

Score: _____

Name: _____

ECE 3055 Quiz - November 5, 2003

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

Page Frames

3 pts.

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

Page Fault Y/N

Y	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
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1. With the FIFO algorithm, 16 page faults will occur.

Page Frames

3 pts.

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

Page Fault Y/N

Y	Y	Y	Y	N	N	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
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2. With the LRU algorithm, 14 page faults will occur.

Page Frames

3 pts.

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	4	4	6	5	5	5	5	5	5	5	8	8	8	8	8	6
			3	3	3	3	3	3	3	3	3	7	7	7	7	7	7	3	3

Page Fault Y/N

Y	Y	Y	Y	N	N	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Y	Y
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3. With the best possible algorithm, a minimum of 10 page faults will occur.

4. Other than having an automatic system to swap data to/from the disk and the ability to run program(s) larger than physical memory, what is the other main advantage gained for a secure multiprocessing OS by having a virtual memory system?

1 pts.

more security with hardware memory protection
 higher CPU utilization with increased degree of multiprogramming