



# **Vidyavardhini's College of Engineering & Technology**

Department of Computer Engineering

Academic Year : 2023-24

## **Experiment no 3**

**Aim:** Write Shell Scripts to do the following:

1. Perform the basic arithmetic operations
2. Display top 10 processes in Ascending order.
3. Display processes with highest memory usage.
4. Display current logged in user and log name.
5. Display current shell, home directory, kernel version.

**Objective:** The shell is the operating system's command-line interface (CLI) and interpreter for the set of commands that are used to communicate with the system. A shell script is usually created for command sequences in which a user has a need to use repeatedly in order to save time.

**Theory:**

Shell is a user program or its environment is provided for user interaction. It is a command prompt within Linux where you can type commands. It is a program that takes your commands from the keyboard and gives them to the OS to perform. Shell is not part of system KERNAL but it uses system KERNAL to execute programs, create files, etc. A Shell Script is a text file that contains a sequence of commands for a UNIX based OS. It is called a Shell Script because it combines into a "Script" in a single file a sequence of commands, that would otherwise have to be presented to the system from a keyboard one at a time. A Shell Script is usually created for command sequences for which a user has a repeated need. You initiate the sequence of commands in Shell Script by simply entering the name of the Shell Script on a command line.

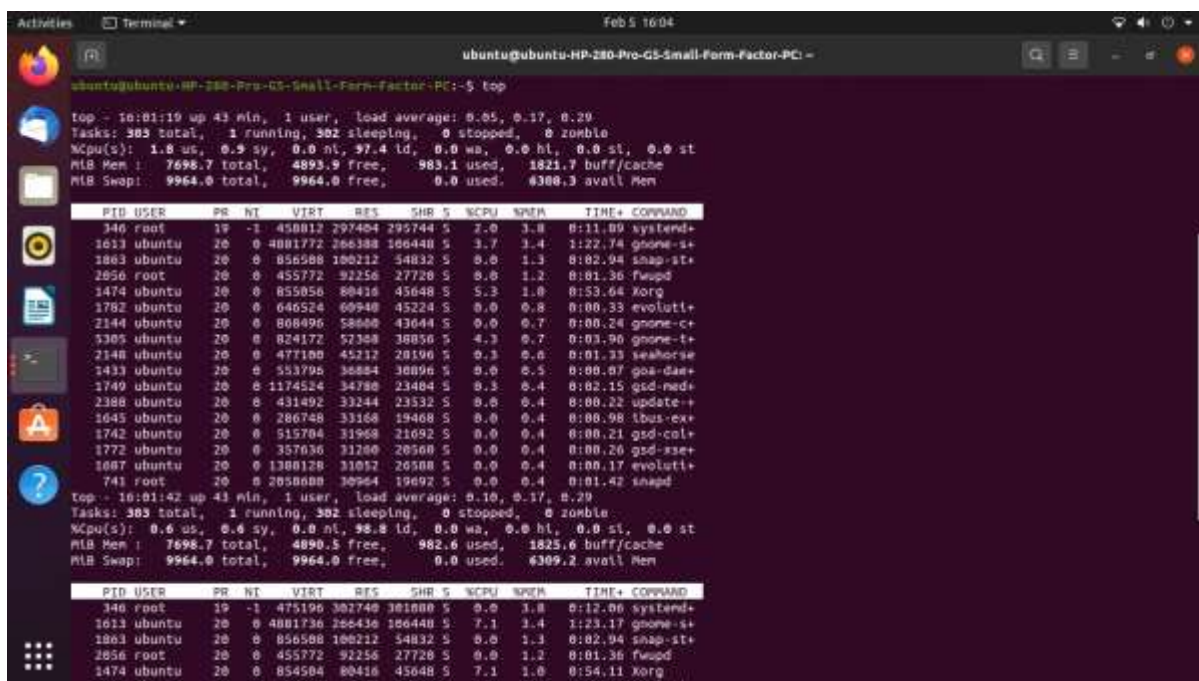
**Types of Shell Script :-**

1. sh - Simple Shell
2. bash - Bourne Again Shell

3. ksh - Korn Shell
4. csh - C Shell
5. ssh - Secure Shell

To use a particular Shell type the Shell name at the command prompt. Eg:- `$csh` - It will switch the current Shell to C Shell. To view the current Shell that is being used, type `echo $SHELL` at the command prompt.

### Output :



```
Activities Terminal Feb 5 16:04
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ top
top - 16:01:19 up 43 min, 1 user, load average: 0.05, 0.17, 0.29
Tasks: 303 total, 1 running, 302 sleeping, 0 stopped, 0 zombie
Cpu(s): 1.8 us, 0.9 sy, 0.0 ni, 97.4 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
Mem: 7696.7 total, 4893.9 free, 983.1 used, 1821.7 buff/cache
Mem Swap: 9964.0 total, 9964.0 free, 0.0 used, 6388.3 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     time+ COMMAND
 346 root        19   -1 458812 297404 295744 S    7.0   3.8   0:11.09 systemd-
1613 ubuntu    20    0 4881772 266388 166440 S    1.7   1.4   1:22.74 gnome-s-
1863 ubuntu    20    0 856588 100212 54832 S    0.0   1.3   0:02.04 snap-st-
2056 root      20    0 455772  92256 27720 S    0.0   1.2   0:01.36 fwupd
1474 ubuntu    20    0 855056  80416 45648 S    5.3   1.0   0:53.64 Xorg
1782 ubuntu    20    0 646524  60940 45224 S    0.0   0.8   0:00.33 evoluti-
2144 ubuntu    20    0 808496  58600 43644 S    0.0   0.7   0:00.24 gnome-cr-
5305 ubuntu    20    0 824172  52308 38856 S    4.3   0.7   0:03.90 gnome-t-
2148 ubuntu    20    0 477100  45212 28196 S    0.3   0.6   0:01.33 seahorse
1433 ubuntu    20    0 553796  36884 36896 S    0.0   0.5   0:00.07 goa-da-
1749 ubuntu    20    0 1174524 34780 23484 S    0.3   0.4   0:02.15 gsd-medi-
2388 ubuntu    20    0 431492  33244 23532 S    0.0   0.4   0:00.22 update-+
1645 ubuntu    20    0 286748  33168 19468 S    0.0   0.4   0:00.98ibus-ex-
1742 ubuntu    20    0 515704  31968 21692 S    0.0   0.4   0:00.21 gsd-col-
1772 ubuntu    20    0 357636  31200 20560 S    0.0   0.4   0:00.26 gsd-rse-
1687 ubuntu    20    0 1388128 31052 20588 S    0.0   0.4   0:00.17 evoluti-
 741 root      20    0 2058080 30964 19692 S    0.0   0.4   0:01.42 snapd

top - 16:01:42 up 43 min, 1 user, load average: 0.10, 0.17, 0.29
Tasks: 303 total, 1 running, 302 sleeping, 0 stopped, 0 zombie
Cpu(s): 0.6 us, 0.4 sy, 0.0 ni, 98.8 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
Mem: 7696.7 total, 4890.5 free, 982.6 used, 1825.6 buff/cache
Mem Swap: 9964.0 total, 9964.0 free, 0.0 used, 6389.2 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     time+ COMMAND
 346 root        19   -1 475196 302740 301880 S    0.0   3.8   0:12.06 systemd-
1613 ubuntu    20    0 4881736 266436 166440 S    7.1   1.4   1:23.17 gnome-s-
1863 ubuntu    20    0 856588 100212 54832 S    0.0   1.3   0:02.04 snap-st-
2056 root      20    0 455772  92256 27720 S    0.0   1.2   0:01.36 fwupd
1474 ubuntu    20    0 854504  80416 45648 S    7.1   1.0   0:54.11 Xorg
```

```
Activities Terminal Jan 31 15:06
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ sudo useradd captian
[sudo] password for ubuntu:
vSorry, try again.
[sudo] password for ubuntu:
Sorry, try again.
[sudo] password for ubuntu:
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ sudo passwd captian
New password:
Retype new password:
passwd: password updated successfully
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ sudo userdel captian
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ sudo group devs1
sudo: group: command not found
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ sudo group add devs1
sudo: group: command not found
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ sudo groupadd devs1
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ sudo useradd captian
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ sudo usermod -s /bin/bash captian
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ whoami
ubuntu
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,ubuntu
tty:x:5:syslog
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
nfsn:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
```

```
Activities Terminal Feb 5 16:04
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ expr 100 + 100
200
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ expr 100 - 100
0
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ expr 100 / 100
1
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ expr 100 \% 10
0
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ ps aux --sort=Mem | head -n 11
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         2  0.0  0.8      0     0 ?        S    15:18   0:00 [kthreadd]
root         3  0.0  0.8      0     0 ?        S    15:18   0:00 [rcu_gp]
root         4  0.0  0.8      0     0 ?        S    15:18   0:00 [rcu_par_gp]
root         6  0.0  0.8      0     0 ?        S    15:18   0:00 [kworker/0:0H-events_highpri]
root         7  0.0  0.8      0     0 ?        S    15:18   0:00 [kworker/0:1-pn]
root         9  0.0  0.8      0     0 ?        S    15:18   0:00 [mm_percpu_wq]
root        10  0.0  0.8      0     0 ?        S    15:18   0:00 [rcu_tasks_rude_]
root        11  0.0  0.8      0     0 ?        S    15:18   0:00 [rcu_tasks_trace]
root        12  0.0  0.8      0     0 ?        S    15:18   0:00 [ksftlrod/0]
root        13  0.1  0.8      0     0 ?        S    15:18   0:00 [rcu_sched]
ubuntu@ubuntu-HP-280-Pro-G5-Small-Form-Factor-PC: ~$ top
top - 16:01:19 up 43 min, 1 user, load average: 0.05, 0.17, 0.29
Tasks: 303 total, 1 running, 302 sleeping, 0 stopped, 0 zombie
CPU(s): 1.8 us, 0.9 sy, 0.0 ni, 97.4 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
Mem: 7698.7 total, 4893.9 free, 983.1 used, 1821.7 buff/cache
Mem Swap: 9964.0 total, 9964.0 free, 0.0 used, 4380.3 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM    TIME+  COMMAND
 340 root        0  -1 458812 297404 295744 S   2.0   3.8   0:11.89 systemd-
1613 ubuntu    20  0 4881772 266388 166448 S   3.7   3.4   1:22.74 gnome-s
1863 ubuntu    20  0 856508 100212 54832 S   0.0   1.3   0:02.94 snap-st
2856 root       0  0 455772  92256 27720 S   0.0   1.2   0:01.36 fupad
1474 ubuntu    20  0 855056  89416 45640 S   5.3   1.0   0:53.64 korg
1792 ubuntu    20  0 646524  60940 45224 S   0.0   0.8   0:08.53 evoluti
2144 ubuntu    20  0 868496  58608 43644 S   0.0   0.7   0:08.24 gnome-c
5305 ubuntu    20  0 824172  52368 38856 S   4.3   0.7   0:03.96 gnome-t
2140 ubuntu    20  0 477100  45212 28196 S   0.3   0.6   0:01.33 seahorse
```

```
Activities Terminal Feb 5 16:04
ubuntu@ubuntu-HP-Z88-Pro-G5-Small-Form-Factor-PC: ~$ top - 16:01:42 up 43 min, 1 user, load average: 0.18, 0.17, 0.29
Tasks: 303 total, 1 running, 302 sleeping, 0 stopped, 0 zombie
Cpu(s): 0.6 us, 0.6 sy, 0.0 ni, 98.8 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
Mem: 7698.7 total, 4890.5 free, 902.6 used, 1825.6 buff/cache
Mem Swap: 9964.0 total, 9964.0 free, 0.0 used, 6309.2 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR   S  %CPU  %MEM     TIME+ COMMAND
 346 root        19   -1 475196 302740 301088 S   0.0   3.8   0:12.06 systemd+
1613 ubuntu     20   0 4881736 266436 166448 S   7.1   3.4   1:23.17 gnome-s+
1863 ubuntu     20   0 856588 100212  54832 S   0.0   1.3   0:02.94 snap-st+
2056 root        20   0 455772  92256  27720 S   0.0   1.2   0:01.30 fuppd
1474 ubuntu     20   0 854504  80416  45648 S   7.1   1.0   0:54.11 Xorg
1782 ubuntu     20   0 646524  60940  45224 S   0.0   0.8   0:08.33 evoluti+
2144 ubuntu     20   0 868496  58660  43644 S   0.0   0.7   0:08.24 gnome-c+
5385 ubuntu     20   0 824172  52368  38856 S   0.6   0.7   0:04.30 gnome-t+
2148 ubuntu     20   0 477100  45112  28196 S   0.6   0.6   0:01.35 Seahorse
1433 ubuntu     20   0 553796  36884  38896 S   0.0   0.5   0:08.07 gdm-dae+
1749 ubuntu     20   0 1174524 34780  23404 S   0.0   0.4   0:02.18 gsd-ned+
2388 ubuntu     20   0 431492  33244  23532 S   0.0   0.4   0:08.22 update+
1645 ubuntu     20   0 286740  33168  19468 S   0.0   0.4   0:08.98ibus-ex+
1742 ubuntu     20   0 515784  31968  21692 S   0.0   0.4   0:08.21 gsd-col+
1772 ubuntu     20   0 357636  31260  20580 S   0.0   0.4   0:08.26 gsd-xse+
1687 ubuntu     20   0 1388128 31052  26580 S   0.0   0.4   0:08.17 evoluti+
 741 root        20   0 2058680 30964 19692 S   0.0   0.4   0:01.42 snapd

ubuntu@ubuntu-HP-Z88-Pro-G5-Small-Form-Factor-PC: ~$ who
ubuntu      10          2024-02-05 20:48 (:0)
ubuntu@ubuntu-HP-Z88-Pro-G5-Small-Form-Factor-PC: ~$ echo $SHELL
/bin/bash
ubuntu@ubuntu-HP-Z88-Pro-G5-Small-Form-Factor-PC: ~$ echo $HOME
/home/ubuntu
ubuntu@ubuntu-HP-Z88-Pro-G5-Small-Form-Factor-PC: ~$ uname -r
5.11.0-27-generic
ubuntu@ubuntu-HP-Z88-Pro-G5-Small-Form-Factor-PC: ~$
```

Conclusion: Comment on the advantages of using shell scripting in Linux.