Operating System Assignment #6

Cenhan Du

October 2020

1 Problem 6.1

a best fit

	12 KiB	5 KiB	19 KiB	13 KiB	7 KiB	8 KiB	16 KiB
14 KiB:	12 KiB	5 KiB	19 KiB	13 KiB	7 KiB	8 KiB	2 KiB
9 KiB:	3 KiB	5 KiB	19 KiB	13 KiB	7 KiB	8 KiB	2 KiB
7 KiB:	3 KiB	5 KiB	19 KiB	13 KiB	8 KiB	2 KiB	
10 KiB:	3 KiB	5 KiB	19 KiB	3 KiB	8 KiB	2 KiB	

b worst fit

	12 KiB	5 KiB	19 KiB	13 KiB	7 KiB	8 KiB	16 KiB
14 KiB:	12 KiB	5 KiB	5 KiB	13 KiB	7 KiB	8 KiB	16 KiB
9 KiB:	12 KiB	5 KiB	5 KiB	13 KiB	7 KiB	8 KiB	7 KiB
7 KiB:	12 KiB	5 KiB	5 KiB	6 KiB	7 KiB	8 KiB	7 KiB
10 KiB:	2 KiB	5 KiB	5 KiB	6 KiB	7 KiB	8 KiB	7 KiB

c first fit

	12 KiB	5 KiB	19 KiB	13 KiB	7 KiB	8 KiB	16 KiB
14 KiB:	12 KiB	5 KiB	5 KiB	13 KiB	7 KiB	8 KiB	16 KiB
9 KiB:	3 KiB	5 KiB	5 KiB	13 KiB	7 KiB	8 KiB	16 KiB
7 KiB:	3 KiB	5 KiB	5 KiB	6 KiB	7 KiB	8 KiB	16 KiB
10 KiB:	3 KiB	5 KiB	5 KiB	6 KiB	7 KiB	8 KiB	6 KiB

d next fit

	12 KiB	5 KiB	19 KiB	13 KiB	7 KiB	8 KiB	16 KiB
14 KiB:	12 KiB	5 KiB	5 KiB	13 KiB	7 KiB	8 KiB	16 KiB
9 KiB:	12 KiB	5 KiB	5 KiB	4 KiB	7 KiB	8 KiB	16 KiB
7 KiB:	12 KiB	5 KiB	5 KiB	4 KiB	8 KiB	16 KiB	
10 KiB:	12 KiB	5 KiB	5 KiB	4 KiB	8 KiB	6 KiB	

2 Problem 6.2

a

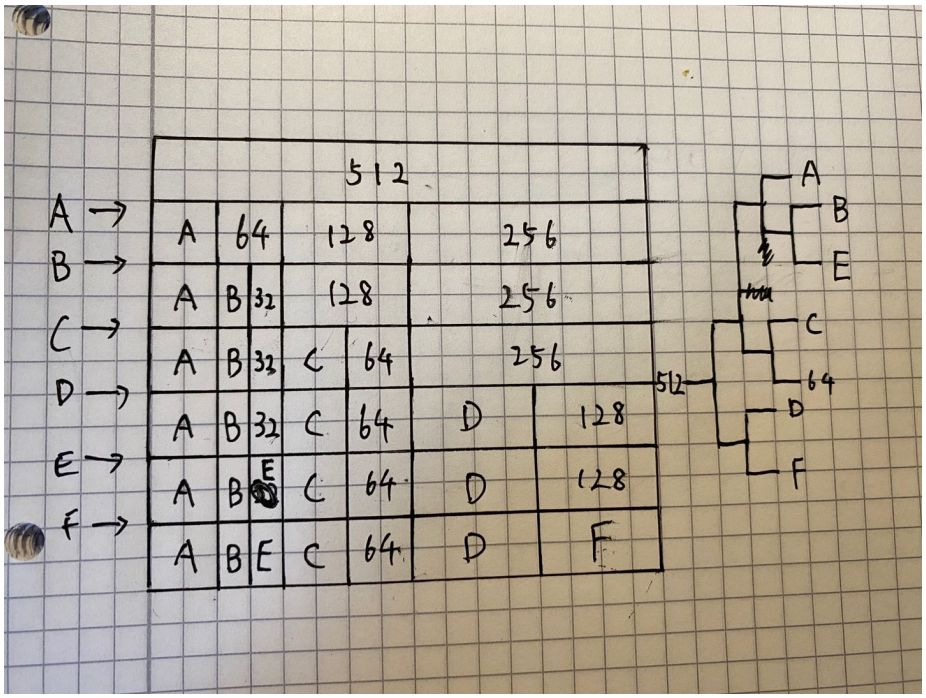

Figure 1: allocation diagram and associated binary tree

b

(64-59)+(32-27)+(32-28)+(64-44)+(128-115)+(128-98)=5+5+4+20+13+30=77KiB

c

No. After process D returns its allocation, even though on the diagram the 64 KiB free block and 128 KiB newly returned free block can join together, Buddy System does not allow any segment sizes other than 2 to the power of i.
In this case, 64+128=192 which is not a number of 2 to the power of i. Therefore, allocation G cannot be accommodated.

3 Problem 6.3

a First In First Out

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

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

b Belady's Optimal

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

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

c Least Recently Used

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

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