Day -2 LSP Assignment (**TASK-1**)

A. Basics into Vim : *Modes in Vim*

- **Normal mode**: This is the default mode for navigation and executing commands. Press Esc to switch to normal mode.
- **Insert mode**: This is for inserting text. Press i from normal mode to switch to insert mode.
- **Visual mode**: This is for selecting text. Press v from normal mode to enter visual mode.
- **Command-line mode**: This is for executing commands. Press : from normal mode to enter command-line mode.

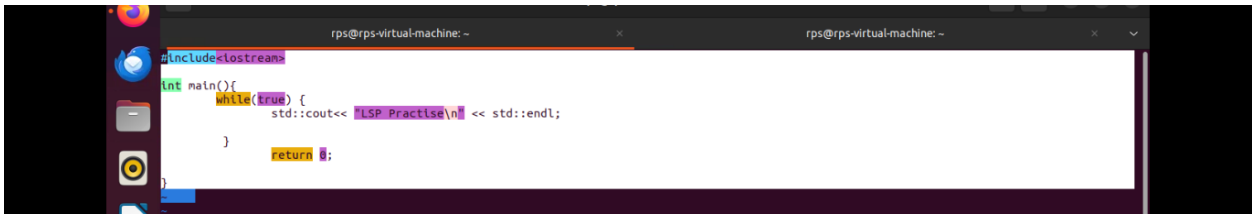
Basic Editing Commands

1. **Entering Insert Mode**
    - i: Insert before the cursor.
    - I: Insert at the beginning of the line.
    - a: Append after the cursor.
    - A: Append at the end of the line.
    - o: Open a new line below the current line and enter insert mode.
    - O: Open a new line above the current line and enter insert mode.
2. **Exiting Insert Mode**
    - Press Esc to return to normal mode.
3. **Navigating in Normal Mode**
    - h: Move left.
    - j: Move down.
    - k: Move up.
    - l: Move right.
    - w: Move to the beginning of the next word.
    - b: Move to the beginning of the previous word.
    - 0: Move to the beginning of the line.
    - $: Move to the end of the line.
4. **Editing Text**
    - x: Delete the character under the cursor.
    - dd: Delete the current line.
    - dw: Delete from the cursor to the end of the word.
    - D: Delete from the cursor to the end of the line.
    - u: Undo the last action.
    - Ctrl+r: Redo the last undone action.
5. **Copying and Pasting**
    - yy: Yank (copy) the current line.
    - yw: Yank from the cursor to the end of the word.
    - p: Paste after the cursor.
    - P: Paste before the cursor.
6. **Replacing Text**

- r: Replace the character under the cursor with another character. Press r followed by the replacement character.
- R: Enter replace mode. Type the new text to overwrite the existing text until you press Esc.

Example Workflow

1. **Open a file in Vim**: vim filename
2. **Enter insert mode**: Press i to start editing.
3. **Type your text**.
4. **Exit insert mode**: Press Esc.
5. **Save changes**: Type :w and press Enter.
6. **Exit Vim**: Type :q and press Enter.

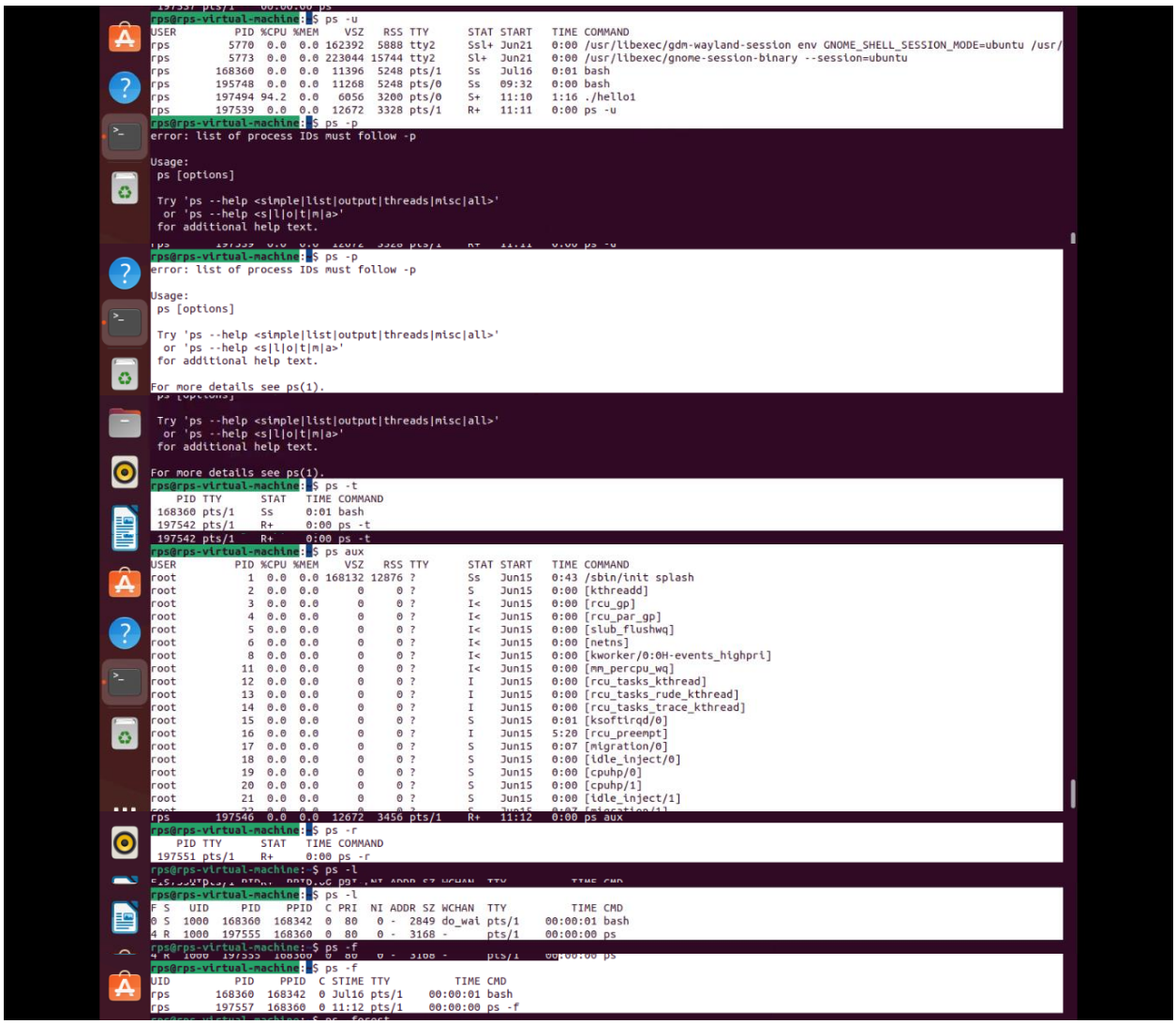


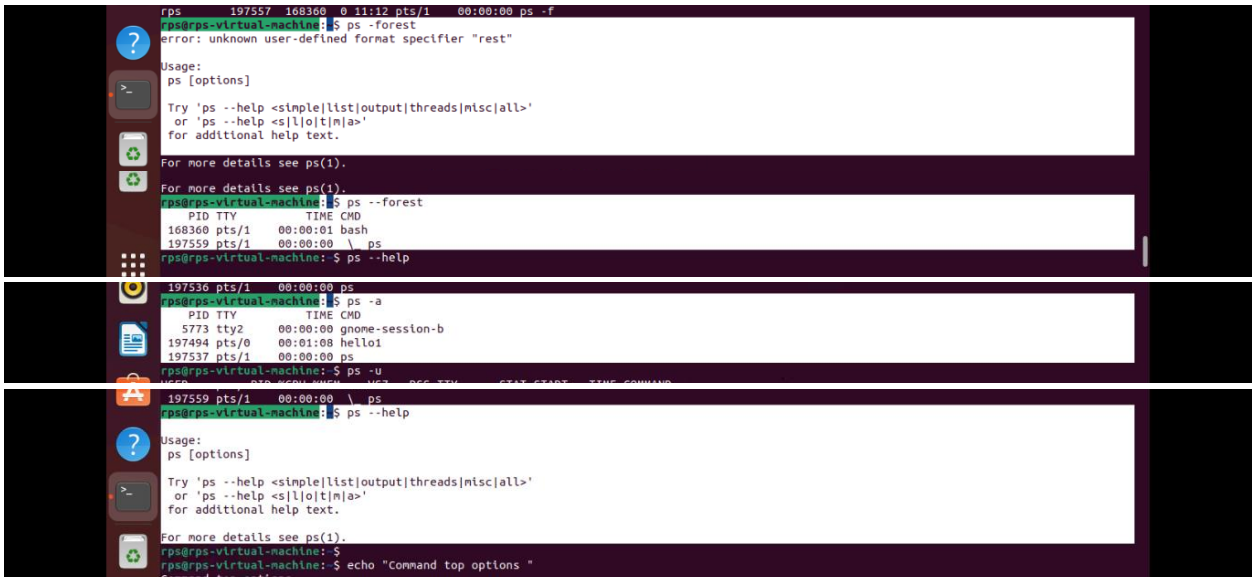
B. Process Management using ps, top and kill commands.

1. ps command

Basic ps Command Options	
Option	**Description**
ps	Display processes
ps -e, -A	All processes
ps -f	Full-format listing
ps -l	Long format
ps -u user	Processes by user

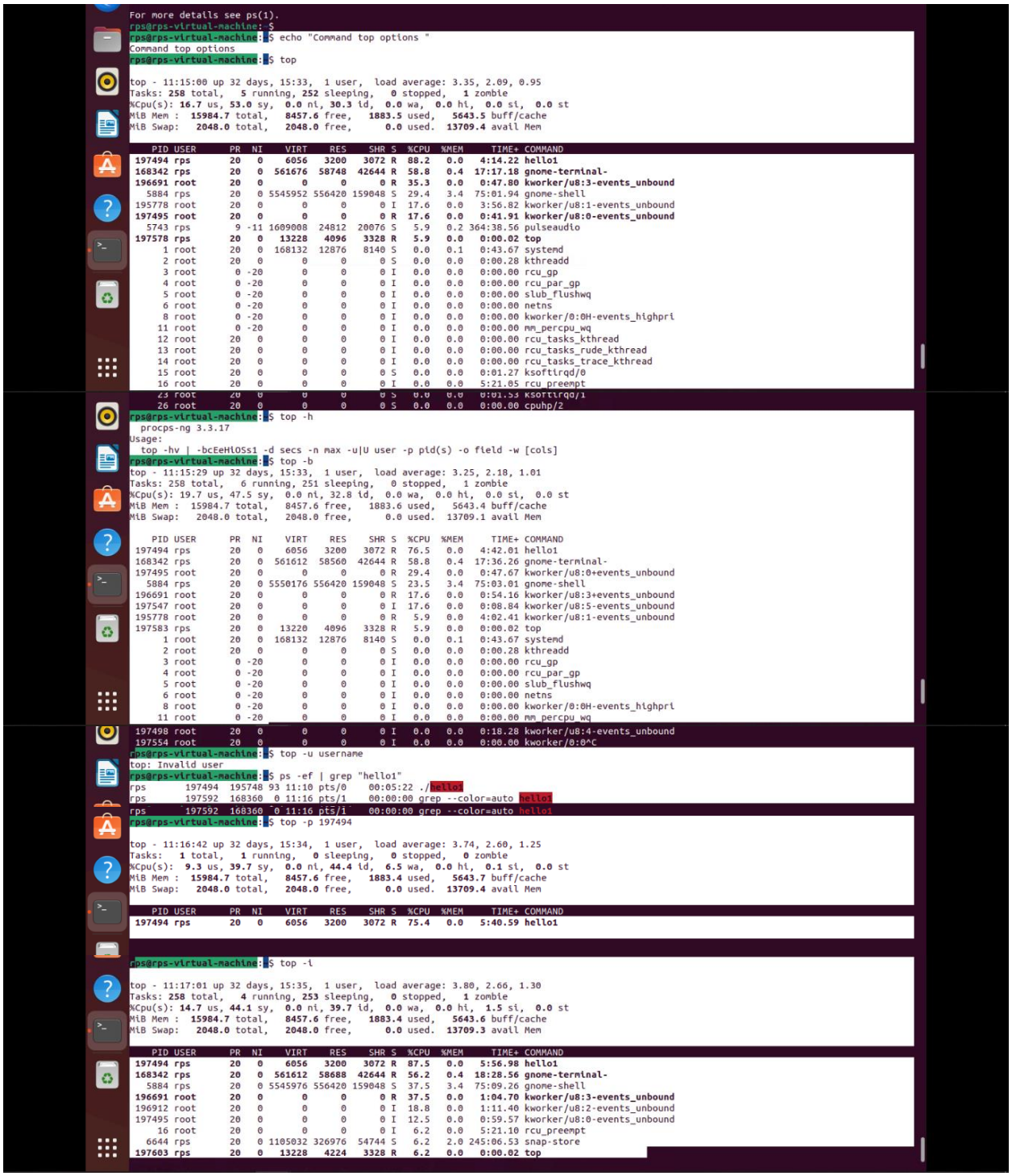
ps -p pid	Specific process by PID
ps -t tty	Processes by terminal

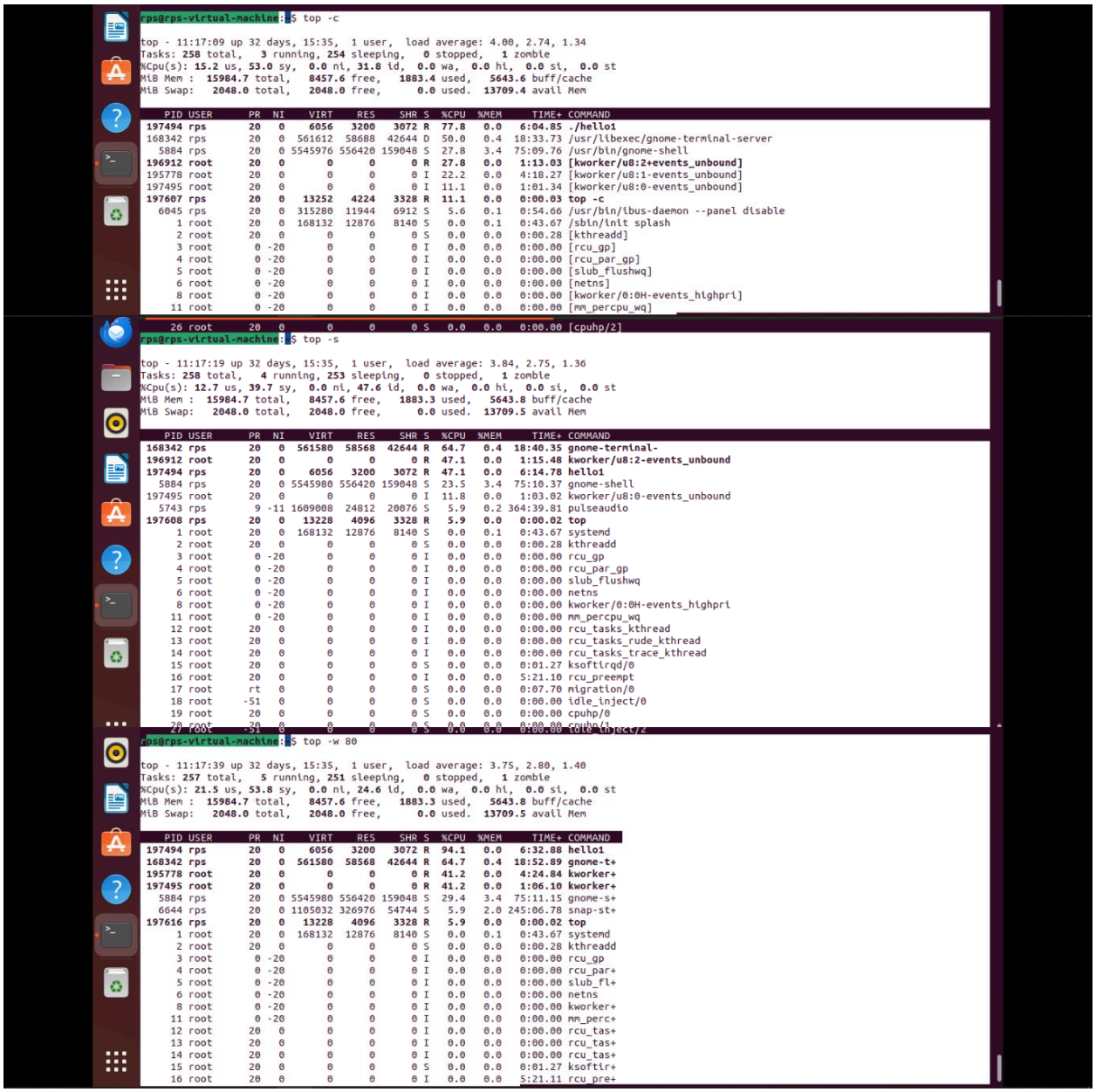




2. top command

top Basic Commands	
Command	**Description**
h or ?	Display help
k or PID	Kill a process
r	Renice a proces
u <username>	Display processes for a specific user
P	Sort by CPU usage
M	Sort by memory usage
T	Sort by time/cumulative time
f	Show fields or column management
o	Change field order
1	Toggle SMP view
c	Toggle command line/program name display
q	Quit top

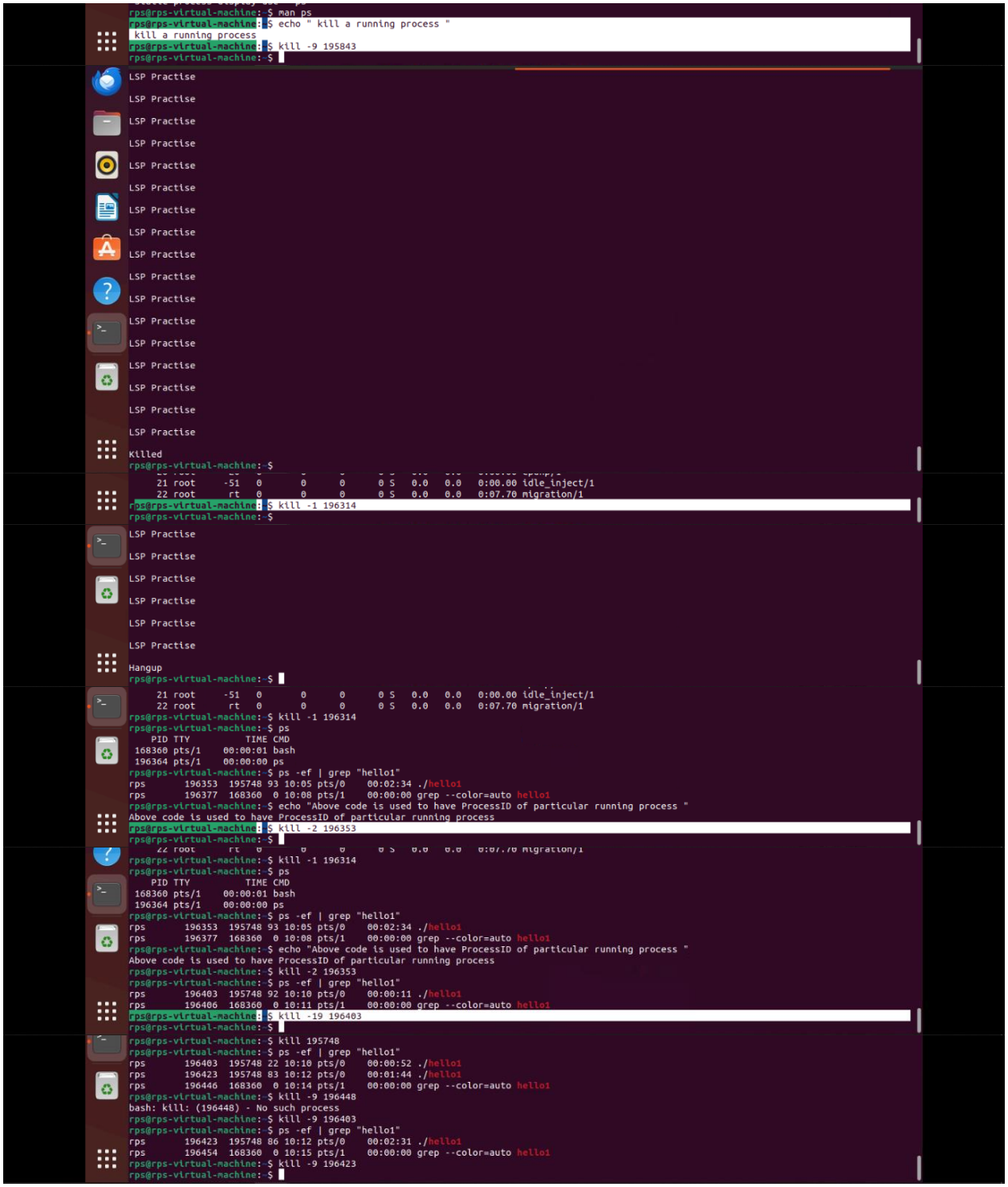

For more details see ps(1).
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ echo "Command top options "
Command top options
rps@rps-virtual-machine:~$ top
top - 11:15:00 up 32 days, 15:33, 1 user, load average: 3.35, 2.09, 0.95
Tasks: 258 total, 5 running, 252 sleeping, 0 stopped, 1 zombie
%Cpu(s): 16.7 us, 53.0 sy, 0.0 ni, 30.3 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 15984.7 total, 8457.6 free, 1883.5 used, 5643.5 buff/cache
MiB Swap: 2048.0 total, 2048.0 free, 0.0 used. 13709.4 avail Mem
PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
197494 rps 20 0 6056 3200 3072 R 88.2 0.0 4:14.22 hello1
168342 rps 20 0 561676 58748 42644 R 58.8 0.4 17:17.18 gnome-terminal-
196691 root 20 0 0 0 0 R 35.3 0.0 0:47.80 kworker/u8:3-events_unbound
5884 rps 20 0 5545952 556420 159048 S 29.4 3.4 75:01.94 gnome-shell
195778 root 20 0 0 0 0 I 17.6 0.0 3:56.82 kworker/u8:1-events_unbound
197495 root 20 0 0 0 0 R 17.6 0.0 0:41.91 kworker/u8:0-events_unbound
5743 rps 9 -11 1609008 24812 20076 S 5.9 0.2 364:38.56 pulseaudio
197578 rps 20 0 13228 4096 3328 R 5.9 0.0 0:00.02 top
1 root 20 0 168132 12876 8140 S 0.0 0.1 0:43.67 systemd
2 root 20 0 0 0 0 S 0.0 0.0 0:00.28 kthreadd
3 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 rcu_gp
4 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 rcu_par_gp
5 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 slub_flushwq
6 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 netns
8 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker/0:0H-events_highpri
11 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 mm_percpu_wq
12 root 20 0 0 0 0 I 0.0 0.0 0:00.00 rcu_tasks_kthread
13 root 20 0 0 0 0 I 0.0 0.0 0:00.00 rcu_tasks_rude_kthread
14 root 20 0 0 0 0 I 0.0 0.0 0:00.00 rcu_tasks_trace_kthread
15 root 20 0 0 0 0 S 0.0 0.0 0:01.27 ksoftirqd/0
16 root 20 0 0 0 0 I 0.0 0.0 5:21.05 rcu_preempt
23 root 20 0 0 0 0 S 0.0 0.0 0:01.53 ksoftirqd/1
26 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/2
rps@rps-virtual-machine:~$ top -h
procps-ng 3.3.17
Usage:
top -hv | -bcEeHlOSs1 -d secs -n max -u|U user -p pid(s) -o field -w [cols]
rps@rps-virtual-machine:~$ top -b
top - 11:15:29 up 32 days, 15:33, 1 user, load average: 3.25, 2.18, 1.01
Tasks: 258 total, 6 running, 251 sleeping, 0 stopped, 1 zombie
%Cpu(s): 19.7 us, 47.5 sy, 0.0 ni, 32.8 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 15984.7 total, 8457.6 free, 1883.6 used, 5643.4 buff/cache
MiB Swap: 2048.0 total, 2048.0 free, 0.0 used. 13709.1 avail Mem
PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
197494 rps 20 0 6056 3200 3072 R 76.5 0.0 4:42.01 hello1
168342 rps 20 0 561612 58560 42644 R 58.8 0.4 17:36.26 gnome-terminal-
197495 root 20 0 0 0 0 R 29.4 0.0 0:47.67 kworker/u8:0+events_unbound
5884 rps 20 0 5550176 556420 159048 S 23.5 3.4 75:03.01 gnome-shell
196691 root 20 0 0 0 0 R 17.6 0.0 0:54.16 kworker/u8:3+events_unbound
197547 root 20 0 0 0 0 I 17.6 0.0 0:08.84 kworker/u8:5-events_unbound
195778 root 20 0 0 0 0 R 5.9 0.0 4:02.41 kworker/u8:1-events_unbound
197583 rps 20 0 13220 4096 3328 R 5.9 0.0 0:00.02 top
1 root 20 0 168132 12876 8140 S 0.0 0.1 0:43.67 systemd
2 root 20 0 0 0 0 S 0.0 0.0 0:00.28 kthreadd
3 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 rcu_gp
4 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 rcu_par_gp
5 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 slub_flushwq
6 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 netns
8 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker/0:0H-events_highpri
11 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 mm_percpu_wq
197498 root 20 0 0 0 0 I 0.0 0.0 0:18.28 kworker/u8:4-events_unbound
197554 root 20 0 0 0 0 I 0.0 0.0 0:00.00 kworker/0:0^C
rps@rps-virtual-machine:~$ top -u username
top: Invalid user
rps@rps-virtual-machine:~$ ps -ef | grep "hello1"
rps 197494 195748 93 11:10 pts/0 00:05:22 ./hello1
rps 197592 168360 0 11:16 pts/1 00:00:00 grep --color=auto hello1
rps 197592 168360 0 11:16 pts/1 00:00:00 grep --color=auto hello1
rps@rps-virtual-machine:~$ top -p 197494
top - 11:16:42 up 32 days, 15:34, 1 user, load average: 3.74, 2.60, 1.25
Tasks: 1 total, 1 running, 0 sleeping, 0 stopped, 0 zombie
%Cpu(s): 9.3 us, 39.7 sy, 0.0 ni, 44.4 id, 6.5 wa, 0.0 hi, 0.1 si, 0.0 st
MiB Mem : 15984.7 total, 8457.6 free, 1883.4 used, 5643.7 buff/cache
MiB Swap: 2048.0 total, 2048.0 free, 0.0 used. 13709.4 avail Mem
PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
197494 rps 20 0 6056 3200 3072 R 75.4 0.0 5:40.59 hello1
rps@rps-virtual-machine:~$ top -i
top - 11:17:01 up 32 days, 15:35, 1 user, load average: 3.80, 2.66, 1.30
Tasks: 258 total, 4 running, 253 sleeping, 0 stopped, 1 zombie
%Cpu(s): 14.7 us, 44.1 sy, 0.0 ni, 39.7 id, 0.0 wa, 0.0 hi, 1.5 si, 0.0 st
MiB Mem : 15984.7 total, 8457.6 free, 1883.4 used, 5643.6 buff/cache
MiB Swap: 2048.0 total, 2048.0 free, 0.0 used. 13709.3 avail Mem
PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
197494 rps 20 0 6056 3200 3072 R 87.5 0.0 5:56.98 hello1
168342 rps 20 0 561612 58688 42644 R 56.2 0.4 18:28.56 gnome-terminal-
5884 rps 20 0 5545976 556420 159048 S 37.5 3.4 75:09.26 gnome-shell
196691 root 20 0 0 0 0 R 37.5 0.0 1:04.70 kworker/u8:3-events_unbound
196912 root 20 0 0 0 0 I 18.8 0.0 1:11.40 kworker/u8:2-events_unbound
197495 root 20 0 0 0 0 I 12.5 0.0 0:59.57 kworker/u8:0-events_unbound
16 root 20 0 0 0 0 I 6.2 0.0 5:21.10 rcu_preempt
6644 rps 20 0 1105032 326976 54744 S 6.2 2.0 245:06.53 snap-store
197603 rps 20 0 13228 4224 3328 R 6.2 0.0 0:00.02 top

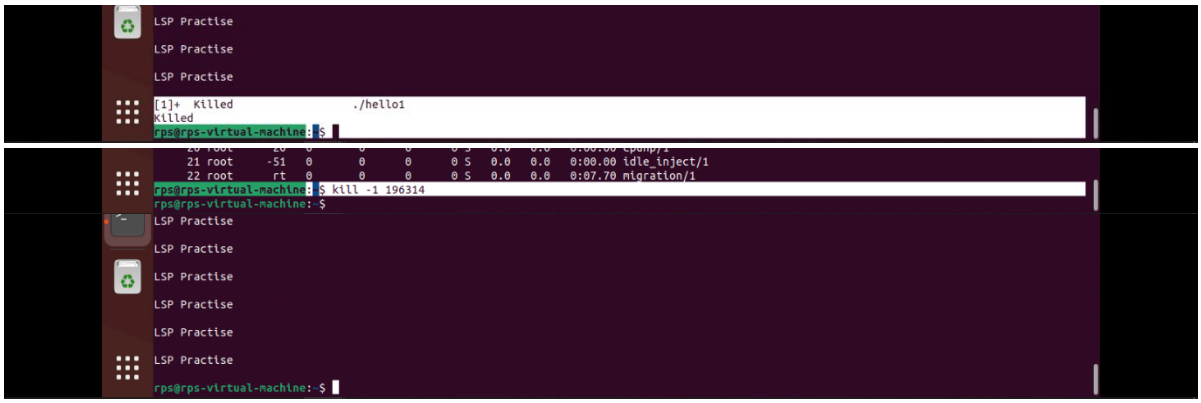


3. kill command

kill Command Options	
Option	**Description**
-l	List all signal names.
-L	List all signal names and numbers.
-s signal	Specify the signal to send (name or number).
-SIGTERM	Terminate the process (default signal).
-SIGKILL	Forcefully kill the process.
-SIGINT	Interrupt the process (Ctrl+C equivalent).

-SIGHUP	Hang up the process (reload configuration).
-SIGSTOP	Stop (pause) the process.
-SIGCONT	Continue a stopped process.

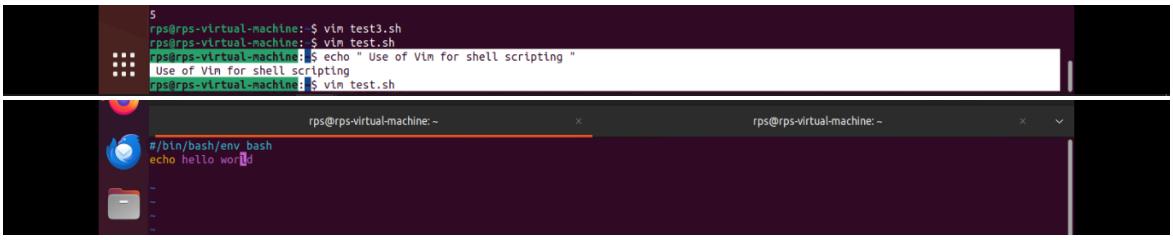




D. Shell scripting in Terminal in V.m

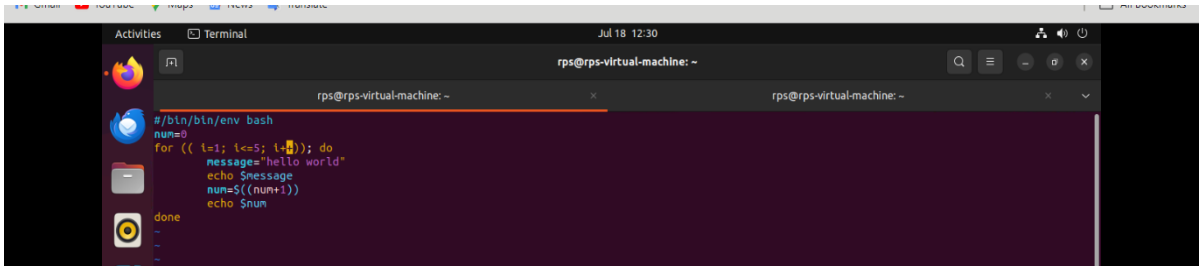
1. Code - 1 // Hello World

i. Input



ii. Onput

2. Code – 2 // Loop



3. Code on how to define and use functions in Bash scripting.