

EI331 COURSE PROJECT

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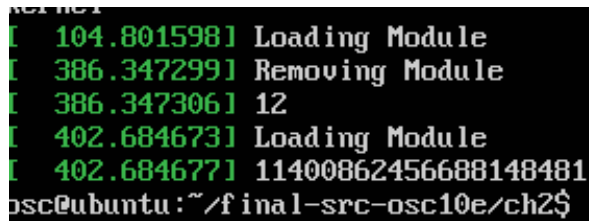
I. PROJECT 1

A. Introduction

This project is an introduction to the Linux Kernel Modules. We are given two *c* files as the example code and are required to use some global variables and commands to see what the kernel module is doing.

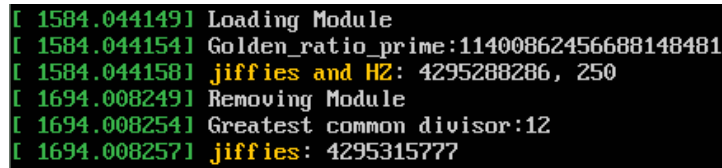
B. Process

The project mainly consists of two parts. One is to load and remove kernel modules and the second is to use the */proc* file system. We did some simple experiments on the concepts first, and then used 2 excersises to verify whether we have mastered the knowledge. The results for the experiments are as follows(we were asked to print the value of the Golden ratio prime, jiffies, HZ, and used a given function to claculate the greatest common divisor):



```
osc@ubuntu:~/final-src-osc10e/ch2$  
[ 104.801598] Loading Module  
[ 386.347299] Removing Module  
[ 386.347306] 12  
[ 402.684673] Loading Module  
[ 402.684677] 11400862456688148481
```

FIG. 1: Part of the results



```
[ 1584.044149] Loading Module  
[ 1584.044154] Golden_ratio_prime:11400862456688148481  
[ 1584.044158] jiffies and HZ: 4295288286, 250  
[ 1694.008249] Removing Module  
[ 1694.008254] Greatest common divisor:12  
[ 1694.008257] jiffies: 4295315777
```

FIG. 2: Part of the results

In the two assignments, we were asked to calculate and print the number of jiffies and the number of seconds from the time our module was first loaded into the kernel to the time we accessed it. We only have to set a global variable to save the value of jiffies when the module was first loaded into the kernel. The seconds can be calculated similarly using jiffies and HZ. Some experimental results are shown below:

```
osc@ubuntu:~/final-src-osc10e/ch2$ cat /proc/jiffies
jiffies:1600
osc@ubuntu:~/final-src-osc10e/ch2$ cat /proc/jiffies
jiffies:2064
osc@ubuntu:~/final-src-osc10e/ch2$ cat /proc/jiffies
jiffies:2297
osc@ubuntu:~/final-src-osc10e/ch2$ cat /proc/jiffies
jiffies:2495
osc@ubuntu:~/final-src-osc10e/ch2$ cat /proc/jiffies
jiffies:2679
```

FIG. 3: The number of jiffies

```
osc@ubuntu:~/final-src-osc10e/ch2$ cat /proc/seconds
seconds:8
osc@ubuntu:~/final-src-osc10e/ch2$ cat /proc/seconds
seconds:10
osc@ubuntu:~/final-src-osc10e/ch2$ cat /proc/seconds
seconds:11
```

FIG. 4: The number of seconds

The code is shown in *jiffies.c* and *seconds.c*.

C. Conclusion

In this project, we get an overview of how the linux modules work and have experimented on how the modules are loaded and deleted from the kernel. Also, we make use of some given files and gloabl variables to reach our goal.