20-07-23

II. Best Fit Algorithm

- Process P_i searching block from starting such that
  1. Block can accomodate process
  2. Memory wastage is minimum

Ques!

40 K — Process P_1

block 1	2	3	4	5
100K	50K	30K	120K	35K

	can occupy
B_1	Yes
B_2	Yes
B_3	No
B_4	Yes
B_5	No

Memory wastage = 100 - 40 = 60 k

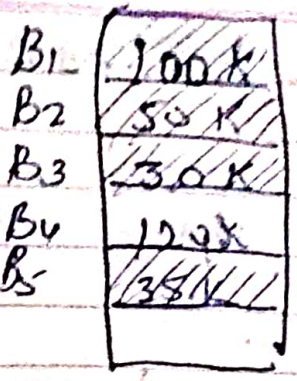
50 - 40 = 10k ✓ Best

120 - 40 = 80 k

Soln

P_1	P_2	P_3	P_4
40	10	30	60

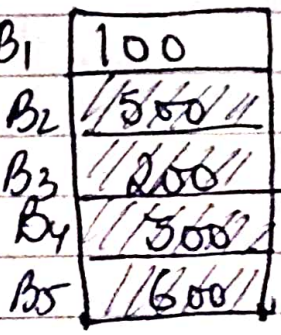
B_1	B_2	B_3	B_4	B_5
100K	50K	30K	120K	35K



- When P_1 is placed in B_2, B_2 is unavailable
- When P_2 is placed in B_3, B_2 and B_3 are unavailable
- When P_3 is placed in B_5, B_2, B_3 & B_5 are unavailable
- When P_4 is placed in B_1 B_2, B_3, B_5 & B_1 are unavailable.

Ques

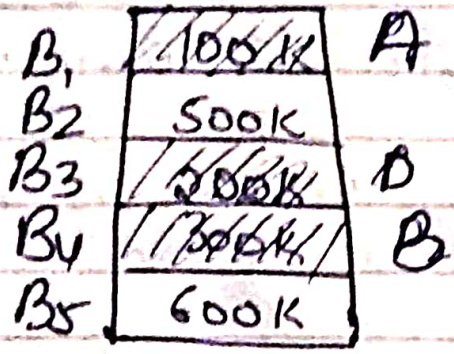
P_1	P_2	P_3	P_4
212	417	112	426



Best Fit

Q.) Job list A, B, C, D

A	B	C	D
414K	220K	670K	64K



Best Fit

The process demand is not satisfies memory is not allocated.

21-07-23

PAGE NO.:
DATE: / /

III Worst fit.

- Process traverse the whole memory.
- Always search the largest partition
- It is slow process.

40 K. Process size.

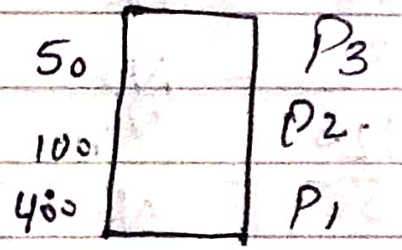
100	50	30	120	35
B1	B2	B3	B4	B5

	size	Can occupy	
B1	100	Yes	100 - 40 = 60
B2	50	Yes	50 - 40 = 10
B3	30	No	
B4	120	Yes	120 - 40 = 80
B5	35	No	

Ques

P_1	P_2	P_3
30K	100K	45K

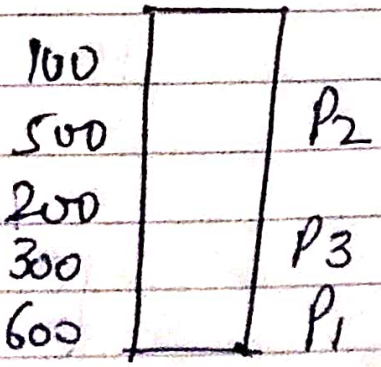
B_1	~~100~~ 50
B_2	100
B_3	400



Ques

P_1	P_2	P_3	P_4
212	417	112	426

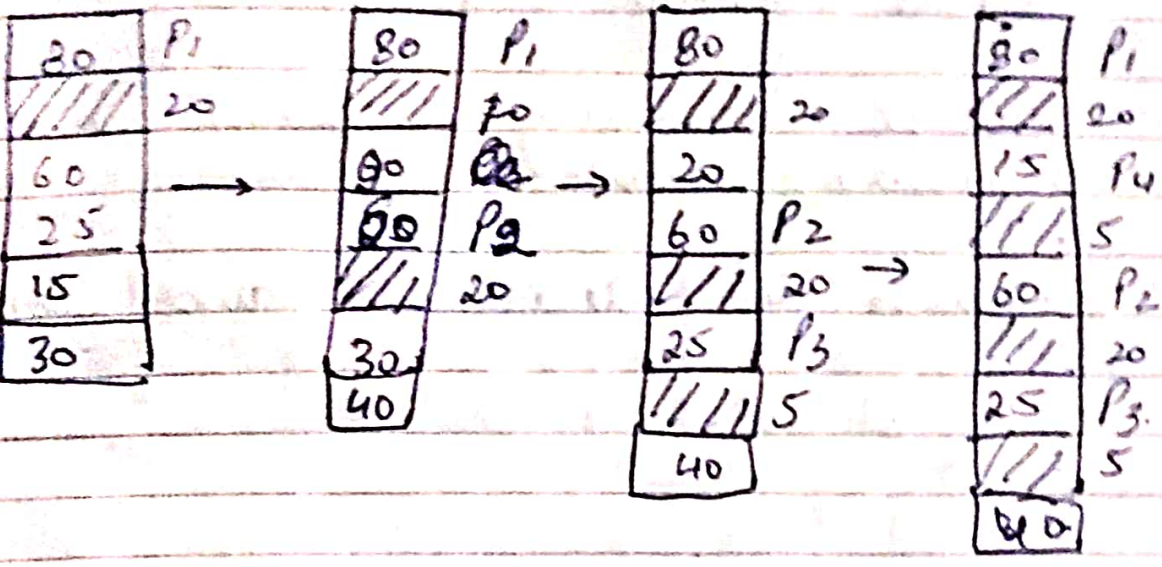
No value for P_4 as no memory is left.

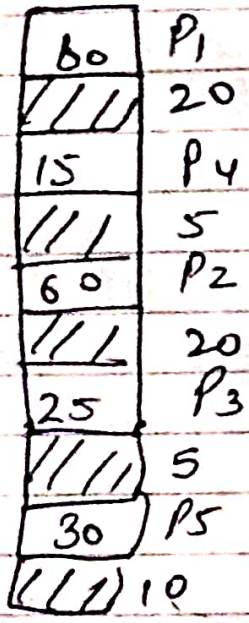


Ques

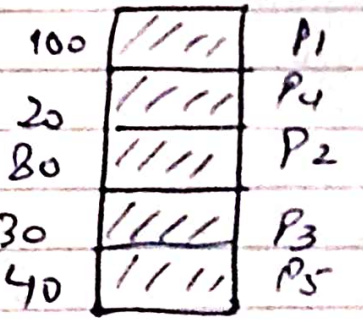
P_1	P_2	P_3	P_4	P_5
80	60	25	15	30

100	20	50	30	40

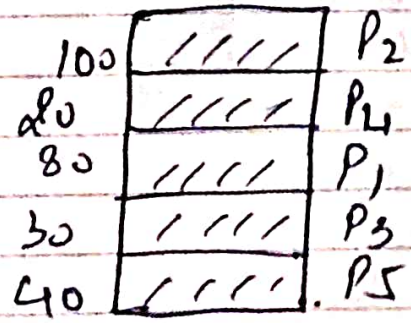




First Fit



Worst Fit



Best Fit

28-07-23

Page replacement Algorithm

Frame size

1. FIFO (First in First Out) = 3
2. Least Recently Used (LRU)
3. optimal page replacement.

Page fault (x)

Page Replacement Reference String

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 1, 2, 0

		1	1	1	2	0	0	0	3	3	3	3	2	2
	0	0	0	0	3	3	3	2	2	2	2	1	1	1
7	7	7	2	2	2	2	4	4	4	0	0	0	0	0
x	x	x	x	hit	x	x	x	x	x	x	hit	x	x	hit

12 page fault

hit = 3

Ques2 frame size = 4

			2	2	2	2	2	2	2	2	2	1	1	1
		1	1	1	1	1	1	1	1	0	0	0	0	0
	0	0	0	0	0	0	4	4	4	4	4	4	4	4
7	7	7	7	7	3	3	3	3	3	3	3	3	2	2
x	x	x	x	hit	x	hit	x	hit	hit	x	hit	x	x	hit

fault - 9 hit - 6

31-07-23

⇒ LRU (Least Recently used)

- Page replacement.
- Replace the page which is not refferd for the longest time in memory (Past)

Ques → 1 2 1 0 3 0 4 2 4.

1 2 1 0 3 0 4 2 4.

recently replac.

			0	0	0	0	0	0
	2	2	2	3	3	3	2	2
1	1	1	1	1	1	4	4	4
x	x	✓	x	x	✓	x	✗	

miss (fault) — fit

frame size = 3

hit = 3

miss = 6.

Ques 4 7 6 1 7 6 1 2 7 2

frame size = 3

		6	6	6	6	6	6	7	7
	7	7	7	7	7	7	2	2	2
4	4	4	1	1	1	1	1	1	1
x	x	x.	x	✓	✓	✓	x	x	✓

hit = 4

miss = 6.

PAGE NO.:
DATE: / /

Ques 7 0 1 2 0 3 0 4 2 3 0 3 1 2 0

		1	1	1	3	3	3	2	2	2	2	1	1	1	
	0	0	0	0	0	0	0	0	3	3	3	3	3	0	
7	7	7	2	2	2	2	4	4	4	0	0	0	2	2	
x	x	x	x	✓	x	✓	x	x	x	x	✓	x	x	x	

hit = 3

miss = 12.

⇒ OPTIMUM Page Replacement

Ques 7 0 1 2 0 3 0 4 2 3 0 3 2

frame size = 4:

	x	x	x	x	✓	x	✓	x	✓	✓	✓	✓	✓	✓
			2	2	2	2	2	2	2	2	2	2	2	2
		1	1	1	1	1	4	4	4	4	4	4	4	4
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	7	7	7	7	3	3	3	3	3	3	3	3	3	3

hit = 8

mis = 6

Ques

frame size = 3:

		✓		✓	x	✓	✓	✓	✓	✓	✓	✓	✓
	1	1	1	3	3	3	3	3	3	3	3	3	3
0	0	0	0	0	0	4	4	4	0	0	0	0	0
7	7	7	2	2	2	2	2	2	2	2	2	2	2

hit = ~~7~~ 8

mis = ~~7~~ 7.

Ques LRU

frame size = 4

fault = 6

hit = 8.

	x	x	x	✓	x	✓	x	✓	✓	✓	✓	✓	✓
			2	2	2	2	2	2	2	2	2	2	2
		1	1	1	1	1	4	4	4	4	4	4	4
	0	0	0	0	0	0	0	0	0	0	0	1	0
7	7	7	7	7	3	3	3	3	3	3	3	3	3

Ans 3 2 1 0 3 2 4 3 2 1 0 4

frame size = 3

FIFO, LRU, Optimum

x	x	x	x	✓	x	x	✓	✓	x	x	✓
		1	1	1	2	2	2	2	2	0	0
	2	2	2	3	3	3	3	3	3	1	1
3	3	3	0	0	0	4	4	4	4	4	4

fault = 9

hit = 3

LRU

							✓	✓			
		1	1	1	2	2	2	2	2	2	4
	2	2	2	2	3	3	3	3	3	0	0
3	3	3	0	0	0	4	4	4	1	1	1

fault = 9

hit = 2

Optimum

				✓	✓
		1	0	0	0
	2	2	2	2	2
3	2	3	3	3	3

04-08-23

Ques Which of the following logical address will produce trap addressing error.

Segment No.	Base	Length
0	1219	700
1	2300	14
2	90	100
3	1327	580
4	1952	96.

(1) 0, 430
2. 1, 11
3 2, 100
4. 3, 425
5 4, 95

Sol Segment offset must lie b/w [0, limit-1] If the segment offset becomes greater than or equal to the limit segment then trap addressing error is produced.

option A 0, 430.
Segment number = 0 segment offset 430
limit of segment - 0 is 700
Segment offset must lie b/w [0, 700-1] = [0, 699]

Since, generated segment offset lies in the above

range, so request generated is valid
No trap produced
Physical address = 1219 + 430 = 1649.

option B 1, 11
Limit of segment – 1 is 14
segment offset must lie b/w [0, 14-1] = [0, 13]
Since, generated segment offset lies in the above range, so request generated is valid
no trap produced.
physical address = 2300 + 11 = 2311

option C 2, 100
Limit of segment – 2 is 100
segment must lie b/w [2, 100-1] = [2, 99]
Since, generated segment offset is below range, so request generated is invalid.
Trap for addressing error.

option D 3, 425
Limit of segment – 3 is 580
segment must lie b/w [3, 580-1] = [3, 579]
Since, generated segment offset is above range so request generated is valid.
no trap produced
physical address = 1327 + 425 = 1752

Option E

Ques2 Consider the following segment table.

Segment #	Base	Length
0	219	600
1	2300	14
2	90	100
3	1327	580
4	1952	96

option A. 0, 430.

Limit of segment 0 – 600
Segment offset must lie b/w [0, 600-1] = [0, 599]
Since generated offset is above range, request generated is valid
no trap produced
physical address = 219 + 430 = 649

Option B 1, 10
Limit of segment - 1 – 14
Segment offset must lie b/w [1, 14-1] = [1, 13]
Since generated offset is above range, request generated is valid, No trap produced.
Physical address = 2300 + 10 = 2310.

option C 2, 500
Limit segment 2 – 100
Segment offset must lie b/w [2, 100-1] = [2, 99]
trap produced
trap addressing error

Option D 3,400.
Limit of segment 3 - 580
Segment offset must lie b/w [3, 580-1] = [2, 579]
Since calculated offset is above range, request generated is valid, No trap produced

PA = 1327 + 400 = 1727.

option E 4,112.

Limit of segment 4 - 96
Segment offset must lie b/w [4, 96-1] = [4, 95]
trap produced.
trap addressing error.