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N 7.1

a) Show how the list of free blocks changes after each allocation using the best-fit algorithm.

Request	16 KiB	8 KiB	6 KiB	21 KiB	14 KiB	10 KiB
9 KiB	16	8	6	21	14	1
11 KiB	16	8	6	21	3	1
7 KiB	16	1	6	21	3	1
16 KiB	0	1	6	21	3	1

b) Show how the list of free blocks changes after each allocation using the worst-fit algorithm.

Request	16 KiB	8 KiB	6 KiB	21 KiB	14 KiB	10 KiB
9 KiB	16	8	6	12	4	10
11 KiB	5	8	6	12	14	10
7 KiB	5	8	6	12	7	10
16 KiB		Can't allocate				

c) Show how the list of free blocks changes after each allocation using the first-fit algorithm.

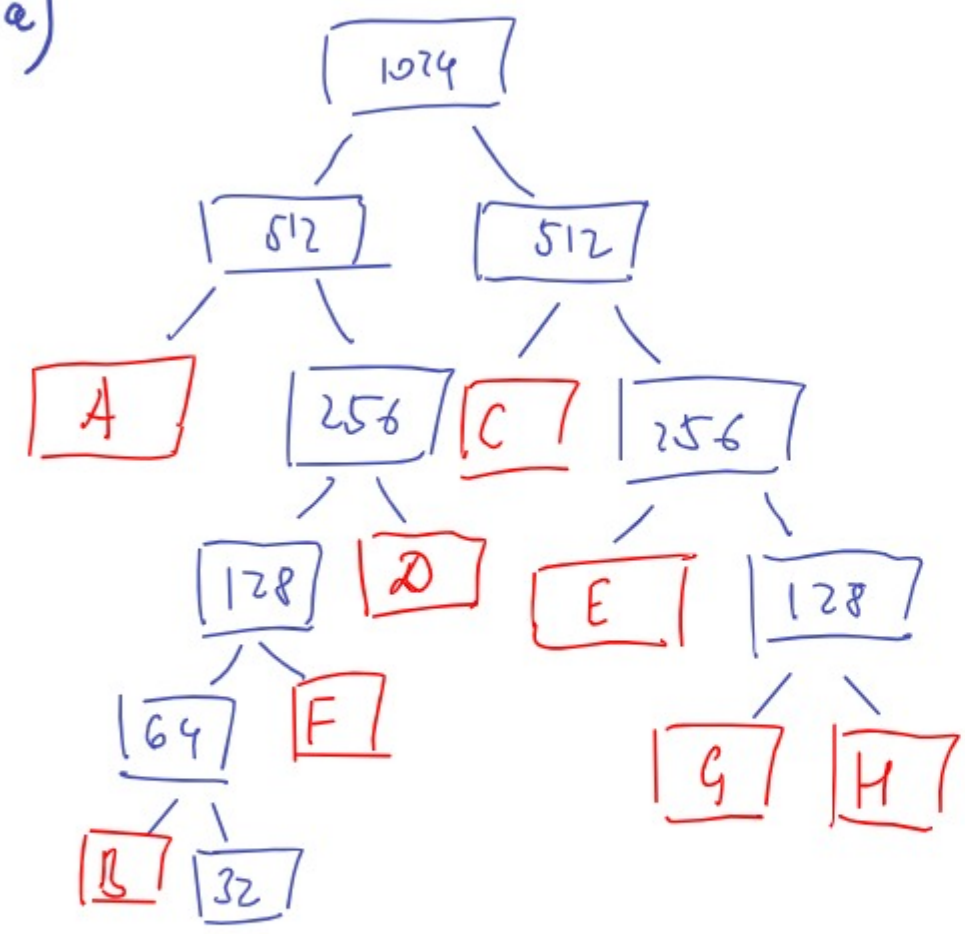
Request	16 KiB	8 KiB	6 KiB	21 KiB	14 KiB	10 KiB
9 KiB	7	8	6	21	14	10
11 KiB	7	8	6	10	14	10
7 KiB	0	8	6	10	14	10
16 KiB			can't allocate			

d) Show how the list of free blocks changes after each allocation using the next-fit algorithm.

Request	16 KiB	8 KiB	6 KiB	21 KiB	14 KiB	10 KiB
9 KiB	7	8	6	21	14	10
11 KiB	7	8	6	10	14	10
7 KiB	7	8	6	10	7	10
16 KiB			can't allocate			

a 7.2

a)



1024							
A	256		512				
A	B 32 64 128		512				
A	B 32 64 128		C	256			
A	B 32 64 D		C	256			
A	B 32 64 D		C	E	128		
A	B 32 F D		C	E	128		
A	B 32 F D		C	E	G	64	
A	B 32 F D		C	E	G	H	

b) Overall internal fragmentation: 32 KiB

Largest chunk to allocate: 32 KiB

c) After deallocation of F we get 2 chunks of 32 and 64 KiB, but we can't merge them, because they have different sizes. So we cannot fulfil the request for 80 KiB.

a 7.3

a) Show how the pages are mapped to two frames using the First-In-First-Out (FIFO) page replacement algorithm.

reference string	3	1	2	4	1	3	2	4	1	3
frame 0	3	3	2	2	1	1	2	2	1	1
frame 1		1	1	4	4	3	3	4	4	3

Show how the pages are mapped to three frames using the First-In-First-Out (FIFO) page replacement algorithm.

reference string	3	1	2	4	1	3	2	4	1	3
frame 0	3	3	3	4	4	4	4	4	4	4
frame 1		1	1	1	1	3	3	3	3	3
frame 2			2	2	2	2	2	2	1	1

b) Show how the pages are mapped to two frames using Belady's Optimal (BO) page replacement algorithm.

reference string	3	1	2	4	1	3	2	4	1	3
frame 0	3	3	2	2	2	2	2	4	1	1
frame 1		1	1	4	1	3	3	3	1	3

Show how the pages are mapped to three frames using Belady's Optimal (BO) page replacement algorithm.

reference string	3	1	2	4	1	3	2	4	1	3
frame 0	3	3	3	3	3	3	2	2	2	3
frame 1		1	1	1	1	1	1	1	1	1
frame 2			2	4	4	4	4	4	4	4

c) Show how the pages are mapped to two frames using the Least Recently Used (LRU) page replacement algorithm.

reference string	3	1	2	4	1	3	2	4	1	3
frame 0	3	3	2	2	1	1	2	2	1	1
frame 1		1	1	4	4	3	3	4	4	3

Show how the pages are mapped to three frames using the Least Recently Used (LRU) page replacement algorithm.

reference string	3	1	2	4	1	3	2	4	1	3
frame 0	3	3	3	4	4	4	2	2	2	3
frame 1		1	1	1	1	1	1	4	4	4
frame 2			2	2	2	3	3	3	1	1