

Activity 12: Kernel Module

	ชื่อ - นามสกุล	รหัสนิสิต
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Checkpoint 1

```

vboxuser@Ubuntu: ~/Downloads/Activity_12/problem1
CC [M] /home/vboxuser/Downloads/Activity_12/problem1/dummy.o
MODPOST /home/vboxuser/Downloads/Activity_12/problem1/Module.symvers
CC [M] /home/vboxuser/Downloads/Activity_12/problem1/dummy.mod.o
LD [M] /home/vboxuser/Downloads/Activity_12/problem1/dummy.ko
BTF [M] /home/vboxuser/Downloads/Activity_12/problem1/dummy.ko
Skipping BTF generation for /home/vboxuser/Downloads/Activity_12/problem1/dummy.ko due to unavailability of vmlinux
make[1]: Leaving directory '/usr/src/linux-headers-6.8.0-56-generic'
vboxuser@Ubuntu:~/Downloads/Activity_12/problem1$ sudo insmod dummy.ko
insmod: ERROR: could not insert module dummy.ko: File exists
vboxuser@Ubuntu:~/Downloads/Activity_12/problem1$ lsmod | grep tail
vboxuser@Ubuntu:~/Downloads/Activity_12/problem1$ lsmod | grep dummy
dummy                12288      0
snd_seq_dummy        12288      0
snd_seq              126976    9 snd_seq_midi,snd_seq_midi_event,snd_seq_dummy
vboxuser@Ubuntu:~/Downloads/Activity_12/problem1$ sudo dmesg | tail
[ 458.824212] audit: type=1400 audit(1744006675.839:176): apparmor="STATUS" operation="profile_replace" info="same as c
urrent profile, skipping" profile="unconfined" name="rsyslogd" pid=4675 comm="apparmor_parser"
[ 483.315297] audit: type=1400 audit(1744006700.325:177): apparmor="DENIED" operation="capable" class="cap" profile="/u
sr/sbin/cupsd" pid=4808 comm="cupsd" capability=12 capname="net_admin"
[ 1203.142969] CPMOD: cleanup
[ 1748.714051] CPCHAR: dev osinfo init
[ 1748.714085] Device MajorNumber 235.
[ 1748.714086] To create a device file:
[ 1748.714087] 'mknod /dev/osinfo c 235 0'.
[ 1748.714088] Try varying minor numbers.
[ 1748.714088] Please remove the device file and module when done.
[ 1979.013923] CPMOD: init
vboxuser@Ubuntu:~/Downloads/Activity_12/problem1$ sudo dmesg | grep CPMOD
[ 421.141160] CPMOD: init
[ 1203.142969] CPMOD: cleanup
[ 1979.013923] CPMOD: init
vboxuser@Ubuntu:~/Downloads/Activity_12/problem1$

```

Checkpoint 2

```
VirtualBox VM Machine View Input Devices Window Help
Ubuntu (Running)
Apr 7 08:14
vboxuser@Ubuntu: ~/Documents/2110313-os-main/assignment12/problem2

vboxuser@Ubuntu:~/Documents/2110313-os-main/assignment12/problem2$ make
make -C /lib/modules/6.8.0-56-generic/build M=/home/vboxuser/Documents/2110313-os-main/assignment12/problem2 modules
make[1]: Entering directory '/usr/src/linux-headers-6.8.0-56-generic'
warning: the compiler differs from the one used to build the kernel
The kernel was built by: aarch64-linux-gnu-gcc-13 (Ubuntu 13.3.0-6ubuntu2-24.04) 13.3.0
You are using: gcc-13 (Ubuntu 13.3.0-6ubuntu2-24.04) 13.3.0
CC [M] /home/vboxuser/Documents/2110313-os-main/assignment12/problem2/osinfo.o
MODPOST /home/vboxuser/Documents/2110313-os-main/assignment12/problem2/Module.symvers
s CC [M] /home/vboxuser/Documents/2110313-os-main/assignment12/problem2/osinfo.mod.o
ld LD [M] /home/vboxuser/Documents/2110313-os-main/assignment12/problem2/osinfo.ko
BTF [M] /home/vboxuser/Documents/2110313-os-main/assignment12/problem2/osinfo.ko
Skipping BTF generation for /home/vboxuser/Documents/2110313-os-main/assignment12/problem2/osinfo.ko due to unavailability of vmlinux
make[1]: Leaving directory '/usr/src/linux-headers-6.8.0-56-generic'
vboxuser@Ubuntu:~/Documents/2110313-os-main/assignment12/problem2$ sudo insmod osinfo.ko
vboxuser@Ubuntu:~/Documents/2110313-os-main/assignment12/problem2$ sudo mknod /dev/osinfo c 235 0
mknod: /dev/osinfo: File exists
vboxuser@Ubuntu:~/Documents/2110313-os-main/assignment12/problem2$ sudo chmod 666 /dev/osinfo
vboxuser@Ubuntu:~/Documents/2110313-os-main/assignment12/problem2$ cat /dev/osinfo
0: CP ENG CU OS 2022S2 - Instructors
1: Veera Muangsins, Ph.D.
2: Krerk Piromsopa, Ph.D.
3: Thongchai Rojkangsadan
vboxuser@Ubuntu:~/Documents/2110313-os-main/assignment12/problem2$
```

Checkpoint 3

```
VirtualBox VM Machine View Input Devices Window Help
Ubuntu (Running)
Apr 7 08:17
vboxuser@Ubuntu: ~/Documents/2110313-os-main/assignment12/problem3

vboxuser@Ubuntu:~/Documents/2110313-os-main/assignment12/problem3$ sudo mknod /dev/osinfo c 235 0
vboxuser@Ubuntu:~/Documents/2110313-os-main/assignment12/problem3$ sudo mknod /dev/osinfo1 c 235 1
vboxuser@Ubuntu:~/Documents/2110313-os-main/assignment12/problem3$ sudo chmod 666 /dev/osinfo /dev/osinfo1
vboxuser@Ubuntu:~/Documents/2110313-os-main/assignment12/problem3$ cat /dev/osinfo
0:CP ENG CU OS 2022S2 - Instructors
1: Veera Muangsins,Ph.D.
2: Krerk Piromsopa, Ph.D.
3: Thongchai Rojkangsadan
vboxuser@Ubuntu:~/Documents/2110313-os-main/assignment12/problem3$ cat /dev/osinfo1
0:CP ENG CU OS 2022S2 - Students, Group Name: เณร [๓๕
1: 6432154921 Waranthorn Chansawang
2: 6430376521 Siwapat Kanchana
3: 6532143021 Monthawat Sawarak
vboxuser@Ubuntu:~/Documents/2110313-os-main/assignment12/problem3$
```

Checkpoint 4

```
os-linux2@os-linux2-VirtualBox:~/2110313-os/assignment12/problem4$ cat /dev/cpuinfo
Vendor ID GenuineIntel
stepping 1
model 13
family 6
processor type 0
extended model 8
```

Checkpoint 5

```
os-linux2@os-linux2-VirtualBox:~/2110313-os/assignment12/problem5_6$ cat /dev/cp-psinfo
1,systemd
2,kthreadd
3,pool_workqueue_
4,kworker/R-rcu_g
5,kworker/R-sync_
6,kworker/R-slub_
7,kworker/R-netns
8,kworker/0:0
10,kworker/0:0H
11,kworker/u8:0
12,kworker/R-mm_pe
13,rcu_tasks_kthre
14,rcu_tasks_rude_
15,rcu_tasks_trace
16,ksoftirqd/0
17,rcu_preempt
18,rcu_exp_par_gp_
19,rcu_exp_gp_kthr
20,migration/0
21,idle_inject/0
22,cpuhp/0
23,cpuhp/1
24,idle_inject/1
25,migration/1
26,ksoftirqd/1
27,kworker/1:0
29,kworker/u9:0
31,kdevtmpfs
32,kworker/R-inet_
33,kworker/u9:1
```

Checkpoint 6

```
os-linux2@os-linux2-VirtualBox:~/2110313-os/assignment12/problem5_6$ cat /dev/cp-meminfo
Total RAM: 4009608 KB
Free RAM: 168492 KB
Available RAM: 3841116 KB
```