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CS 326: Operating System

Program Assignment #1

Part I:

In order to run Kernel on Linux I used the source code simple.c and Makefile in order to run Kernel. First, run make on the terminal so the necessary Kernel files will be created. Second, run sudo insmod simple.ko to install the Kernel simple after this has been run to check whether Kernel has been successfully installed run "lsmod | grep simple and you will see whether simple is installed. If installed, you will see "Loading Module" when you run dmesg on terminal. This means you have successfully installed the simple Kernel. Lastly, run "sudo rmmod simple" to remove the Kernel and when you run dmesg "Removing Module" should appear.

Steps to successfully run Kernel on Linux:

1- Download simple.c and Makefile
2- Run make
3- Clear Kernel buffer by writing "sudo dmseg –c"
4- Run sudo insmod simple.ko → this will install Kernel simple
5- Run lsmod | grep simple to check if Kernel simple has been successfully installed
6- Run dmesg to see kernel log→ should see "Loading Module"
7- Run sudo rmmod simple →to delete Kernel
8- Run dmesg to see Kernel log → should see "Removing Module"

After following these steps we have successfully installed and removed a Kernel module on Linux. Part II is the addition of the birthday linked list into this Kernel code.

Part II:

In order to create a linked list with the Kernel module I used the list.h library, which has all necessary functions to create a linked list to store the 5 birthdays. I used the following functions to create they birthday linked list:

- INIT_LIST_HEAD() - to initialize the head of the linked list
- list_add_tail() – to add birthdays to tail of list
- list_for_each_entry – to iterate through the linked list and print out all the birtdays inside the list
- list_for_each_entry_safe() – to traverse to linked list and start removing node which are the birthdays
- list_del() – to delete current birthday node
- kfree – to free the space in memory

To run this Kernel code you can simply follow the steps in part I and you will see that when you run sudo insmod simple.ko , you will see 5 birthdays being added by the Kernel and when you run sudo rmmod simple, you will see the 5 birthdays being removed from Kernel.