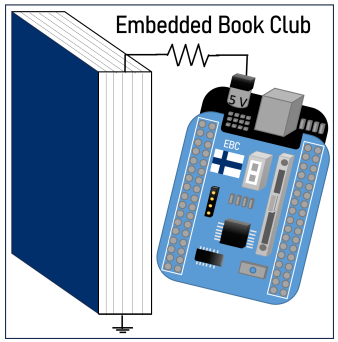

Linux Device Driver Development
Chapter 4: Writing Character Device Drivers

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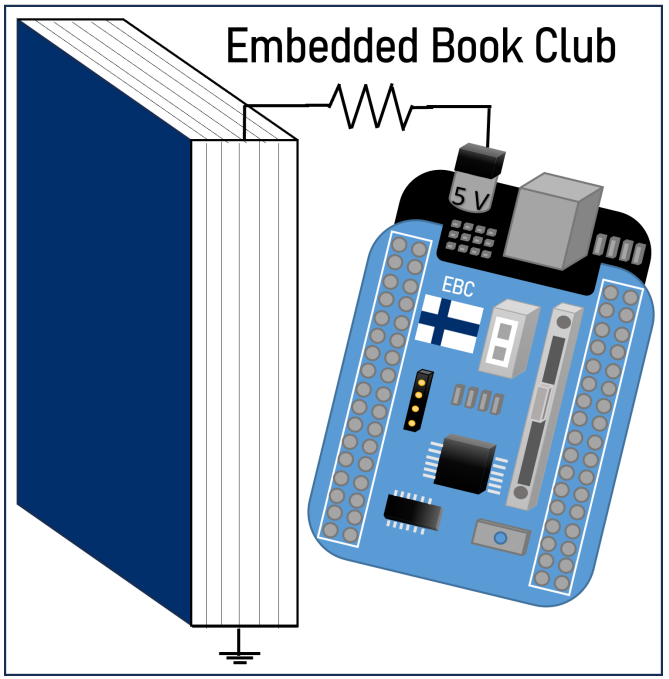
Embedded Book Club Finland

We're knowledge sharing enthusiasts, focused on hosting in-person events, to bond over technical topics related to embedded systems.

Our goal is to

- Create a community focused on Embedded Systems and related topics
- Share knowledge, and to learn about new topics, trends and practices
- Having fun learning and working on projects together



Chapter 4: Writing Character Device Drivers

Unix-based systems expose hardware to userspace by means of special files. If they're registered, they'll show up under /dev and can be accessed by programs that have the correct access rights.
Character devices and block devices are devices that can be accessed through these special files. Character devices transfer data byte-by-byte whereas block devices does in blocks. Some examples of character devices include serial ports and input devices such as keyboards, mice, touchepads, video devices, etc. Block devices generally apply to storage devices (e.g., hard drives, CD-ROMs, etc)

This chapter covers

- Concept of major/minor device numbers
- Character device data structure
- Creating a device node
- implementing file operations

Chapter 4: Writing Character Device Drivers
The concept of major and minor numbers

$ ls -la /dev

```
jon@nohau:~$ ls -la /dev/
total 4
drwxr-xr-x  19 root    root         4300 syys   18 14:50 .
drwxr-xr-x  20 root    root         4096 syys   14  2022 ..
crw-r--r--   1 root    root      10, 235 elo    28 19:13 autofs
drwxr-xr-x   2 root    root          520 elo    29 10:27 block
drwxr-xr-x   2 root    root           80 elo    29 10:27 bsg
crw-rw----   1 root    disk      10, 234 syys    1 10:26 btrfs-control
drwxr-xr-x   3 root    root           60 elo    28 19:13 bus
lrwxrwxrwx   1 root    root            3 syys   18 13:33 cdrom -> sr0
drwxr-xr-x   2 root    root         3940 syys   18 14:50 char
crw--w----   1 root    tty       5,    1 elo    28 19:14 console
lrwxrwxrwx   1 root    root           11 elo    28 19:13 core -> /proc/kcore
```

Chapter 4: Writing Character Device Drivers
Character device data structure and more

- *struct cdev* in *include/linux/cdev.h*
- *struct file_operations*
- *struct inode*
- *struct file*

Chapter 4: Writing Character Device Drivers
Registration and deregistration

- unregister_chrdev_region(dev_t , count);
- int alloc_chrdev_region(dev_t *, unsigned int firstminor, unsigned int count, char *name)
- cdev_init
- cdev_add
- device_create()
- class_create()

Chapter 4: Writing Character Device Drivers
Registration and deregistration

INCOMPLETE