

Worksheet 07 - Memory Management

1. A page table (PT) has the following contents.

Page Number	Frame number
0	5
1	6
2	
3	9
4	12

Page size = 512 words. Given the logical address LA = 1780, determine the following:

Page number p, Offset w and Frame number f.

$1780 / 512 = 3$ page

$1780 \% 512 = 244$ words

frame is 9

2. A page table (PT) has the following contents.

Page Number	Frame number
0	6
1	
2	10
3	13
4	7

Page size = 512 words. Given the logical address LA = 350, determine the following:

Page number p , Offset w , Frame number f and physical address.

$350 / 512 = 0$ page

$350 \% 512 = 350$

frame is 6

3. A memory system employs both paging and segmentation:

- The logical address size is 32 bits.
- Page size is 512 words.
- The segment table contains 2^{13} entries.

a. What is the size of w?

$$2^{32} / 2^{13} = 2^{19}$$

b. What is the maximum number of pages per segment?

$$2^{19} / 2^{11} = 2^8 = 256 \text{ pages}$$

4. Assume a virtual memory that uses segmentation and paging for a single process.

Segment table and page table entries contain frame numbers of the corresponding page tables or pages.

Size of segment table = size of page table = size of page = size of frame = 512 words.

Segment table (ST) starts at address 0 of physical memory.

Physical memory (PM) has the following contents:

	0	1	2	3	4	...
PM	5	9	7	4	1	...

What will be

The page table (PT) of segment 2 starts at physical address?

$$526 (2 \cdot 7 + 512)$$

The page table (PT) of segment 3 starts at physical address?

$$524 (3 \cdot 4 + 512)$$