School of Computer Science Engineering and Technology
Bennett University (The Times Group)

Program- BTech-3rd Semester
Course Code- CSET213
Year- 2024
Date- 09/09/2024

Type- Sp. Core-I
Course Name-Linux and Shell Programming
Semester- Odd
Batch- Cyber Security (B9-16)

Lab Assignment 5

Exp No	Name	CLO Achieved			Marks
		CO1	CO2	CO3	
5	Introduction to Shell, Shell basic commands, variables	√	√		2

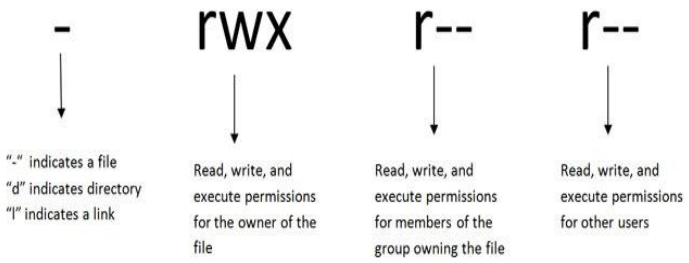
Objective: To understand file permissions, external & bult-in Linux commands, and environment variables using shell commands

Outcomes: After hands-on you will be able to understand basic layout of a shell program and write basic shell scripts.

Hands-on Learning (60 minutes)

Understanding Linux File Permissions (30 minutes)

Command	Syntax	Work

chmod	$ chmod g+w filename
	$ chmod g-wx filename
	
	$ chmod o+w filename
	
	$ chmod o-rwx foldername
		Changing the permissions on files and directories
		 

	$ chmod ugo+rwx foldername	to give read, write, and execute to everyone.
	$ chmod a=r foldername	to give only read permission for everyone.
	$ chmod 777 foldername	Change Permissions in Numeric Code instead of "r", "w", or "x". 0= No Permission, 1 = Execute 2 = Write 4 = Read Permission numbers are:

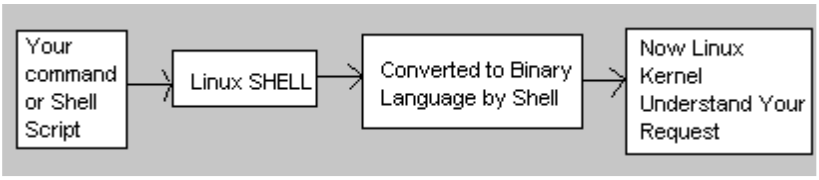
		0 = --- 1 = --x 2 = -w- 3 = -wx 4 = r- 5 = r-x 6 = rw- 7 = rwx

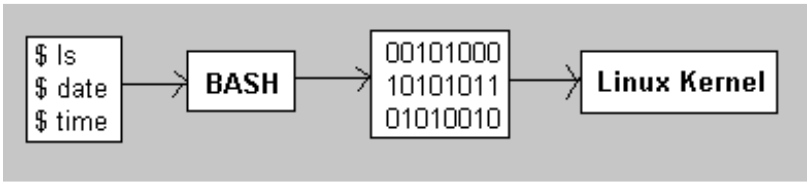
chgrp	$ chgrp groupname filename
	
	$ chgrp groupname foldername
		Change Groups of Files and Directories

chown	$ chown name filename
	
	$ chown name foldername
		changing ownerships of files and directories

Introduction to Shell Programming

- ✓ Shell program is a logical sequence of Linux commands to solve a problem.
- ✓ Shell script can take input from user, file and output them on screen, file.
- ✓ Useful to create our own commands that can save our lots of time and to automate some tasks of day today life.





Variables in Shell Script

- ✓ Sometimes to process our data/information, it must be kept in computers RAM memory.
- ✓ RAM memory is divided into small locations, and each location had unique number called memory location/address, which is used to hold our data.
- ✓ Programmer can give a unique name to this memory location/address called memory variable or variable (Its a named storage location that may take different values, but only one at a time).
- ✓ **In Shell, there are two types of variables:**
  - System variables - Created and maintained by Linux itself. This type of variable defined in CAPITAL LETTERS.

- User defined variables (UDV) - Created and maintained by user. This type of variable defined in lower LETTERS.

✓ **Reading variables from a user input using read command**

- read [options] var1 var2 … varN

We can read a user input in its input variable as follows:

```
$ read
    Hello World
$ echo $REPLY
    Hello World
```

We can read a value from user input as follows:

```
$ read text
    Hello
$ echo $text
    Hello
```

We can read multiple values from user input as follows:

```
$ read name usn marks
    Foo 345 78
$ echo $name $usn $marks
    Foo 345 78
```

We can read only the n characters and don't wait for the user to input a complete line as follows:

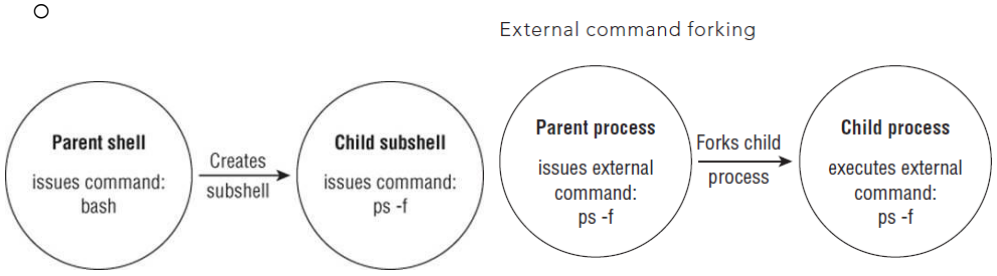
```
$ read -n 5    # option -n number takes only 5 characters from user
input
    Hello$
$ echo $REPLY
    Hello
```

We can prompt the user a message before reading user input as follows:

```
$ read -p "What is your name?"    # -p allows to prompt user a message
    What is your name?Foo
$  echo $REPLY
    Foo
```

Hiding an input character when reading in console:

```
$  read -s -p "Enter your secret key:"  # -s doesn't echo input in
console
Enter your secret key:$    #Pressing enter key brings command prompt $
echo $REPLY
foo
```



External commands Vs Built-in commands (10 minutes)

For external commands a child process is forked, while built-in commands are part of the shell's toolkit.

```
$ which ps
/bin/ps
$
$ type -a ps
ps is /bin/ps
```

```
$ type cd
cd is a shell builtin
$
$ type exit
exit is a shell builtin
$
```

Environment Variables (10 minutes)

- These allow us to customize our LINUX environment

```
$ setenv Dog Goofy
```

```
$ printenv, $ printenv HOME, $ echo $HOME, $ ls $HOME, $ ls /home/vimal, $ set
```

User Defined Variables:

```
$ echo $my_variable, $ my_variable=Hello, $ echo $my_variable
```

Problems to be solved (40 minutes)

1. Write a shell script to change permissions of a file state.txt. (Odd Batch)
2. Write a shell script to print multiplication table of a given number. (Odd Batch)
3. Write a shell script that displays “man”,”bear”,”pig”,”dog”,”cat”,and “sheep” on the screen with each appearing on a separate line. Try to do this in as few lines as possible. (Even Batch)
4. Write a shell script to merge the content of three files with tab separated and coma separated formats. (Even Batch)
5. Write a shell program to convert all lowercase letters in a file to uppercase letter. (Both)
6. Read the marks of 10 students for LSP course in terms of Name, regID, and Marks and redirect in a file.

Submission Instructions:

1. Submission requires the screen shots of all the incurred steps to execute a shell script or a video showing the whole process.
2. All these files are in single zip folder.
3. Use the naming convention: Prog_CourseCode_RollNo_LabNo.docx (Example: BCA3rdSem_CBCA221_ E21BCA002_Lab1.1)
4. Submission is through LMS only