

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.

The first screenshot shows a terminal window where the user navigates to the directory /home/rps and opens the file hello1.cpp using the command `vim hello1.cpp`. The second screenshot shows the user in insert mode, typing the text `LSP Practise` into the file. The third screenshot shows the user saving the file with `:w` and exiting Vim with `:q`.

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

```
rps@rps-virtual-machine:~$ echo "All commands of ps"
All commands of ps
rps@rps-virtual-machine:~$ man ps
rps@rps-virtual-machine:~$ ps
  PID TTY          TIME CMD
168360 pts/1    00:00:01 bash
197533 pts/1    00:00:00 ps
rps@rps-virtual-machine:~$ ps -A
  PID TTY          TIME CMD
  1 ?        00:00:43 systemd
  2 ?        00:00:00 kthreadd
  3 ?        00:00:00 rcu_gp
  4 ?        00:00:00 rcu_par_gp
  5 ?        00:00:00 slub_flushwq
  6 ?        00:00:00 netns
  8 ?        00:00:00 kworker/0:0H-events_highpri
 11 ?        00:00:00 mm_percpu_wq
 12 ?        00:00:00 rcu_tasks_kthread
 13 ?        00:00:00 rcu_tasks_rude_kthread
 14 ?        00:00:00 rcu_tasks_trace_kthread
```

```
rps@rps-virtual-machine:~$ ps -u
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root      5770   0.0  0.0 162392 5888 tty2    Ssl+  Jun21   0:00 /usr/libexec/gdm-wayland-session env GNOME_SHELL_SESSION_MODE=ubuntu /usr/
root      5773   0.0  0.0 223044 15744 tty2    Sl+   Jun21   0:00 /usr/libexec/gnome-session-binary --session=ubuntu
root     168360   0.0  0.0 11396 5248 pts/1    Ss   Jul16   0:01 bash
root     195748   0.0  0.0 11268 5248 pts/0    Ss   09:32   0:00 bash
root     197494 94.2  0.0 6056 3200 pts/0    S+   11:10   1:16 ./hello1
root     197539   0.0  0.0 12672 3328 pts/1    R+   11:11   0:00 ps -u

rps@rps-virtual-machine:~$ ps -p
error: list of process IDs must follow -p

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.

rps@rps-virtual-machine:~$ ps -p
error: list of process IDs must follow -p

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).
ps -pXXXXXX

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).
rps@rps-virtual-machine:~$ ps -t
  PID TTY          STAT TIME COMMAND
168360 pts/1    Ss   0:01 bash
197542 pts/1    R+   0:00 ps -t
197542 pts/1    R+   0:00 ps -t

rps@rps-virtual-machine:~$ ps aux
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  0.0  0.0 168132 12876 ?        Ss   Jun15   0:43 /sbin/init splash
root         2  0.0  0.0      0   0 ?        S    Jun15   0:00 [kthreadd]
root         3  0.0  0.0      0   0 ?        I<   Jun15   0:00 [rcu_gp]
root         4  0.0  0.0      0   0 ?        I<   Jun15   0:00 [rcu_par_gp]
root         5  0.0  0.0      0   0 ?        I<   Jun15   0:00 [slub_flushwq]
root         6  0.0  0.0      0   0 ?        I<   Jun15   0:00 [netns]
root         8  0.0  0.0      0   0 ?        I<   Jun15   0:00 [kworker/0:0H-events_highpri]
root        11  0.0  0.0      0   0 ?        I<   Jun15   0:00 [mm_percpu_wq]
root        12  0.0  0.0      0   0 ?        I    Jun15   0:00 [rcu_tasks_kthread]
root        13  0.0  0.0      0   0 ?        I    Jun15   0:00 [rcu_tasks_rude_kthread]
root        14  0.0  0.0      0   0 ?        I    Jun15   0:00 [rcu_tasks_trace_kthread]
root        15  0.0  0.0      0   0 ?        S    Jun15   0:01 [ksoftirqd/0]
root        16  0.0  0.0      0   0 ?        I    Jun15   5:20 [rcu_preempt]
root        17  0.0  0.0      0   0 ?        S    Jun15   0:07 [migration/0]
root        18  0.0  0.0      0   0 ?        S    Jun15   0:00 [idle_inject/0]
root        19  0.0  0.0      0   0 ?        S    Jun15   0:00 [cpuhp/0]
root        20  0.0  0.0      0   0 ?        S    Jun15   0:00 [cpuhp/1]
root        21  0.0  0.0      0   0 ?        S    Jun15   0:00 [idle_inject/1]
root     197540   0.0  0.0 12672 3456 pts/1    R+   11:12   0:00 ps aux

rps@rps-virtual-machine:~$ ps -r
  PID TTY          STAT TIME COMMAND
197551 pts/1    R+   0:00 ps -r

rps@rps-virtual-machine:~$ ps -l
  PID TTY          STAT TIME COMMAND
rps@rps-virtual-machine:~$ ps -l
F S UID PID PPID C PRI NI ADDR SZ WCHAN TTY          TIME CMD
0 S 1000 168360 168342 0 80 0 - 2849 do_wal pts/1    00:00:01 bash
4 R 1000 197555 168360 0 80 0 - 3168 - pts/1    00:00:00 ps

rps@rps-virtual-machine:~$ ps -f
  UID      PID PPID C TIME TTY          TIME CMD
root     168360 168342 0 Jul16 pts/1    00:00:01 bash
root     197557 168360 0 11:12 pts/1    00:00:00 ps -f
```

```
rps 197557 168360 0 11:12 pts/1 00:00:00 ps -f
rps@rps-virtual-machine:~$ ps -forest
error: unknown user-defined format specifier "rest"

Usage:
ps [options]

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

For more details see ps(1).
rps@rps-virtual-machine:~$ ps --forest
PID TTY TIME CMD
168360 pts/1 00:00:01 bash
197559 pts/1 00:00:00 \ ps
rps@rps-virtual-machine:~$ ps --help
197536 pts/1 00:00:00 ps
rps@rps-virtual-machine:~$ ps -a
PID TTY TIME CMD
5773 tty2 00:00:00 gnome-session-b
197494 pts/0 00:01:08 hello1
197537 pts/1 00:00:00 ps
rps@rps-virtual-machine:~$ ps -u
USER PID %CPU %MEM VSZ STATE START TIME COMMAND
rps 197559 pts/1 00:00:00 \ ps
rps@rps-virtual-machine:~$ ps --help
Usage:
ps [options]

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

For more details see ps(1).
rps@rps-virtual-machine:~$
rps@rps-virtual-machine:~$ echo "Command top options "
```

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
l	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
NCPU(s): 16.7 us, 53.0 sy, 0.0 ni, 30.3 id, 0.0 wa, 0.0 hi, 0.0 st, 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	NCPU	%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	0:01.33	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
```

```
procping 3.3.17
```

```
Usage:
```

```
top -hv [-bcEeHlOss1] -d secs -n max -u|U user -p pid(s) -o ffield -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, 0 running, 251 sleeping, 0 stopped, 1 zombie
NCPU(s): 19.7 us, 47.5 sy, 0.0 ni, 32.8 id, 0.0 wa, 0.0 hi, 0.0 st, 0.0 st
MiB Mem : 15984.7 total, 8457.6 free, 1883.0 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	NCPU	%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	17:16.26	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 0 I 0.0 0.0 0:18.28 kworker/u8:4-events_unbound
```

```
197554 root 20 0 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
NCPU(s): 9.3 us, 39.7 sy, 0.0 ni, 44.4 id, 6.5 wa, 0.0 hi, 0.1 st, 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	NCPU	%MEM	TIME+	COMMAND
197494	rps	20	0	6056	3200	3072	R	75.4	0.0	5:40.59	hello1

```
rps@rps-virtual-machine:~$ top -l
```

```
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
NCPU(s): 14.7 us, 44.1 sy, 0.0 ni, 39.7 id, 0.0 wa, 0.0 hi, 1.5 st, 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	NCPU	%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
6044	rps	20	0	1185032	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


```

rps@rps-virtual-machine:~$ top -c
top - 11:17:09 up 32 days, 15:35, 1 user, load average: 4.00, 2.74, 1.34
Tasks: 258 total, 3 running, 254 sleeping, 0 stopped, 1 zombie
NCpu(s): 15.2 us, 53.0 sy, 0.0 ni, 31.8 id, 0.0 wa, 0.0 hi, 0.0 st, 0.0 sr
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, 13709.4 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM    TIME+  COMMAND
197494 rps        20   0   6056   3200  3072  R   77.8   0.0   6:04.85  ./hello1
168342 rps        20   0   561612 58688 42644  D   50.0   0.4   18:33.73  /usr/libexec/gnome-terminal-server
5884 rps        20   0   5545976 556420 159048  S   27.8   3.4   75:09.76  /usr/bin/gnome-shell
196912 root       20   0   0   0   0  R   27.8   0.0   1:13.03  [kworker/u8:2-events_unbound]
195778 root       20   0   0   0   0  I   22.2   0.0   4:18.27  [kworker/u8:1-events_unbound]
197495 root       20   0   0   0   0  I   11.1   0.0   1:01.34  [kworker/u8:0-events_unbound]
197607 rps        20   0   13252  4224  3328  R   11.1   0.0   0:00.03  top -c
6045 rps        20   0   315280 11944  6912  S    5.6   0.1   0:54.66  /usr/bin/lbus-daemon --panel disable
1 root    20   0   168132 12876  8140  S    0.0   0.1   0:43.67  /sbin/init splash
2 root    20   0   0   0   0  S    0.0   0.0   0:00.28  [kthreadd]
3 root    0 -20  0   0   0  S    0.0   0.0   0:00.00  [rcu_gp]
4 root    0 -20  0   0   0  S    0.0   0.0   0:00.00  [rcu_par_gp]
5 root    0 -20  0   0   0  S    0.0   0.0   0:00.00  [slub_flushwq]
6 root    0 -20  0   0   0  S    0.0   0.0   0:00.00  [netns]
8 root    0 -20  0   0   0  S    0.0   0.0   0:00.00  [kworker/0:0H-events_highpri]
11 root   0 -20  0   0   0  S    0.0   0.0   0:00.00  [nm_percpu_wq]

rps@rps-virtual-machine:~$ top -s
top - 11:17:19 up 32 days, 15:35, 1 user, load average: 3.84, 2.75, 1.36
Tasks: 258 total, 4 running, 253 sleeping, 0 stopped, 1 zombie
NCpu(s): 12.7 us, 39.7 sy, 0.0 ni, 47.6 id, 0.0 wa, 0.0 hi, 0.0 st, 0.0 sr
MiB Mem : 15984.7 total, 8457.6 free, 1883.3 used, 5643.8 buff/cache
MiB Swap: 2048.0 total, 2048.0 free, 0.0 used, 13709.5 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM    TIME+  COMMAND
168342 rps        20   0   561580 58568 42644  R   64.7   0.4   18:40.35  gnome-terminal-
196912 root       20   0   0   0   0  R   47.1   0.0   1:15.48  kworker/u8:2-events_unbound
197494 rps        20   0   6056   3200  3072  R   47.1   0.0   6:14.78  hello1
5884 rps        20   0   5545980 556420 159048  S   23.5   3.4   75:10.37  gnome-shell
197495 root       20   0   0   0   0  I   11.8   0.0   1:03.02  kworker/u8:0-events_unbound
5743 rps        9 -11 1609008 24812 20076  S    5.9   0.2   364:39.81  pulseaudio
197608 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  S    0.0   0.0   0:00.00  rcu_gp
4 root    0 -20  0   0   0  S    0.0   0.0   0:00.00  rcu_par_gp
5 root    0 -20  0   0   0  S    0.0   0.0   0:00.00  slub_flushwq
6 root    0 -20  0   0   0  S    0.0   0.0   0:00.00  netns
8 root    0 -20  0   0   0  S    0.0   0.0   0:00.00  kworker/0:0H-events_highpri
11 root   0 -20  0   0   0  S    0.0   0.0   0:00.00  nm_percpu_wq
12 root    20   0   0   0   0  S    0.0   0.0   0:00.00  rcu_tasks_kthread
13 root    20   0   0   0   0  S    0.0   0.0   0:00.00  rcu_tasks_rude_kthread
14 root    20   0   0   0   0  S    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  S    0.0   0.0   5:21.10  rcu_preempt
17 root    rt    0   0   0   0  S    0.0   0.0   0:07.70  migration/0
18 root   -51   0   0   0   0  S    0.0   0.0   0:00.00  idle_inject/0
19 root    20   0   0   0   0  S    0.0   0.0   0:00.00  cphp/0
20 root    20   0   0   0   0  S    0.0   0.0   0:00.00  cphp/1

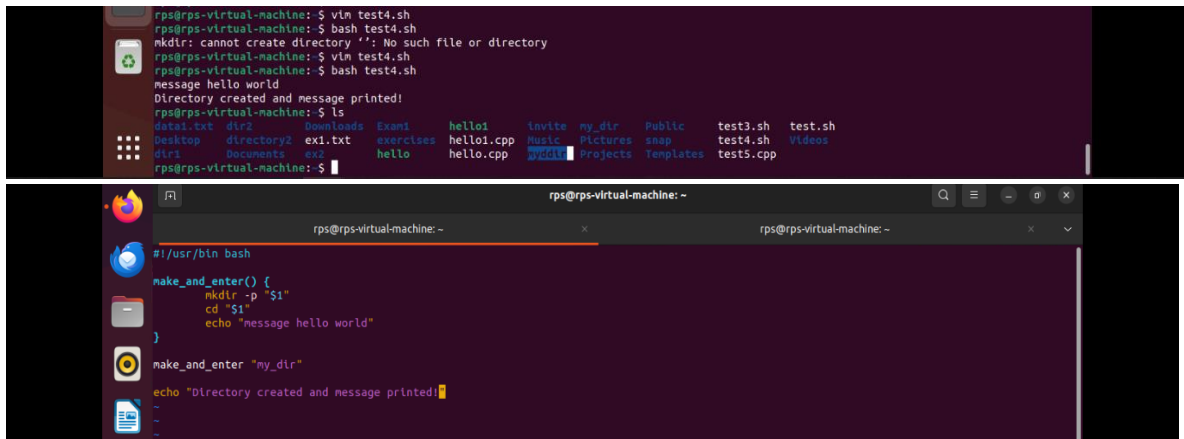
rps@rps-virtual-machine:~$ top -w 00
top - 11:17:39 up 32 days, 15:35, 1 user, load average: 3.75, 2.80, 1.40
Tasks: 257 total, 5 running, 251 sleeping, 0 stopped, 1 zombie
NCpu(s): 21.5 us, 53.8 sy, 0.0 ni, 24.6 id, 0.0 wa, 0.0 hi, 0.0 st, 0.0 sr
MiB Mem : 15984.7 total, 8457.6 free, 1883.3 used, 5643.8 buff/cache
MiB Swap: 2048.0 total, 2048.0 free, 0.0 used, 13709.5 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM    TIME+  COMMAND
197494 rps        20   0   6056   3200  3072  R   94.1   0.0   6:32.88  hello1
168342 rps        20   0   561580 58568 42644  R   64.7   0.4   18:52.89  gnome-ter-
195778 root       20   0   0   0   0  R   41.2   0.0   4:24.84  kworker+
197495 root       20   0   0   0   0  R   41.2   0.0   1:06.10  kworker+
5884 rps        20   0   5545980 556420 159048  S   29.4   3.4   75:11.15  gnome-sh
6045 rps        20   0   1105032 326976 54744  S    5.9   2.0   245:06.78  snap-st+
197616 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  S    0.0   0.0   0:00.00  rcu_gp
4 root    0 -20  0   0   0  S    0.0   0.0   0:00.00  rcu_par+
5 root    0 -20  0   0   0  S    0.0   0.0   0:00.00  slub_fl+
6 root    0 -20  0   0   0  S    0.0   0.0   0:00.00  netns
8 root    0 -20  0   0   0  S    0.0   0.0   0:00.00  kworker+
11 root   0 -20  0   0   0  S    0.0   0.0   0:00.00  nm_perc+
12 root    20   0   0   0   0  S    0.0   0.0   0:00.00  rcu_tas+
13 root    20   0   0   0   0  S    0.0   0.0   0:00.00  rcu_tas+
14 root    20   0   0   0   0  S    0.0   0.0   0:00.00  rcu_tas+
15 root    20   0   0   0   0  S    0.0   0.0   0:01.27  ksoftlr+
16 root    20   0   0   0   0  S    0.0   0.0   5:21.11  rcu_pre-
```

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).

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



The image consists of two screenshots of a terminal window. The top screenshot shows the execution of a script named test4.sh. The first run fails with an error: "mkdir: cannot create directory '': No such file or directory". The second run succeeds, printing "message hello world" and "Directory created and message printed!". A directory listing follows, showing files like data1.txt, dir2, Downloads, Exam1, hello1, invite, my_dir, Public, test3.sh, and test.sh. The bottom screenshot shows the definition of a function named make_and_enter. The function takes an argument \$1, creates a directory with mkdir -p \$1, changes to that directory with cd \$1, and prints "message hello world". The function is then called with make_and_enter "my_dir", which prints "Directory created and message printed!".

```
rps@rps-virtual-machine:~$ vln test4.sh
rps@rps-virtual-machine:~$ bash test4.sh
mkdir: cannot create directory '': No such file or directory
rps@rps-virtual-machine:~$ vln test4.sh
rps@rps-virtual-machine:~$ bash test4.sh
message hello world
Directory created and message printed!
rps@rps-virtual-machine:~$ ls
data1.txt  dir2      Downloads  Exam1    hello1    invite    my_dir    Public   test3.sh  test.sh
desktop    directory2  ex1.txt    exercises hello1.cpp Music     Pictures  snap     test4.sh  Videos
dirs       Documents  ex2        hello    hello.cpp  Projects  Templates test5.cpp

rps@rps-virtual-machine:~$
```

```
rps@rps-virtual-machine:~$ cat test4.sh
#!/usr/bin/bash

make_and_enter() {
    mkdir -p "$1"
    cd "$1"
    echo "message hello world"
}

make_and_enter "my_dir"

echo "Directory created and message printed!"
```