

CSE 330: Operating Systems
Spring 2018

Class: 26 **Date: 4/17**

Note Title

2 classes left

- 1 review class -

Files / Directories

Disks — set of blocks

(block oriented device)

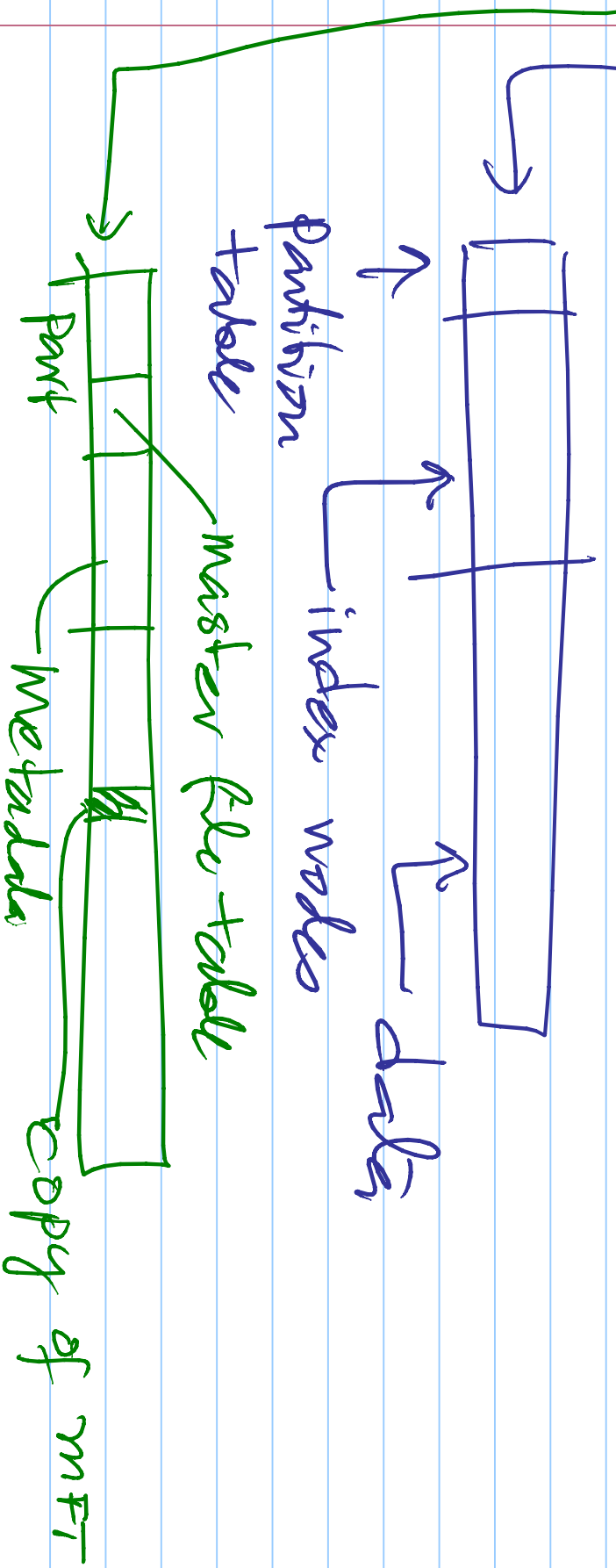


P/W on blocks

Sequence of blocks

UNIX file system

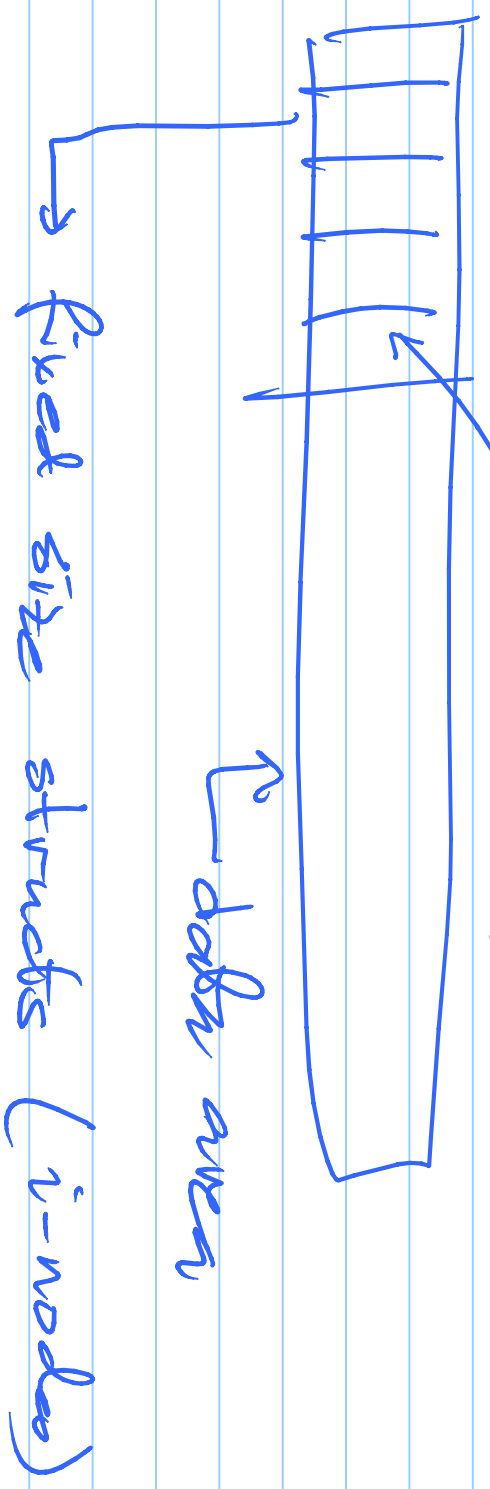
Windows file system (NTFS)

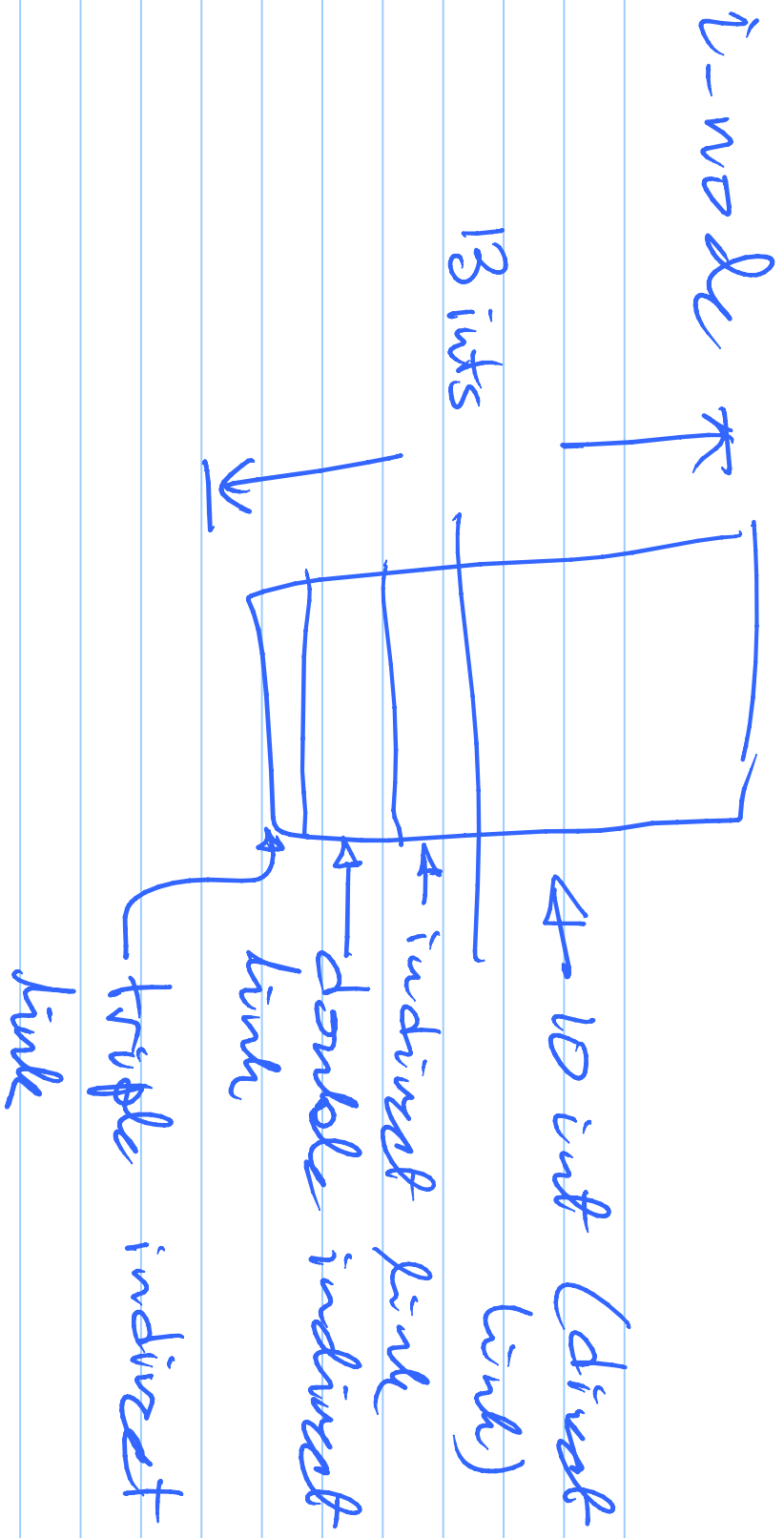


File systems

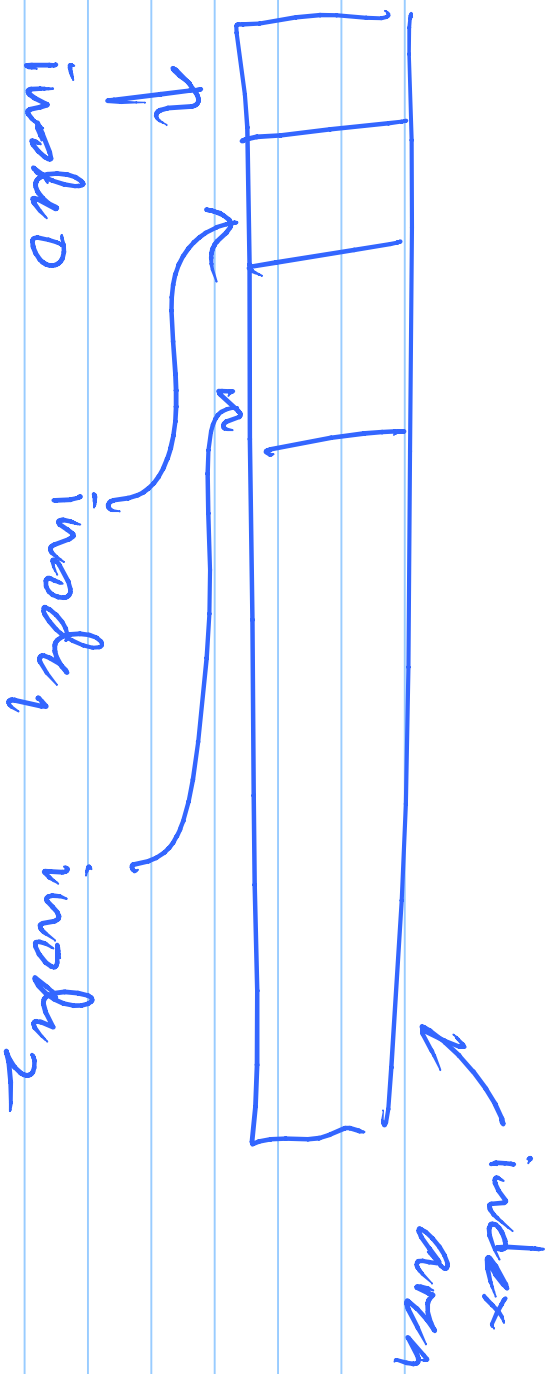
- ① META DATA
- ② Actual DATA → the files
- ③ Directories

Unix file system



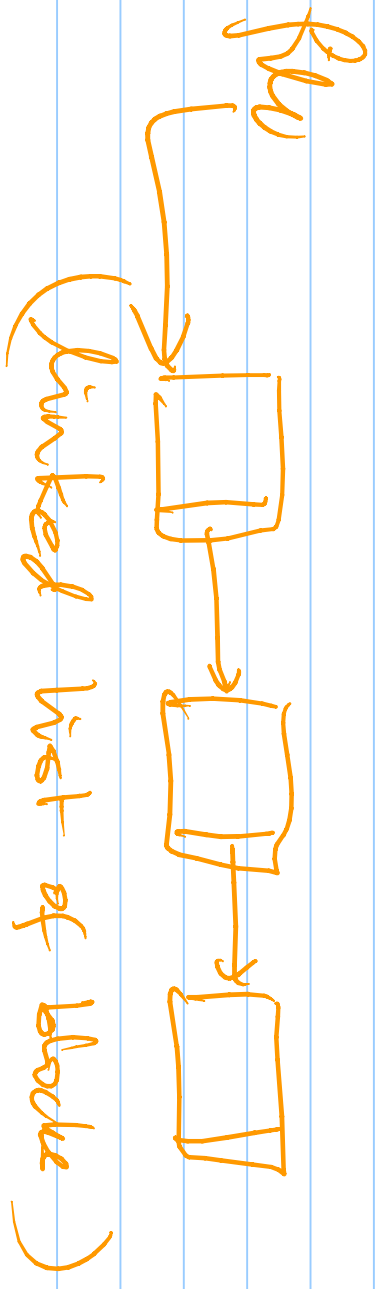
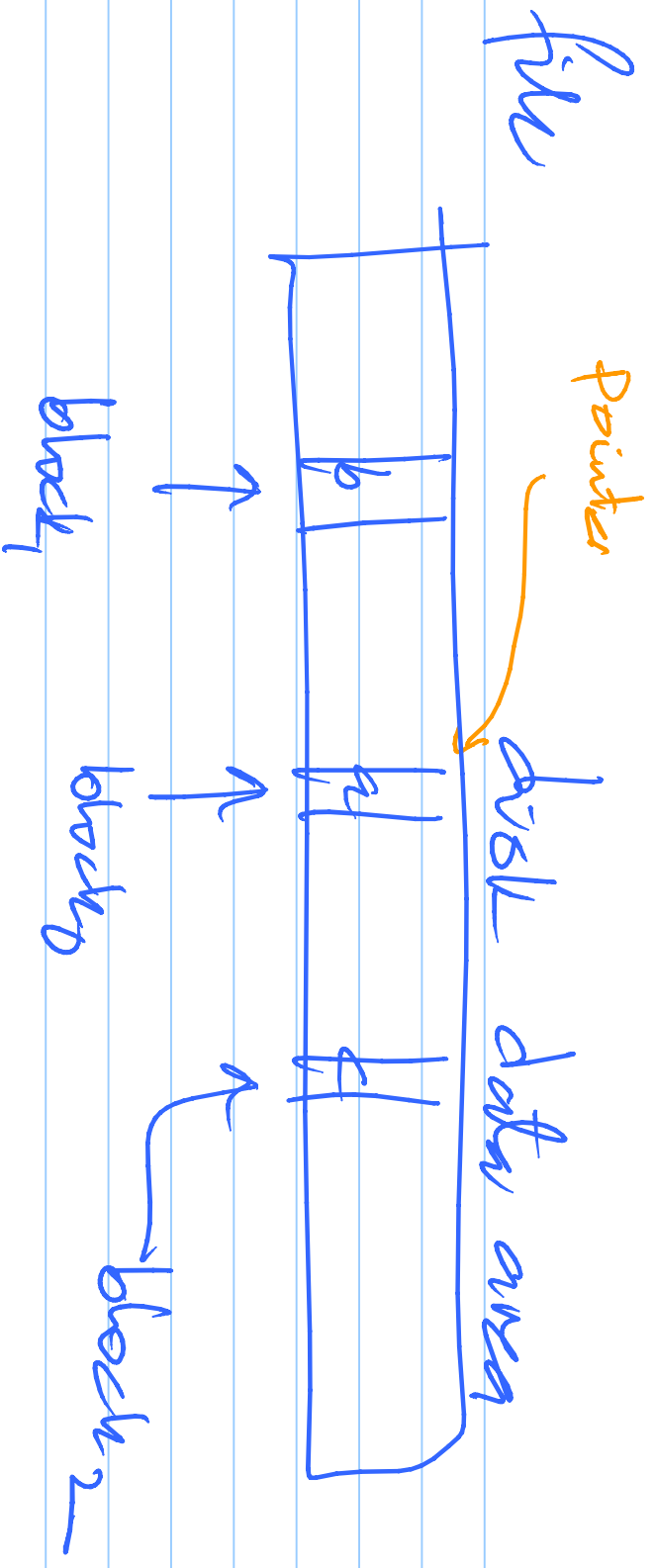


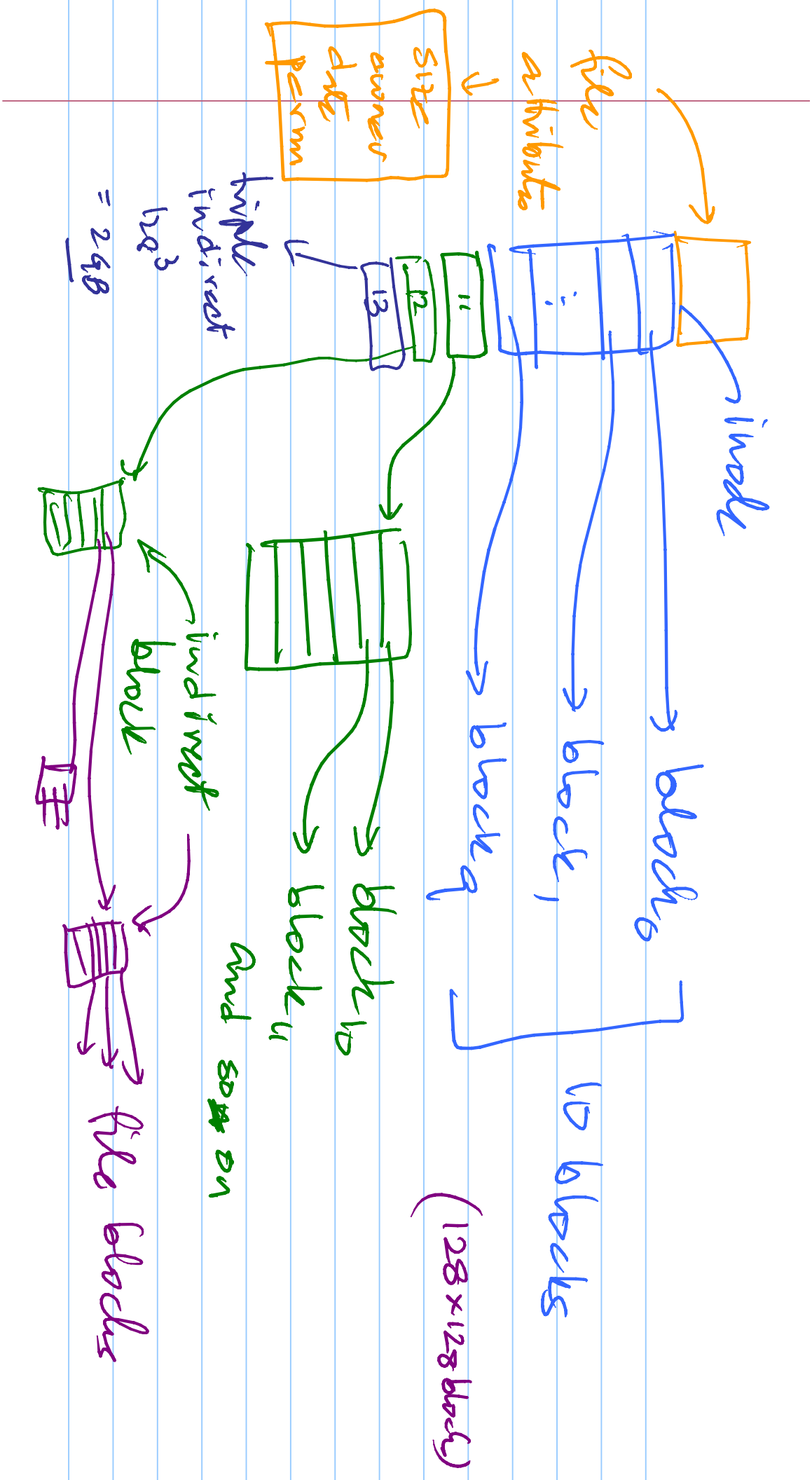
One i-node points to a file (each file is represented by an i-node.)



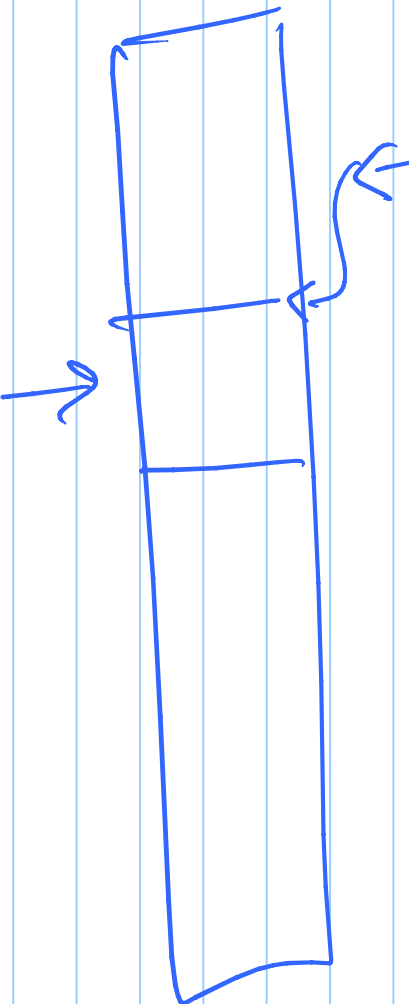
0, 1, 2 → i-number

each cell has an i-number





Given file's in number



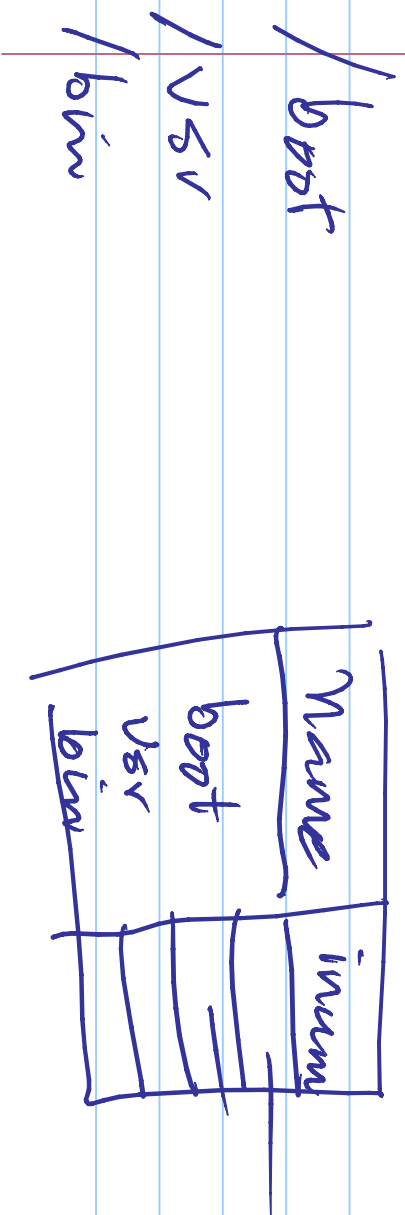
find in number

→ find all data in file

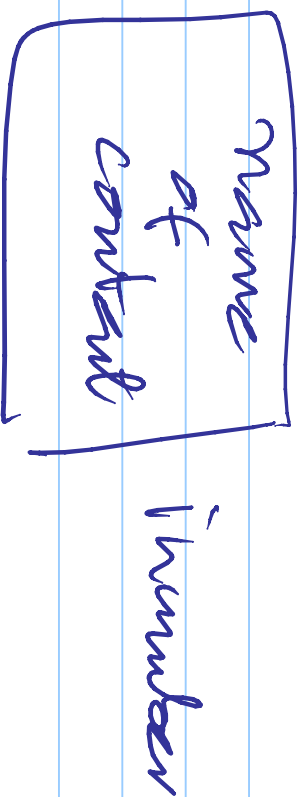
root directory

- name \rightarrow nothing \rightarrow /
- inumber - 0

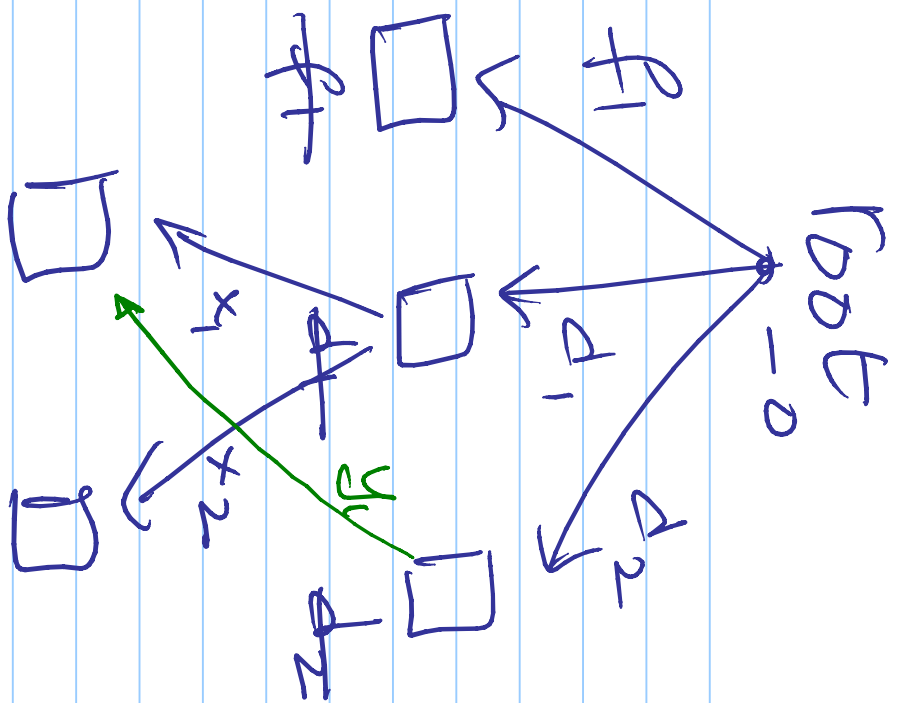
- it is a file, but it contains a table



Directory is a table ↓



— film name or directory name



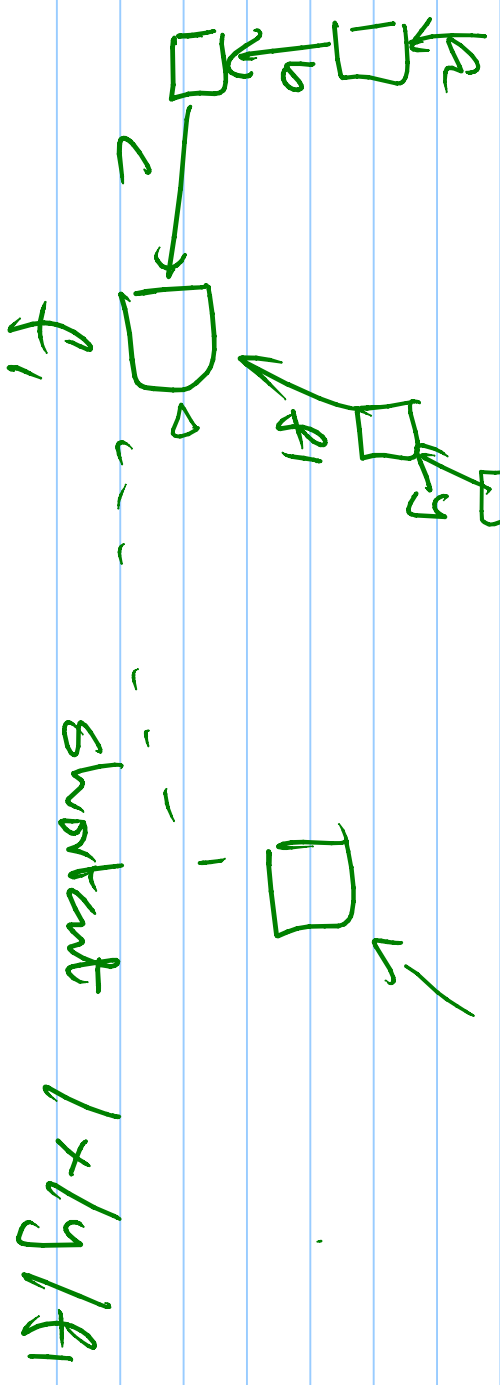
$|d_1 / x_1$

is the same file

as

$|d_2 / y_1$

Shortcut, symbolic link, link (hard)



$$a/b/c \equiv l/x/y/f1$$

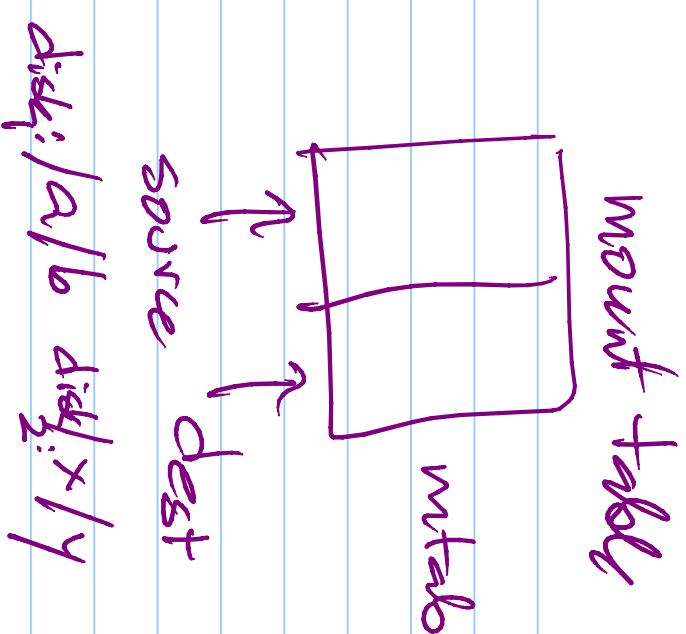
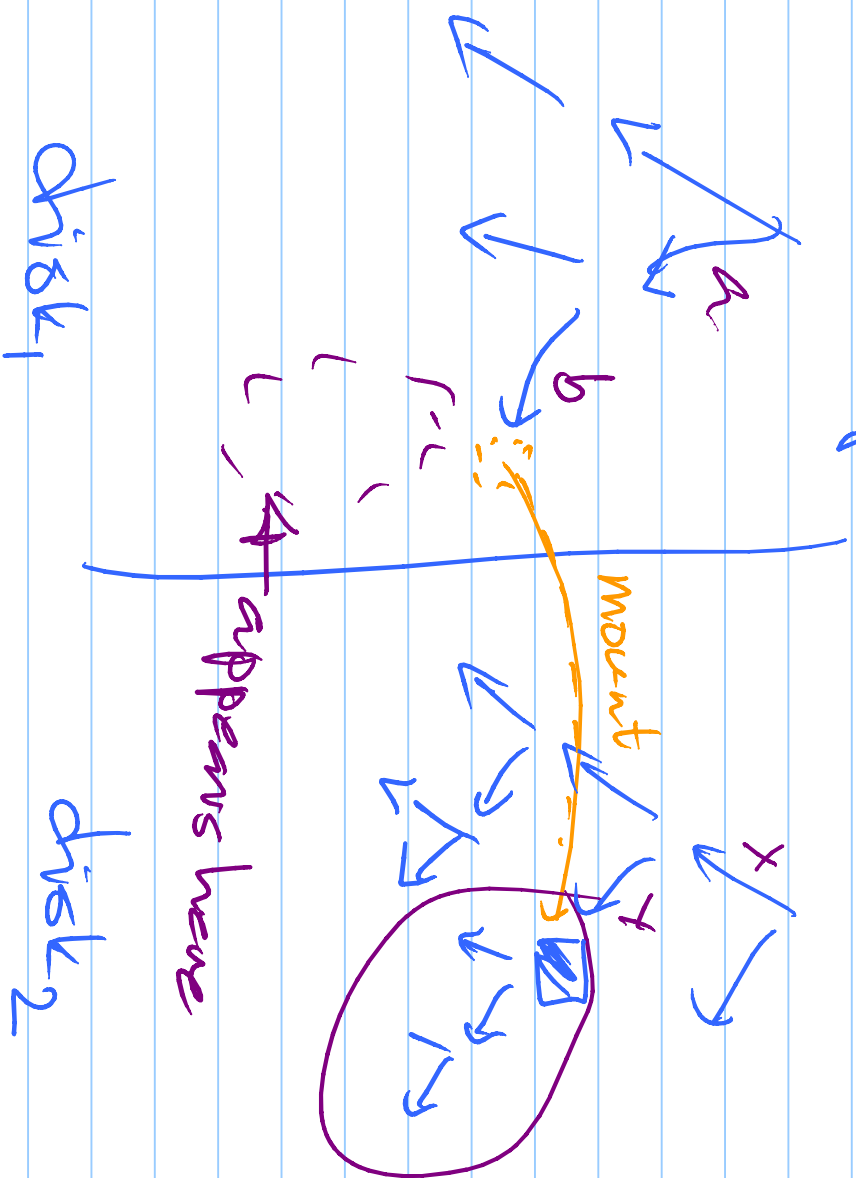
First link to file → when file is created

Second (or third) link to file

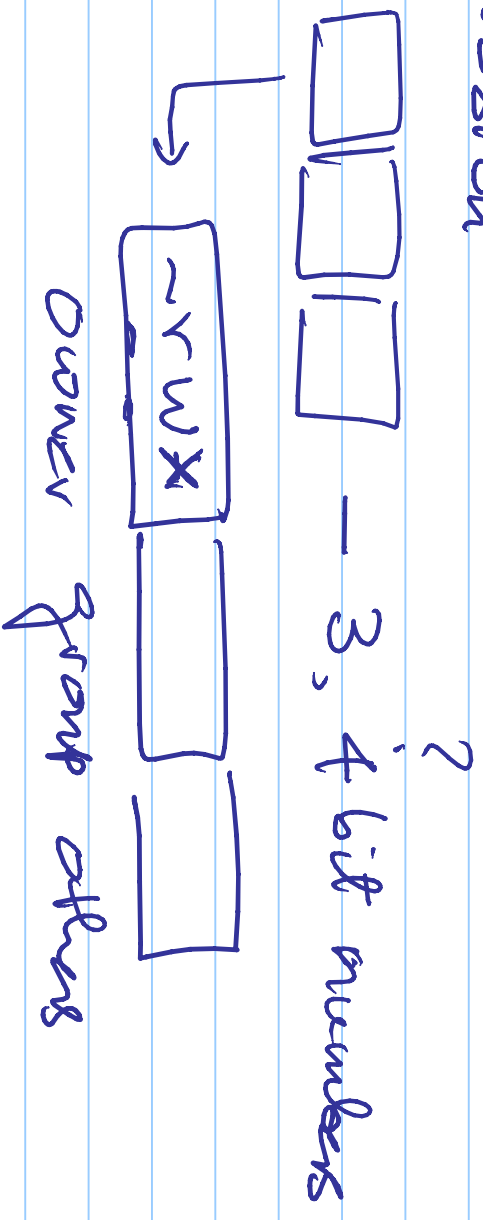
→ file must exist

→ cannot be a directory

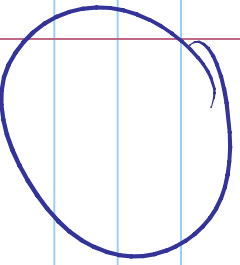
Mounting



file permission



Accessing Files / directories



app

→
syscall

→ OS

→ filesystem

→ disk
drivers

create (filename, permission)

↳ create a dir entry to an empty file

unlink (filename) → delete dir entry

+ delete file if all links gone

$fd = \text{open}(\text{file}, \text{mode})$

← filename

← read or write

→ use `namei` to get `inumber`

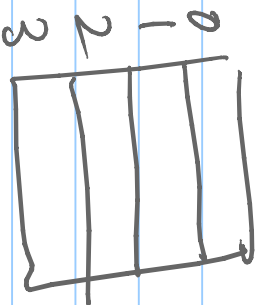
→ check permissions

→ if all is OK

→ put `inumber`

→ return ... 3

File descriptor



File table



$n = \text{read}(fd, \text{buff}, N)$

↳ num read

-1 if error

File desc

buffer (array)

Number of bytes to read

≤ size

of buffer

$n = \text{write}(fd, \text{buff}, N)$

Same

num

↳ from here, write N bytes

writer → should be = N

