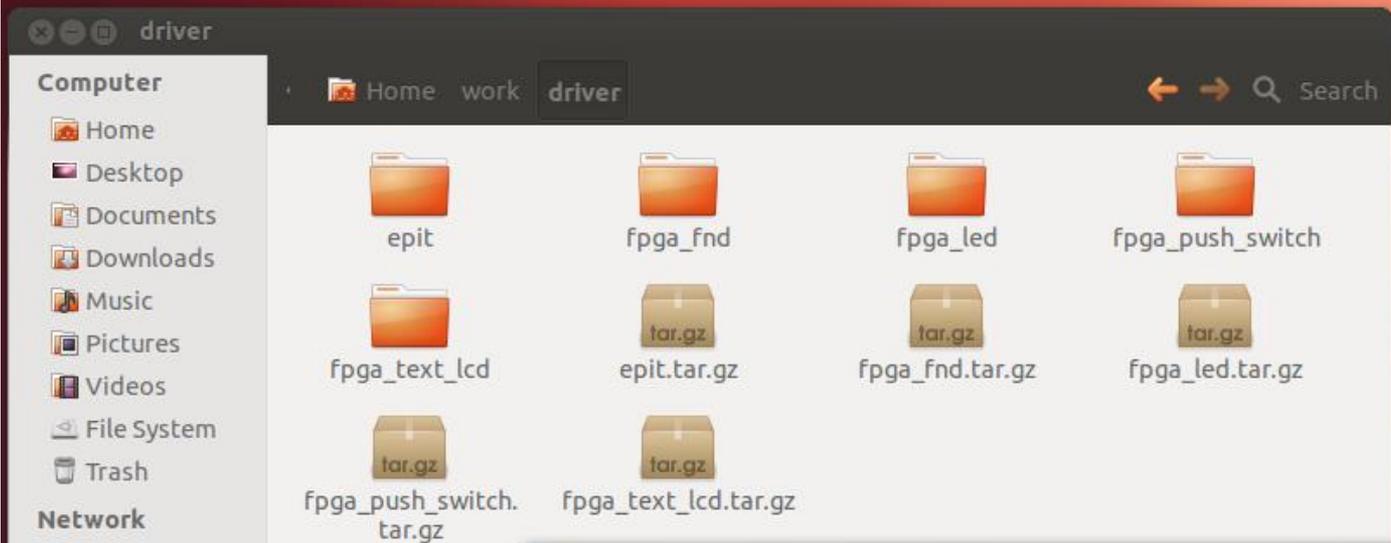

Lab 3

Device Drivers

Driver Example Folders



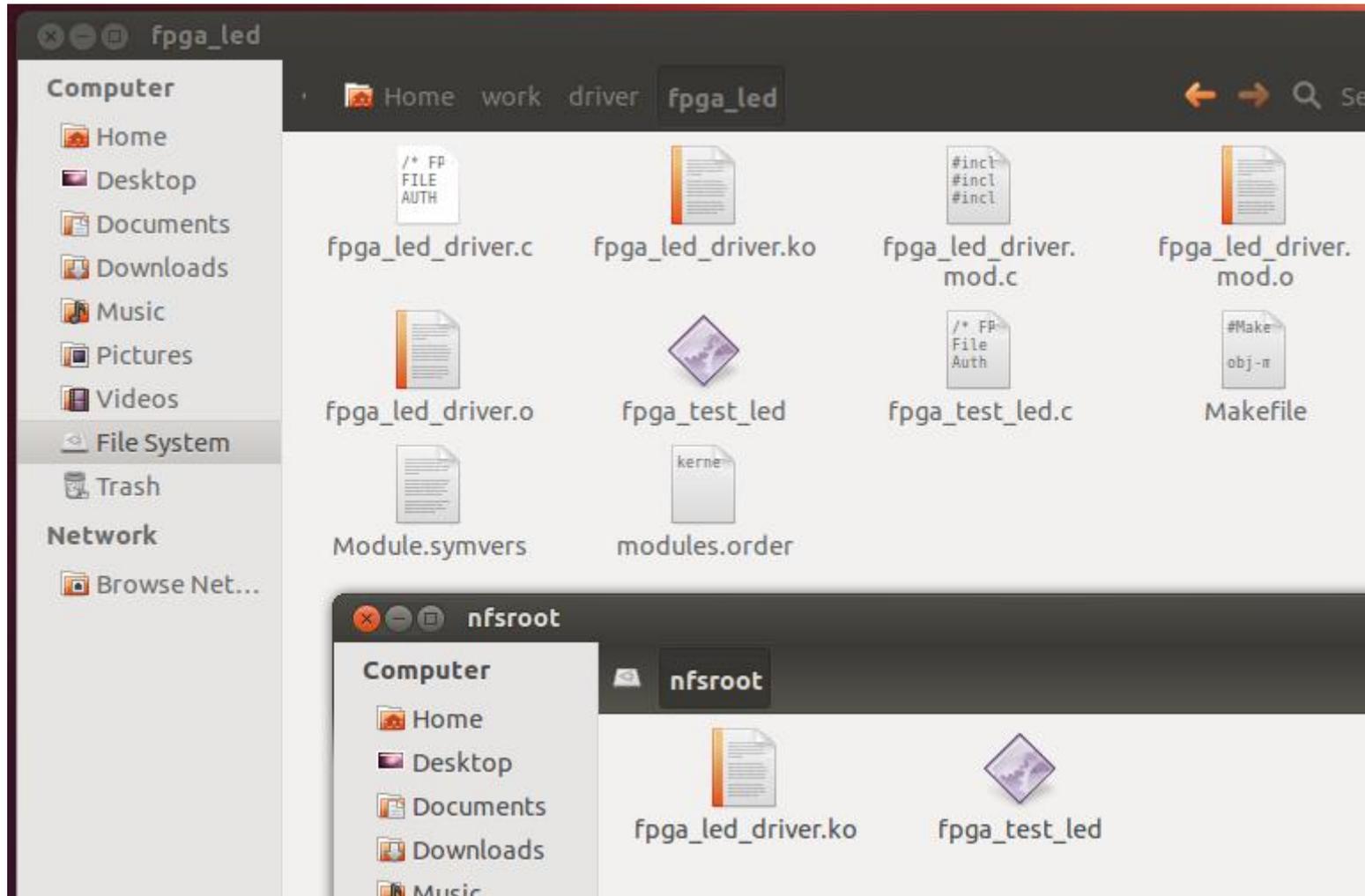
The screenshot shows a file manager window titled 'driver' with a sidebar on the left containing 'Computer' and 'Network' sections. The main area displays the contents of the 'driver' directory, which includes folders for 'epit', 'fpga_fnd', 'fpga_led', and 'fpga_push_switch', and tar.gz files for 'epit.tar.gz', 'fpga_fnd.tar.gz', 'fpga_led.tar.gz', 'fpga_text_lcd.tar.gz', and 'fpga_push_switch.tar.gz'.

```
control@lab-pc2: ~/work/driver
control@lab-pc2:~$ cd work/driver
control@lab-pc2:~/work/driver$ ls
epit          fpga_fnd.tar.gz  fpga_push_switch  fpga_text_lcd.tar.gz
epit.tar.gz  fpga_led         fpga_push_switch.tar.gz
fpga_fnd     fpga_led.tar.gz  fpga_text_lcd
control@lab-pc2:~/work/driver$
```

Build

```
control@lab-pc2: ~/work/driver/fpga_led
control@lab-pc2:~/work/driver/fpga_led$ make clean
rm -rf *.ko
rm -rf *.mod.*
rm -rf *.o
rm -rf fpga_test_led
rm -rf Module.symvers
rm -rf modules.order
rm -rf .led*
rm -rf .tmp*
control@lab-pc2:~/work/driver/fpga_led$ make
make -C /work/achroimx6q/achroimx_kernel SUBDIRS=/home/control/work/driver/fpga_
led modules ARCH=arm
make[1]: Entering directory `/work/achroimx6q/achroimx_kernel'
  CC [M] /home/control/work/driver/fpga_led/fpga_led_driver.o
  Building modules, stage 2.
  MODPOST 1 modules
  CC      /home/control/work/driver/fpga_led/fpga_led_driver.mod.o
  LD [M] /home/control/work/driver/fpga_led/fpga_led_driver.ko
make[1]: Leaving directory `/work/achroimx6q/achroimx_kernel'
arm-none-linux-gnueabi-gcc -static -o fpga_test_led fpga_test_led.c
control@lab-pc2:~/work/driver/fpga_led$ make install
cp -a fpga_led_driver.ko /nfsroot
cp -a fpga_test_led /nfsroot
control@lab-pc2:~/work/driver/fpga_led$ █
```

Copy Files to /nsfroot



Target Console

```
insmod fpga_led_driver.ko  
mknod /dev/fpga_led c 260 0  
./fpga_test_led 1
```

```
[root@ACHRO ~]# cd /mnt/nfs  
[root@ACHRO nfs]# ls  
fpga_led_driver.ko  fpga_test_led*  
[root@ACHRO nfs]# insmod fpga_led_driver.ko  
[root@ACHRO nfs]# mknod /dev/fpga_led c 260 0  
[root@ACHRO nfs]# ./fpga_test_led 1  
Current LED Value : 1  
  
[root@ACHRO nfs]# █
```

Exercise 1

- 다음 폴더의 예제들을 실행해서 동작을 확인하십시오.
 - fpga_led
 - fpga_fnd
 - fpga_text_lcd
 - fpga_push_switch

Exercise 2

- 프로그램이 시작되면 `standard console`에서 영어 문자열 입력을 기다린다.(`gets`, `fgets` 사용)
- `Standard console`에 임의의 영어 문자열을 입력하면 그 문자열을 `character LCD`에 나타낸다
- 문자열을 나타낸 후 다시 입력을 기다린다.
- 반드시 두 개의 `thread`를 사용한다. 한 개의 `thread`는 영어 문자열 입력을 받고, 그 문자열을 다른 `thread`에 보낸다. 그러면 문자열을 받은 `thread`는 그 문자열을 `character LCD`에 나타낸다.