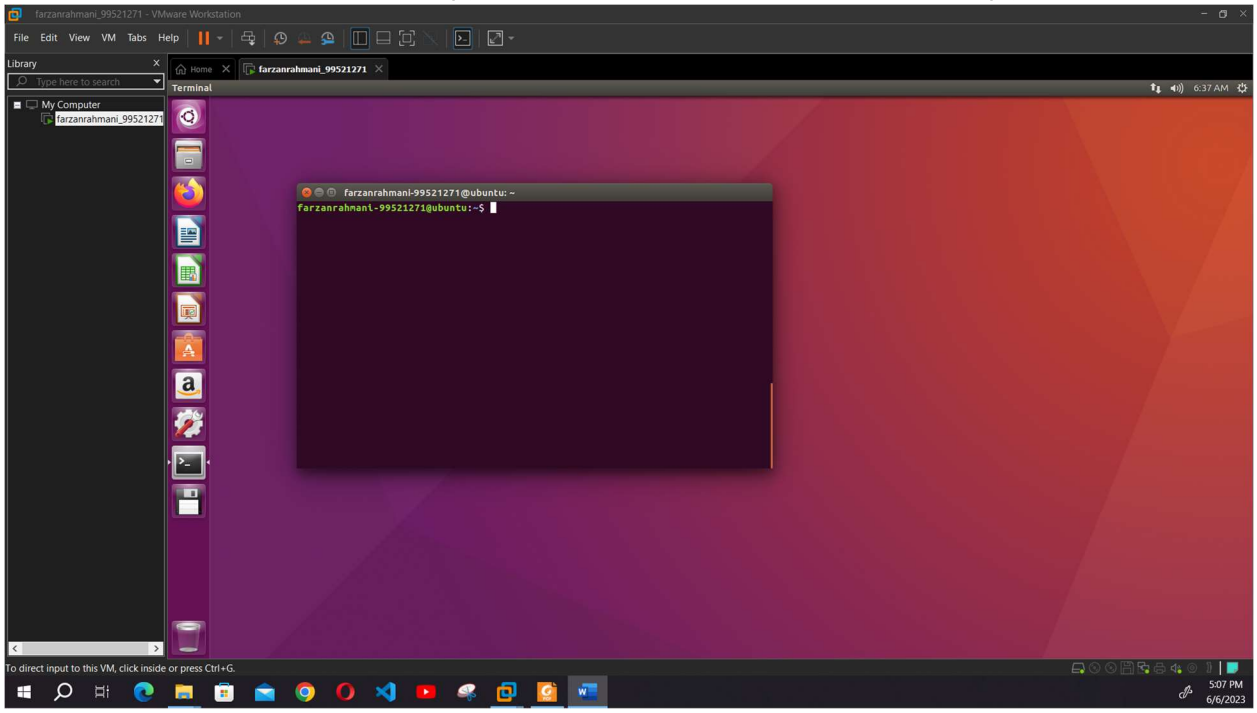
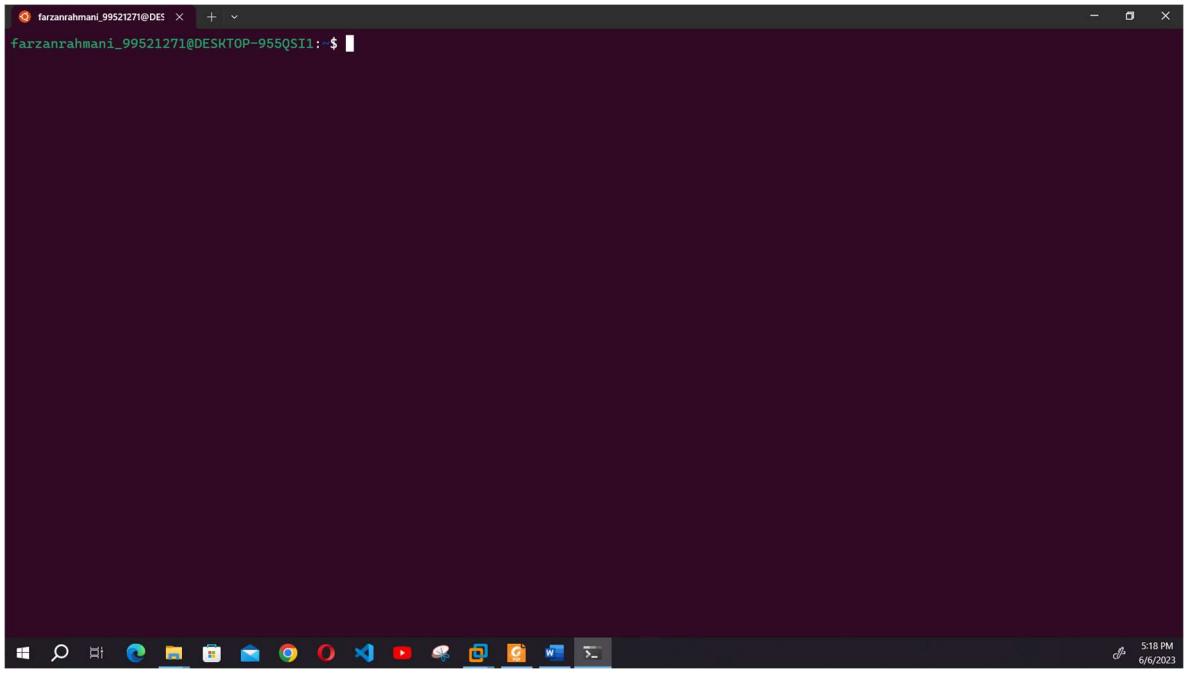
به نام خدا

تمرین جلسه یازدهم

فرزان رحمانی ۹۹۵۲۱۲۷۱

با توجه به اینکه گفته شده بود ممکن است این تمرین موجب خرابی سیستم شود برای حل آن از ماشین مجازی استفاده کردم.(در تمرین های قبل از wsl استفاده می کردم.)





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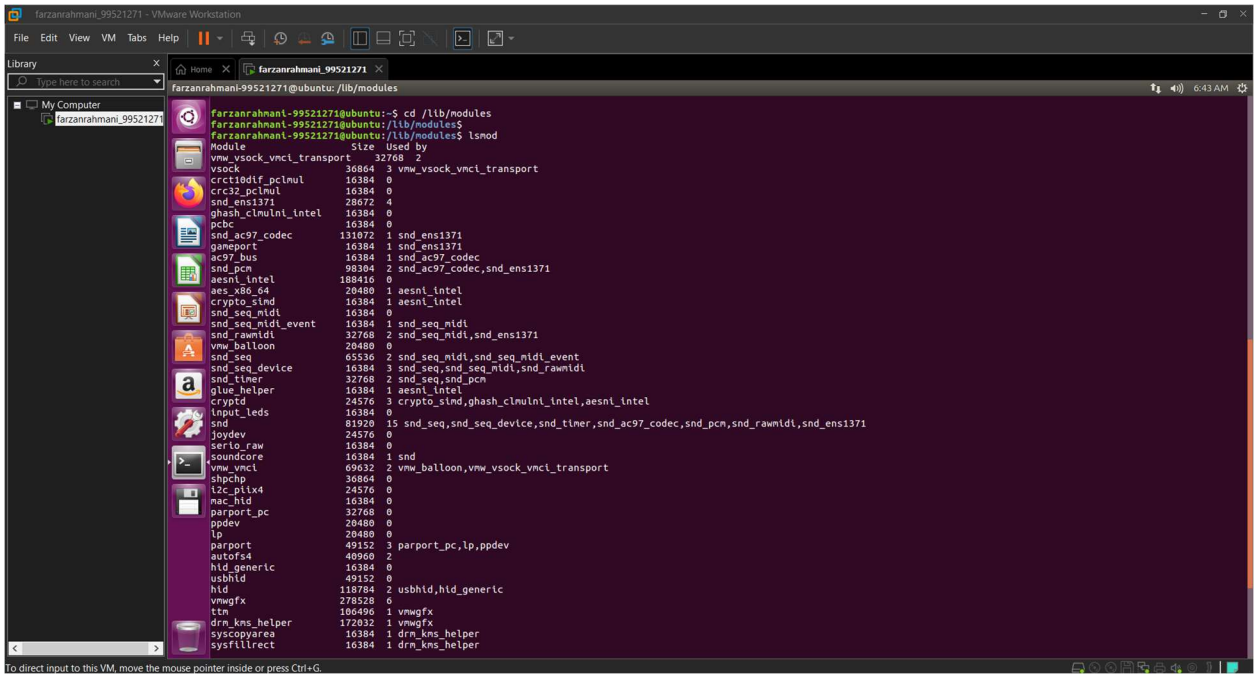
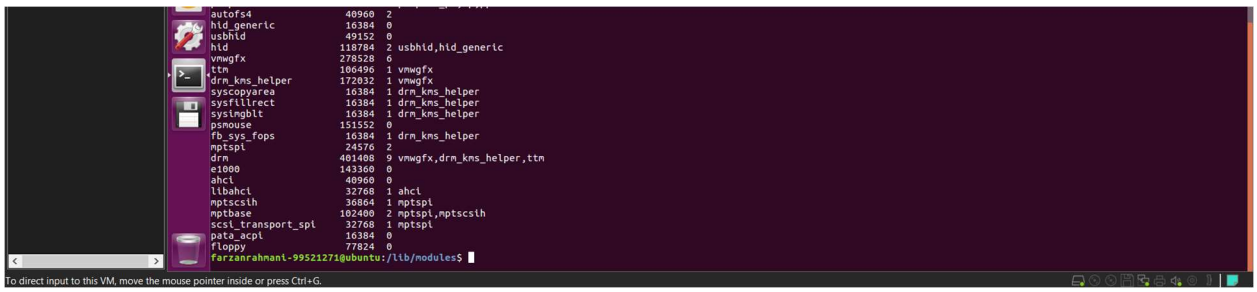
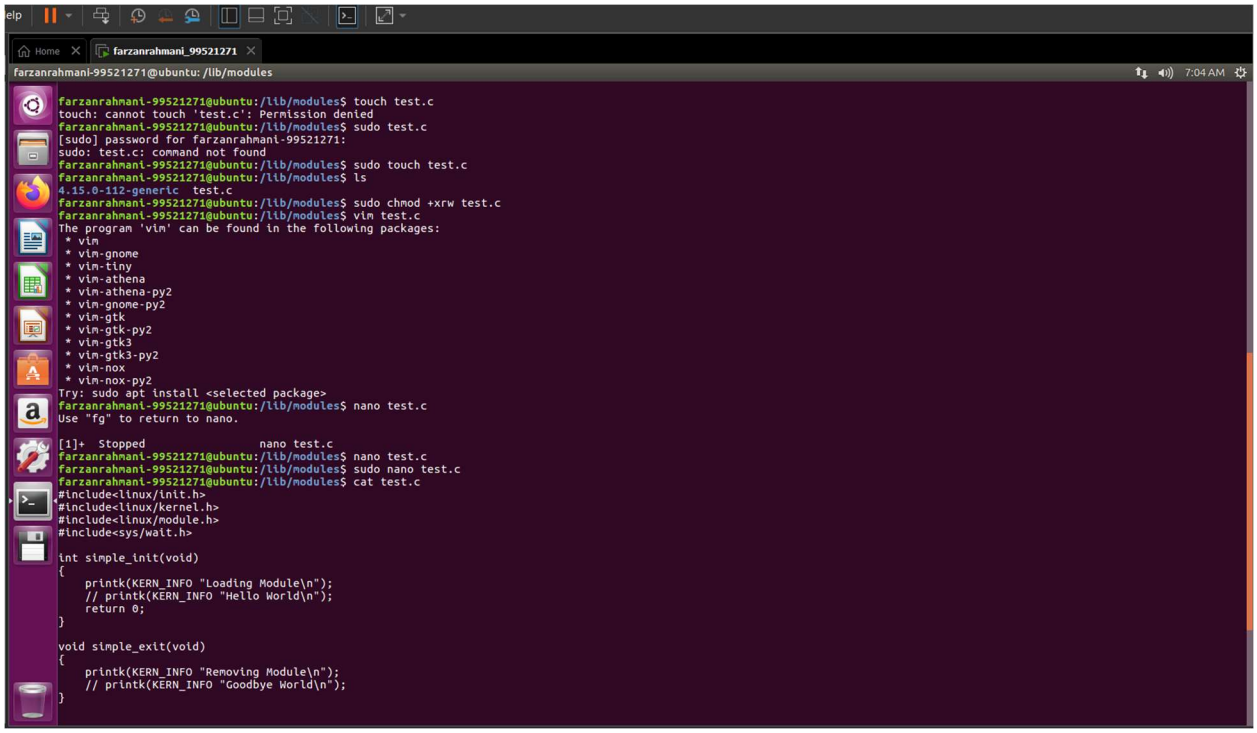
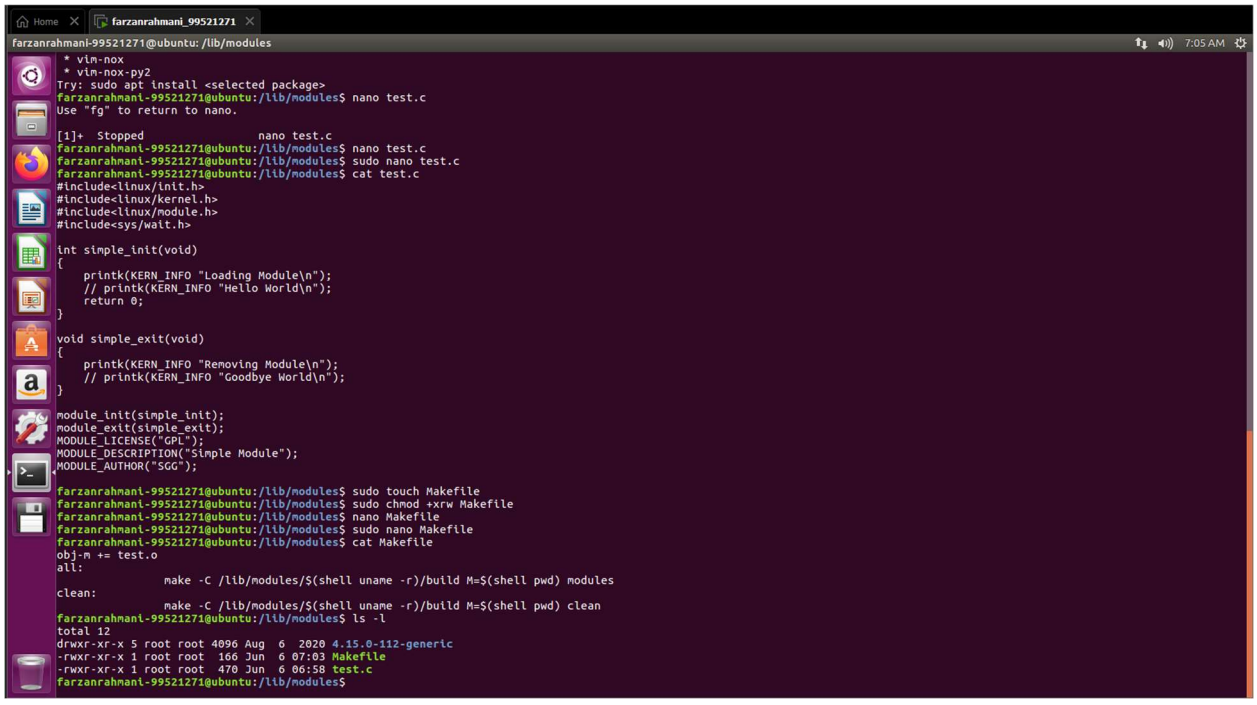
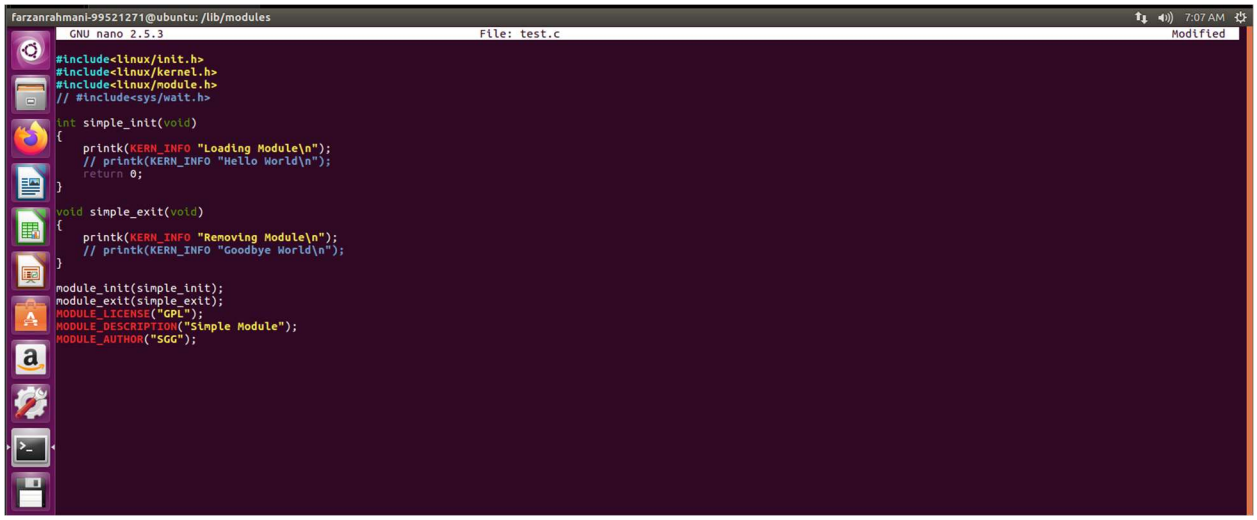
بخش اول:

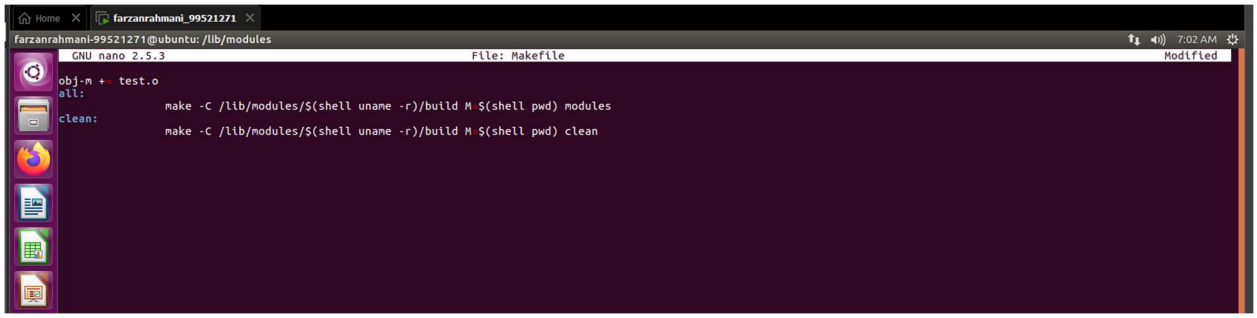

farzanrahmani_99521271 - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
farzanrahmani_99521271
Home
farzanrahmani_99521271
farzanrahmani-99521271@ubuntu: /lib/modules
6:43 AM
farzanrahmani-99521271@ubuntu:~$ cd /lib/modules
farzanrahmani-99521271@ubuntu:/lib/modules$
farzanrahmani-99521271@ubuntu:/lib/modules$ lsmod
Module Size Used by
vmw_vsock_vmci_transport 32768 2
vsock 36864 3 vmw_vsock_vmci_transport
crct10dif_pclmul 16384 0
crc32_pclmul 16384 0
snd_ens1371 28672 4
ghash_clmulni_intel 16384 0
pcbc 16384 0
snd_ac97_codec 131072 1 snd_ens1371
gameport 16384 1 snd_ens1371
ac97_bus 16384 1 snd_ac97_codec
snd_pcm 98304 2 snd_ac97_codec,snd_ens1371
aesni_intel 188416 0
aes_x86_64 20480 1 aesni_intel
crypto_simd 16384 1 aesni_intel
snd_seq_midi 16384 0
snd_seq_midi_event 16384 1 snd_seq_midi
snd_rawmidi 32768 2 snd_seq_midi,snd_ens1371
vmw_balloon 20480 0
snd_seq 65536 2 snd_seq_midi,snd_seq_midi_event
snd_seq_device 16384 3 snd_seq,snd_seq_midi,snd_rawmidi
snd_timer 32768 2 snd_seq,snd_pcm
glue_helper 16384 1 aesni_intel
cryptd 24576 3 crypto_simd,ghash_clmulni_intel,aesni_intel
input_leds 16384 0
snd 81920 15 snd_seq,snd_seq_device,snd_timer,snd_ac97_codec,snd_pcm,snd_rawmidi,snd_ens1371
joydev 24576 0
serio_raw 16384 0
soundcore 16384 1 snd
vmw_vmci 69632 2 vmw_balloon,vmw_vsock_vmci_transport
shpchp 36864 0
i2c_piix4 24576 0
mac_hid 16384 0
parport_pc 32768 0
ppdev 20480 0
lp 20480 0
parport 49152 3 parport_pc,lp,ppdev
autofs4 40960 2
hid_generic 16384 0
usbhid 49152 0
hid 118784 2 usbhid,hid_generic
vmwgfx 278528 6
ttm 106496 1 vmwgfx
drm_kms_helper 172032 1 vmwgfx
syscopyarea 16384 1 drm_kms_helper
sysfillrect 16384 1 drm_kms_helper
To direct input to this VM, move the mouse pointer inside or press Ctrl+G.

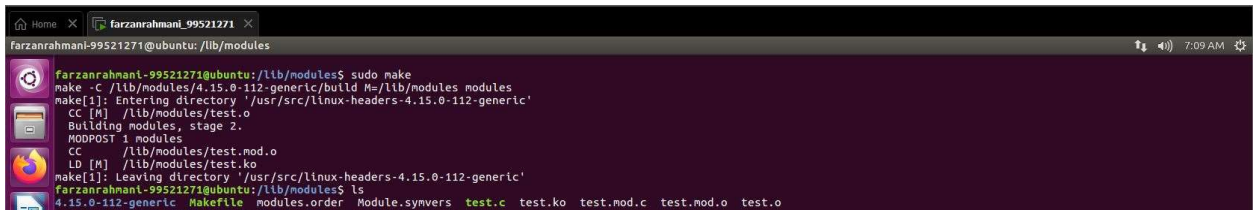

autofs4 40960 2
hid_generic 16384 0
usbhid 49152 0
hid 118784 2 usbhid,hid_generic
vmwgfx 278528 6
ttm 106496 1 vmwgfx
drm_kms_helper 172032 1 vmwgfx
syscopyarea 16384 1 drm_kms_helper
sysfillrect 16384 1 drm_kms_helper
sysimgblt 16384 1 drm_kms_helper
psmouse 151552 0
fb_sys_fops 16384 1 drm_kms_helper
mptspi 24576 2
drm 401408 9 vmwgfx,drm_kms_helper,ttm
e1000 143360 0
ahci 40960 0
libahci 32768 1 ahci
mptscsih 36864 1 mptspi
mptbase 102400 2 mptspi,mptscsih
scsi_transport_spi 32768 1 mptspi
pata_acpi 16384 0
floppy 77824 0
farzanrahmani-99521271@ubuntu:/lib/modules$
To direct input to this VM, move the mouse pointer inside or press Ctrl+G.


elp
Home
farzanrahmani_99521271
farzanrahmani-99521271@ubuntu: /lib/modules
7:04 AM
farzanrahmani-99521271@ubuntu:/lib/modules$ touch test.c
touch: cannot touch 'test.c': Permission denied
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo test.c
[sudo] password for farzanrahmani-99521271:
sudo: test.c: command not found
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo touch test.c
farzanrahmani-99521271@ubuntu:/lib/modules$ ls
4.15.0-112-generic test.c
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo chmod +xrw test.c
farzanrahmani-99521271@ubuntu:/lib/modules$ vim test.c
The program 'vim' can be found in the following packages:
 * vim
 * vim-gnome
 * vim-tiny
 * vim-athena
 * vim-athena-py2
 * vim-gnome-py2
 * vim-gtk
 * vim-gtk-py2
 * vim-gtk3
 * vim-gtk3-py2
 * vim-nox
 * vim-nox-py2
Try: sudo apt install <selected package>
farzanrahmani-99521271@ubuntu:/lib/modules$ nano test.c
Use "fg" to return to nano.
[1]+ Stopped   nano test.c
farzanrahmani-99521271@ubuntu:/lib/modules$ nano test.c
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo nano test.c
farzanrahmani-99521271@ubuntu:/lib/modules$ cat test.c
#include<linux/init.h>
#include<linux/kernel.h>
#include<linux/module.h>
#include<sys/wait.h>
int simple_init(void)
{
    printk(KERN_INFO "Loading Module\n");
    // printk(KERN_INFO "Hello World\n");
    return 0;
}
void simple_exit(void)
{
    printk(KERN_INFO "Removing Module\n");
    // printk(KERN_INFO "Goodbye World\n");
}

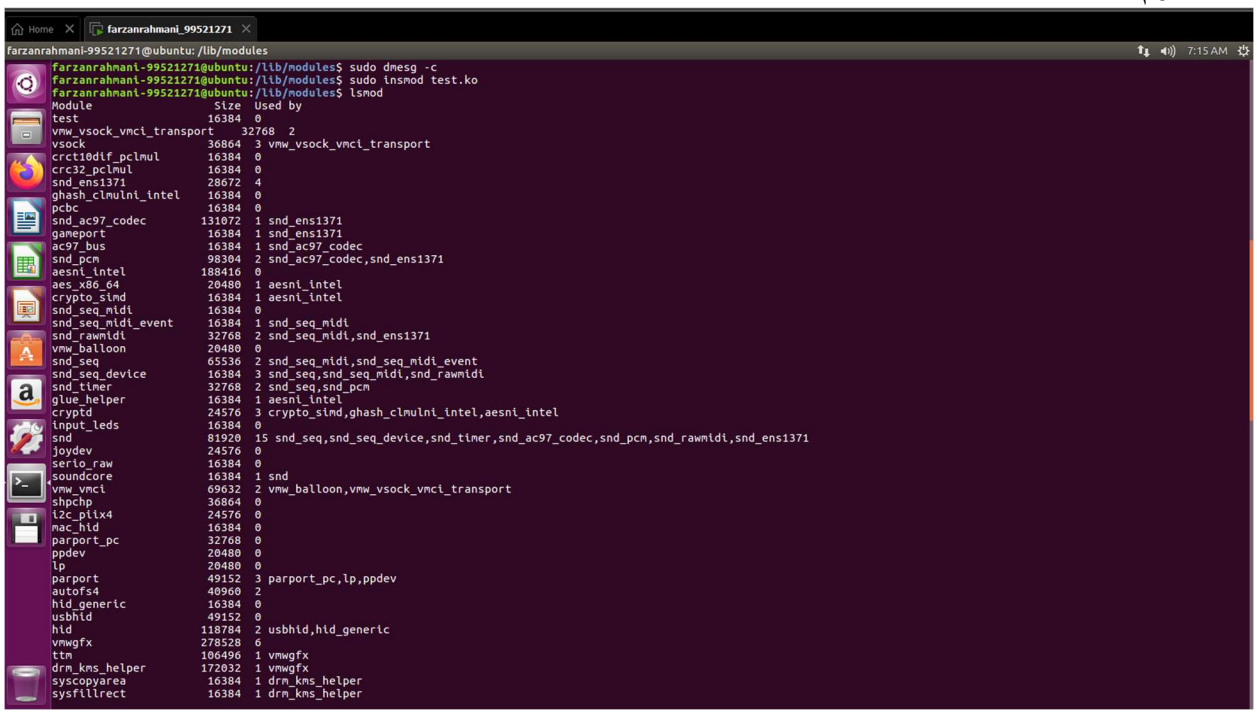

Home
farzanrahmani_99521271
farzanrahmani-99521271@ubuntu: /lib/modules
7:05 AM
 * vim-nox
 * vim-nox-py2
Try: sudo apt install <selected package>
farzanrahmani-99521271@ubuntu:/lib/modules$ nano test.c
Use "fg" to return to nano.
[1]+ Stopped   nano test.c
farzanrahmani-99521271@ubuntu:/lib/modules$ nano test.c
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo nano test.c
farzanrahmani-99521271@ubuntu:/lib/modules$ cat test.c
#include<linux/init.h>
#include<linux/kernel.h>
#include<linux/module.h>
#include<sys/wait.h>
int simple_init(void)
{
    printk(KERN_INFO "Loading Module\n");
    // printk(KERN_INFO "Hello World\n");
    return 0;
}
void simple_exit(void)
{
    printk(KERN_INFO "Removing Module\n");
    // printk(KERN_INFO "Goodbye World\n");
}
module_init(simple_init);
module_exit(simple_exit);
MODULE_LICENSE("GPL");
MODULE_DESCRIPTION("Simple Module");
MODULE_AUTHOR("SGG");
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo touch Makefile
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo chmod +xrw Makefile
farzanrahmani-99521271@ubuntu:/lib/modules$ nano Makefile
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo nano Makefile
farzanrahmani-99521271@ubuntu:/lib/modules$ cat Makefile
obj-m += test.o
all:
	make -C /lib/modules/$(shell uname -r)/build M=$(shell pwd) modules
clean:
	make -C /lib/modules/$(shell uname -r)/build M=$(shell pwd) clean
farzanrahmani-99521271@ubuntu:/lib/modules$ ls -l
total 12
drwxr-xr-x 5 root root 4096 Aug 6 2020 4.15.0-112-generic
-rwxr-xr-x 1 root root 166 Jun 6 07:03 Makefile
-rwxr-xr-x 1 root root 470 Jun 6 06:58 test.c
farzanrahmani-99521271@ubuntu:/lib/modules$

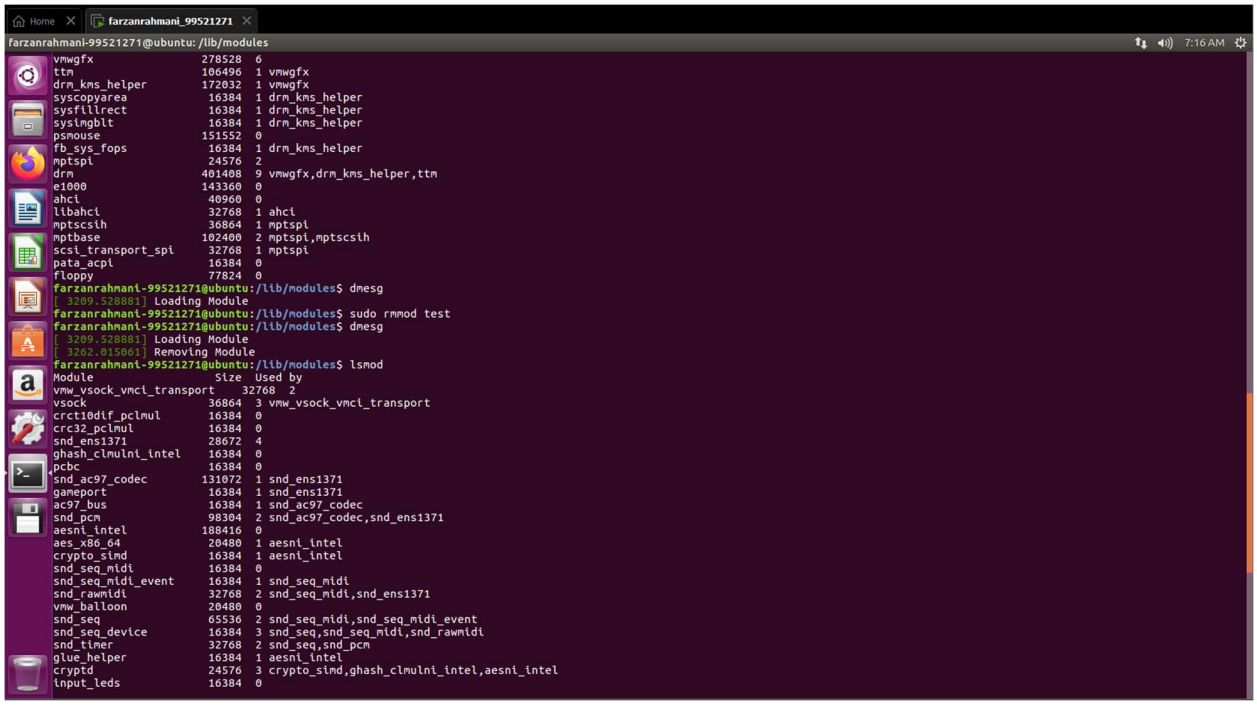

farzanrahmani-99521271@ubuntu: /lib/modules
7:07 AM
GNU nano 2.5.3
File: test.c
Modified
#include<linux/init.h>
#include<linux/kernel.h>
#include<linux/module.h>
// #include<sys/wait.h>
int simple_init(void)
{
printk(KERN_INFO "Loading Module\n");
// printk(KERN_INFO "Hello World\n");
return 0;
}
void simple_exit(void)
{
printk(KERN_INFO "Removing Module\n");
// printk(KERN_INFO "Goodbye World\n");
}
module_init(simple_init);
module_exit(simple_exit);
MODULE_LICENSE("GPL");
MODULE_DESCRIPTION("Simple Module");
MODULE_AUTHOR("SGG");

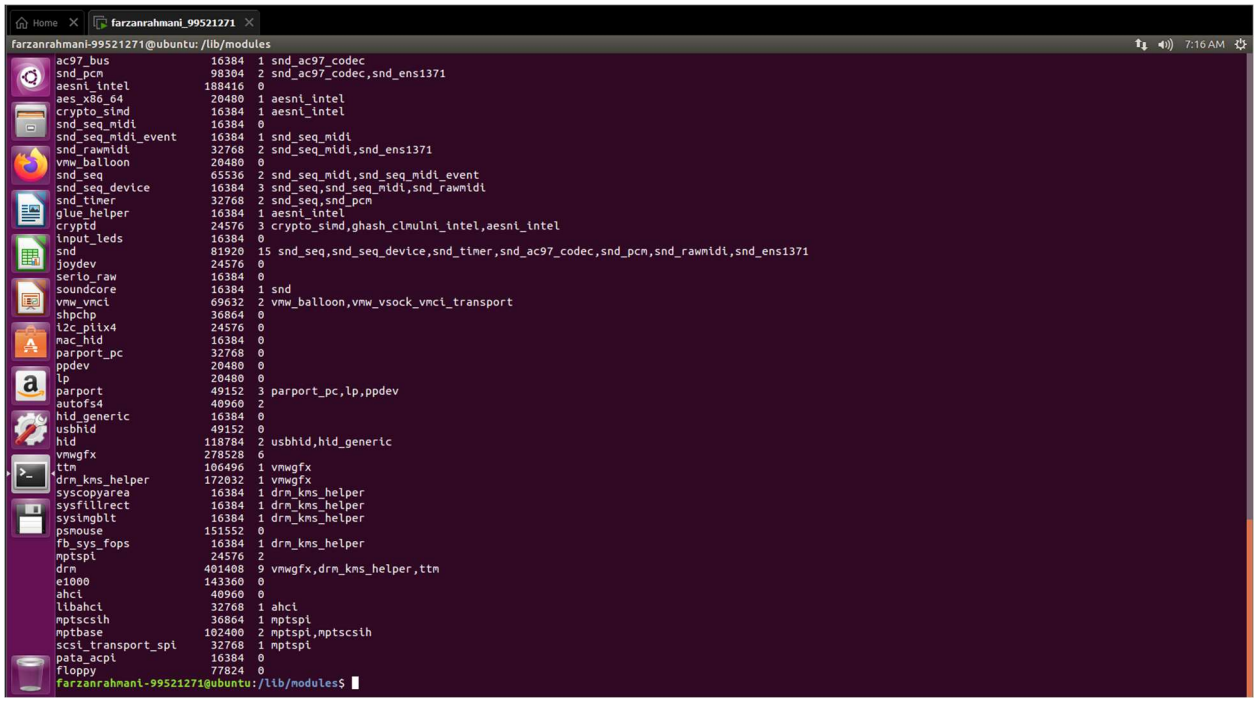

Home
farzanrahmani_99521271
farzanrahmani-99521271@ubuntu: /lib/modules
7:02 AM
GNU nano 2.5.3
File: Makefile
Modified
obj-m += test.o
all:
make -C /lib/modules/$(shell uname -r)/build M=$(shell pwd) modules
clean:
make -C /lib/modules/$(shell uname -r)/build M=$(shell pwd) clean


Home
farzanrahmani_99521271
farzanrahmani-99521271@ubuntu: /lib/modules
7:09 AM
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo make
make -C /lib/modules/4.15.0-112-generic/build M=/lib/modules modules
make[1]: Entering directory '/usr/src/linux-headers-4.15.0-112-generic'
CC [M] /lib/modules/test.o
Building modules, stage 2.
MODPOST 1 modules
CC /lib/modules/test.mod.o
LD [M] /lib/modules/test.ko
make[1]: Leaving directory '/usr/src/linux-headers-4.15.0-112-generic'
farzanrahmani-99521271@ubuntu:/lib/modules$ ls
4.15.0-112-generic Makefile modules.order Module.symvers test.c test.ko test.mod.c test.mod.o test.o

بخش دوم:


Home
farzanrahmani_99521271
farzanrahmani-99521271@ubuntu: /lib/modules
7:15 AM
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo dmesg -c
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo insmod test.ko
farzanrahmani-99521271@ubuntu:/lib/modules$ lsmod
Module Size Used by
test 16384 0
vmw_vsock_vmci_transport 32768 2
vsock 36864 3 vmw_vsock_vmci_transport
crct10dif_pclmul 16384 0
crc32_pclmul 16384 0
snd_ens1371 28672 4
ghash_clmulni_intel 16384 0
pcbc 16384 0
snd_ac97_codec 131072 1 snd_ens1371
gameport 16384 1 snd_ens1371
ac97_bus 16384 1 snd_ac97_codec
snd_pcm 98304 2 snd_ac97_codec,snd_ens1371
aesni_intel 188416 0
aes_x86_64 20480 1 aesni_intel
crypto_simd 16384 1 aesni_intel
snd_seq_midi 16384 0
snd_seq_midi_event 16384 1 snd_seq_midi
snd_rawmidi 32768 2 snd_seq_midi,snd_ens1371
vmw_balloon 20480 0
snd_seq 65536 2 snd_seq_midi,snd_seq_midi_event
snd_seq_device 16384 3 snd_seq,snd_seq_midi,snd_rawmidi
snd_timer 32768 2 snd_seq,snd_pcm
glue_helper 16384 1 aesni_intel
cryptd 24576 3 crypto_simd,ghash_clmulni_intel,aesni_intel
input_leds 16384 0
snd 81920 15 snd_seq,snd_seq_device,snd_timer,snd_ac97_codec,snd_pcm,snd_rawmidi,snd_ens1371
joydev 24576 0
serio_raw 16384 0
soundcore 16384 1 snd
vmw_vmci 69632 2 vmw_balloon,vmw_vsock_vmci_transport
shpchp 36864 0
i2c_piix4 24576 0
mac_hid 16384 0
parport_pc 32768 0
ppdev 20480 0
lp 20480 0
parport 49152 3 parport_pc,lp,ppdev
autofs4 40960 2
hid_generic 16384 0
usbhid 49152 0
hid 118784 2 usbhid,hid_generic
vmwgfx 278528 6
ttm 106496 1 vmwgfx
drm_kms_helper 172032 1 vmwgfx
syscopyarea 16384 1 drm_kms_helper
sysfillrect 16384 1 drm_kms_helper


Home
farzanrahmani_99521271
farzanrahmani-99521271@ubuntu: /lib/modules
7:16 AM
vmwgfx 278528 6
ttm 106496 1 vmwgfx
drm_kms_helper 172032 1 vmwgfx
syscopyarea 16384 1 drm_kms_helper
sysfillrect 16384 1 drm_kms_helper
sysimgblt 16384 1 drm_kms_helper
psmouse 151552 0
fb_sys_fops 16384 1 drm_kms_helper
mptspi 24576 2
drm 401408 9 vmwgfx,drm_kms_helper,ttm
e1000 143360 0
ahci 40960 0
libahci 32768 1 ahci
mptscsih 36864 1 mptspi
mptbase 102400 2 mptspi,mptscsih
scsi_transport_spi 32768 1 mptspi
pata_acpi 16384 0
floppy 77824 0
farzanrahmani-99521271@ubuntu:/lib/modules$ dmesg
[3209.528881] Loading Module
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo rmmod test
farzanrahmani-99521271@ubuntu:/lib/modules$ dmesg
[3209.528881] Loading Module
[3262.015061] Removing Module
farzanrahmani-99521271@ubuntu:/lib/modules$ lsmod
Module Size Used by
vmw_vsock_vmci_transport 32768 2
vsock 36864 3 vmw_vsock_vmci_transport
crct10dif_pclmul 16384 0
crc32_pclmul 16384 0
snd_ens1371 28672 4
ghash_clmulni_intel 16384 0
pcbc 16384 0
snd_ac97_codec 131072 1 snd_ens1371
gameport 16384 1 snd_ens1371
ac97_bus 16384 1 snd_ac97_codec
snd_pcm 98304 2 snd_ac97_codec,snd_ens1371
aesni_intel 188416 0
aes_x86_64 20480 1 aesni_intel
crypto_simd 16384 1 aesni_intel
snd_seq_midi 16384 0
snd_seq_midi_event 16384 1 snd_seq_midi
snd_rawmidi 32768 2 snd_seq_midi,snd_ens1371
vmw_balloon 20480 0
snd_seq 65536 2 snd_seq_midi,snd_seq_midi_event
snd_seq_device 16384 3 snd_seq,snd_seq_midi,snd_rawmidi
snd_timer 32768 2 snd_seq,snd_pcm
glue_helper 16384 1 aesni_intel
cryptd 24576 3 crypto_simd,ghash_clmulni_intel,aesni_intel
input_leds 16384 0


Home
farzanrahmani_99521271
farzanrahmani-99521271@ubuntu: /lib/modules
7:16 AM
ac97_bus 16384 1 snd_ac97_codec
snd_pcm 98304 2 snd_ac97_codec,snd_ens1371
aesni_intel 188416 0
aes_x86_64 20480 1 aesni_intel
crypto_simd 16384 1 aesni_intel
snd_seq_midi 16384 0
snd_seq_midi_event 16384 1 snd_seq_midi
snd_rawmidi 32768 2 snd_seq_midi,snd_ens1371
vmw_balloon 20480 0
snd_seq 65536 2 snd_seq_midi,snd_seq_midi_event
snd_seq_device 16384 3 snd_seq,snd_seq_midi,snd_rawmidi
snd_timer 32768 2 snd_seq,snd_pcm
glue_helper 16384 1 aesni_intel
cryptd 24576 3 crypto_simd,ghash_clmulni_intel,aesni_intel
input_leds 16384 0
snd 81920 15 snd_seq,snd_seq_device,snd_timer,snd_ac97_codec,snd_pcm,snd_rawmidi,snd_ens1371
joydev 24576 0
serio_raw 16384 0
soundcore 16384 1 snd
vmw_vmci 69632 2 vmw_balloon,vmw_vsock_vmci_transport
shpchp 36864 0
i2c_piix4 24576 0
mac_hid 16384 0
parport_pc 32768 0
ppdev 20480 0
lp 20480 0
parport 49152 3 parport_pc,lp,ppdev
autofs4 40960 2
hid_generic 16384 0
usbhid 49152 0
hid 118784 2 usbhid,hid_generic
vmwgfx 278528 6
ttm 106496 1 vmwgfx
drm_kms_helper 172032 1 vmwgfx
syscopyarea 16384 1 drm_kms_helper
sysfillrect 16384 1 drm_kms_helper
sysimgblt 16384 1 drm_kms_helper
psmouse 151552 0
fb_sys_fops 16384 1 drm_kms_helper
mptspi 24576 2
drm 401408 9 vmwgfx,drm_kms_helper,ttm
e1000 143360 0
ahci 40960 0
libahci 32768 1 ahci
mptscsih 36864 1 mptspi
mptbase 102400 2 mptspi,mptscsih
scsi_transport_spi 32768 1 mptspi
pata_acpi 16384 0
floppy 77824 0
farzanrahmani-99521271@ubuntu:/lib/modules$

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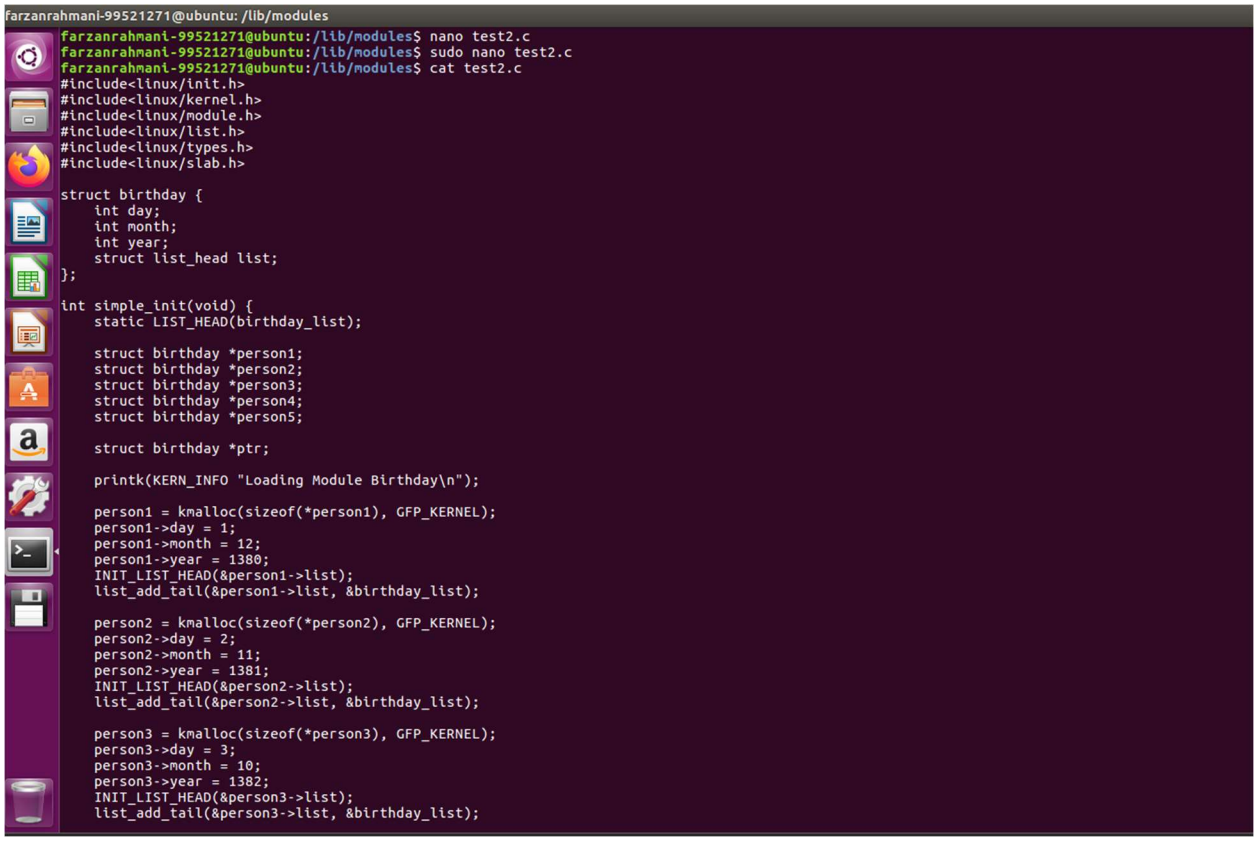
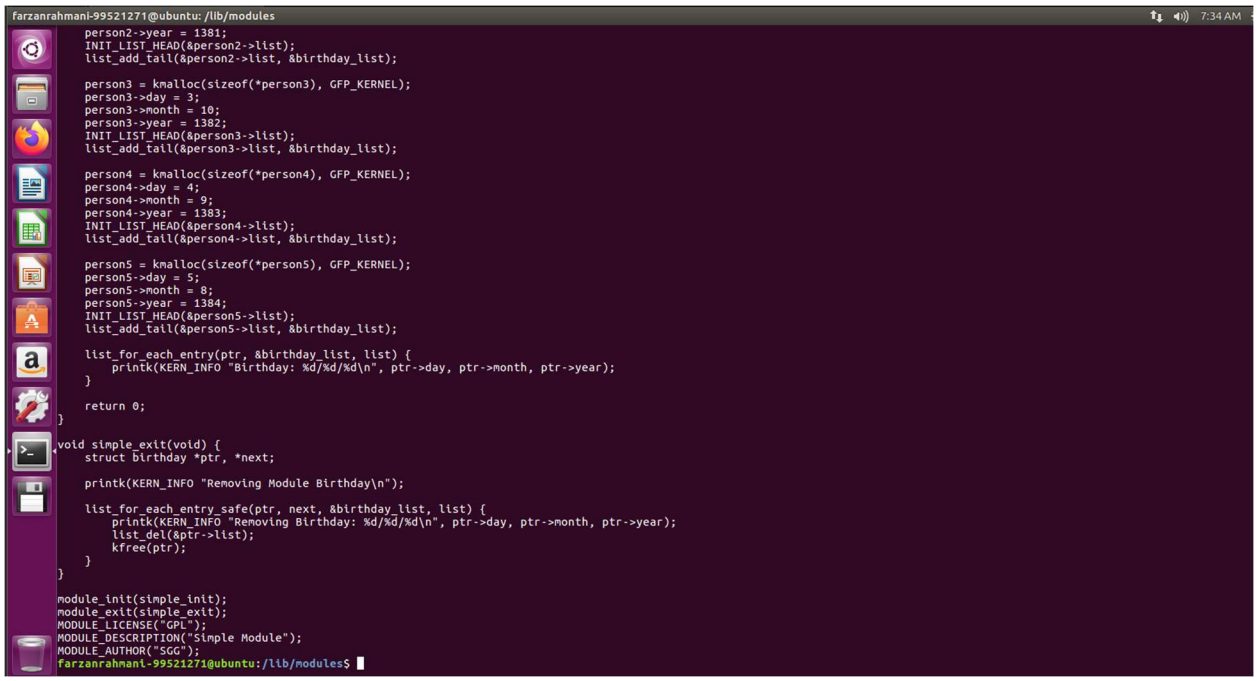
```
farzanrahmani-99521271@ubuntu: /lib/modules
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo touch test2.c
farzanrahmani-99521271@ubuntu:/lib/modules$ nano test2.c
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo nano test2.c
farzanrahmani-99521271@ubuntu:/lib/modules$
```

```
Home
farzanrahmani_99521271
farzanrahmani-99521271@ubuntu: /lib/modules
  GNU nano 2.5.3                    File: test2.c                    Modified

#include<linux/init.h>
#include<linux/kernel.h>
#include<linux/module.h>
#include<linux/list.h>
#include<linux/types.h>
#include<linux/slab.h>

struct birthday {
    int day;
    int month;
    int year;
    struct list_head list;
};

// declaring birthday_list
static LIST_HEAD(birthday_list);

int simple_init(void) {

    struct birthday *person1;
    struct birthday *person2;
    struct birthday *person3;
    struct birthday *person4;
    struct birthday *person5;

    struct birthday *ptr;

    printk(KERN_INFO "Loading Module Birthday\n");

    person1 = kmalloc(sizeof(*person1), GFP_KERNEL);
    person1->day = 1;
    person1->month = 12;
    person1->year = 1380;
    INIT_LIST_HEAD(&person1->list);
    list_add_tail(&person1->list, &birthday_list);

    person2 = kmalloc(sizeof(*person2), GFP_KERNEL);
    person2->day = 2;
    person2->month = 11;
    person2->year = 1381;
    INIT_LIST_HEAD(&person2->list);
    list_add_tail(&person2->list, &birthday_list);

    person3 = kmalloc(sizeof(*person3), GFP_KERNEL);
    person3->day = 3;
```

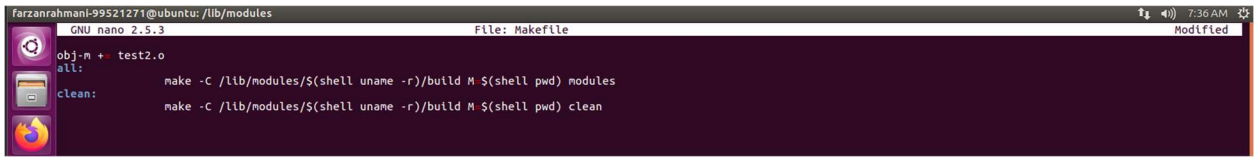
```
    person3 = kmalloc(sizeof(*person3), GFP_KERNEL);
    person3->day = 3;
    person3->month = 10;
    person3->year = 1382;
    INIT_LIST_HEAD(&person3->list);
    list_add_tail(&person3->list, &birthday_list);

    person4 = kmalloc(sizeof(*person4), GFP_KERNEL);
    person4->day = 4;
    person4->month = 9;
    person4->year = 1383;
    INIT_LIST_HEAD(&person4->list);
    list_add_tail(&person4->list, &birthday_list);

    person5 = kmalloc(sizeof(*person5), GFP_KERNEL);
    person5->day = 5;
    person5->month = 8;
    person5->year = 1384;
    INIT_LIST_HEAD(&person5->list);
    list_add_tail(&person5->list, &birthday_list);

    list_for_each_entry(ptr, &birthday_list, list) {
        printk(KERN_INFO "Birthday: %d/%d/%d\n", ptr->day, ptr->month, ptr->year);
    }

    return 0;
}
```

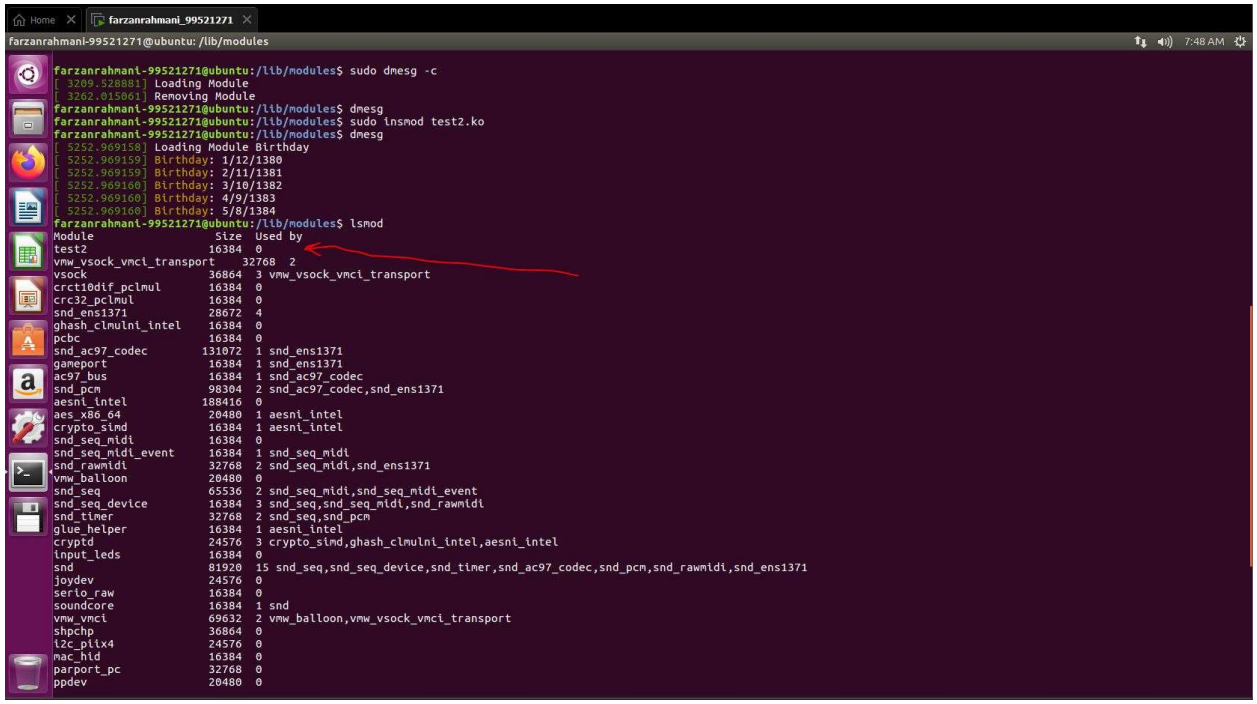
```
    return 0;
}

void simple_exit(void) {
    struct birthday *ptr, *next;

    printk(KERN_INFO "Removing Module Birthday\n");

    list_for_each_entry_safe(ptr, next, &birthday_list, list) {
        printk(KERN_INFO "Removing Birthday: %d/%d/%d\n", ptr->day, ptr->month, ptr->year);
        list_del(&ptr->list);
        kfree(ptr);
    }
}

module_init(simple_init);
module_exit(simple_exit);
MODULE_LICENSE("GPL");
MODULE_DESCRIPTION("Simple Module");
MODULE_AUTHOR("SGG");
```


farzanrahmani-99521271@ubuntu: /lib/modules
farzanrahmani-99521271@ubuntu:/lib/modules$ nano test2.c
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo nano test2.c
farzanrahmani-99521271@ubuntu:/lib/modules$ cat test2.c
#include<linux/init.h>
#include<linux/kernel.h>
#include<linux/module.h>
#include<linux/list.h>
#include<linux/types.h>
#include<linux/slab.h>
struct birthday {
int day;
int month;
int year;
struct list_head list;
};
int simple_init(void) {
static LIST_HEAD(birthday_list);
struct birthday *person1;
struct birthday *person2;
struct birthday *person3;
struct birthday *person4;
struct birthday *person5;
struct birthday *ptr;
printk(KERN_INFO "Loading Module Birthday\n");
person1 = kmalloc(sizeof(*person1), GFP_KERNEL);
person1->day = 1;
person1->month = 12;
person1->year = 1380;
INIT_LIST_HEAD(&person1->list);
list_add_tail(&person1->list, &birthday_list);
person2 = kmalloc(sizeof(*person2), GFP_KERNEL);
person2->day = 2;
person2->month = 11;
person2->year = 1381;
INIT_LIST_HEAD(&person2->list);
list_add_tail(&person2->list, &birthday_list);
person3 = kmalloc(sizeof(*person3), GFP_KERNEL);
person3->day = 3;
person3->month = 10;
person3->year = 1382;
INIT_LIST_HEAD(&person3->list);
list_add_tail(&person3->list, &birthday_list);

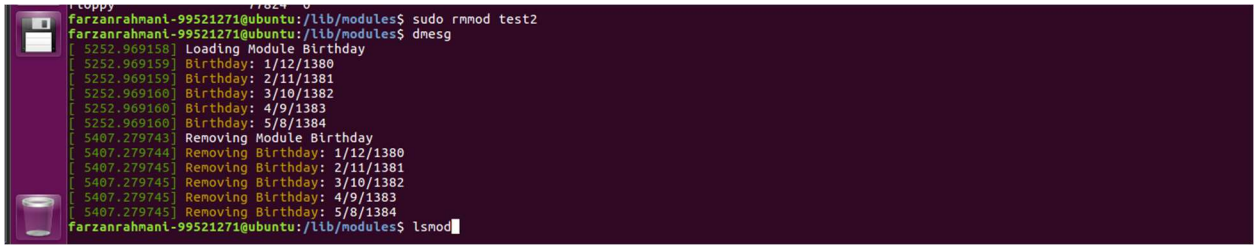

farzanrahmani-99521271@ubuntu: /lib/modules
7:34 AM
person2->year = 1381;
INIT_LIST_HEAD(&person2->list);
list_add_tail(&person2->list, &birthday_list);
person3 = kmalloc(sizeof(*person3), GFP_KERNEL);
person3->day = 3;
person3->month = 10;
person3->year = 1382;
INIT_LIST_HEAD(&person3->list);
list_add_tail(&person3->list, &birthday_list);
person4 = kmalloc(sizeof(*person4), GFP_KERNEL);
person4->day = 4;
person4->month = 9;
person4->year = 1383;
INIT_LIST_HEAD(&person4->list);
list_add_tail(&person4->list, &birthday_list);
person5 = kmalloc(sizeof(*person5), GFP_KERNEL);
person5->day = 5;
person5->month = 8;
person5->year = 1384;
INIT_LIST_HEAD(&person5->list);
list_add_tail(&person5->list, &birthday_list);
list_for_each_entry(ptr, &birthday_list, list) {
printk(KERN_INFO "Birthday: %d/%d/%d\n", ptr->day, ptr->month, ptr->year);
}
return 0;
}
void simple_exit(void) {
struct birthday *ptr, *next;
printk(KERN_INFO "Removing Module Birthday\n");
list_for_each_entry_safe(ptr, next, &birthday_list, list) {
printk(KERN_INFO "Removing Birthday: %d/%d/%d\n", ptr->day, ptr->month, ptr->year);
list_del(&ptr->list);
kfree(ptr);
}
}
module_init(simple_init);
module_exit(simple_exit);
MODULE_LICENSE("GPL");
MODULE_DESCRIPTION("Simple Module");
MODULE_AUTHOR("SGG");
farzanrahmani-99521271@ubuntu:/lib/modules$

```
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo nano Makefile
farzanrahmani-99521271@ubuntu:/lib/modules$ cat Makefile
obj-m += test2.o
all:
	make -C /lib/modules/$(shell uname -r)/build M=$(shell pwd) modules
clean:
	make -C /lib/modules/$(shell uname -r)/build M=$(shell pwd) clean
```

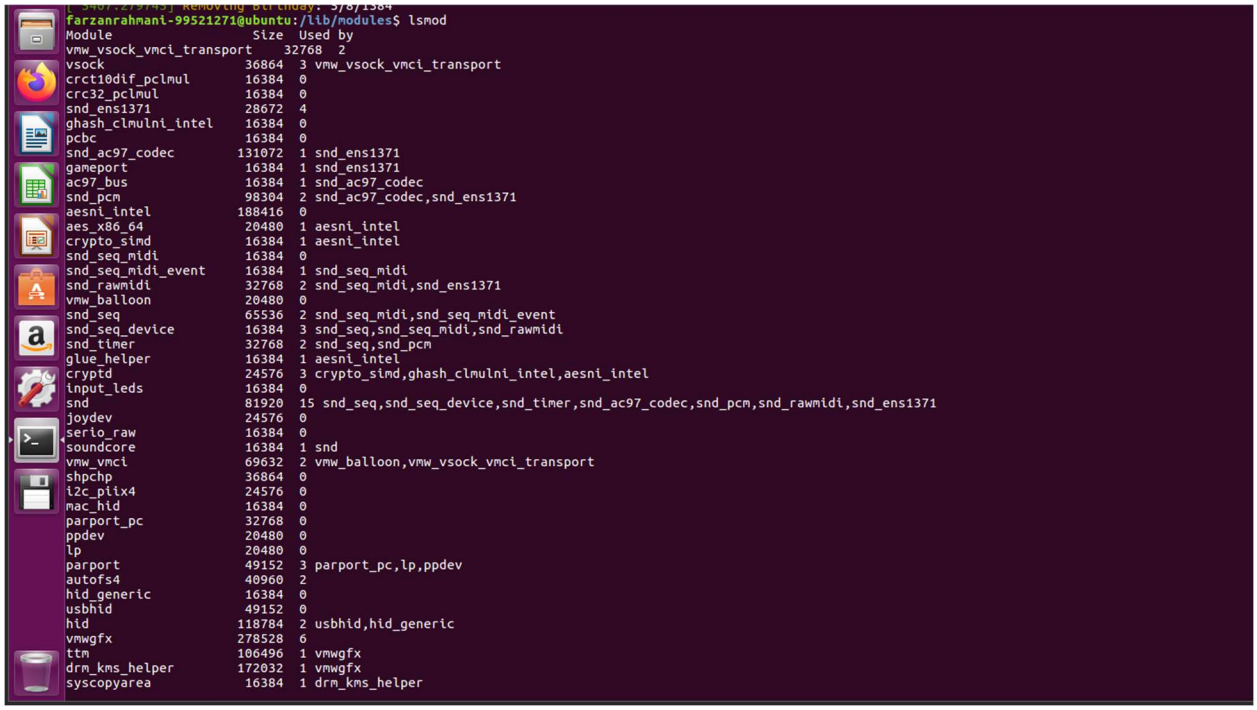




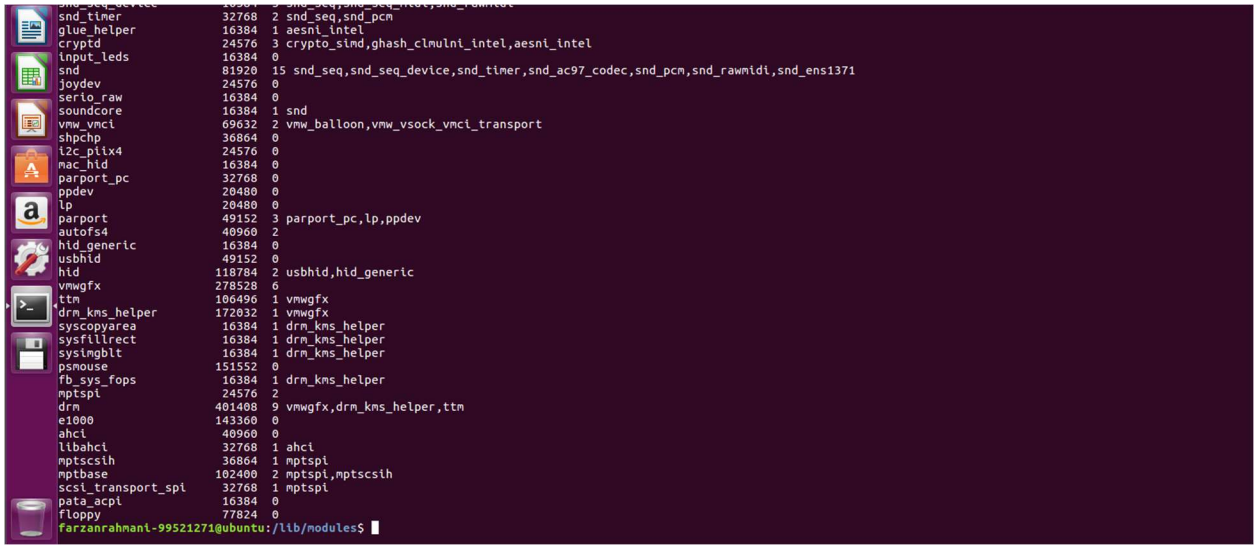
```
parport_pc             32768  0
ppdev                  20480  0
lp                     20480  0
parport                49152  3 parport_pc,lp,ppdev
autofs4                40960  2
hid_generic            16384  0
usbhid                 49152  0
hid                   118784  2 usbhid,hid_generic
vmwgfx                278528  6
ttm                   106496  1 vmwgfx
drm_kms_helper        172032  1 vmwgfx
syscopyarea            16384  1 drm_kms_helper
sysfillrect            16384  1 drm_kms_helper
sysimgblt              16384  1 drm_kms_helper
psmouse               151552  0
fb_sys_fops            16384  1 drm_kms_helper
mptspi                 24576  2
drm                   401408  9 vmwgfx,drm_kms_helper,ttm
e1000                 143360  0
ahci                   40960  0
libahci                32768  1 ahci
mptscsih               36864  1 mptspi
mptbase               102400  2 mptspi,mptscsih
scsi_transport_spi     32768  1 mptspi
pata_acpi              16384  0
floppy                 77824  0
farzanrahmani-99521271@ubuntu:/lib/modules$
```



```
floppy                 77824  0
farzanrahmani-99521271@ubuntu:/lib/modules$ sudo rmmod test2
farzanrahmani-99521271@ubuntu:/lib/modules$ dmesg
[ 5252.969158] Loading Module Birthday
[ 5252.969159] Birthday: 1/12/1380
[ 5252.969159] Birthday: 2/11/1381
[ 5252.969160] Birthday: 3/10/1382
[ 5252.969160] Birthday: 4/9/1383
[ 5252.969160] Birthday: 5/8/1384
[ 5407.279743] Removing Module Birthday
[ 5407.279744] Removing Birthday: 1/12/1380
[ 5407.279745] Removing Birthday: 2/11/1381
[ 5407.279745] Removing Birthday: 3/10/1382
[ 5407.279745] Removing Birthday: 4/9/1383
[ 5407.279745] Removing Birthday: 5/8/1384
farzanrahmani-99521271@ubuntu:/lib/modules$ lsmod
```



```
[ 5407.279745] Removing Birthday: 5/8/1384
farzanrahmani-99521271@ubuntu:/lib/modules$ lsmod
Module                  Size  Used by
vmw_vsock_vmci_transport    32768  2
vsock                   36864  3 vmw_vsock_vmci_transport
crct10dif_pclmul        16384  0
crc32_pclmul            16384  0
snd_ens1371             28672  4
ghash_clmulni_intel     16384  0
pcbc                    16384  0
snd_ac97_codec         131072  1 snd_ens1371
gameport                16384  1 snd_ens1371
ac97_bus                16384  1 snd_ac97_codec
snd_pcm                 98304  2 snd_ac97_codec,snd_ens1371
aesni_intel            188416  0
aes_x86_64              20480  1 aesni_intel
crypto_simd             16384  1 aesni_intel
snd_seq_midi            16384  0
snd_seq_midi_event      16384  1 snd_seq_midi
snd_rawmidi             32768  2 snd_seq_midi,snd_ens1371
vmw_balloon             20480  0
snd_seq                 65536  2 snd_seq_midi,snd_seq_midi_event
snd_seq_device          16384  3 snd_seq,snd_seq_midi,snd_rawmidi
snd_timer               32768  2 snd_seq,snd_pcm
glue_helper             16384  1 aesni_intel
cryptd                  24576  3 crypto_simd,ghash_clmulni_intel,aesni_intel
input_leds              16384  0
snd                     81920  15 snd_seq,snd_seq_device,snd_timer,snd_ac97_codec,snd_pcm,snd_rawmidi,snd_ens1371
joydev                  24576  0
serio_raw               16384  0
soundcore               16384  1 snd
vmw_vmci                69632  2 vmw_balloon,vmw_vsock_vmci_transport
shpchp                  36864  0
i2c_piix4               24576  0
mac_hid                 16384  0
parport_pc              32768  0
ppdev                   20480  0
lp                      20480  0
parport                 49152  3 parport_pc,lp,ppdev
autofs4                 40960  2
hid_generic             16384  0
usbhid                  49152  0
hid                    118784  2 usbhid,hid_generic
vmwgfx                 278528  6
ttm                    106496  1 vmwgfx
drm_kms_helper         172032  1 vmwgfx
syscopyarea             16384  1 drm_kms_helper
```


snd_timer 32768 2 snd_seq,snd_pcm
glue_helper 16384 1 aesni_intel
cryptd 24576 3 crypto_simd,ghash_clmulni_intel,aesni_intel
input_leds 16384 0
snd 81920 15 snd_seq,snd_seq_device,snd_timer,snd_ac97_codec,snd_pcm,snd_rawmidi,snd_ens1371
joydev 24576 0
serio_raw 16384 0
soundcore 16384 1 snd
vmw_vmci 69632 2 vmw_balloon,vmw_vsock_vmci_transport
shpchp 36864 0
i2c_piix4 24576 0
mac_hid 16384 0
parport_pc 32768 0
ppdev 20480 0
lp 20480 0
parport 49152 3 parport_pc,lp,ppdev
autofs4 40960 2
hid_generic 16384 0
usbhid 49152 0
hid 118784 2 usbhid,hid_generic
vmwgfx 278528 6
ttm 106496 1 vmwgfx
drm_kms_helper 172032 1 vmwgfx
syscopyarea 16384 1 drm_kms_helper
sysfillrect 16384 1 drm_kms_helper
sysimgblt 16384 1 drm_kms_helper
psmouse 151552 0
fb_sys_fops 16384 1 drm_kms_helper
mptspi 24576 2
drm 401408 9 vmwgfx,drm_kms_helper,ttm
e1000 143360 0
ahci 40960 0
libahci 32768 1 ahci
mptscsih 36864 1 mptspi
mptbase 102400 2 mptspi,mptscsih
scsi_transport_spi 32768 1 mptspi
pata_acpi 16384 0
floppy 77824 0
farzanrahmani-99521271@ubuntu:/lib/modules$

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