

NAME : DHRUV NILKUND

SRN : PES1UG21CS178

ROLL NUMBER : 26

CODE :

```
#include <linux/init.h>
```

```
#include <linux/kernel.h>
```

```
#include <linux/module.h>
```

```
#include <linux/sched.h>
```

```
#include <linux/init_task.h>
```

```
void dfs(struct task_struct *task,int indent)
```

```
{
```

```
    struct task_struct *task_next;
```

```
    struct list_head *list;
```

```
    list_for_each(list, &task->children) {
```

```
        task_next = list_entry(list, struct task_struct, sibling);
```

```
        for (int i=0; i<indent; i++)
```

```
        {
```

```
            if (i%2 == 0 || i == 0)
```

```

        printk(KERN_CONT"%c", '|');
    else
        printk(KERN_CONT" ");
}

    printk(KERN_CONT"%c%c", '|', '_');
    printk(KERN_CONT "pid: %d | pname: %s | state: %ud\n", task_next-
>pid, task_next->comm, task_next->__state);

    dfs(task_next,indent+2);
}
}

int tasks_lister_dfs_init(void)
{
    printk(KERN_INFO "Loading module...\n");

    dfs(&init_task,0);

    printk(KERN_INFO "Module loaded.\n");
    return 0;
}

```

```
void tasks_lister_dfs_exit(void)
{
    printk(KERN_INFO "Module removed.\n");
}
```

```
module_init(tasks_lister_dfs_init);
module_exit(tasks_lister_dfs_exit);
MODULE_LICENSE("GPL");
```

OUTPUT :

1) MAKE COMMAND

```
root@ubuntu:/home/dhruvindia/Downloads# insmod listtask1
root@Ubuntu:/home/dhruvindia/Downloads# make
make -C /lib/modules/5.15.0-43-generic/build M=/home/dhruvindia/Downloads modules
make[1]: Entering directory '/usr/src/linux-headers-5.15.0-43-generic'
warning: the compiler differs from the one used to build the kernel
The kernel was built by: gcc (Ubuntu 11.2.0-19ubuntu1) 11.2.0
You are using:          gcc (Ubuntu 11.3.0-1ubuntu1~22.04) 11.3.0
... make[1]: Leaving directory '/usr/src/linux-headers-5.15.0-43-generic'
...
root@Ubuntu:/home/dhruvindia/Downloads#
```

2) INSMOD COMMAND TO INSTALL THE MODULE

```
...
...
... root@Ubuntu:/home/dhruvindia/Downloads# insmod listtask1.ko
...
root@Ubuntu:/home/dhruvindia/Downloads#
```

3) dmesg COMMAND TO LIST ALL PROCESSES

```
1 [ 9259.776632] | | | _pid: 1915 | pname: sh | state: 1d
2 [ 9259.776634] | | | _pid: 1921 | pname: ibus-daemon | state: 1d
3 [ 9259.776636] | | | _pid: 2019 | pname: ibus-dconf | state: 1d
4 [ 9259.776640] | | | _pid: 2021 | pname: ibus-extension- | state: 1d
5 [ 9259.776643] | | | _pid: 2089 | pname: ibus-engine-sim | state: 1d
6 [ 9259.776658] | | | _pid: 1916 | pname: gsd-a11y-settin | state: 1d
7 [ 9259.776660] | | | _pid: 1918 | pname: gsd-color | state: 1d
8 [ 9259.776662] | | | _pid: 1919 | pname: gsd-datetime | state: 1d
9 [ 9259.776664] | | | _pid: 1923 | pname: gsd-housekeepin | state: 1d
10 [ 9259.776666] | | | _pid: 1924 | pname: gsd-keyboard | state: 1d
11 [ 9259.776669] | | | _pid: 1927 | pname: gsd-media-keys | state: 1d
12 [ 9259.776671] | | | _pid: 1930 | pname: gsd-power | state: 1d
13 [ 9259.776674] | | | _pid: 1945 | pname: gsd-print-notif | state: 1d
14 [ 9259.776676] | | | _pid: 1946 | pname: gsd-rfkill | state: 1d
15 [ 9259.776679] | | | _pid: 1950 | pname: gsd-screensaver | state: 1d
16 [ 9259.776682] | | | _pid: 1956 | pname: gsd-sharing | state: 1d
17 [ 9259.776685] | | | _pid: 1957 | pname: gsd-smartcard | state: 1d
18 [ 9259.776687] | | | _pid: 1959 | pname: gsd-sound | state: 1d
19 [ 9259.776689] | | | _pid: 1963 | pname: gsd-wacom | state: 1d
20 [ 9259.776691] | | | _pid: 1904 | pname: gjs | state: 1d
21 [ 9259.776693] | | | _pid: 2036 | pname: ibus-portal | state: 1d
22 [ 9259.776696] | | | _pid: 2064 | pname: gsd-printer | state: 1d
23 [ 9259.776711] | | | _pid: 2102 | pname: gvfsd-metadata | state: 1d
24 [ 9259.776713] | | | _pid: 2142 | pname: xdg-desktop-por | state: 1d
25 [ 9259.776716] | | | _pid: 2146 | pname: xdg-desktop-por | state: 1d
26 [ 9259.776718] | | | _pid: 2148 | pname: gjs | state: 1d
27 [ 9259.776720] | | | _pid: 2236 | pname: xdg-desktop-por | state: 1d
28 [ 9259.776722] | | | _pid: 2620 | pname: gnome-terminal- | state: 1d
29 [ 9259.776724] | | | _pid: 22408 | pname: bash | state: 1d
30 [ 9259.776727] | | | _pid: 22526 | pname: su | state: 1d
31 [ 9259.776730] | | | _pid: 22559 | pname: bash | state: 1d
32 [ 9259.776734] | | | _pid: 119233 | pname: insmod | state: 0d
33 [ 9259.776738] | | | _pid: 42290 | pname: bash | state: 1d
34 [ 9259.776741] | | | _pid: 2624 | pname: seahorse | state: 1d
35 [ 9259.776743] | | | _pid: 2621 | pname: gnome-calendar | state: 1d
36 [ 9259.776745] | | | _pid: 7590 | pname: gsd-xsettings | state: 1d
```

```
1 [ 9259.776906] | _pid: 133 | pname: zswap-shrink | state: 1026d
2 [ 9259.776908] | _pid: 134 | pname: kworker/u9:0 | state: 1026d
3 #in [ 9259.776909] | _pid: 139 | pname: charger_manager | state: 1026d
4 #in [ 9259.776911] | _pid: 163 | pname: kworker/1:1H | state: 1026d
5 in [ 9259.776913] | _pid: 191 | pname: scsi_eh_2 | state: 1d
6 #in [ 9259.776915] | _pid: 192 | pname: scsi_tmf_2 | state: 1026d
7 [ 9259.776916] | _pid: 195 | pname: kworker/0:1H | state: 1026d
8 voi [ 9259.776918] | _pid: 197 | pname: kworker/3:1H | state: 1026d
9 [ 9259.776919] | _pid: 222 | pname: jbd2/sda3-8 | state: 1d
10 s [ 9259.776921] | _pid: 223 | pname: ext4-rsv-conver | state: 1026d
11 s [ 9259.776923] | _pid: 300 | pname: ipmi-msghandler | state: 1026d
12 [ 9259.776924] | _pid: 390 | pname: cryptd | state: 1026d
13 [ 9259.776927] | _pid: 410 | pname: ttm_swap | state: 1026d
14 [ 9259.776928] | _pid: 413 | pname: irq/18-vmwgfx | state: 1d
15 [ 9259.776930] | _pid: 414 | pname: card0-crtc0 | state: 1d
16 [ 9259.776931] | _pid: 415 | pname: card0-crtc1 | state: 1d
17 [ 9259.776933] | _pid: 416 | pname: card0-crtc2 | state: 1d
18 [ 9259.776934] | _pid: 417 | pname: card0-crtc3 | state: 1d
19 [ 9259.776936] | _pid: 418 | pname: card0-crtc4 | state: 1d
20 [ 9259.776938] | _pid: 419 | pname: card0-crtc5 | state: 1d
21 [ 9259.776939] | _pid: 422 | pname: card0-crtc6 | state: 1d
22 [ 9259.776941] | _pid: 423 | pname: card0-crtc7 | state: 1d
23 pri [ 9259.776942] | _pid: 32175 | pname: kworker/2:2 | state: 1026d
24 [ 9259.776944] | _pid: 65569 | pname: kworker/3:2 | state: 1026d
25 > [ 9259.776946] | _pid: 67771 | pname: kworker/u8:3 | state: 1026d
26 [ 9259.776948] | _pid: 81557 | pname: kworker/u8:2 | state: 1026d
27 [ 9259.776949] | _pid: 81558 | pname: kworker/0:2 | state: 0d
28 } [ 9259.776951] | _pid: 93621 | pname: kworker/1:2 | state: 1026d
29 [ 9259.776953] | _pid: 98175 | pname: kworker/2:1 | state: 1026d
30 int [ 9259.776954] | _pid: 108644 | pname: kworker/0:1 | state: 1026d
31 { [ 9259.776956] | _pid: 108710 | pname: kworker/3:0 | state: 1026d
32 [ 9259.776958] | _pid: 114193 | pname: kworker/u8:0 | state: 1026d
33 [ 9259.776960] | _pid: 114517 | pname: kworker/1:0 | state: 1026d
34 [ 9259.776962] | _pid: 115058 | pname: kworker/3:1 | state: 1026d
[ 9259.776963] Module loaded.
root@Ubuntu:/home/dhruvindia/Downloads#
```