

GSIO18 – SISTEMAS OPERACIONAIS

Operating Systems – William Stallings – 7th Edition Chapter 08 – Virtual Memory

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REVIEW QUESTIONS

- 8.3** Why is the principle of locality crucial to the use of virtual memory?
- 8.5** What is the purpose of a translation lookaside buffer?
- 8.7** What is the difference between resident set management and page replacement policy?
- 8.9** What is accomplished by page buffering?

PROBLEMS

8.2 Suppose the page table for the process currently executing on the processor looks like the following. All numbers are decimal, everything is numbered starting from zero, and all addresses are memory byte addresses. The page size is 1,024 bytes. a) Describe exactly how, in general, a virtual address generated by the CPU is translated into a physical main memory address. b. What physical address, if any, would each of the following virtual addresses correspond to? (Do not try to handle any page faults, if any.) (i) 1,052 (ii) 2,221 (iii) 5,499

Virtual Page Number	Valid Bit	Reference Bit	Modify Bit	Page Frame Number
0	1	1	0	4
1	1	1	1	7
2	0	0	0	--
3	1	0	0	2
4	0	0	0	--
5	1	0	1	0

8.6 A process contains eight virtual pages on disk and is assigned a fixed allocation of four page frames in main memory. The following page trace occurs:

** 1, 0, 2, 2, 1, 7, 6, 7, 0, 1, 2, 0, 3, 0, 4, 5, 1, 5, 2, 4, 5, 6, 7, 6, 7, 2, 4, 2, 7, 3, 3, 2, 3

- a. Show the successive pages residing in the four frames using the LRU replacement policy. Compute the hit ratio in main memory. Assume that the frames are initially empty.
- b. Repeat part (a) for the FIFO replacement policy.
- c. Compare the two hit ratios and comment on the effectiveness of using FIFO to approximate LRU with respect to this particular trace.