

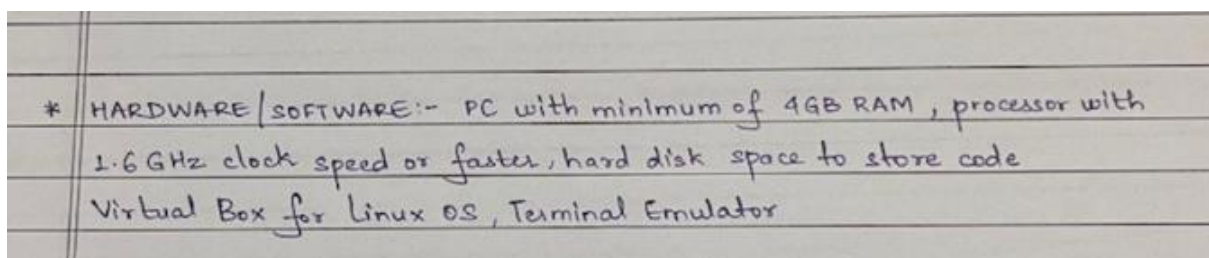
Name of Student: Vidhi Binwal		PRN 22070122249	
Semester: IV		Year AY 23-24	
Subject Title: Operating Systems Lab			
EXPERIMENT No: 10		Assignment No : 11	
TITLE: Shell Script for Process operations		DoP : 20/4/24	

Aim: Implement shell script to list the processes for the current shell, Display information about processes, Display the global priority of a process, change the priority of a process with default arguments.

Learning Outcomes:

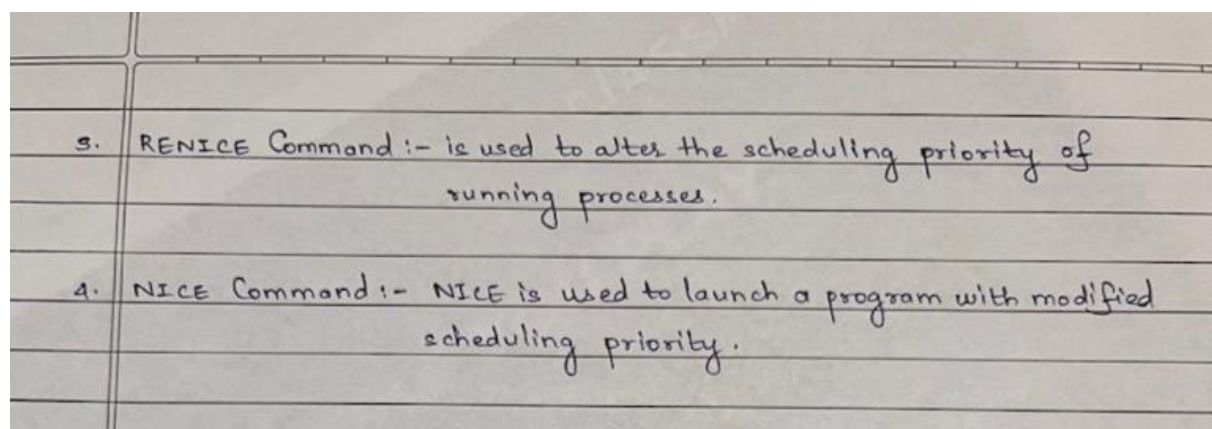
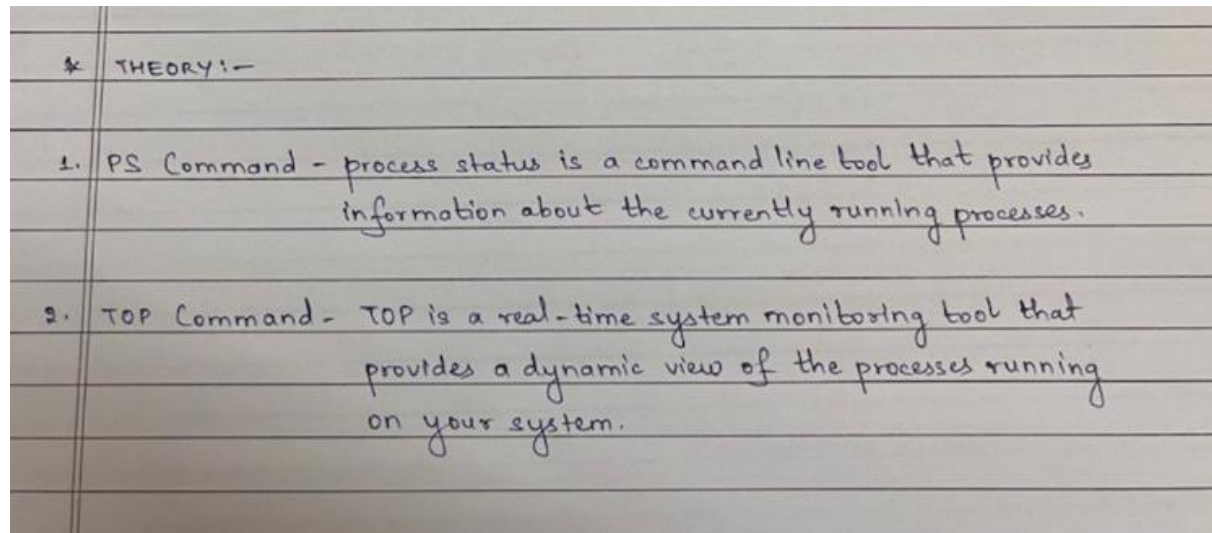
1. To understand Commands: PS, TOP, RENICE, NICE
2. To demonstrate shell script to implement above mentioned using Linux Commands

Hardware/Software:



* **HARDWARE/SOFTWARE:-** PC with minimum of 4GB RAM , processor with 1.6 GHz clock speed or faster, hard disk space to store code
Virtual Box for Linux OS , Terminal Emulator

Theory:



Algorithm:

```
#!/bin/bash
```

```
List_Processes() {  
    echo "List of all Processes:"  
    ps aux  
}
```

```
Processes_Info() {  
    read -p "Enter the PID of the process: " pid  
    if [[ -n "$pid" && "$pid" =~ ^[0-9]+$ ]]; then
```

```

        echo "Information about Process $pid:"
        ps -p "$pid" -o pid,cmd,%cpu,%mem
    else
        echo "Invalid PID. Please enter a valid numeric process ID."
    fi
}

Global_Priority() {
    read -p "Enter PID of process: " pid
    if [[ -n "$pid" && "$pid" =~ ^[0-9]+$ ]]; then
        priority=$(ps -p "$pid" -o pri=)
        echo "Global priority of process $pid: $priority"
    else
        echo "Invalid PID. Please enter a valid numeric process ID."
    fi
}

Change_Priority() {
    read -p "Enter the PID of the process: " pid
    read -p "Enter new Priority (-20 to 19): " priority
    if [[ "$priority" -ge -20 && "$priority" -le 19 ]]; then
        renice "$priority" -p "$pid" 2>/dev/null
        if [[ $? -eq 0 ]]; then
            echo "Priority of process $pid changed to $priority."
        else
            echo "Error: Failed to change process priority."
        fi
    else
        echo "Invalid priority. Please enter a value between -20 and 19."
    fi
}

while true; do

```

```
echo "1. List Processes"
echo "2. Process Info"
echo "3. Global Priority"
echo "4. Change Priority"
echo "5. EXIT"
read -p "Choose an option (1-5): " choice
case $choice in
    1) List_Processes ;;
    2) Processes_Info ;;
    3) Global_Priority ;;
    4) Change_Priority ;;
    5) echo "Exiting..."; exit ;;
    *) echo "Invalid choice. Please enter a number between 1 and 5." ;;
esac
done
```

Program:

```
1#!/bin/bash
2
3List_Processes() {
4    echo "List of all Processes:"
5    ps aux
6}
7
8Processes_Info() {
9    read -p "Enter the PID of the process: " pid
10
11    if [[ -n "$pid" && "$pid" =~ ^[0-9]+$ ]]; then
12        echo "Information about Process $pid:"
13        ps -p "$pid" -l
14    else
15        echo "Invalid PID. Please enter a valid numeric process ID."
16    fi
17}
18
19Global_Priority() {
20    read -p "Enter PID of process: " pid
21    if [[ -n "$pid" && "$pid" =~ ^[0-9]+$ ]]; then
22        priority=$(ps -p "$pid" -o pri= -r | tr -d '\n')
23        echo "Global priority of process $pid: $priority"
24    else
25        echo "Invalid PID. Please enter a valid numeric process ID."
26    fi
27}
28
29Change_Priority() {
30    read -p "Enter the PID of the process: " pid
31    read -p "Enter new Priority (-20 to 19): " priority
32}
```

```

33 if [[ "$priority" -ge -20 && "$priority" -le 19 ]]; then
34     renice "$priority" "$pid" 2>/dev/null
35     if [[ $? -eq 0 ]]; then
36         echo "Priority of process $pid changed to $priority."
37     else
38         echo "Error: Failed to change process priority."
39     fi
40 else
41     echo "Invalid priority. Please enter a value between -20 and 19."
42 fi
43 }
44
45 while true; do
46     echo "1. List Processes"
47     echo "2. Process Info"
48     echo "3. Global Priority"
49     echo "4. Change Priority"
50     echo "5. EXIT"
51     read -p "Choose an option (1-5): " choice
52
53     case $choice in
54         1) List_Processes ;;
55         2) Processes_Info ;;
56         3) Global_Priority ;;
57         4) Change_Priority ;;
58         5) echo "Exiting..."; exit ;;
59         *) echo "Invalid choice. Please enter a number between 1 and 5." ;;
60     esac
61 done

```



```

1 list_processes() {
2     echo " list all processes"
3     ps
4 }
5
6 processes_info() {
7     read *p " Enter the PID of the process : " pid
8     echo " information abt process $pid :"
9     ps *p $pid
10 }
11 global_prio() {
12     read *p " Enter PID of process:" pid
13     echo " Global priority $pid:"
14     ps *p pri.pid *p $pid
15 }
16 change_priority() {
17     read *p " enter the PID of process " pid
18     read *p " enter new priority " priority
19     priority=$((priority:-10))
20     renice $priority *p $pid
21     echo " priority is $pid changed to $priority "
22 }
23

```



```

24 while true: do
25 echo "1 List process"
26 echo " 2. Process info "
27 echo " 3. Global priority"
28 echo "4. change priority (default :10)"
29 echo "5. exit"
30 read *p " choose an option (1-5)" choice
31 case $choice in
32 1) list_processes ::
33 2) process_info ::
34 3) global_priority ::
35 4) change_priority ::
36 5) echo "exiting " : exit ::
37 case
38 done
39 chmod +x process_manager.sh
40 chmod

```

Output:

```

1. List Processes
2. Process Info
3. Global Priority
4. Change Priority
5. EXIT
Choose an option (1-5): 1
List of all Processes:

```

USER	PID	%CPU	%MEM	VSZ	RSS	TTY	STAT	START	TIME	COMMAND
root	1	3.9	0.1	166768	11832	?	Ss	20:57	0:05	/sbin/init auto noprompt splash
root	2	0.0	0.0	0	0	?	S	20:57	0:00	[kthreadd]
root	3	0.0	0.0	0	0	?	I<	20:57	0:00	[rcu_gp]
root	4	0.0	0.0	0	0	?	I<	20:57	0:00	[rcu_par_gp]
root	5	0.0	0.0	0	0	?	I<	20:57	0:00	[slub_flushwq]
root	6	0.0	0.0	0	0	?	I<	20:57	0:00	[netns]
root	7	0.0	0.0	0	0	?	I	20:57	0:00	[kworker/0:0-events]
root	8	0.0	0.0	0	0	?	I<	20:57	0:00	[kworker/0:0H-ttm]
root	9	0.0	0.0	0	0	?	I	20:57	0:00	[kworker/0:1-cgroup_destroy]
root	10	2.7	0.0	0	0	?	I	20:57	0:03	[kworker/u256:0-events_unbound]
root	11	0.0	0.0	0	0	?	I<	20:57	0:00	[mm_percpu_wq]
root	12	0.0	0.0	0	0	?	I	20:57	0:00	[rcu_tasks_kthread]
root	13	0.0	0.0	0	0	?	I	20:57	0:00	[rcu_tasks_rude_kthread]
root	14	0.0	0.0	0	0	?	I	20:57	0:00	[rcu_tasks_trace_kthread]
root	15	0.1	0.0	0	0	?	S	20:57	0:00	[ksoftirqd/0]
root	16	0.4	0.0	0	0	?	I	20:57	0:00	[rcu_preempt]
root	17	0.0	0.0	0	0	?	S	20:57	0:00	[migration/0]
root	18	0.0	0.0	0	0	?	S	20:57	0:00	[idle_inject/0]
root	19	0.0	0.0	0	0	?	S	20:57	0:00	[cpuhp/0]
root	20	0.0	0.0	0	0	?	S	20:57	0:00	[cpuhp/1]
root	21	0.0	0.0	0	0	?	S	20:57	0:00	[idle_inject/1]
root	22	1.8	0.0	0	0	?	S	20:57	0:02	[migration/1]
root	23	0.1	0.0	0	0	?	S	20:57	0:00	[ksoftirqd/1]
root	24	0.0	0.0	0	0	?	I	20:57	0:00	[kworker/1:0-events]
root	25	0.0	0.0	0	0	?	I<	20:57	0:00	[kworker/1:0H-kblockd]
root	26	0.0	0.0	0	0	?	S	20:57	0:00	[kdevtmpfs]
root	27	0.0	0.0	0	0	?	I<	20:57	0:00	[inet_frag_wq]
root	28	0.0	0.0	0	0	?	I	20:57	0:00	[kworker/u256:1-events_unbound]
root	29	0.0	0.0	0	0	?	S	20:57	0:00	[kauditd]
root	30	0.0	0.0	0	0	?	I	20:57	0:00	[kworker/0:2-cgroup_destroy]
root	31	0.0	0.0	0	0	?	S	20:57	0:00	[khungtaskd]

```
1. List Processes
2. Process Info
3. Global Priority
4. Change Priority
5. EXIT
Choose an option (1-5): 2
Enter the PID of the process: 10
Information about Process 10:
  PID TTY      STAT   TIME COMMAND
    1 ?        Ss      0:05 /sbin/init auto noprompt splash
   10 ?        I       0:03 [kworker/u256:0-events_unbound]
1. List Processes
2. Process Info
3. Global Priority
4. Change Priority
5. EXIT
Choose an option (1-5): 3
Enter PID of process: 9
Global priority of process 9:
1. List Processes
2. Process Info
3. Global Priority
4. Change Priority
5. EXIT
Choose an option (1-5): 4
Enter the PID of the process: 10
Enter new Priority (-20 to 19): 10
Error: Failed to change process priority.
1. List Processes
2. Process Info
3. Global Priority
4. Change Priority
5. EXIT
Choose an option (1-5): 5
Exiting...
```


Conclusion:

* CONCLUSION:-

After executing all the given shell command, we got familiar with the use of Linux terminal for accessing and using various files, documents etc.