

```

a1@AAA:~/repos/test1$ make
make -C /lib/modules/`uname -r`/build M=$PWD
make[1]: Entering directory '/usr/src/linux-headers-6.2.0-35-generic'
warning: the compiler differs from the one used to build the kernel
The kernel was built by: x86_64-linux-gnu-gcc-11 (Ubuntu 11.4.0-1ubuntu1~22.04) 11.4.0
You are using:          gcc-11 (Ubuntu 11.4.0-1ubuntu1~22.04) 11.4.0
make[1]: Leaving directory '/usr/src/linux-headers-6.2.0-35-generic'
a1@AAA:~/repos/test1$ sudo insmod hello.ko
a1@AAA:~/repos/test1$ lsmod
Module                  Size  Used by
hello                   16384  0
vboxsf                  98304  1
snd_intel8x0            53248  2
snd_ac97_codec          200704 1 snd_intel8x0

```

```

a1@AAA:~/repos/test1$ sudo insmod hello.ko
a1@AAA:~/repos/test1$ modinfo hello.ko
filename:                /home/a1/repos/test1/hello.ko
myIntCheck:              How many to print hullo
license:                 Dual BSD/GPL
description:             Hello, world in Linux Kernel Training
author:                  Nokhrina Daria
srcversion:              8F4D0F50F790730ECBD7C1B
depends:
retpoline:              Y
name:                    hello
vermagic:                6.2.0-35-generic SMP preempt mod_unload modversions
parm:                    myIntCheck:uint (int)
a1@AAA:~/repos/test1$

```

Пояснення:

printMyData викликається двічі:

```

printk("    First");

printMyData();

printk("    Second");

printMyData();

```

Second викликається для перевірки видалення, тому після нього не виводиться нічого, адже все було видаленно при першому виклику printMyData();, коли друкувалося.

**При myIntCheck = 1:**

```

a1@AAA:~/repos/test1$ make
make -C /lib/modules/`uname -r`/build M=$PWD
make[1]: Entering directory '/usr/src/linux-headers-6.2.0-35-generic'
warning: the compiler differs from the one used to build the kernel
The kernel was built by: x86_64-linux-gnu-gcc-11 (Ubuntu 11.4.0-1ubuntu1~22.04) 11.4.0
You are using:          gcc-11 (Ubuntu 11.4.0-1ubuntu1~22.04) 11.4.0
make[1]: Leaving directory '/usr/src/linux-headers-6.2.0-35-generic'
a1@AAA:~/repos/test1$ sudo insmod hello.ko
a1@AAA:~/repos/test1$ sudo rmmod hello
a1@AAA:~/repos/test1$ sudo journalctl --since "1 minute ago" | grep kernel
rpy 11 03:33:30 AAA kernel: 0 hi hi hullo
rpy 11 03:33:30 AAA kernel:      First
rpy 11 03:33:30 AAA kernel: Time: 5615128009561
rpy 11 03:33:30 AAA kernel:      Second
rpy 11 03:34:19 AAA kernel: Goodbye my friend, I shall miss you dearly...
rpy 11 03:34:19 AAA kernel: Hello world driver loaded.
rpy 11 03:34:22 AAA kernel: 0 hi hi hullo
rpy 11 03:34:22 AAA kernel:      First
rpy 11 03:34:22 AAA kernel: Time: 5705519092408
rpy 11 03:34:22 AAA kernel:      Second
a1@AAA:~/repos/test1$

```

При myIntCheck = 0:

```

a1@AAA:~/repos/test1$ sudo insmod hello.ko myIntCheck=0
a1@AAA:~/repos/test1$ sudo rmmod hello
a1@AAA:~/repos/test1$ sudo journalctl --since "1 minute ago" | grep kernel
rpy 11 03:36:07 AAA kernel: 0 hi hi hullo
rpy 11 03:36:07 AAA kernel:      First
rpy 11 03:36:07 AAA kernel: Time: 5765588477185
rpy 11 03:36:07 AAA kernel:      Second
rpy 11 03:36:36 AAA kernel: Goodbye my friend, I shall miss you dearly...
rpy 11 03:36:36 AAA kernel: Warning
rpy 11 03:36:43 AAA kernel: Hello world driver loaded.
rpy 11 03:36:43 AAA kernel:      First
rpy 11 03:36:43 AAA kernel:      Second
a1@AAA:~/repos/test1$

```

1 – це минула програма при =1, тому там є час.

2 – ця програма. Так як в кодї йде спочатку вивід «Warning», а потім вже "Hello world driver loaded.", то він перед ним. Часу нема, бо i = 0.

При myIntCheck = 7:

```
a1@AAA: ~/repos/test1
a1@AAA:~$ sudo insmod hello.ko myIntCheck=7
[sudo] password for a1:
insmod: ERROR: could not load module hello.ko: No such file or directory
a1@AAA:~$ cd repos
a1@AAA:~/repos$ cd test1
a1@AAA:~/repos/test1$ sudo insmod hello.ko myIntCheck=7
a1@AAA:~/repos/test1$ sudo rmmod hello
a1@AAA:~/repos/test1$ sudo journalctl --since "1 minute ago" | grep kernel
rpy 11 03:41:15 AAA kernel: Goodbye my friend, I shall miss you dearly...
rpy 11 03:41:15 AAA kernel: Warning
rpy 11 03:41:15 AAA kernel: Hello world driver loaded.
rpy 11 03:41:15 AAA kernel: 0 hi hi hullo
rpy 11 03:41:15 AAA kernel: 1 hi hi hullo
rpy 11 03:41:15 AAA kernel: 2 hi hi hullo
rpy 11 03:41:15 AAA kernel: 3 hi hi hullo
rpy 11 03:41:15 AAA kernel: 4 hi hi hullo
rpy 11 03:41:15 AAA kernel: 5 hi hi hullo
rpy 11 03:41:19 AAA kernel: 6 hi hi hullo
rpy 11 03:41:19 AAA kernel:      First
rpy 11 03:41:19 AAA kernel: Time: 6121522252271
rpy 11 03:41:19 AAA kernel: Time: 6121522254045
rpy 11 03:41:19 AAA kernel: Time: 6121522254926
rpy 11 03:41:19 AAA kernel: Time: 6121522255717
rpy 11 03:41:19 AAA kernel: Time: 6121522256412
rpy 11 03:41:19 AAA kernel: Time: 6121522257113
rpy 11 03:41:19 AAA kernel: Time: 6121522257808
rpy 11 03:41:19 AAA kernel:      Second
a1@AAA:~/repos/test1$
```

При myIntCheck = 100:

```
a1@AAA:~/repos/test1$ sudo insmod hello.ko myIntCheck=100
insmod: ERROR: could not insert module hello.ko: Invalid parameters
a1@AAA:~/repos/test1$
```