of 'ls' command. Search for the word "alphabetic". Find the next occurrence and then find the previous occurrence.
3. Read your name from the keyboard and display it.
4. Create the directory structure dir1/dir4 and dir1/dir2/dir3 with a single command and then change directory to dir3
5. Create some files using **Vim**
6. Display the current directory
7. Listing Files and folders
 - a. List the contents of dir1 (Qn. 4) and all its descendants
 - b. List the contents of dir3 (Qn. 4) in
 - i. Alphabetical Order
 - ii. Sorted on Time of modification, newest first
 - iii. Sorted on Size
 - iv. Reverse of all above
 - v. Long listing of files Sorted on Size with smallest first and size
 - vi. displayed in human readable form
8. Execute **ls** and store the output to a file lsoutput
9. Display the file
 - a. starting with the first 10 lines and
 - b. starting with the 10th line with provision for
 - i. Scrolling Up
 - ii. Scrolling Up and Down
10. Execute **ls -l** and add the output to lsoutput, at the end.
11. Execute **ls -l** and feed the result to less command, to scroll through the directory listing.
12. Copy the file file1 to newfile.
 - a. If newfile already exists, it should be replaced.
 - b. If newfile already exists, it should not be replaced.
 - c. If newfile already exists, it should be replaced, but only with the consent of the user.
 - d. If newfile already exists, it should be replaced only if its contents is older than that of file1.
 - e. Even if newfile is read only.
 - f. Create a link instead of copying.
 - g. Copy the entire directory tree from dir1 of Qn.4 to a new directory dir5
13. Create a new directory, dir6 inside dir1
 - a. Move all files in dir5 into it.
 - b. Delete all files where the name starts with a vowel character, upper or lower case.
 - c. Delete all files where the name is at least 3 characters long.
 - d. Delete all hidden folders, and files.
14. Create a file testfile1 using **Vim**
 - a. Set line number

- b. Type your name and address with district and pincode
 - c. Copy paste the contents 10 times
 - d. Replace all occurrence of your district with a neighbouring district
- 15. Create 2 files testfile2 and testfile3 using **Vim**.
 - a. Modify the permissions of testfile2 using symbolic mode.
 - i. Add read permission to others
 - ii. revoke write from owner
 - iii. set only execute to Group.
 - iv. add write to owner, revoke read from others and set read only to group.
 - v. set read and write to all
 - b. Modify the permissions of testfile3 using numeric mode
 - i. Set read and write to all
 - ii. set read,write and execute to owner, read and execute to group and read only to others
 - c. Set the permissions of testfile2 the same as that of testfile3
- 16. Use **head** and **tail** piped with cat /etc/passwd to display the details of
 - a. The first 12 users in the system.
 - b. The last 7 users in the system.
 - c. All but the first 3.
 - d. All but the last 5.
 - e. Only the 9 th.
- 17. Use **grep** to
 - a. Display all lines in a file that contains the string “abc”
 - b. Display all lines in a file that *does not* contain the string “abc”
- 18. Using **expr**
 - a. Read two integers X and Y. Display the sum, difference, product, quotient and remainder of these variables.
 - b. Read a string, S, a position, p and a length l. Display the substring of length l starting at position p from the string S
- 19.
 - a. Add a normal user, user1. Create (if it does not exist) the folder /user1 and set /user1 as the home directory of user1. Also set /bin/bash as the login shell (*Use a single command*).
 - b. Modify the user account of user1, to expire it after a specific date.
 - c. Change the owner and group of the directory tree from dir2 and all its contents to user1
 - d. Delete the user account user1
 - i. By retaining the home folder
 - ii. By deleting the home folder
- 20. Miscellaneous
 - a. Using **tar** create a tar.gz file of the folder dir1 of Qn.4 with the name *mydir.tar.gz*
 - b. Extract the contents of *mydir.tar.gz* to dir6 of Qn.13

- c. Use **top** to display processes sorted on
 - i. ProcessId
 - ii. CPU%
- d. Use **ps** to display
 - i. Processes associated with the current terminal
 - ii. All processes in the system
- e. Use **df** to display the storage available in each partition in human readable form.

Lab cycle-3

Experiment No.5

- a) File system hierarchy in a common Linux distribution,
- b) File and device permissions,
- c) Study of system configuration files in /etc,
- d) Familiarizing log files for system events, user activity, network events.

Lab cycle-4

Experiment No.6

- a) Shell scripting: study bash syntax, environment variables, variables, control constructs such as if, for and while, aliases and functions, accessing command line arguments passed to shell scripts.
- b) Study of startup scripts, login and logout scripts, familiarity with systemd and system 5 init scripts is expected

Shell Script program questions

1. Write a script to show current date, time and current directory.
2. Write a script to reverse of a number
3. Write a script to largest among three numbers
4. Write a script check whether the number is Armstrong or not.
5. Write a script to check password and login
6. Write a script to count the prime numbers in specific range

7. Write a script to convert the contents of a given file from uppercase to lowercase and also count the number of lines, words and characters of the resultant file. Also display the resultant file in descending order.

8. Write a script to perform following basic math operation as:

Addition, subtraction, multiplication, division

9. Read 3 marks of a student and find the average. Display the grade of the student based on the average. (*if..then..elif..fi*)

S >= 90%

A < 90%, but >= 80%

B < 80%, but >= 60%

P < 80%, but >= 40%

F < 40%

10. Read the name of an Indian state and display the main language according to the table. For other states, the output may be “Unknown”. Use “|” to separate states with same language (*case..esac*)

State	Main Language
Andhra Pradesh	Telugu
Assam	Assamese
Bihar	Hindi
Himachal Pradesh	Hindi
Karnataka	Kannada
Kerala	Malayalam
Lakshadweep	Malayalam
Tamil Nadu	Tamil

11. Change the home folder of all users whose name starts with stud from /home/username to /usr/username. Also change the password of username to username123 (e.g., /home/stud25 changes to /usr/stud25 and his/her password changes to stud25123) - (*Use for .. in*)

12. Read a number and display the multiplication table of the number up to 10 lines. - (*Use for((..))*)

13. Read a Decimal number. Convert it to Binary and display the result. - (*Use while*)

Lab cycle-5

Experiment No.7: Networking

IPv4 networking, network commands: ping route traceroute, nslookup, ip. Setting up static and dynamic IP addresses. Concept of Subnets, CIDR address schemes, Subnet masks, iptables, setting up a firewall for LAN, Application layer (L7) proxies.

Experiment No.8: Network & Packet Analysis

Analyzing network packet stream using tcpdump and wireshark. service tests using nc.

Lab cycle-6

Experiment No.9: Setting up the LAMP Stack

Illustrate the steps involved in installing the LAMP Stack on a Linux machine. Deploy phpMyadmin.

Experiment No.10: Laravel Installation

Installation and configuration of Laravel

Experiment No.11

Build and install software from source code, familiarity with make and cmake utilities expected.

Experiment No.12

Introduction to Hypervisors and VMs, Xen or KVM,

Introduction to Containers: Docker, installation and deployment

Experiment No.13

Automation using Ansible: Spin up a new Linux VM using Ansible playbook