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Problem 8.1:

(a) 1024 KiB = 1048576 B

Page Size = 2048 B

Frames = 1048576 B / 2048 B = **512 Frames**

(b) Logical Address Space:

Maximum = 32 Pages

$\log_2(32 \cdot 2048) =$ **16 Bits**

(32: Pages, 2048: Page Size)

Physical Address Space:

Memory Size = 1048576 B $\Rightarrow \log_2(1048576) =$ **20 Bits**

(c) Logical address $\Rightarrow$ 16 Bits

Page Number: $\log_2(32) =$ **5 Bits** (32: Pages)

Offset is the remaining **11 Bits**

Problem 8.2:

(a)

P1

Frame Number	Additional Bits
0x800	r-x-v
0x600	r-x-v
	rw-d-
	rw-d-
0x800	rw-dv
0x300	rw-dv

P2

Frame Number	Additional Bits
0x900	r-x-v
0xC00	r-x-v
0x400	rw-dv
0x100	rw-dv
	rw-d-
	rw-d-

(b) After P1 loads Page 1&2 into Phy. memory address 0x200 to modify a global variable and loads Page 3, 5 into the physical memory address 0x500 to dynamically allocate a string, the result page table will be:

Frame Number	Additional Bits
0x800	r-x-v
0x600	r-x-v
0x200	rw-dv
0x500	rw-dv
0x800	rw-dv
0x300	rv-dv

After P2 loads Page 2, 6 into physical memory address 0x700 to allocate 16 Bytes on the heap, this will be the table for P2:

Frame Number	Additional Bits
0x900	r-x-v
0xC00	r-x-v
0x400	rw-dv
0x100	rw-dv
0x700	rw-dv
	rw-d-

(c)

Process 1:

Frame Number	Additional Bits
0x800	r-x-v
0x600	r-x-v
	rw-d-
0x200	rw-dv
	rw-d-
0x800	rw-dv
0x300	rw-dv

Process 2:

Frame Number	Additional Bits
0x900	r-x-v
0xC00	r-x-v
0x200	rw-dv
0x400	rw-dv
0x100	rw-dv
	rw-d-
	rw-d-