

OS

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- Kisi: → No 1 → isian singkat  
 No 2 → File management (20%)  
 No 3 → I/O (FIFO, SSTF, SCAN, CSCAN) 20%  
 No 4 → Bitmap 20%  
 No 5 → LRU, Optimal, (20%)

## 2) File management

- ① Buatlah FAT (File Allocation Table) untuk 3 buah file tersebut:

A = 5 - 14 - 7 - 2  
 B = 1 - 13 - 0 - 6 - 9  
 C = 11 - 4 - 12 - 8 - 15

Bila masing-masing block berukuran 10KB, brp size masing-masing file?

0	6	
1	13	← File B start here
2	-1	
3		
4	12	
5	14	← File A start here
6	9	
7	2	
8	15	
9	-1	
10		
11	4	← File C start here
12	8	
13	0	
14	7	
15	-1	

Size file A = 4 × 10 KB = 40KB

B = 5 × 10 KB = 50KB

C = 5 × 10 KB = 50KB

External fragmentation = 2 × 10 KB = 20KB

Implement system file menggunakan FAT yang berisi entry berikut ini:

x x 0 17 14 13 0 19 -1 0 3 15 0 7 -1 18 8 11 4 16 0

Dengan:

x = block untuk pemakaian khusus OS

-1 = akhir suatu file

0 = block yang kosong

Jika file A mulai dari block 5 dan file B mulai dari block 10, dimana setiap block berukuran 10 KB, maka:

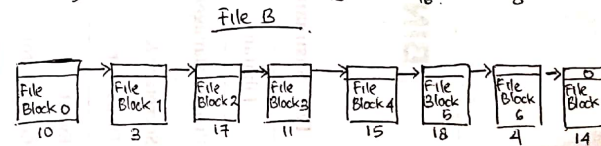
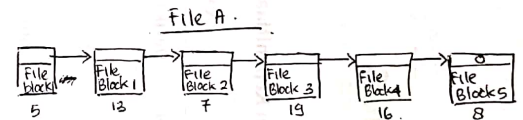
- a) Gambar block yang dialokasikan pada file A dan file B  
 b) Hitung kapasitas file A dan file B.

0	x
1	x
2	0
3	17
4	14
5	13
6	0
7	19
8	-1
9	0
10	3
11	15
12	0
13	7
14	-1
15	18
16	8
17	11
18	4
19	16
20	0

← File A start here

← File B start here

b) File A = 6 × 10 KB = 60KB  
 File B = 8 × 10 KB = 80KB

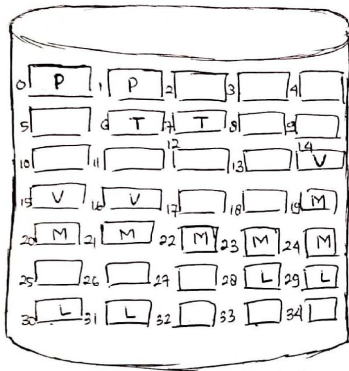


A = 5 - 13 - 7 - 19 - 16 - 8

B = 10 - 3 - 17 - 11 - 15 - 18 - 4 - 14

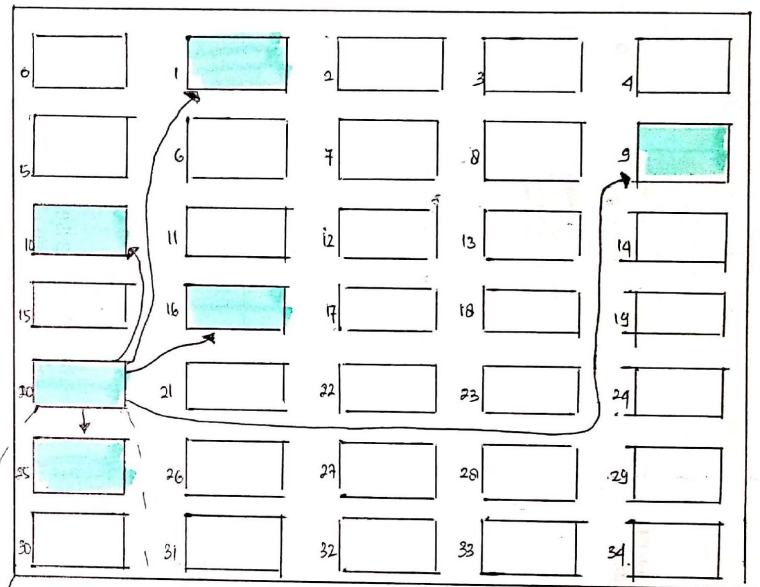
② Buatlah Contiguous Allocation untuk table berikut

	File start	Length
Photo	0	2
Video	14	3
Mail	19	6
List	28	4
Txt	6	2



③ Buatlah Index Allocation untuk

Netbeans di Index block 20 dengan block 9,16,1,10,25,-1



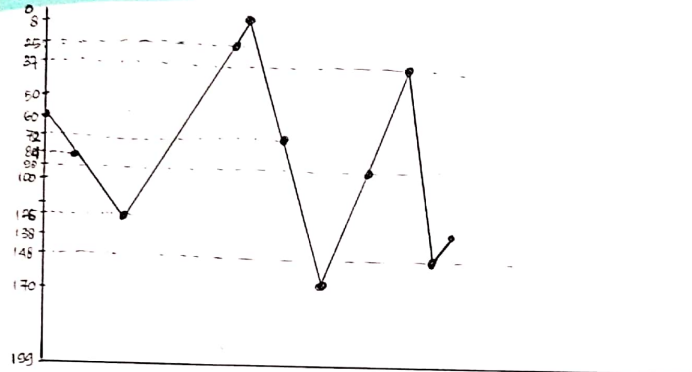
Anggap bentuknya tabung

9,16,1,10,25,-1

3) I/O (FIFO, SSTF, SCAN, C-SCAN) <sup>Sesuai PPT II BINUS</sup>

Posisi head dari suatu disk dengan 200-track (0-199) adalah 60  
 Bila permintaan data sbg berikut:  
 84, 126, 25, 8, 72, 170, 90, 37, 148, 138

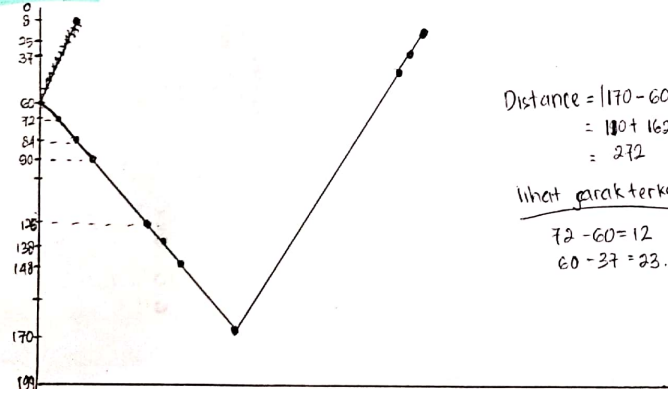
**a) FIFO / FCFS**



$$\text{Distance} = |84-60| + |126-84| + |25-126| + |8-25| + |72-8| + |170-72| + |90-170| + |37-90| + |148-37| + |148-138|$$

$$= 600$$

**b) SSTF** → 8, 25, 37, 72, 84, 90, 126, 138, 148, 170



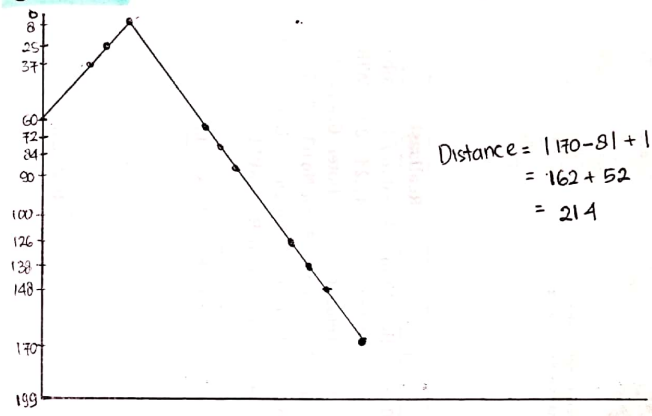
$$\text{Distance} = |170-60| + |170-8|$$

$$= 110 + 162$$

$$= 272$$

lihat karakteristik  
 $72-60=12$  ✓  
 $60-37=23$

**c) SCAN**

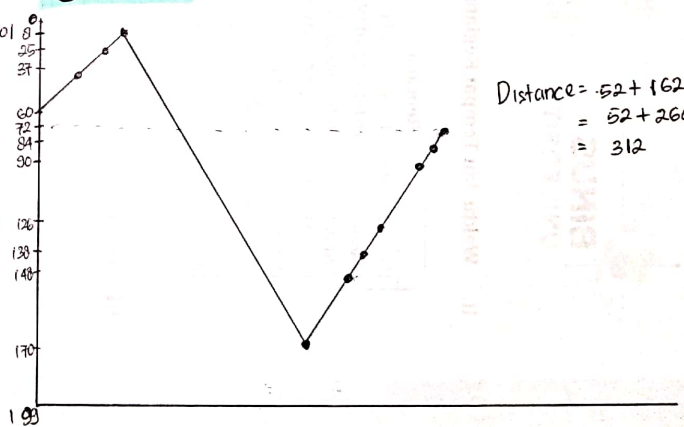


$$\text{Distance} = |170-81| + |160-81|$$

$$= 162 + 52$$

$$= 214$$

**d) C-SCAN**

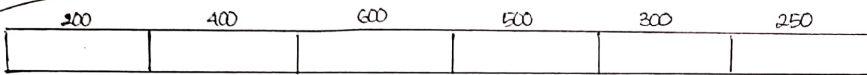


$$\text{Distance} = 52 + 162 + 98$$

$$= 52 + 260$$

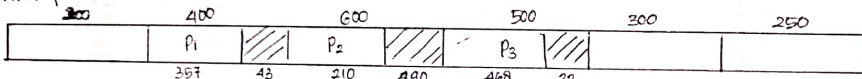
$$= 312$$

#### 4> Bitmap



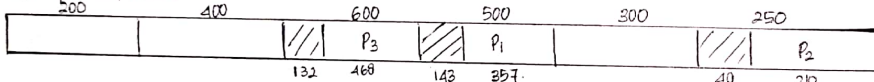
$P_1 = 357$   
 $P_2 = 210$   
 $P_3 = 468$   
 $P_4 = 491$

##### • First fit (Fixed)



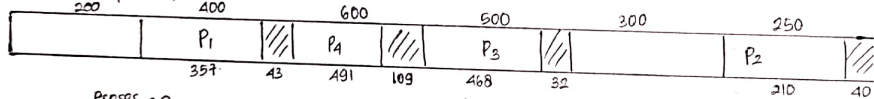
$Proses = 491$   
 $sisa = 200 + 300 + 250 = 750$   
 $Proses < sisa \rightarrow \text{External fragmentation} = 491$   
 $\text{internal fragment} = 43 + 190 + 32 = 465$

##### • Next Fit (Fixed)



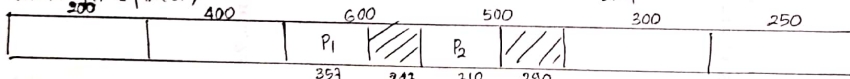
$Proses = 491$   
 $sisa = 200 + 400 + 300 = 900$   
 $\text{External fragment} = 491$   
 $\text{internal fragment} = 132 + 143 + 40 = 315$

##### • Best fit (Fixed)



$Proses = 0$   
 $sisa = 200 + 300 = 500$   
 $\text{External fragment} = 0$   
 $\text{internal fragment} = 43 + 109 + 32 + 40 = 224$

##### • worst fit (Fixed)



$Proses = 468 + 491 = 959$   
 $sisa = 200 + 400 + 300 + 250 = 1150$   
 $\text{External fragment} = 959$   
 $\text{internal fragment} = 243 + 290 = 533$

##### • Quick fit (Fixed)



$\text{External fragment} = 0$   
 $\text{internal fragment} = 40 + 43 + 32 + 109 = 224$

## Buddy System

1 MB block

A Request 100 KB

B Request 240 KB

C Request 64 KB

D Request 256 KB

Release B

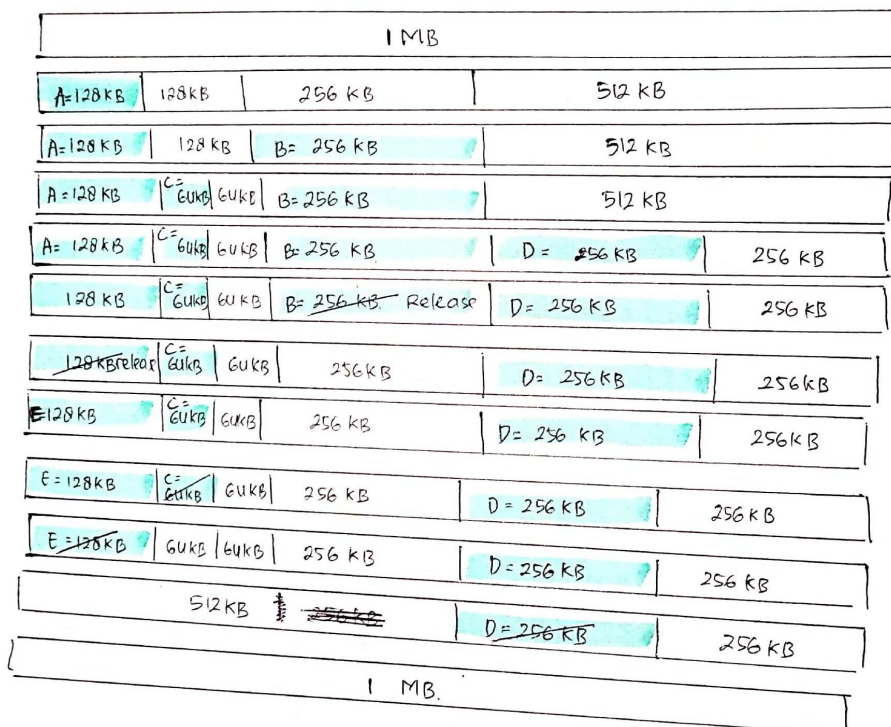
Release A

E Request 75 KB

Release C

Release E

Release D



5> Diketahui urutan page sbg berikut

2-3-1-5-2-4-0-6-3-0-1-1-2-4-6-5-2-0-2-4

yang akan dieksekusi dalam 4 buah page frame  
tentukan bedasar algoritma:

• Optimal

2	3	1	5	2	4	0	6	3	0	1	1	2	4	6	5	2	0	2	4
2	2	2	2	2	2	2	6	6	6	6	6	6	6	6	5	5	5	5	5
	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2
		1	1	1	1	1	1	1	1	1	1	1	4	4	4	4	4	4	4
			5	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
					F	F	F					F	F		F				

Page Fault = 6  
Ratio = 10/20

• LRU

2	3	1	5	2	4	0	6	3	0	1	1	2	4	6	5	2	0	2	4
2	2	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4	4	0	0
	3	3	3	3	4	4	4	4	4	1	1	1	1	1	5	5	5	5	5
		1	1	1	1	0	0	0	0	0	0	0	0	6	6	6	6	6	4
			5	5	5	5	6	6	6	6	6	2	2	2	2	2	2	2	2
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
					F	F	F	F		F		F	F	F	F		F		

Page Fault = 11  
Ratio = 15/20

• FIFO

2	3	1	5	2	4	0	6	3	0	1	1	2	4	6	5	2	0	2	4
2	2	2	2	2	4	4	4	4	4	1	1	1	1	1	5	5	5	5	5
	3	3	3	3	3	0	0	0	0	0	0	2	2	2	2	2	0	0	0
		1	1	1	1	1	6	6	6	6	6	6	4	4	4	4	2	2	2
			5	5	5	5	5	3	3	3	3	3	3	6	6	6	6	6	4
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
					F	F	F	F		F		F	F	F	F		F		

Page Fault = 12  
Ratio = 16/20

• Clock Policy

2	3	1	5	2	4	0	6	3	0	1	1	2	4	6	5	2	0	2	4
2 <sub>0</sub>	2 <sub>0</sub>	2 <sub>0</sub>	2 <sub>0</sub>	2 <sub>0</sub>	2 <sub>0</sub>	0 <sub>0</sub>	0 <sub>0</sub>	0 <sub>0</sub>	0 <sub>0</sub>	0 <sub>0</sub>	0 <sub>0</sub>	0 <sub>0</sub>	0 <sub>0</sub>	4 <sub>0</sub>	4 <sub>0</sub>	4 <sub>0</sub>	0 <sub>0</sub>	0 <sub>0</sub>	0 <sub>0</sub>
	3 <sub>0</sub>	3 <sub>0</sub>	3 <sub>0</sub>	3 <sub>0</sub>	4 <sub>0</sub>	4 <sub>0</sub>	4 <sub>0</sub>	4 <sub>0</sub>	4 <sub>0</sub>	1 <sub>0</sub>	1 <sub>0</sub>	1 <sub>0</sub>	1 <sub>0</sub>	1 <sub>0</sub>	1 <sub>0</sub>	2 <sub>0</sub>	2 <sub>0</sub>	2 <sub>0</sub>	2 <sub>0</sub>
		1 <sub>0</sub>	1 <sub>0</sub>	1 <sub>0</sub>	1 <sub>0</sub>	1 <sub>0</sub>	6 <sub>0</sub>	6 <sub>0</sub>	6 <sub>0</sub>	6 <sub>0</sub>	6 <sub>0</sub>	2 <sub>0</sub>	2 <sub>0</sub>	2 <sub>0</sub>	5 <sub>0</sub>	5 <sub>0</sub>	5 <sub>0</sub>	5 <sub>0</sub>	5 <sub>0</sub>
			5 <sub>0</sub>	5 <sub>0</sub>	5 <sub>0</sub>	5 <sub>0</sub>	5 <sub>0</sub>	3 <sub>0</sub>	3 <sub>0</sub>	3 <sub>0</sub>	3 <sub>0</sub>	3 <sub>0</sub>	3 <sub>0</sub>	1 <sub>0</sub>	6 <sub>0</sub>	6 <sub>0</sub>	6 <sub>0</sub>	6 <sub>0</sub>	4 <sub>0</sub>