

Linux Environment Lab 3

Table of Contents

| | |
|--|---|
| Objective | 2 |
| Prerequisites | 3 |
| Problem Statement | 3 |
| Summary | 3 |
| Fundamental concepts | 3 |
| Template for each step | 4 |
| Step-1: Create a Shell Script | 4 |
| Step-2 : Save and Execute Shell Script | 5 |
| Step-3 : Another way of executing script | 6 |
| Step-4 : Assignment | 6 |
| Step-5 : Solution | 6 |
| References | 9 |

1. Objective

Understanding the Linux Architecture, File System, Commands etc.

2. Prerequisites

| Prerequisites | Version |
|------------------|--------------------|
| Operating System | Linux (Any flavor) |

3. Problem Statement

To understand the basics of Shell Scripting and how we can use it to automate the repetitive tasks.

4. Summary

| Steps | Description |
|--------|---------------------------------------|
| Step 1 | Create a shell script |
| Step 2 | Save & execute a shell script |
| Step 3 | Another way of executing shell script |
| Step 4 | Assignment |
| Step 5 | Solution |

5. Fundamental Concepts

Shell Scripting

A shell script is a computer program designed to be run by the Unix shell, a command-line interpreter. Typical operations performed by shell scripts include file manipulation, program execution, and printing text. The commands and syntax of the shell script are the same as that entered at the command line. Because of this, there is no need to switch to a completely different syntax. It is much faster to write a code in shell script than in other programming languages

6. Template for each step

Step 1: Creating a Shell Script

- Create a file **hello.sh** using command **touch**

```

vlab@ubuntu: ~/shell
vlab@ubuntu:~/shell$ touch hello.sh
vlab@ubuntu:~/shell$ ls
hello.sh
vlab@ubuntu:~/shell$
  
```

- Open the **hello.sh** file in **nano** editor by executing below command and write the program given in below screenshot

```

GNU nano 4.8      hello.sh      Modified
#!/bin/bash

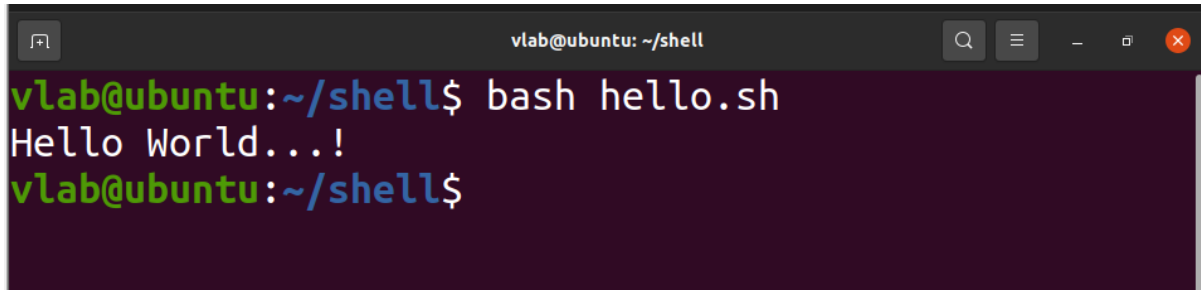
#Simple Hello World program

message='Hello World...!'

echo $message
  
```

Step 2: Execute the Script

- Save the file by pressing keys Ctrl + O then Ctrl + X to exit from the editor and, execute the file using command: `bash hello.sh`

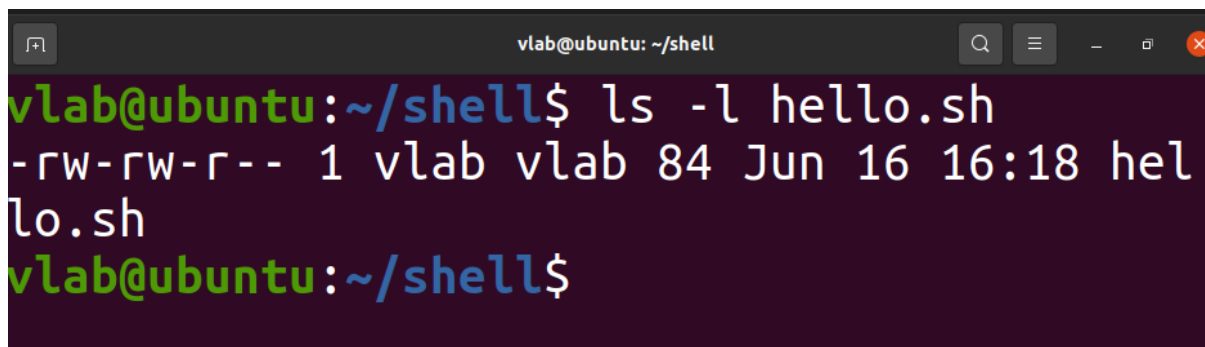


```

vlab@ubuntu: ~/shell
vlab@ubuntu:~/shell$ bash hello.sh
Hello World...!
vlab@ubuntu:~/shell$
  
```

Step 3: Another way of executing the script

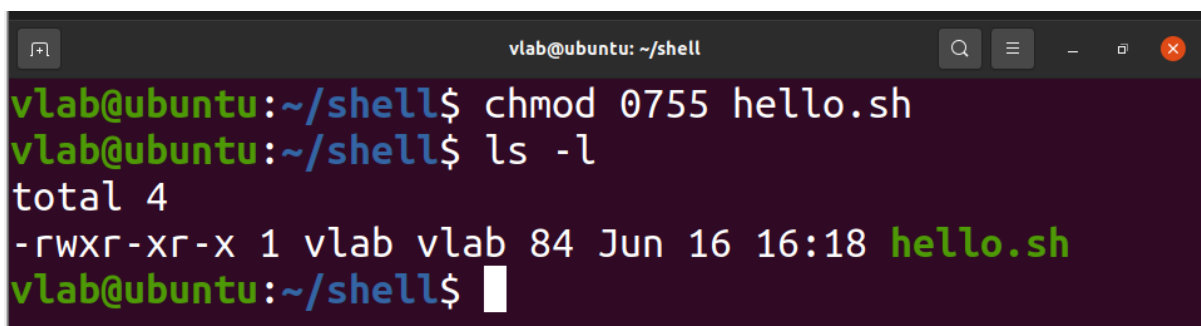
- Make the file executable. First, check the current file permissions using command `ls -l hello.sh`



```

vlab@ubuntu:~/shell$ ls -l hello.sh
-rw-rw-r-- 1 vlab vlab 84 Jun 16 16:18 hello.sh
vlab@ubuntu:~/shell$
  
```

- Now, we will give execute permission to all users for hello.sh file using command `chmod 0755 hello.sh` and then check the file permission using command `ls -l`



```

vlab@ubuntu:~/shell$ chmod 0755 hello.sh
vlab@ubuntu:~/shell$ ls -l
total 4
-rwxr-xr-x 1 vlab vlab 84 Jun 16 16:18 hello.sh
vlab@ubuntu:~/shell$
  
```

- Now, all users have a execute permission to file hello.sh, we will run the file by writing its name and location.

```
vlab@ubuntu: ~/shell
vlab@ubuntu:~/shell$ ./hello.sh
Hello World...!
vlab@ubuntu:~/shell$
```

Step 4: Assignment

Create a shell script which will print the below system information on the terminal like:

- Hostname
- File System disk space usage
- Free and used memory in the system
- System uptime and load
- All logged-in users

Hint: You can take a help of below commands. First execute each command on the terminal and see what each command is doing and later you can use it in the shell script.

- who, hostnamectl, echo, free, df -h, uptime

Step 5: Solution

- Create a file with name **sysinfo.sh** using **touch** command

```
vlab@ubuntu: ~/shell
vlab@ubuntu:~/shell$ touch sysinfo.sh
vlab@ubuntu:~/shell$ ls
sysinfo.sh
vlab@ubuntu:~/shell$
```

- Open the file using **nano** and copy and paste the below code in it.

```
#!/bin/bash
# Display Hostname information:
echo "[***** HOSTNAME INFORMATION *****]"
hostnamectl
echo ""
# Display File system disk space usage:
echo "[***** FILE SYSTEM DISK SPACE USAGE *****]"
df -h
echo ""
# Display Free and used memory in the system:
echo "[***** FREE AND USED MEMORY *****]"
free
echo ""
# Display the System uptime and load:
echo "[***** SYSTEM UPTIME AND LOAD *****]"
uptime
echo ""
# Display Logged-in users:
echo "[***** CURRENTLY LOGGED-IN USERS *****]"
who
echo ""
```

- Save the file by pressing key **Ctrl + O** and **Enter** and execute the script

```
vlab@ubuntu: ~/shell
vlab@ubuntu:~/shell$ bash sysinfo.sh
[***** HOSTNAME INFORMATION *****]
Static hostname: ubuntu
Icon name: computer-vm
Chassis: vm
Machine ID: 13eb36c16f9241d9b0098b4334a8e9ae
Boot ID: 03b314c3320b4ad8a8e6506e3c388cf0
Virtualization: vmware
Operating System: Ubuntu 20.04.2 LTS
Kernel: Linux 5.8.0-55-generic
Architecture: x86_64

[***** FILE SYSTEM DISK SPACE USAGE *****]
Filesystem      Size  Used Avail Use% Mounted on
udev            1.9G   0    1.9G   0% /dev
tmpfs           391M  2.1M  389M   1% /run
/dev/sda5       98G   42G   51G  46% /
tmpfs           2.0G   0    2.0G   0% /dev/shm
tmpfs           5.0M  4.0K   5.0M   1% /run/lock
tmpfs           2.0G   0    2.0G   0% /sys/fs/cgroup
/dev/loop2      56M   56M    0 100% /snap/core18/1997
/dev/loop0     100M  100M    0 100% /snap/core/11167
/dev/loop3     100M  100M    0 100% /snap/core/11187
/dev/loop4      56M   56M    0 100% /snap/core18/2066
/dev/loop5     208M  208M    0 100% /snap/code/65
/dev/loop6     167M  167M    0 100% /snap/signal-desktop/358
/dev/loop7      66M   66M    0 100% /snap/gtk-common-themes/1515
/dev/loop1     208M  208M    0 100% /snap/code/66
/dev/loop13     65M   65M    0 100% /snap/gtk-common-themes/1514
/dev/loop14     163M  163M    0 100% /snap/gnome-3-28-1804/145
/dev/loop15     409M  409M    0 100% /snap/pycharm-community/240
/dev/loop16     33M   33M    0 100% /snap/snapd/12057
/dev/loop17     219M  219M    0 100% /snap/gnome-3-34-1804/72
/dev/loop18     51M   51M    0 100% /snap/snap-store/542
/dev/sda1       511M   4.0K  511M   1% /boot/efi
overlay         98G   42G   51G  46% /var/lib/docker/overlay2/7946f432d88025e1bb316d1203d4d2f294c78c1306814106af67df3ed7b4d80/merged
overlay         98G   42G   51G  46% /var/lib/docker/overlay2/0367c3d12edc14b1bc16cb5cc1e8b759b9cb4bce5ed39b207076fbc704beab23/merged
tmpfs           391M   28K  391M   1% /run/user/1000

[***** FREE AND USED MEMORY *****]
              total        used          free        shared  buff/cache        availabl
Mem:         4000704        1560296        902988         15428        1537420        216307
Swap:         2097148              0        2097148

[***** SYSTEM UPTIME AND LOAD *****]
19:19:41 up 6:24, 1 user, load average: 0.11, 0.06, 0.01

[***** CURRENTLY LOGGED-IN USERS *****]
vlab      :0                2021-06-16 13:26 (:0)

vlab@ubuntu:~/shell$
```


7. References

- https://en.wikipedia.org/wiki/Shell_script