LINUX PROGRAMMING WEEK 8

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1. With the help of UCK produce your own kernel and perform installation on a laptop/desktop

AIM: To perform kernel modification using the LKM module, and display helloworld.

PROCEDURE:

- Install the build libraries
- Write the code for hello world as follows

```
#include linux/module.h>
#include ux/kernel.h>
#include ux/init.h>
MODULE_LICENSE("GPL");
MODULE_AUTHOR("Kailash 18MIS1074");
MODULE_DESCRIPTION("hello world first kernel program");
MODULE_VERSION("0.1");
static int __init hello_start(void)
{
  printk(KERN_INFO "Loading hello module...\n");
  printk(KERN_INFO "Hello world! \n");
  printk(KERN_INFO "Kailash 18MIS1074\n");
  return 0;
}
static void __exit hello_end(void)
  printk(KERN_INFO "Goodbye! This was expt for week 8\n");
```

module_init(hello_start);
module_exit(hello_end);

• Write code for Makefile as follows:

obj-m = hello.o

all:

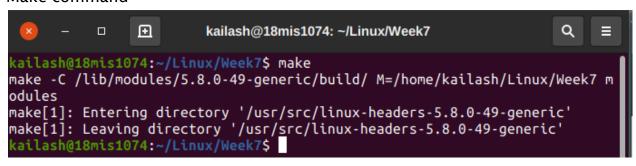
make -C /lib/modules/\$(shell uname -r)/build/ M=\$(PWD) modules clean:

make -C /lib/modules/\$(shell uname -r)/build M=\$(PWD) clean

- Run the program by running make command
- Use insmod to show hello.ko (ko for kernel object) file
- Run modinfo hello.ko to describe the program
- Navigate to /var/log/kern.log file, at the time where we executed the file we can see what we intended to display.

OUTPUT:

Make command



```
ⅎ
                         kailash@18mis1074: ~/Linux/Week7
kailash@18mis1074:~/Linux/Week7$ sudo insmod hello.ko
insmod: ERROR: could not insert module hello.ko: File exists
kailash@18mis1074:~/Linux/Week7$ modinfo hello.ko
filename:
                /home/kailash/Linux/Week7/hello.ko
version:
description:
                hello world first kernel program
                Kailash 18MIS1074
author:
license:
srcversion:
                A061E209ECB81F745A9D2EA
depends:
retpoline:
name:
                hello
vermagic:
                5.8.0-49-generic <u>SMP</u> mod_unload modversions
kailash@18mis1074:~/Linux/Week7$
```

Our statements being logged in /var/log/kern.log

```
May 9 19:57:41 18mis1074 kernel: [ 1800.560830] Loading hello module...
May 9 19:57:41 18mis1074 kernel: [ 1800.560833] Hello world!
May 9 19:57:41 18mis1074 kernel: [ 1800.560833] <mark>K</mark>ailash 18MIS1074
```

RESULT:

Thus, we have successfully written hello world program at kernel level, using the printk() command