Demand paging problems (page replacement algorithms):

1. For the following reference string apply the FIFO page replacement algorithm.

Reference string	**1**	**7**	**5**	**4**	**0**	**1**	**4**	**7**	**3**	**6**	**5**	**0**	**4**	**7**	**3**	**2**	**1**
Physical frame 0	1	7	5	4	0	1	1	7	3	6	5	0	4	7	3	2	1
Physical frame 1		1	7	5	4	0	0	1	7	3	6	5	0	4	7	3	2
Physical frame 2			1	7	5	4	4	0	1	7	3	6	5	0	4	7	3
Physical frame 3				1	7	5	5	4	0	1	7	3	6	5	0	4	7
Page faults	F	F	F	F	F	F		F	F	F	F	F	F	F	F	F	F
Victim frames					1	7		5	4	0	1	7	3	6	5	0	4

2. For the following reference string apply the OPT page replacement algorithm.

Reference string	**1**	**7**	**5**	**4**	**0**	**1**	**4**	**7**	**3**	**6**	**5**	**0**	**4**	**7**	**3**	**2**	**1**
Physical frame 0	1	1	1	1	1	1	1	1	3	6	5	5	5	5	3	2	1
Physical frame 1		7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Physical frame 2			5	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Physical frame 3				4	4	4	4	4	4	4	4	4	4	4	4	4	4
Page faults	F	F	F	F	F				F	F	F				F	F	F
Victim frames					5				1	3	6				5	3	2

3. For the following reference string apply the LRU page replacement algorithm.

Reference string	**1**	**7**	**5**	**4**	**0**	**1**	**4**	**7**	**3**	**6**	**5**	**0**	**4**	**7**	**3**	**2**	**1**
Physical frame 0	1	1	1	1	0	0	0	0	3	3	3	3	4	4	4	4	1
Physical frame 1		7	7	7	7	1	1	1	1	6	6	6	6	7	7	7	7
Physical frame 2			5	5	5	5	5	7	7	7	7	0	0	0	0	2	2
Physical frame 3				4	4	4	4	4	4	4	5	5	5	5	3	3	3
Page faults	F	F	F	F	F	F		F	F	F	F	F	F	F	F	F	F
Victim frames					1	7		5	0	1	4	7	3	6	5	0	4

4. For the following reference string apply the LFU page replacement algorithm.

Reference string	**1**	**7**	**5**	**4**	**0**	**1**	**4**	**7**	**3**	**6**	**5**	**0**	**4**	**7**	**3**	**2**	**1**
Physical frame 0	1	1	1	1	0	1	1	1	1	1	1	0	0	0	3	2	1
Physical frame 1		7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Physical frame 2			5	5	5	5	5	5	3	6	5	5	5	5	5	5	5
Physical frame 3				4	4	4	4	4	4	4	4	4	4	4	4	4	4
Page faults	F	F	F	F	F	F			F	F	F	F			F	F	F
Victim frames					1	0			5	3	6	1			0	3	2