

↔ 0.7x

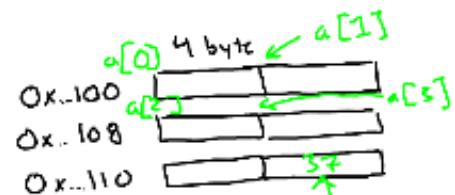
Implement malloc and free - also PAX

Operations on pointers

`int32_t * a`

assume a holds
address 0x...100

We have done:

lookup at index $a[i]$ assign at index $a[i] = v$ print $\text{printf}(\text{"%p\n"}, a)$ $a[3]$ what address is looked up?0x...160 (0x..100 + 32*3)0x...1000x...110

↑ 32 bits,
so 4 bytes
so x100+12

What would we write to set address 0x...114 to 37?

 $a[5] = 37$ `uint8_t * b` assume b holds address 0x..200 $b[3]$ what address? 0x..203What would we write to set 0x..214 to 37? $b[20] = 37$

$a[3]$ vs. $b[3]$ the size of the type `int32_t` vs `uint8_t`
determines the offset/address to use

dereferencing a pointer

 $*a$ it means look up the value at a
equiv to $a[0]$

$a + n$
pointer arithmetic

means calculate the address at start byte

 $a + \text{sizeof}(T) * n$ where a's type is $T*$ $a + 4 * n$ when a's type is `int32_t*`

* $(a + 3)$ means $a[3]$

* $(a + 5) = 37$ means $a[5] = 37$