Name: Meet Brijwani

Roll no: 14

Batch: S11

Experiment 2: Linux shell script

Aim:

 Write shell scripts to do the following:

a. Display OS version, release number, kernel version

b. Display top 10 processes in descending order

c. Display processes with highest memory usage.

d. Display current logged in user and log name.

 Display current shell, home directory, operating system type, current path setting, current working directory.

Theory:

A]

i) uname - r{username}
To show the OS version, release no. OS release version
ii) uname - v
Shows Kernel version (last when launched)
iii) uname - a
Shows all the details including OS used, PC and other details.
us - c + u - r → us - a

B]

i) ps-aux (i) sort : nk +41 tail
Sorts 10 processes in descending order. It shows logged in users, modes of memory & storage.
OR
ii) ps-aux | tail
Same as above
OR

iii) ps-aux | sort -nl+4 | tail - n15 (shows top 15 processes)
same with 15

C]

i) sudo apt install htop
shows date of processes with highest memory
ii) ps - eo pid, ppid, cmd, % mem, % cpu –sort =-% mem | head
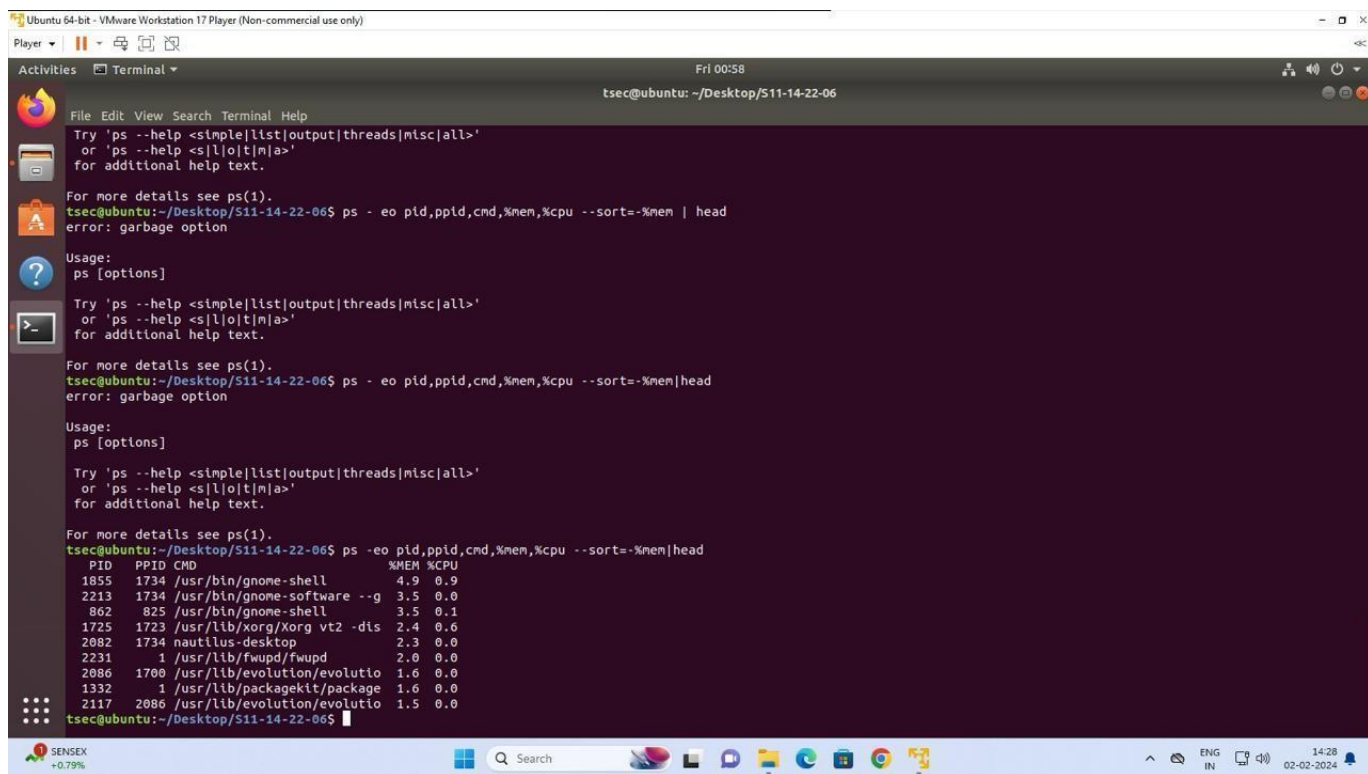same as above same as above

D]

i) ps-p$$
Shows process ID and current shell

ii) echo display home directory
echo $ home
To display home directory

Output:

File Edit View Search Terminal Help

```
tsec@ubuntu:~/Desktop/S11-14-22-06$ clear
tsec@ubuntu:~/Desktop/S11-14-22-06$ cat -> EnvironmentVar.sh
^C
tsec@ubuntu:~/Desktop/S11-14-22-06$ ls
EnvironmentVar.sh
tsec@ubuntu:~/Desktop/S11-14-22-06$ gedit EnvironmentVar.sh
tsec@ubuntu:~/Desktop/S11-14-22-06$ sh EnvironmentVar.sh
Path for the system is: /usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin
Display User ID as:
Display the parent ProCessID: 2381
Display the username:
Display the current directory: /home/tsec/Desktop/S11-14-22-06
Disk Usage
Free/Total disk:1.9G/1.9G
Top 10 processes in the system sorted by memory
MemTotal:        3994712 kB
MemFree:          748436 kB
MemAvailable:    2285584 kB
Buffers:          179988 kB
Cached:          1521068 kB
SwapCached:            0 kB
Active:          2059504 kB
Inactive:         556276 kB
Active(anon):     772768 kB
Inactive(anon):   162152 kB
Active(file):    1286736 kB
Inactive(file):   394124 kB
Unevictable:          16 kB
Mlocked:              16 kB
SwapTotal:        969960 kB
SwapFree:         968924 kB
Dirty:                72 kB
Writeback:             0 kB
AnonPages:        914460 kB
Mapped:           241224 kB
Shmem:             20352 kB
KReclaimable:     122292 kB
Slab:             209544 kB
SReclaimable:     122292 kB
SUnreclaim:        87252 kB
```

File Edit View Search Terminal Help

```
WritebackTmp:          0 kB
CommitLimit:     2967316 kB
Committed_AS:    4885052 kB
VmallocTotal:   34359738367 kB
VmallocUsed:       27652 kB
VmallocChunk:          0 kB
Percpu:            53760 kB
HardwareCorrupted:     0 kB
AnonHugePages:         0 kB
ShmemHugePages:        0 kB
ShmemPmdMapped:        0 kB
FileHugePages:         0 kB
FilePmdMapped:         0 kB
CmaTotal:              0 kB
CmaFree:               0 kB
HugePages_Total:       0
HugePages_Free:        0
HugePages_Rsvd:        0
HugePages_Surp:        0
Hugepagesize:       2048 kB
Hugetlb:               0 kB
DirectMap4k:      259904 kB
DirectMap2M:     3934208 kB
DirectMap1G:     2097152 kB
The OS version is:
NAME="Ubuntu"
VERSION="18.04.6 LTS (Bionic Beaver)"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 18.04.6 LTS"
VERSION_ID="18.04"
HOME_URL="https://www.ubuntu.com/"
SUPPORT_URL="https://help.ubuntu.com/"
BUG_REPORT_URL="https://bugs.launchpad.net/ubuntu/"
PRIVACY_POLICY_URL="https://www.ubuntu.com/legal/terms-and-policies/privacy-policy"
VERSION_CODENAME=bionic
UBUNTU_CODENAME=bionic
The Kernel version is:
Linux version 5.4.0-150-generic (buildd@bos03-amd64-012) (gcc version 7.5.0 (Ubuntu 7.5.0-3ubuntu1~18.04)) #167~18.04.1-Ubuntu SMP Wed May 24 00:51:42 UTC 2023
tsec@ubuntu:~/Desktop/S11-14-22-06$ gedit EnvironmentVar.sh
```

Terminal screenshot 1 (Fri 00:40):

```
tsec@ubuntu:~/Desktop/S11-14-22-06$ ps -aux | tail
tsec      4872  0.0  0.4 555972 19272 ?        Ssl  00:26   0:00 /usr/libexec/xdg-desktop-portal-gtk
root      5241  0.0  0.0      0     0 ?        I    00:27   0:00 [kworker/1:6-cgr]
root      5242  0.0  0.0      0     0 ?        I    00:27   0:00 [kworker/1:7-eve]
root      5295  0.0  0.0      0     0 ?        I    00:33   0:00 [kworker/u256:1-]
tsec      5298  0.3  1.2 961896 49100 ?        Sl   00:34   0:01 /usr/bin/nautilus --gapplication-service
root      5310  0.0  0.0      0     0 ?        I    00:34   0:00 [kworker/1:0-eve]
root      5317  0.0  0.0      0     0 ?        I    00:35   0:00 [kworker/1:1-cgr]
root      5318  0.0  0.0      0     0 ?        I    00:35   0:00 [kworker/1:2-cgr]
tsec      5349  0.0  0.0  39672  3704 pts/1    R+   00:38   0:00 ps -aux
tsec      5350  0.0  0.0   7516   856 pts/1    S+   00:38   0:00 tail
tsec@ubuntu:~/Desktop/S11-14-22-06$ sudo apt install htop
[sudo] password for tsec:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  fonts-liberation2 fonts-opensymbol gir1.2-gst-plugins-base-1.0 gir1.2-gstreamer-1.0 gir1.2-gudev-1.0 gir1.2-udisks-2.0 grilo-plugins-0.3-base gstreamer1.0-gtk3
  libboost-date-time1.65.1 libboost-filesystem1.65.1 libboost-iostreams1.65.1 libboost-locale1.65.1 libcdr-0.1-1 libclucene-contribs1v5 libclucene-core1v5
  libcmis-0.5-5v5 libcolamd2 libdazzle-1.0-0 libe-book-0.1-1 libedataserverui-1.2-2 libeot0 libepubgen-0.1-1 libetonyek-0.1-1 libevent-2.1-6 libexiv2-14
  libfreerdp-client2-2 libfreerdp2-2 libgc1c2 libgee-0.8-2 libgexiv2-2 libgom-1.0-0 libgpgmepp6 libgpod-common libgpod4 liblangtag-common liblangtag1 liblirc-client0
  liblua5.3-0 libmediaart-2.0-0 libmspub-0.1-1 libodfgen-0.1-1 libqqwing2v5 libraw16 librevenge-0.0-0 libsgutils2-2 libssh-4 libsuitesparseconfig5 libvncclient1
  libwinpr2-2 libxapian30 libxmlsec1-nss lp-solve media-player-info python3-mako python3-markupsafe syslinux syslinux-common syslinux-legacy usb-creator-common
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  htop
0 upgraded, 1 newly installed, 0 to remove and 49 not upgraded.
Need to get 80.0 kB of archives.
After this operation, 221 kB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 htop amd64 2.1.0-3 [80.0 kB]
Fetched 80.0 kB in 1s (135 kB/s)
Selecting previously unselected package htop.
(Reading database ... 151763 files and directories currently installed.)
Preparing to unpack .../htop_2.1.0-3_amd64.deb ...
Unpacking htop (2.1.0-3) ...
Setting up htop (2.1.0-3) ...
Processing triggers for desktop-file-utils (0.23-1ubuntu3.18.04.2) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for gnome-menus (3.13.3-11ubuntu1.1) ...
Processing triggers for mime-support (3.60ubuntu1) ...
```


Terminal screenshot 2 (Fri 00:48):

```
root      5295  0.0  0.0      0     0 ?        I    00:33   0:00 [kworker/u256:1-]
tsec      5298  0.3  1.2 961896 49100 ?        Sl   00:34   0:01 /usr/bin/nautilus --gapplication-service
root      5310  0.0  0.0      0     0 ?        I    00:34   0:00 [kworker/1:0-eve]
root      5317  0.0  0.0      0     0 ?        I    00:35   0:00 [kworker/1:1-cgr]
root      5318  0.0  0.0      0     0 ?        I    00:35   0:00 [kworker/1:2-cgr]
tsec      5349  0.0  0.0  39672  3704 pts/1    R+   00:38   0:00 ps -aux
tsec      5350  0.0  0.0   7516   856 pts/1    S+   00:38   0:00 tail
tsec@ubuntu:~/Desktop/S11-14-22-06$ sudo apt install htop
[sudo] password for tsec:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  fonts-liberation2 fonts-opensymbol gir1.2-gst-plugins-base-1.0 gir1.2-gstreamer-1.0 gir1.2-gudev-1.0 gir1.2-udisks-2.0 grilo-plugins-0.3-base gstreamer1.0-gtk3
  libboost-date-time1.65.1 libboost-filesystem1.65.1 libboost-iostreams1.65.1 libboost-locale1.65.1 libcdr-0.1-1 libclucene-contribs1v5 libclucene-core1v5
  libcmis-0.5-5v5 libcolamd2 libdazzle-1.0-0 libe-book-0.1-1 libedataserverui-1.2-2 libeot0 libepubgen-0.1-1 libetonyek-0.1-1 libevent-2.1-6 libexiv2-14
  libfreerdp-client2-2 libfreerdp2-2 libgc1c2 libgee-0.8-2 libgexiv2-2 libgom-1.0-0 libgpgmepp6 libgpod-common libgpod4 liblangtag-common liblangtag1 liblirc-client0
  liblua5.3-0 libmediaart-2.0-0 libmspub-0.1-1 libodfgen-0.1-1 libqqwing2v5 libraw16 librevenge-0.0-0 libsgutils2-2 libssh-4 libsuitesparseconfig5 libvncclient1
  libwinpr2-2 libxapian30 libxmlsec1-nss lp-solve media-player-info python3-mako python3-markupsafe syslinux syslinux-common syslinux-legacy usb-creator-common
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  htop
0 upgraded, 1 newly installed, 0 to remove and 49 not upgraded.
Need to get 80.0 kB of archives.
After this operation, 221 kB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 htop amd64 2.1.0-3 [80.0 kB]
Fetched 80.0 kB in 1s (135 kB/s)
Selecting previously unselected package htop.
(Reading database ... 151763 files and directories currently installed.)
Preparing to unpack .../htop_2.1.0-3_amd64.deb ...
Unpacking htop (2.1.0-3) ...
Setting up htop (2.1.0-3) ...
Processing triggers for desktop-file-utils (0.23-1ubuntu3.18.04.2) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for gnome-menus (3.13.3-11ubuntu1.1) ...
Processing triggers for mime-support (3.60ubuntu1) ...
tsec@ubuntu:~/Desktop/S11-14-22-06$ ps -p$$
  PID TTY          TIME CMD
 2381 pts/1    00:00:00 bash
tsec@ubuntu:~/Desktop/S11-14-22-06$ ps -eo pid, ppid, cmd, %mem, %cpu -sort =-%mem | head
```

Screenshot 1:

```
ps [options]

 Try 'ps --help <simple|list|output|threads|misc|all>'
  or 'ps --help <s|l|o|t|m|a>'
 for additional help text.

For more details see ps(1).
tsec@ubuntu:~/Desktop/S11-14-22-06$ ps -eo pid, ppid, cmd, %mem, %cpu -sort =-%mem | head
error: improper list

Usage:
 ps [options]

 Try 'ps --help <simple|list|output|threads|misc|all>'
  or 'ps --help <s|l|o|t|m|a>'
 for additional help text.

For more details see ps(1).
tsec@ubuntu:~/Desktop/S11-14-22-06$ uname -v
#167~18.04.1-Ubuntu SMP Wed May 24 00:51:42 UTC 2023
tsec@ubuntu:~/Desktop/S11-14-22-06$ uname -a
Linux ubuntu 5.4.0-150-generic #167~18.04.1-Ubuntu SMP Wed May 24 00:51:42 UTC 2023 x86_64 x86_64 x86_64 GNU/Linux
tsec@ubuntu:~/Desktop/S11-14-22-06$ name -r{username}

Command 'name' not found, did you mean:

  command 'mame' from snap mame (mame0261)
  command 'uname' from deb coreutils
  command 'mame' from deb mame
  command 'nvme' from deb nvme-cli
  command 'lame' from deb lame
  command 'namei' from deb util-linux
  command 'nam' from deb nam
  command 'nama' from deb nama
  command 'named' from deb bind9

See 'snap info <snapname>' for additional versions.

tsec@ubuntu:~/Desktop/S11-14-22-06$
```


Screenshot 2:

```
 Try 'ps --help <simple|list|output|threads|misc|all>'
  or 'ps --help <s|l|o|t|m|a>'
 for additional help text.

For more details see ps(1).
tsec@ubuntu:~/Desktop/S11-14-22-06$ ps -eo pid, ppid, cmd, %mem, %cpu -sort =-%mem | head
error: improper list

Usage:
 ps [options]

 Try 'ps --help <simple|list|output|threads|misc|all>'
  or 'ps --help <s|l|o|t|m|a>'
 for additional help text.

For more details see ps(1).
tsec@ubuntu:~/Desktop/S11-14-22-06$ uname -v
#167~18.04.1-Ubuntu SMP Wed May 24 00:51:42 UTC 2023
tsec@ubuntu:~/Desktop/S11-14-22-06$ uname -a
Linux ubuntu 5.4.0-150-generic #167~18.04.1-Ubuntu SMP Wed May 24 00:51:42 UTC 2023 x86_64 x86_64 x86_64 GNU/Linux
tsec@ubuntu:~/Desktop/S11-14-22-06$ name -r{username}

Command 'name' not found, did you mean:

  command 'mame' from snap mame (mame0261)
  command 'uname' from deb coreutils
  command 'mame' from deb mame
  command 'nvme' from deb nvme-cli
  command 'lame' from deb lame
  command 'namei' from deb util-linux
  command 'nam' from deb nam
  command 'nama' from deb nama
  command 'named' from deb bind9

See 'snap info <snapname>' for additional versions.

tsec@ubuntu:~/Desktop/S11-14-22-06$ uname -r
5.4.0-150-generic
tsec@ubuntu:~/Desktop/S11-14-22-06$
```

```
tsec@ubuntu:~/Desktop/S11-14-22-06$ ps -eo pid, ppid, cmd, %mem, %cpu -sort =-%mem | head
error: improper list

Usage:
 ps [options]

 Try 'ps --help <simple|list|output|threads|misc|all>'
  or 'ps --help <s|l|o|t|m|a>'
 for additional help text.

For more details see ps(1).
tsec@ubuntu:~/Desktop/S11-14-22-06$ uname -v
#167~18.04.1-Ubuntu SMP Wed May 24 00:51:42 UTC 2023
tsec@ubuntu:~/Desktop/S11-14-22-06$ uname -a
Linux ubuntu 5.4.0-150-generic #167~18.04.1-Ubuntu SMP Wed May 24 00:51:42 UTC 2023 x86_64 x86_64 x86_64 GNU/Linux
tsec@ubuntu:~/Desktop/S11-14-22-06$ name -r{username}

Command 'name' not found, did you mean:

  command 'mame' from snap mame (mame0261)
  command 'uname' from deb coreutils
  command 'mame' from deb mame
  command 'nvme' from deb nvme-cli
  command 'lame' from deb lame
  command 'namei' from deb util-linux
  command 'nam' from deb nam
  command 'nama' from deb nama
  command 'named' from deb bind9

See 'snap info <snapname>' for additional versions.

tsec@ubuntu:~/Desktop/S11-14-22-06$ uname -r
5.4.0-150-generic
tsec@ubuntu:~/Desktop/S11-14-22-06$ echo $ home
$ home
tsec@ubuntu:~/Desktop/S11-14-22-06$ echo $
$
tsec@ubuntu:~/Desktop/S11-14-22-06$
tsec@ubuntu:~/Desktop/S11-14-22-06$
```



```
 Try 'ps --help <simple|list|output|threads|misc|all>'
  or 'ps --help <s|l|o|t|m|a>'
 for additional help text.

For more details see ps(1).
tsec@ubuntu:~/Desktop/S11-14-22-06$ ps - eo pid,ppid,cmd,%mem,%cpu --sort=-%mem | head
error: garbage option

Usage:
 ps [options]

 Try 'ps --help <simple|list|output|threads|misc|all>'
  or 'ps --help <s|l|o|t|m|a>'
 for additional help text.

For more details see ps(1).
tsec@ubuntu:~/Desktop/S11-14-22-06$ ps - eo pid,ppid,cmd,%mem,%cpu --sort=-%mem|head
error: garbage option

Usage:
 ps [options]

 Try 'ps --help <simple|list|output|threads|misc|all>'
  or 'ps --help <s|l|o|t|m|a>'
 for additional help text.

For more details see ps(1).
tsec@ubuntu:~/Desktop/S11-14-22-06$ ps -eo pid,ppid,cmd,%mem,%cpu --sort=-%mem|head
  PID  PPID CMD                         %MEM %CPU
 1855  1734 /usr/bin/gnome-shell         4.9  0.9
 2213  1734 /usr/bin/gnome-software --g  3.5  0.0
  862   825 /usr/bin/gnome-shell         3.5  0.1
 1725  1723 /usr/lib/xorg/Xorg vt2 -dis  2.4  0.6
 2082  1734 nautilus-desktop             2.3  0.0
 2231     1 /usr/lib/fwupd/fwupd         2.0  0.0
 2086  1700 /usr/lib/evolution/evolutio  1.6  0.0
 1332     1 /usr/lib/packagekit/package  1.6  0.0
 2117  2086 /usr/lib/evolution/evolutio  1.5  0.0
tsec@ubuntu:~/Desktop/S11-14-22-06$
```

Conclusion: Thus, we have successfully studied and implemented shell scripting languages