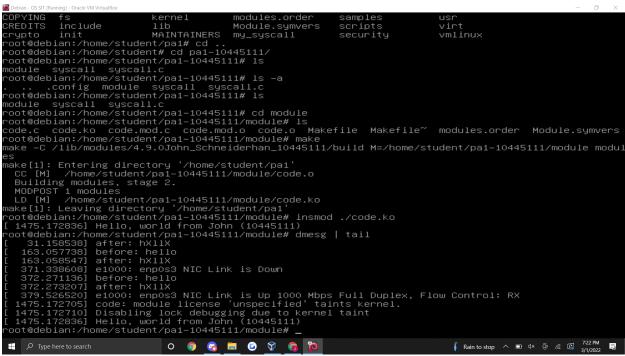John Schneiderhan

"I pledge my honor that I have abided by the Stevens Honor System"

## Part D (Screenshot of Kernel version)



```
[ 1475.172705] code: module license 'unspecified' taints kernel.
[ 1475.172710] Disabling lock debugging due to kernel taint
[ 1475.172836] Hello, world from John (10445111)
[ 1515.810157] Task "rmmod" (pid 1818)
[ 1515.812898] Goodbye!
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module#
root@debian:/home/student/pa1-10445111/module# uname -a
Linux debian 4.9.0John_Schneiderhan_10445111 #4 SMP Tue Mar 1 18:08:28 EST 2022 x86_64 GNU/Linux
root@debian:/home/student/pa1-10445111/module#
```

## Part E, P1 (Screenshot of Kernel log after loading the module)



```
COPYING      fs              kernel          modules.order    samples        usr
CREDITS      include         lib             Module.symvers   scripts        virt
crypto       init            MAINTAINERS     my_syscall       security       vmlinux
root@debian:/home/student/pa1# cd ..
root@debian:/home/student# cd pa1-10445111/
root@debian:/home/student/pa1-10445111# ls
module  syscall  syscall.c
root@debian:/home/student/pa1-10445111# ls -a
.  ..  .config  module  syscall  syscall.c
root@debian:/home/student/pa1-10445111# ls
module  syscall  syscall.c
root@debian:/home/student/pa1-10445111# cd module
root@debian:/home/student/pa1-10445111/module# ls
code.c  code.ko  code.mod.c  code.mod.o  code.o  Makefile  Makefile~  modules.order  Module.symvers
root@debian:/home/student/pa1-10445111/module# make
make -C /lib/modules/4.9.0John_Schneiderhan_10445111/build M=/home/student/pa1-10445111/module modul
es
make[1]: Entering directory '/home/student/pa1'
  CC [M]  /home/student/pa1-10445111/module/code.o
  Building modules, stage 2.
  MODPOST 1 modules
  LD [M]  /home/student/pa1-10445111/module/code.ko
make[1]: Leaving directory '/home/student/pa1'
root@debian:/home/student/pa1-10445111/module# insmod ./code.ko
[ 1475.172836] Hello, world from John (10445111)
root@debian:/home/student/pa1-10445111/module# dmesg | tail
[   31.158538] after: hX11X
[  163.057738] before: hello
[  163.058547] after: hX11X
[  371.338608] e1000: enp0s3 NIC Link is Down
[  372.271136] before: hello
[  372.273207] after: hX11X
[  379.526520] e1000: enp0s3 NIC Link is Up 1000 Mbps Full Duplex, Flow Control: RX
[ 1475.172705] code: module license 'unspecified' taints kernel.
[ 1475.172710] Disabling lock debugging due to kernel taint
[ 1475.172836] Hello, world from John (10445111)
root@debian:/home/student/pa1-10445111/module# _
```

## Part E, P2 (Screenshot of Kernel log after unloading the module)

```
root@debian:/home/student/pa1-10445111/module# make
make -C /lib/modules/4.9.0John_Schneiderhan_10445111/build M=/home/student/pa1-10445111/module modul
es
make[1]: Entering directory '/home/student/pa1'
  CC [M]  /home/student/pa1-10445111/module/code.o
  Building modules, stage 2.
  MODPOST 1 modules
  LD [M]  /home/student/pa1-10445111/module/code.ko
make[1]: Leaving directory '/home/student/pa1'
root@debian:/home/student/pa1-10445111/module# insmod ./code.ko
[ 1475.172836] Hello, world from John (10445111)
root@debian:/home/student/pa1-10445111/module# dmesg | tail
[   31.158538] after: hX11X
[  163.057738] before: hello
[  163.058547] after: hX11X
[  371.338608] e1000: enp0s3 NIC Link is Down
[  372.271136] before: hello
[  372.273207] after: hX11X
[  379.526520] e1000: enp0s3 NIC Link is Up 1000 Mbps Full Duplex, Flow Control: RX
[ 1475.172705] code: module license 'unspecified' taints kernel.
[ 1475.172710] Disabling lock debugging due to kernel taint
[ 1475.172836] Hello, world from John (10445111)
root@debian:/home/student/pa1-10445111/module# rmmod ./code.ko
[ 1515.810157] Task "rmmod" (pid 1818)
[ 1515.812898] Goodbye!
root@debian:/home/student/pa1-10445111/module# dmesg | tail
[  163.058547] after: hX11X
[  371.338608] e1000: enp0s3 NIC Link is Down
[  372.271136] before: hello
[  372.273207] after: hX11X
[  379.526520] e1000: enp0s3 NIC Link is Up 1000 Mbps Full Duplex, Flow Control: RX
[ 1475.172705] code: module license 'unspecified' taints kernel.
[ 1475.172710] Disabling lock debugging due to kernel taint
[ 1475.172836] Hello, world from John (10445111)
[ 1515.810157] Task "rmmod" (pid 1818)
[ 1515.812898] Goodbye!
root@debian:/home/student/pa1-10445111/module# _
```

## Part H, P1 (Screenshot of output of user space C program)

```
        char test2[] = "supercalifragilisticexpialidocious";

        printf("%s\n", test2);

        printf("%d\n", syscall(548, test2));

        printf("%s\n", test2);

        return 0;
}


~
~
~
~
~
~
~
~
~
~
~
"syscall.c" 25L, 352C written
root@debian:/home/student/pa1-10445111# gcc syscall.c -o syscall
root@debian:/home/student/pa1-10445111# ./syscall
hello
[  163.057738] before: hello
[  163.058547] after: hX11X
2
hX11X
supercalifragilisticexpialidocious
-1
supercalifragilisticexpialidocious
root@debian:/home/student/pa1-10445111#
```

Part H, P2 (Screenshot of Kernel log of user space C program)



```
Debian - OS SIT [Running] - Oracle VM VirtualBox                                                    −   □   ×

~
~
~
~
~
~
~
~
~
~
"syscall.c" 25L, 352C written
root@debian:/home/student/pa1-10445111# gcc syscall.c -o syscall
root@debian:/home/student/pa1-10445111# ./syscall
hello
[  163.057738] before: hello
[  163.058547] after: hX11X
2
hX11X
supercalifragilisticexpialidocious
-1
supercalifragilisticexpialidocious
root@debian:/home/student/pa1-10445111# dmesg | tail
              00:00:00.000266 main      Process ID: 1342
              00:00:00.000268 main      Package type: LINUX_64BITS_GENERIC
[    2.231880] 00:00:00.002095 main      5.2.16 r123759 started. Verbose level = 0
[    2.412706] clocksource: Switched to clocksource tsc
[    3.991486] e1000: enp0s3 NIC Link is Up 1000 Mbps Full Duplex, Flow Control: RX
[    3.992012] IPv6: ADDRCONF(NETDEV_CHANGE): enp0s3: link becomes ready
[   31.158078] before: hello
[   31.158538] after: hX11X
[  163.057738] before: hello
[  163.058547] after: hX11X
root@debian:/home/student/pa1-10445111#
```