

Score: _____

Name: _____

ECE 3055 Quiz 13 - April 22, 2009

1-3. Determine the number of page faults that will occur in the following page reference string assuming 4 page frames are available. All frames are initially empty.

1, 2, 4, 3, 5, 8, 2, 1, 2, 3, 6, 1, 2, 6, 5, 2, 1, 2, 3, 7

Page Frames

1	1	1	1	5	5	5	5	5	3	3	3	3	3	3	3	1	1	1	1
	2	2	2	2	8	8	8	8	8	6	6	6	6	6	6	6	3	3	3
		4	4	4	4	2	2	2	2	2	2	2	2	5	5	5	5	5	7
			3	3	3	3	1	1	1	1	1	1	1	1	2	2	2	2	2

Page Fault Y/N

Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	N	Y	Y	Y	N	Y	Y	Y
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1. With the FIFO algorithm, 15 page faults will occur.

Page Frames

1	1	1	1	5	5	5	5	5	3	3	3	3	3	5	5	5	5	5	7
	2	2	2	2	8	8	8	8	8	6	6	6	6	6	6	6	6	3	3
		4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1

Page Fault Y/N

Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	N	N	N	Y	Y
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2. With the LRU algorithm, 13 page faults will occur.

Page Frames

1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		4	4	5	8	8	8	8	8	6	6	6	6	5	5	5	5	5	7
			3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Page Fault Y/N

Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	N	N	Y	N	N	N	N	Y
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3. With the best possible algorithm, a minimum of 9 page faults will occur.

4. What happens to performance when physical memory is over allocated to too many active processes in a virtual memory system resulting in numerous page faults and what is the term used to describe it?

the system spends all of its time on I/O to swap pages and performance drops. It is called thrashing

5. What is the problem with using a single level VM page table and why are more complex schemes often used?

It can take large amounts of physical memory for the page table. (see page 337)