Worksheet 8

2/2/2025

12 Points Possible

Attempt 2

2/1/2025

NEXT UP: Review Feedback

Attempt 2 Score: N/A

Add Comment

Unlimited Attempts Allowed

Details

Q1: What would be the advantages/disadvantages of having a larger page?

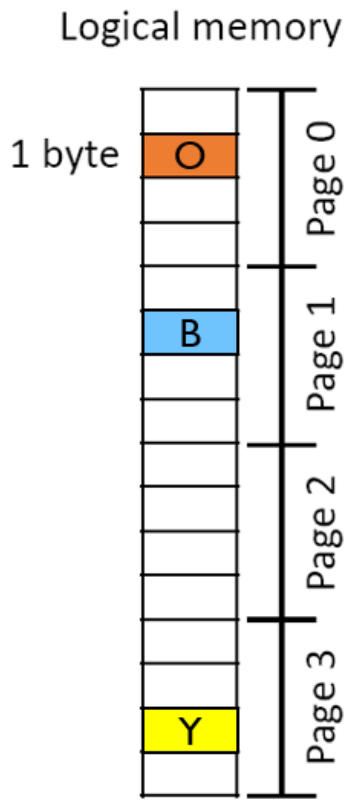
Q2: Assume a logical address space with size of 16 and a page size of 4 bytes. How many bits do we need to represent the logical address?

Q3:

m = 4 = total size of logical address

n = 2 = size of page

What the address of the orange, blue and yellow bytes?



Answer 1:

Advantage:

If pages are larger, there are fewer pages in the table. So the searching becomes easier for a small-scale table.

Disadvantage:

If the page size is big, then there can be more memory wastage. Because we might need to accommodate processes in memory larger than it's needed.

Answer 2:

Number of bits needed for the logical address = log2 (address space size) = log2(16) = 4 bits

Answer 3:

- Total size of logical address (m) = 4 bits
- Size of each page (n) = 2 bits

So, the logical address space is, 2^m bytes = 2^4 = 16 bytes
Each page contains, 2^n bytes = 2^2 = 4 bytes

The logical address has two parts:

- Page number = m - n = 2 bits

- Offset = n = 2 bits

For the total logical address space of 16 bytes (0 ~ 15, from top to bottom) and 4 bytes (0 ~ 3) of each page,
the mapping is:

- (top) Page 0
- (middle) Page 1
- (middle) Page 2
- (bottom) Page 3

Bytes	Offset	Page
	0	Page0
Orange	**1**	**Page0**
	2	Page0
	3	Page0
	0	Page1
Blue	**1**	**Page1**
	2	Page1
	3	Page1
	0	Page2
	1	Page2
	2	Page2
	3	Page2
	0	Page3
	1	Page3
Yellow	**2**	**Page3**
	3	Page3

The addresses for Orange, Blue, and Yellow bytes can be calculated using the above:

1. **Orange Byte:** 0001 (Page 00, Offset 01)
2. **Blue Byte:** 0101 (Page 01, Offset 01)
3. **Yellow Byte:** 1110 (Page 11, Offset 10)

New Attempt