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ECE 331
2/23/17

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Exam: Open notes/book (no network!)

- RE
- Perl
- Cmd Line {shell tools}
- Shell
- Permissions
- Filesystem
- Package
- C
- Dir structure
- Makefiles

"IOCTL"
"i/o control"
→ Big Lock ←
↑ Problem Solved

Kernel Stuff

*Transition into kernel space using interupt

*What is the kernel?

⇒ Resource manager!

↙ memory, network gpio, video, i2c, storage

↪ manage processes (want to be 'fair')

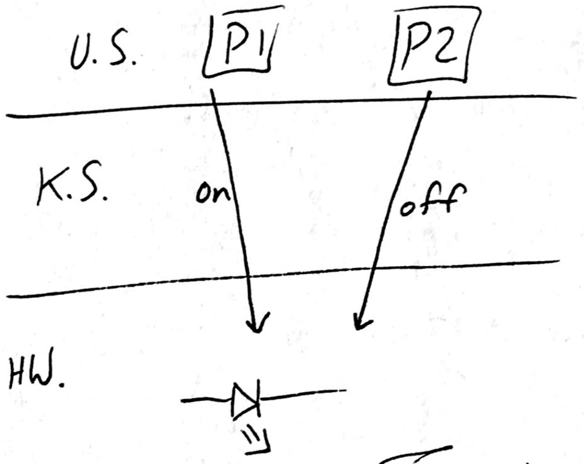
{*have to use global variables in kernel}

"Concurrency" (multiple code running)

"Premptive Kernel"

*Can have this issue on avrdude (interupts!)

→ 3 terms
- "race conditions"
- "locking" - "coherency" (atomic variable)
- "deadlock" (lock nvr released :-;)



[*Try to minimize locking and the code required]

Kernel

*No main() in kernel (only usr space)

→ entry : init_module ; called when we run #insmod module.ko

-> exit : cleanup_module ; then, #rmmod module

gotta be root, loads "kernel object"

* Code should compile with

0 warnings

*KERN_NOTICE

-INFO

-DEBUG

*lsmod - lists module

```
#lsmod | head
```

(shows modules)

*messages printed to /var/log

```
# sudo rmmod systimer ; sudo insmod systimer.ko
```

*static on a function : only visible in that file (scope)

*Kernel can be compiled as monolithic

[*Use const, static, etc in kernel]

ex.) __init //throw away after it's run (saves memory)

*objdump -~~x~~ h <kernel_module>

*dump sections

[Linux Device Drivers]

Module : Attributes

- .MODULE_LICENSE("GPL")
- . AUTHOR
- . DESCRIPTION
- . SUPPORT_DEVICE

*modinfo <module>