Wing Lee
Github: ayanamesu
ID: 920558688
CSC415 Operating Systems

Assignment 6 – Coding A Device Driver

Description:
This assignment is to write a C program that creates a device driver and has a simple caesar cipher program inside which then prompts the user to input some texts or characters and then in return encrypts the message and then decrypts the message.

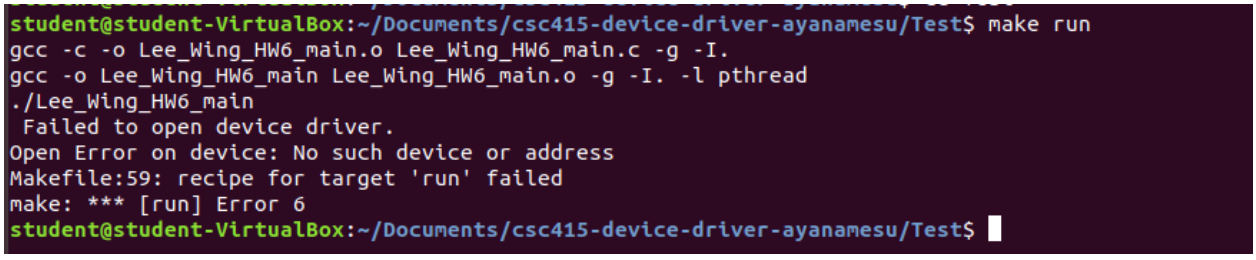
Approach / What I Did:
First I had to come up with what I really wanted to make out of this device driver. I remember in class the professor went over a caesar cipher which peaked my interest. What I started doing was looking at linux driver tutorials because I had almost zero clue going in and I saw that they had functions which we worked with and structures for file operations which we also had worked with before. I used the init function because this was one of the main issues I was having with my device driver as I kept getting an error telling me that file or address doesn't exist error 255 and after fixing the init function this worked. After that there's an open function , a read and write function, and a release function along with a close. I also made the caesar cipher functions for encrypt and decrypt, initially I was going to have it inside ioctl command but it was giving me errors so I made separate functions.

Issues and Resolutions:

My first issue was … (Provide details, even screen shots of the problem)
I resolved it by… (Provide details on how you resolved this issue)

My first issue was running it honestly I had almost no clue what the commands to run were. Thankfully I resolved it with the help of the people on stack listed the commands and I was able to attempt to run.

My next issue was actually attempting to run it i got error on device: no such device or address



So I decided to mess around with the init function some more. I resolved this by adding in the checks which created the class and destroyed it?

After that I got the similar error but with the Error 255 instead this one was pretty difficult to check for as I know the init is working the device Driver and I followed the commands and

everything that my peers had given me but what ended up resolving this was copy pasting the /dev/caeserCipher from my main function because spelling error caused this? so after redoing the whole process a few times it finally worked.

Oh I remade like 4 operating systems because one had a git error when trying to push and commit it wouldn't because of corrupted files and what not. Then the next one was because I thought my system crashed but it didnt I just spelled the /dev wrong.

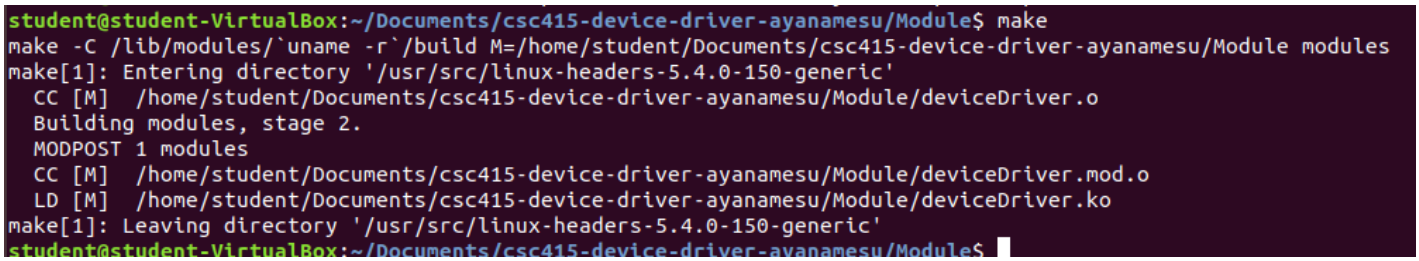
Analysis: (If required for the assignment)

Screen shot of compilation:
Make sure it is easily readable (i.e. do not cram lots of screen shots on a single page) and that it includes the command and the complete compilation output of gcc. There should be no warnings or errors. (Note the screen shot must include command line to command line as shown)

Suggestion is to run `make clean` then run `make` for the compilation screen shot as it must include the complete compilation.

This should be in the Linux Terminal window and not visual studio.

Module Make:



Screen shot(s) of the execution of the program:

Make sure it is easily readable (i.e. do not cram lots of screen shots on a single page) and that it includes the command (`make run`). (Note the screen shot must include command line to command line as shown)

Show all necessary screen shots (some assignments require more than one).
These should be in the Linux Terminal window and not visual studio.

If the screen shot is multiple screens, it can be broken into multiple screen shots, such that each screen shot is more readable.

Sudo insmod deviceDriver.ko

```
student@student-VirtualBox:~/Documents/csc415-device-driver-ayanamesu/Module$ sudo insmod deviceDriver.ko
[sudo] password for student:
student@student-VirtualBox:~/Documents/csc415-device-driver-ayanamesu/Module$
```

Sudo mknod /dev/caeserCipher c 415 0

```
student@student-VirtualBox:~/Documents/csc415-device-driver-ayanamesu/Module$ sudo mknod /dev/caeserCipher c 415 0
mknod: /dev/caeserCipher: File exists
student@student-VirtualBox:~/Documents/csc415-device-driver-ayanamesu/Module$
```

Sudo chmod 666 /dev/caeserCipher

```
student@student-VirtualBox:~/Documents/csc415-device-driver-ayanamesu/Module$ sudo chmod 666 /dev/caeserCipher
student@student-VirtualBox:~/Documents/csc415-device-driver-ayanamesu/Module$
```

MAKE RUN:

```
student@student-VirtualBox:~/Documents/csc415-device-driver-ayanamesu/Test$ make run
gcc -c -o Lee_Wing_HW6_main.o Lee_Wing_HW6_main.c -g -I.
gcc -o Lee_Wing_HW6_main Lee_Wing_HW6_main.o -g -I. -l pthread
./Lee_Wing_HW6_main
Opening the deviceDriver
Enter a key for encryption: 4
Enter some characters to be encrypted:
get me some water
This is the text you are encrypting:
get me some water

Encrypted text:
jhw#ph#vrph#zdwhu

Decrypting text

Decrypted text:
get me some water

Exiting the program
student@student-VirtualBox:~/Documents/csc415-device-driver-ayanamesu/Test$
```

```
student@student-VirtualBox:~/Documents/csc415-device-driver-ayanamesu/Test$ make run
./Lee_Wing_HW6_main
Opening the deviceDriver
Enter a key for encryption: 3
Enter some characters to be encrypted:
ggggggggg
This is the text you are encrypting:
ggggggggg

Encrypted text:
iiiiiiiii

Decrypting text

Decrypted text:
ggggggggg

Exiting the program
student@student-VirtualBox:~/Documents/csc415-device-driver-ayanamesu/Test$
```