TD No 8

Ex 1

Consider the following page reference:

1, 2, 3, 1, 7, 4, 1, 8, 2, 7, 8, 4, 3, 8, 1, 1

How many page faults would occur for the following replacement algorithms, assuming four frames? Remember that all frames are initially empty.

- FIFO
- LRU
- Optimal

FIFO:

1, 2, 3, 1, 7, 4, 1, 8, 2, 7, 8, 4, 3, 8, 1, 1

1	1	1	1	1	4	4	4	4	7	7	7				
	2	2	2	2	2	1	1	1	1	1	4				
		3	3	3	3	3	8	8	8	8	8				
				7	7	7	7	2	2	2	2				

LRU

1, 2, 3, 1, 7, 4, 1, 8, 2, 7, 8, 4, 3, 8, 1, 1

1	1	1	1	1	1	1	1	1	1	1	4						
	2	2	2	2	4	4	4	4	7	7	7						
		3	3	3	3	3	8	8	8	8	8						
				7	7	7	7	2	2	2	2						

optimal

1, 2, 3, 1, 7, 4, 1, 8, 2, 7, 8, 4, 3, 8, 1, 1

1	1	1	1	1	1	1	8	8	8	8	8	8	8	8	8		
	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3		
		3	3	3	4	4	4	4	4	4	4	4	4	4	4		
				7	7	7	7	7	7	7	7	7	7	1	1		

Ex 2

a. In a paging system, the logical address space is 8 GB, the page's size is 1 KB, and the size of physical memory is 2 GB. Indicate the necessary number of bits for each of the following elements:
   - Virtual address
   - Physical address
   - Page's number
   - Frame's number
   - Offset

b. In the same system, we give the page table of the process P:

page	0	1	2	3	4	5	6	7	8
frame	3	8	15	2	0	9	6	4	7

1. Give the size of P.

2. Give the physical addresses of the following logical addresses if they are valid:
   i. (3, 563)
   ii. (10, 0)
   iii. (0, 1024)
   iv. 1000
   v. 5000
   vi. 12000

Ex 3

Given the following segment table of a process P:

Segment	0	1	2	3	4	5
base	120	0	250	900	450	800
limit	100	50	150	250	350	100

a) Give the size of P.

b) What is the necessary number of bits to represent the segment number of the process P?

c) Give the physical addresses of the following logical addresses if they are valid:
   a. 01000010001010
   b. 11001011110010
   c. 10000011001111
   d. 00000001110000