

CS 326 Heap Allocation Edge Cases

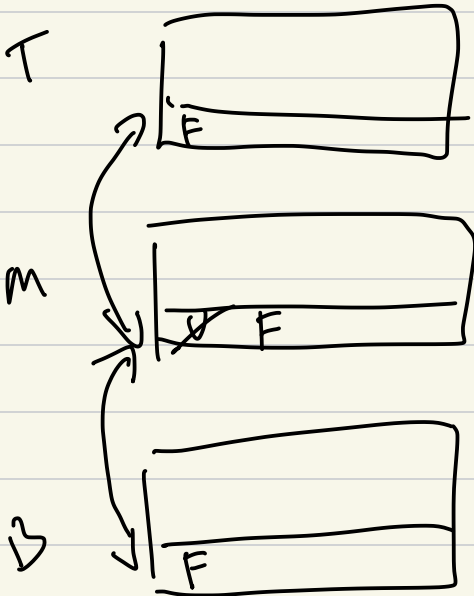
Lab03 practice problems

unrustify

micro

VS Code

Debugging



$\text{merge}(M, T)$

$\text{merge}(B, M)$

$\text{Merge}(B, M)$

$\text{merge}(B, T)$

large allocation > 4096

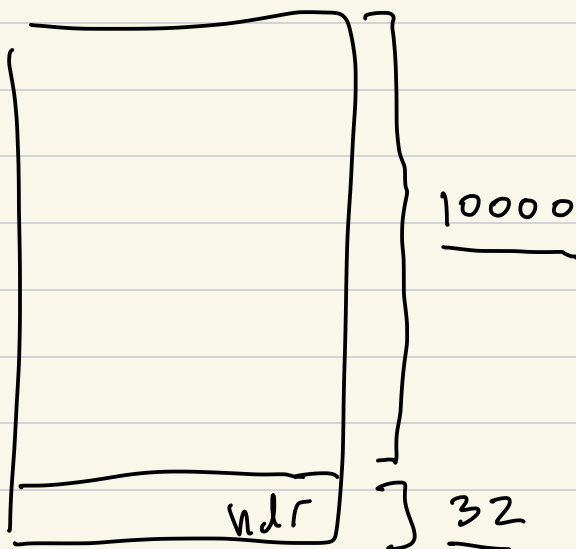
10000

4096 4Kx1

8192 4Kx2

12288 4Kx3

Head



Goal: what multiple of 4096 do we need

$$\underbrace{10032}_{\text{reqsize}} \% 4096 =$$

$$d = 10032 / 4096 = 2$$

$$\underline{m} = (reqsize / 4096) + (reqsize \% 4096) ? 1 : 0;$$

$$d = reqsize / 4096;$$

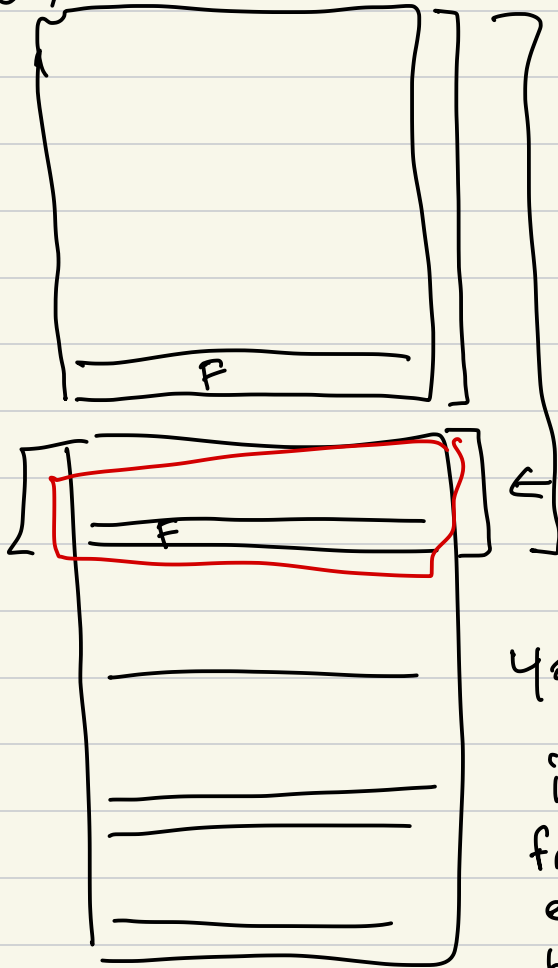
$$\text{if } (reqsize \% 4096 > 0) \{$$

$$d = d + 1;$$

$$\}$$

$$sbw(d * 4096)$$

Test 09



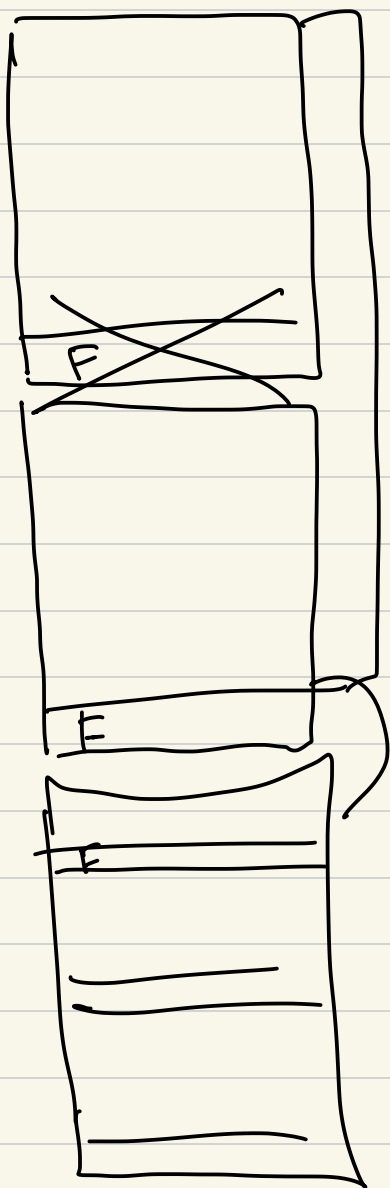
$\text{malloc}(\underline{n})$
↑

4096

is there a
free block at
end of
block-list?

actual n

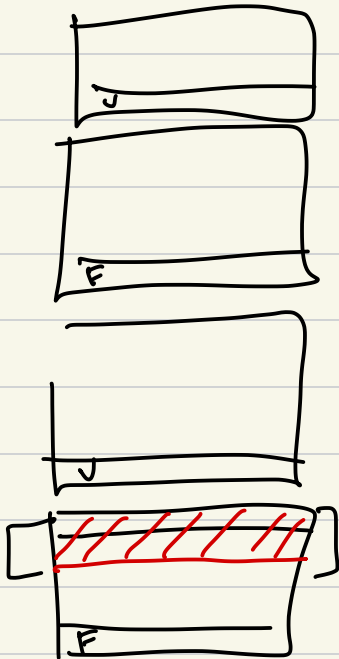
$$\boxed{\text{free}} = n - (\text{sizeof}(\text{struct block_hdr}) + \text{last} \rightarrow \text{size})$$



sbk(8192)

Debugging

heap allocation



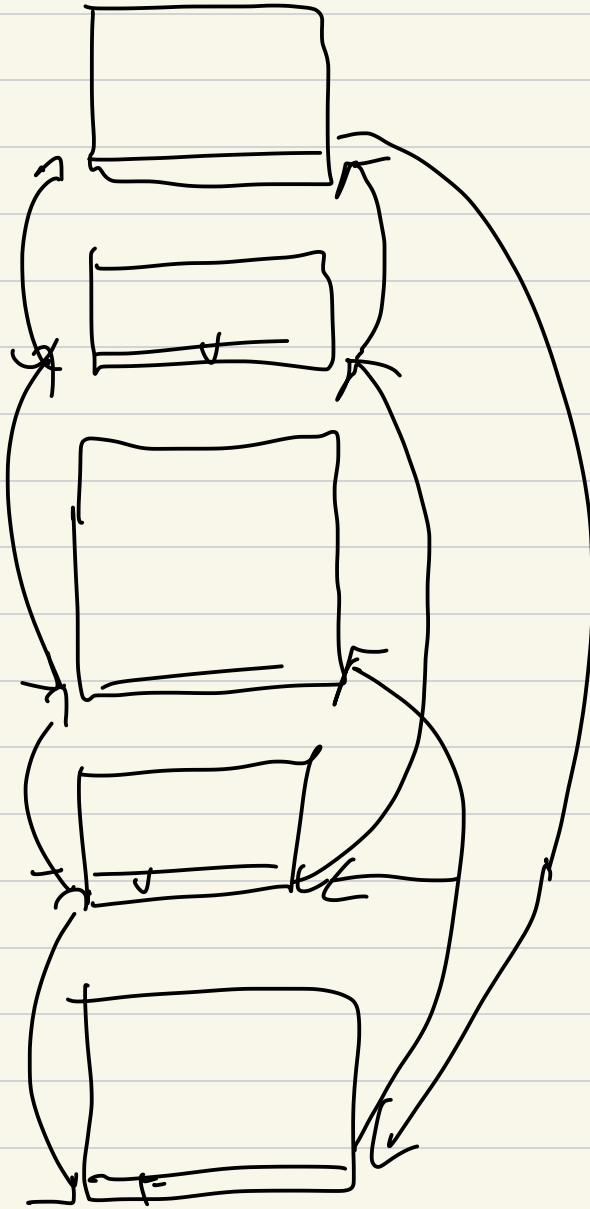
look for first free
block that's big
enough.

First Fit

- Best Fit

- Worst Fit

fragmentation



struct block_hdr {

struct list_elem *
struct list_elem *elem;

}