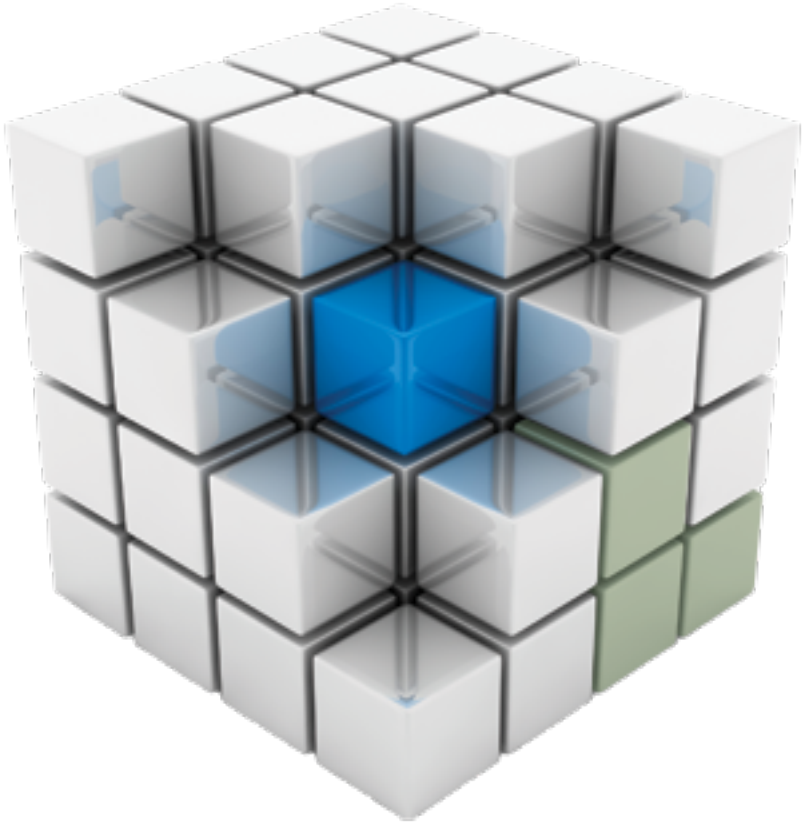
# Kernel Modules -loading,Unloading

## Assignment 4

30 August 2015



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**Specifications of Kernel:**
**OS : Linux**
**Version :3.19**
**Virtual Machine:VMware Fusion**

PART 2

- Create a new `struct birthday` with the given elements(day,month etc,..)
- When the module is loaded, the function that is mentioned in `module_init()` macro will be executed. So, we create function `simple_init()` and pass it to `module_init`
- `simple_init()` contains the code to be executed while module loading.So, here we write code to construct a circular double linked list of 5 `birthday` structs
- `kmalloc()` is a kernel version of user malloc to allocate space dynamically
- Each and every time, while creating a new birthday struct , to get random or unpredicted DOB, I am using the address of that variable and taking the modulus.
- The function `list_add_tail()` adds the newly created data structure to the circular linked list
- The task to be done are written in the function `list_for_each_entry()` that traverses through out the data structure and implements the functionality,(printing date,month,year …)
- The Makefile is then made with

  ```
  obj-m := my module.o
  ```

  and the other variables(version,location of kernel headers,etc) are added along with the functionalities for clean,install,make.
- Now to remove any previously made make executables,

  ```
  make clean
  ```
- make -To build the module.It generates executables ,mymodule.ko
- sudo `insmod mymodule.ko` -To load the module to kernel.
- `dmesg` -To see the system logs
- Now the module can be unloaded by sudo rammed mymodule
- The function in `module_exit()` macro will be executed.Here, I passed the `simple_exit()` function.

Note: Warnings will be generated if there are mixed declarations.(ex:struct declaration)

## The following are the kernel logs after loading and unloading module

```
[10195.185714] Loading myModule
[10195.185726] Student DOB 18/6/1996
[10195.185728] Student DOB 7/5/1997
[10195.185729] Student DOB 15/1/1998
[10195.185730] Student DOB 15/9/1999
[10195.185731] Student DOB 25/1/2000
vasanthreddy32@ubuntu:~/newmodule$
```

```
[10195.185726] Student DOB 18/6/1996
[10195.185728] Student DOB 7/5/1997
[10195.185729] Student DOB 15/1/1998
[10195.185730] Student DOB 15/9/1999
[10195.185731] Student DOB 25/1/2000
[10228.274700] Removing myModule
[10228.274705] Removed successfully
vasanthreddy32@ubuntu:~/newmodule$
```