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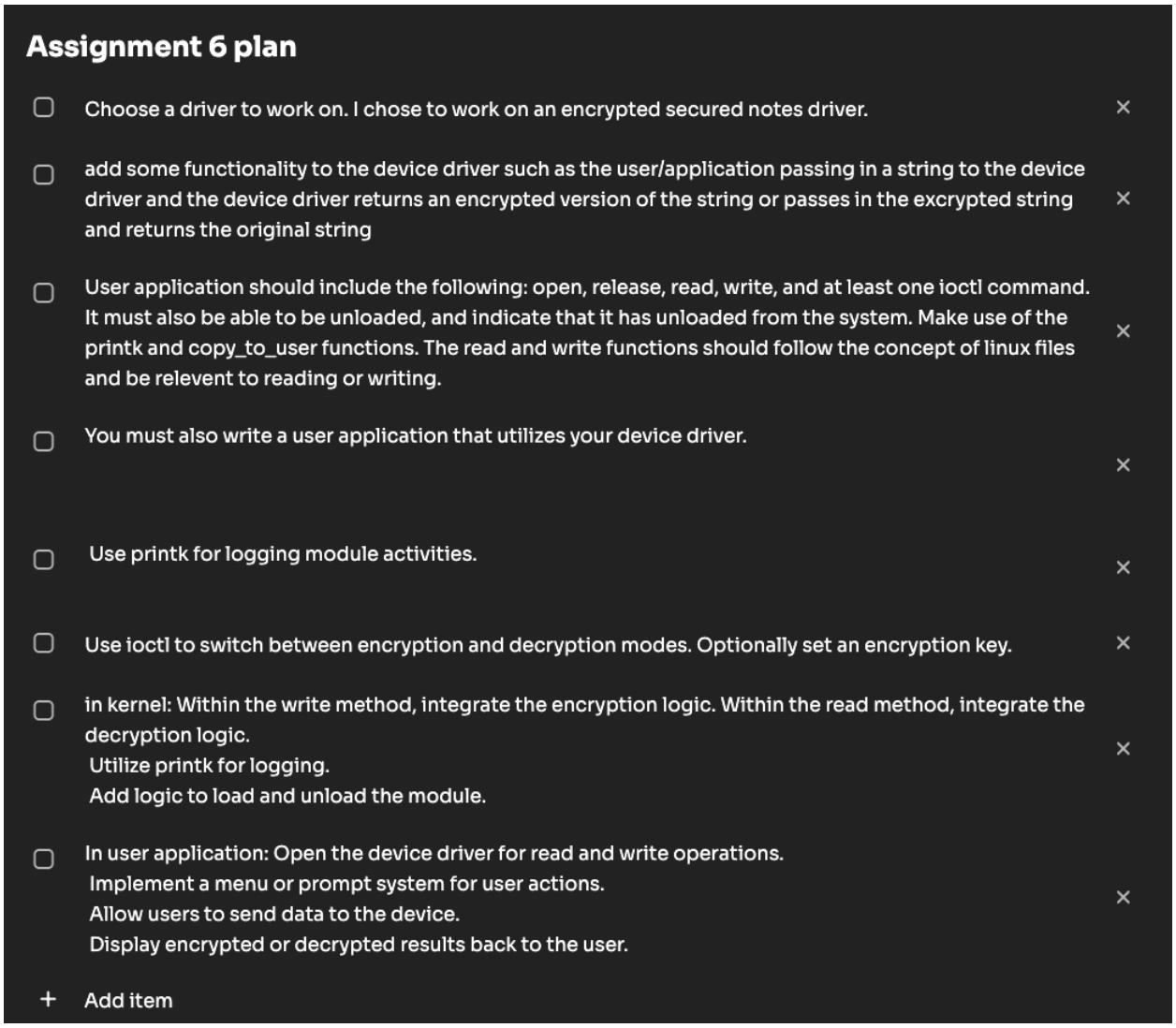
CSC415 Operating Systems

Assignment 6 – Device Driver

Description:
This assignment is to write a C program that develops a linux dric driver called notes. That encryptes storage and retrievies user notes within the kernel space.

Approach / What I Did:

Before I decided what driver to work on, I researched in-depth on what driver are and how they work. To breakdown the requirements and plan the structure of code, I made a check list listed below. My initial focus was to establish a basic structure for the driver, ensuring that it could integrate smoothly with the kernel. The IOCTL commands were then incorporated, emphasizing the switching mechanism between encryption and decryption.Thanks toi Java point, I found out about encryption tenchinique called Caesar cipher aka shift clipher or additive cipher.



Issues and Resolutions:

My first issue was that device driver wasn't recognized by the kernel due to wrong file path I resolved it by simply copying the correct file path to the main function.

Next isse: In my next issues I faced issues with read/write operations, but refining the buffer transfer functions fixed the issue.

Screen shot of compilation:

secure_notes.c:

```
student@student-VirtualBox:~/Downloads/csc415-device-driver-Vijayt2001-main/Module$ make
make -C /lib/modules/`uname -r`/build M=/home/student/Downloads/csc415-device-driver-Vijayt2001-main/Module modules
make[1]: Entering directory '/usr/src/linux-headers-5.4.0-150-generic'
  CC [M]  /home/student/Downloads/csc415-device-driver-Vijayt2001-main/Module/secure_notes.o
  Building modules, stage 2.
  MODPOST 1 modules
  CC [M]  /home/student/Downloads/csc415-device-driver-Vijayt2001-main/Module/secure_notes.mod.o
  LD [M]  /home/student/Downloads/csc415-device-driver-Vijayt2001-main/Module/secure_notes.ko
make[1]: Leaving directory '/usr/src/linux-headers-5.4.0-150-generic'
student@student-VirtualBox:~/Downloads/csc415-device-driver-Vijayt2001-main/Module$
```

main:

```
student@student-VirtualBox:~/Downloads/csc415-device-driver-Vijayt2001-main/Test$ make clean
rm *.o Tolnoorkar_Vijayraj_HW6_main
student@student-VirtualBox:~/Downloads/csc415-device-driver-Vijayt2001-main/Test$ make
gcc -c -o Tolnoorkar_Vijayraj_HW6_main.o Tolnoorkar_Vijayraj_HW6_main.c -g -I.
gcc -o Tolnoorkar_Vijayraj_HW6_main Tolnoorkar_Vijayraj_HW6_main.o -g -I. -l pthread
```

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

```
student@student-VirtualBox:~/Downloads/csc415-device-driver-Vijayt2001-main/Test$ make run
./Tolnoorkar_Vijayraj_HW6_main
Writing to the device...
Reading from the device...
Data: Yes the message is retirved! Thanks for a very tough but very hekpful semester!
student@student-VirtualBox:~/Downloads/csc415-device-driver-Vijayt2001-main/Test$
```