

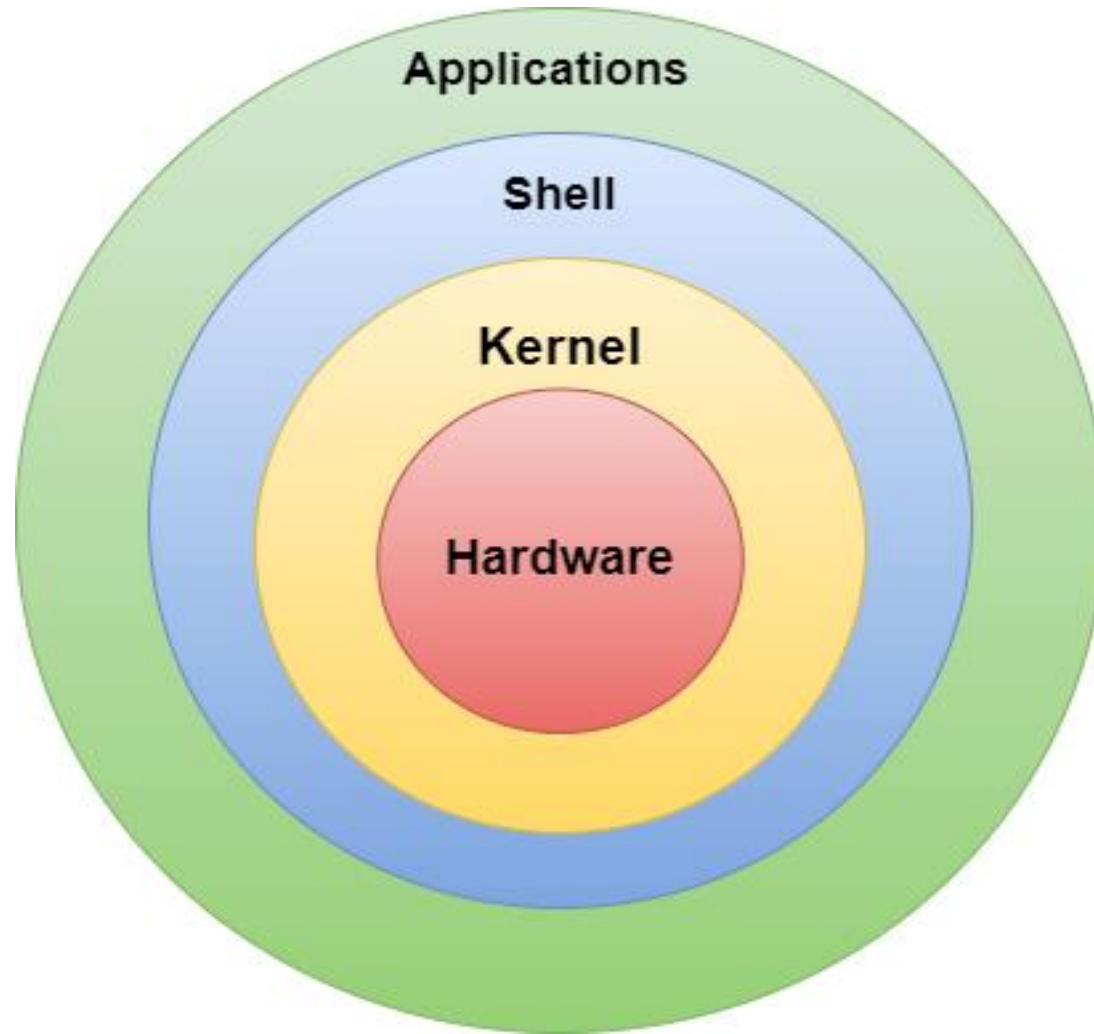
Operating System Lab

CS341



Course Instructor
Dr. Satendra Kumar
CSE Dept. IIT Patna

What is a Linux Shell?



What is Shell scripting?

- A shell script is a set of commands used to perform some specific task.
- All the command written in the shell script are executed sequentially.
- With the help of shell scripting some tasks such as file manipulation, program execution, user interaction and automation of tasks can be done.
- The main advantage of shell scripting is automation and avoid repetitive work.
- Each shell script file is stored with a .sh extension.

Some basic shell commands

- `pwd`: Prints the path/full name of the current or working directory.
- `ls -ltr`: It lists down all the files and directories within a file system.
- `mkdir <folder_name>`: This command is used to create a new folder
- `cd <folder_name>`: Used to change the path to a particular folder.
- `touch <file_name>`: Used to create a file within a folder.
- `echo`: It is like `printf` statement in C used to print some line.
- `nano`: to edit/ write to a shell script file.
- The first line of the shell script should be comment of the form:
`#!/bin/sh`
- Initially the user has only read and write permission to a shell script file. To provide the executable permission the following command is given:

`chmod u+x <file_name>`

```
vboxuser@blockexplorer:~$ pwd
/home/vboxuser
vboxuser@blockexplorer:~$ ls -ltr
total 40
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Videos
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Templates
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Public
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Pictures
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Music
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Downloads
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Documents
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Desktop
drwx----- 4 vboxuser vboxuser 4096 Aug  2 01:48 snap
drwxrwxr-x 4 vboxuser vboxuser 4096 Aug  2 03:06 osassignment1
vboxuser@blockexplorer:~$ mkdir demonstrate
vboxuser@blockexplorer:~$ ls -ltr
total 44
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Videos
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Templates
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Public
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Pictures
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Music
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Downloads
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Documents
drwxr-xr-x 2 vboxuser vboxuser 4096 Aug  1 11:54 Desktop
drwx----- 4 vboxuser vboxuser 4096 Aug  2 01:48 snap
drwxrwxr-x 4 vboxuser vboxuser 4096 Aug  2 03:06 osassignment1
drwxrwxr-x 2 vboxuser vboxuser 4096 Aug  8 12:30 demonstrate
vboxuser@blockexplorer:~$
```

```
vboxuser@blockexplorer:~/demonstrate$ ls
test_script.sh
vboxuser@blockexplorer:~/demonstrate$ nano test_script.sh
vboxuser@blockexplorer:~/demonstrate$ ls -ltr
total 4
-rw-rw-r-- 1 vboxuser vboxuser 33 Aug  8 12:37 test_script.sh
vboxuser@blockexplorer:~/demonstrate$ ./test_script.sh
bash: ./test_script.sh: Permission denied
vboxuser@blockexplorer:~/demonstrate$ chmod u+x test_script.sh
vboxuser@blockexplorer:~/demonstrate$ ls -ltr
total 4
-rwxrw-r-- 1 vboxuser vboxuser 33 Aug  8 12:37 test_script.sh
vboxuser@blockexplorer:~/demonstrate$ ./test_script.sh
Learning is fun
vboxuser@blockexplorer:~/demonstrate$
```

Basics of Shell Scripting

❑ Variables in Shell script

- To use a defined variable in a shell script we use the \$ symbol.
- In order to store Linux commands in a variable we simply write the Linux command to the variable by adding a \$ symbol before it.

```
GNU nano 6.2 basics.sh
#!/bin/bash
#Variables in shell script
name = Shubham
age = 26

echo My name is $name and my age is $age

# Linux commands stored in variables
host = $(hostname)
echo The hostname is $host
```

```
vboxuser@blockexplorer:~/demonstrate$ ./basics.sh
My name is Shubham and my age is 26
The hostname is blockexplorer
```

❑ How to take input from user

- In order to take input from user we use read command followed by variable name.

read <variable name>

```
#How to take value from the user  
echo What is your name?  
read name  
echo Hi $name welcome to the OS Lab
```

```
vboxuser@blockexplorer:~/demonstrate$ ./basics.sh  
My name is Shubham and my age is 26  
The hostname is blockexplorer  
What is your name?  
█
```

```
vboxuser@blockexplorer:~/demonstrate$ ./basics.sh  
My name is Shubham and my age is 26  
The hostname is blockexplorer  
What is your name?  
Shubham  
Hi Shubham welcome to the OS Lab
```


❑ If-else condition in Shell Scripting

```
#if-else condition in Shell script

echo Hi scholar
echo what is your degree?

read degree

if [ "$degree" == "M.Tech" ] || [ "$degree" == "Ph.D" ]; then
    echo "You are eligible to take 6th or 7th level course"
else
    echo "You are not eligible to take 6th or 7th level course"
fi
```

```
My name is Shubham and my age is 26
The hostname is blockexplorer
What is your name?
SHubham
Hi SHubham welcome to the OS Lab
Hi scholar
what is your degree?
Ph.D
You are eligible to take 6th or 7th level course
vboxuser@blockexplorer:~/demonstrate$ ./basics.sh
My name is Shubham and my age is 26
The hostname is blockexplorer
What is your name?
Shubham
Hi Shubham welcome to the OS Lab
Hi scholar
what is your degree?
B.Tech
You are not eligible to take 6th or 7th level course
vboxuser@blockexplorer:~/demonstrate$
```

❑ Types of Relational Operators in Shell script

| Operator | Notation |
|--------------------------|----------|
| Equal | -eq/== |
| Greater than or equal to | -ge |
| Less than or equal to | -le |
| Not equal | -ne/!= |
| Greater than | -gt |
| Less than | -lt |

❑ Switch case in Scripting

```
# Switch case statement in shell scripting

echo Press any option
echo 1=Show date
echo 2=List files in current directory
echo 3=Show current path

read choice

case $choice in
    1)date;;
    2)ls -ltr;;
    3)pwd;;
    *)echo Invalid Input
esac
```

```
Press any option
1=Show date
2=List files in current directory
3=Show current path
2
total 8
-rwxrw-r-- 1 vboxuser vboxuser 33 Aug 8 12:37 test_script.sh
-rw-rw-r-- 1 vboxuser vboxuser 0 Aug 8 13:24 basibs.sh
-rwxrw-r-- 1 vboxuser vboxuser 842 Aug 8 16:44 basics.sh
```

❑ Looping in Shell script

➤ for i in {start..end}
do
 echo Number is \$i
done

```
#looping in shell scripts  
for num in {1..10}  
do  
    echo Number is $num  
done
```

```
/home/vboxuser/demonstrate  
Number is 1  
Number is 2  
Number is 3  
Number is 4  
Number is 5  
Number is 6  
Number is 7  
Number is 8  
Number is 9  
Number is 10  
vboxuser@blockexplorer:~/demonstrate$
```

► While loop

```
#While loop in scripting
num=10
count=0
while [ $count -le $num ]
do
    echo The number is $count
    let count++
done
```

```
The number is 0
The number is 1
The number is 2
The number is 3
The number is 4
The number is 5
The number is 6
The number is 7
The number is 8
The number is 9
The number is 10
vboxuser@blockexplorer:~/demonstrate$
```

➤ Iterating through the items of a file

```
# how to iterate through the items of a file

filepath="/home/vboxuser/demonstrate/courses.txt"

for item in $(cat $filepath)
do
    echo The core subjects to be studied are $item
done
```

```
The core subjects to be studied are DataStructure
The core subjects to be studied are DBMS
The core subjects to be studied are Algorithms
The core subjects to be studied are DiscreteMathematics
The core subjects to be studied are ComputerNetworks
The core subjects to be studied are TOC
The core subjects to be studied are CompilerDesign
vboxuser@blockexplorer:~/demonstrate$
```

➤ How to take input as command line argument

```
# how to pass input as command line arguments

name=${1}
course=${2}

echo "MR. ${name} has enrolled for ${course} @ IIT Patna"

```

```
vboxuser@blockexplorer:~/demonstrate$ ./basics.sh
MR.  has enrolled for  @ IIT Patna
vboxuser@blockexplorer:~/demonstrate$
```

```
vboxuser@blockexplorer:~/demonstrate$ ./basics.sh Shubham Ph.D
My name is Shubham and my age is 26
MR. Shubham has enrolled for Ph.D @ IIT Patna
vboxuser@blockexplorer:~/demonstrate$
```

Thank You