# Lab 9 Dice Module

Hu Zhengdong, 517370910249

Lu Yiyun 518370910015

2020, Nov. 25

1. Tasks
2. What needs to be returned by read and write file operations for a character device?

* A stream of characters will be returned by the operations.

1. How are exactly those major and minor numbers working? You vaguely remember that you can display them using ls -l /dev.

* The major number tells you which driver handles which device file. The minor number is used only by the driver itself to differentiate which device it's operating on, just in case the driver handles more than one device.

1. Where are the following terms located in linux source code?

module\_init: /usr/src/linux-headers-5.4.0-53/include/linux/module.h

module\_exit: /usr/src/linux-headers-5.4.0-53/include/linux/module.h

printk: /usr/src/linux-headers-5.4.0-53/include/linux/printk.h

container\_of： /usr/src/linux-headers-5.4.0-53/include/linux/kernel.h

dev\_t: /usr/src/linux-headers-5.4.0-53/include/linux/device.h

MAJOR: /usr/src/linux-headers-5.4.0-53/include/uapi/linux/kdev\_t.h

MINOR: /usr/src/linux-headers-5.4.0-53/include/uapi/linux/kdev\_t.h

MKDEV: /usr/src/linux-headers-5.4.0-53/include/linux/kdev\_t.h

alloc\_chrdev\_region: /usr/src/linux-headers-5.4.0-53/include/linux/fs.h

module\_param: /usr/src/linux-headers-5.4.0-53/include/linux/moduleparam.h

cdev\_init: /usr/src/linux-headers-5.4.0-42/include/linux/cdev.h

cdev\_add: /usr/src/linux-headers-5.4.0-42/include/linux/cdev.h

cdev\_del: /usr/src/linux-headers-5.4.0-42/include/linux/cdev.h

THIS\_MODULE: /usr/src/linux-headers-5.4.0-42/include/linux/export.h:

1. How to generate random numbers when working inside the Linux kernel? You think that a while back you read something about getting the current time
2. How to define and specify module options

We can use the the file\_operations structure to specify module options, which stores the pointer to different operations.

|  |
| --- |
| struct file\_operations {  struct module \*owner;  loff\_t (\*llseek) (struct file \*, loff\_t, int);  ssize\_t (\*read) (struct file \*, char \*, size\_t, loff\_t \*);  ssize\_t (\*write) (struct file \*, const char \*, size\_t, loff\_t \*);  int (\*readdir) (struct file \*, void \*, filldir\_t);  unsigned int (\*poll) (struct file \*, struct poll\_table\_struct \*);  int (\*ioctl) (struct inode \*, struct file \*, unsigned int, unsigned long);  int (\*mmap) (struct file \*, struct vm\_area\_struct \*);  int (\*open) (struct inode \*, struct file \*);  int (\*flush) (struct file \*);  int (\*release) (struct inode \*, struct file \*);  int (\*fsync) (struct file \*, struct dentry \*, int datasync);  int (\*fasync) (int, struct file \*, int);  int (\*lock) (struct file \*, int, struct file\_lock \*);  ssize\_t (\*readv) (struct file \*, const struct iovec \*, unsigned long,  loff\_t \*);  ssize\_t (\*writev) (struct file \*, const struct iovec \*, unsigned long,  loff\_t \*);  }; |