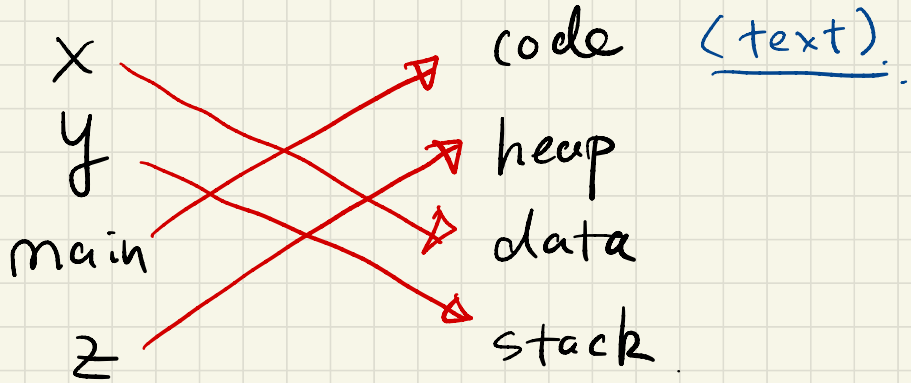


We come to CS571!



Leaky abstraction!

# Static Relocation.

Loader.

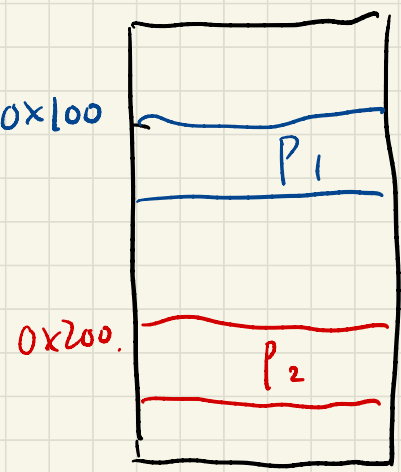
0x000 mov  
0x004 add  
0x008 mov.

rewrite.

P1  
0x100 mov  
0x104 add  
0x108 mov.

rewrite

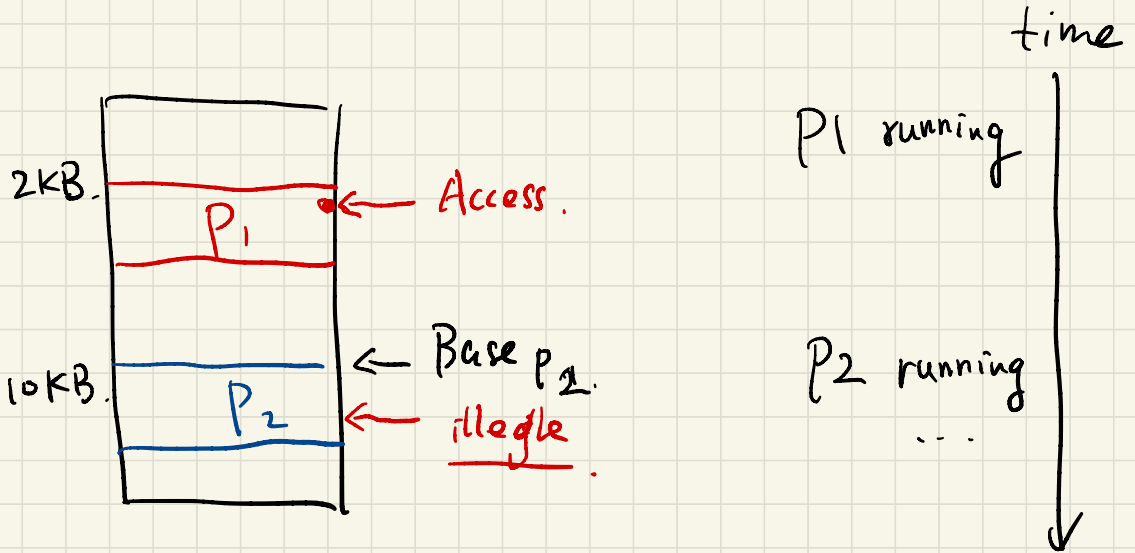
PA



0x200 mov  
0x204 add  
0x208 mov

# Dynamic Relocation.

$$\text{Base: } PA = VA + \text{Base}$$



$$P1: \text{ Load } 100 \quad PA \\ 100 + \text{Base} = 2124$$

$$P1: \text{ Load } \underline{9014}$$

(Stack) Overflow

# Base-and-Bounds.

Pros: Fast + simple.

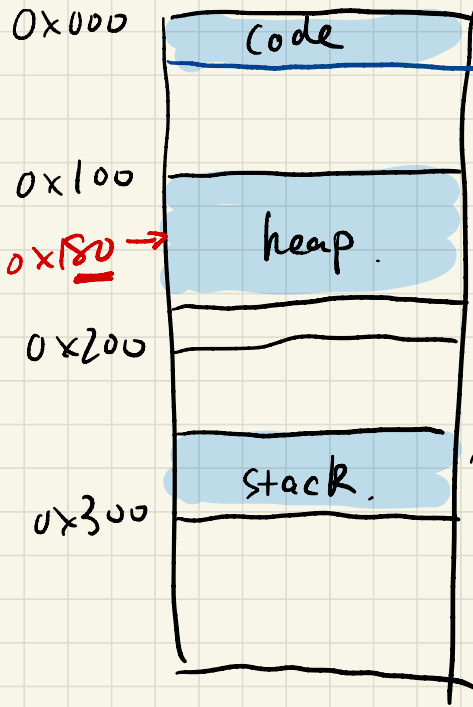
Little bookkeeping info.

Cons: Not flexible.

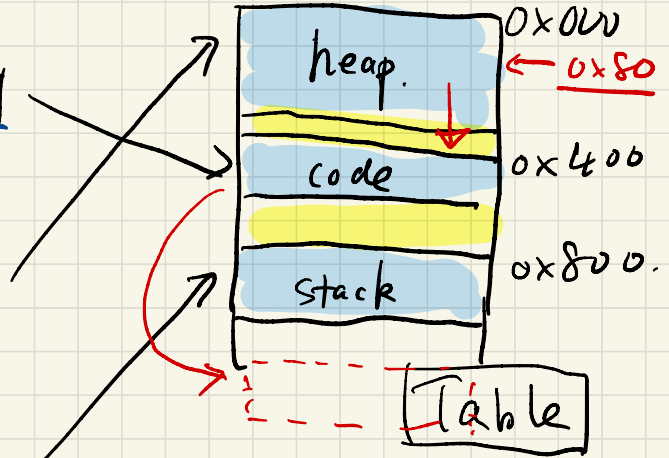
Waste memory



Segmentation:



PA



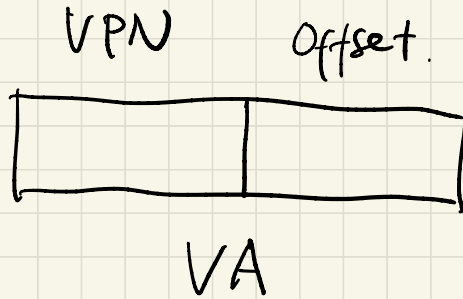
Base Bounds.

code	0x400	0x40
heap	0	0xC0
stack	0x800	0x80

$$\text{Offset } \underline{0x80} + \text{Base}_{\text{heap}} = \underline{0x80}$$

dilemma (1) waste mem

(2) waste time.



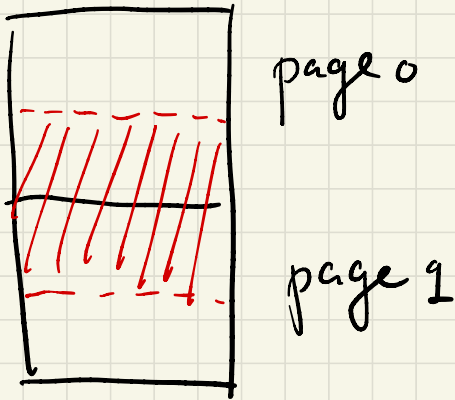
highbits  
2

$$64 - \log_2(4\text{KB})$$

$$= 64 - 12$$

$$= \underline{52}$$

compulsory



$2^{52}$   
pages.

HOU.

Baseline PT  $\rightarrow$  image of  
Virt Addr  
Space.

Linear Inverted PT  $\rightarrow$  image of  
phys. addr  
Space.

$O(N)$ .