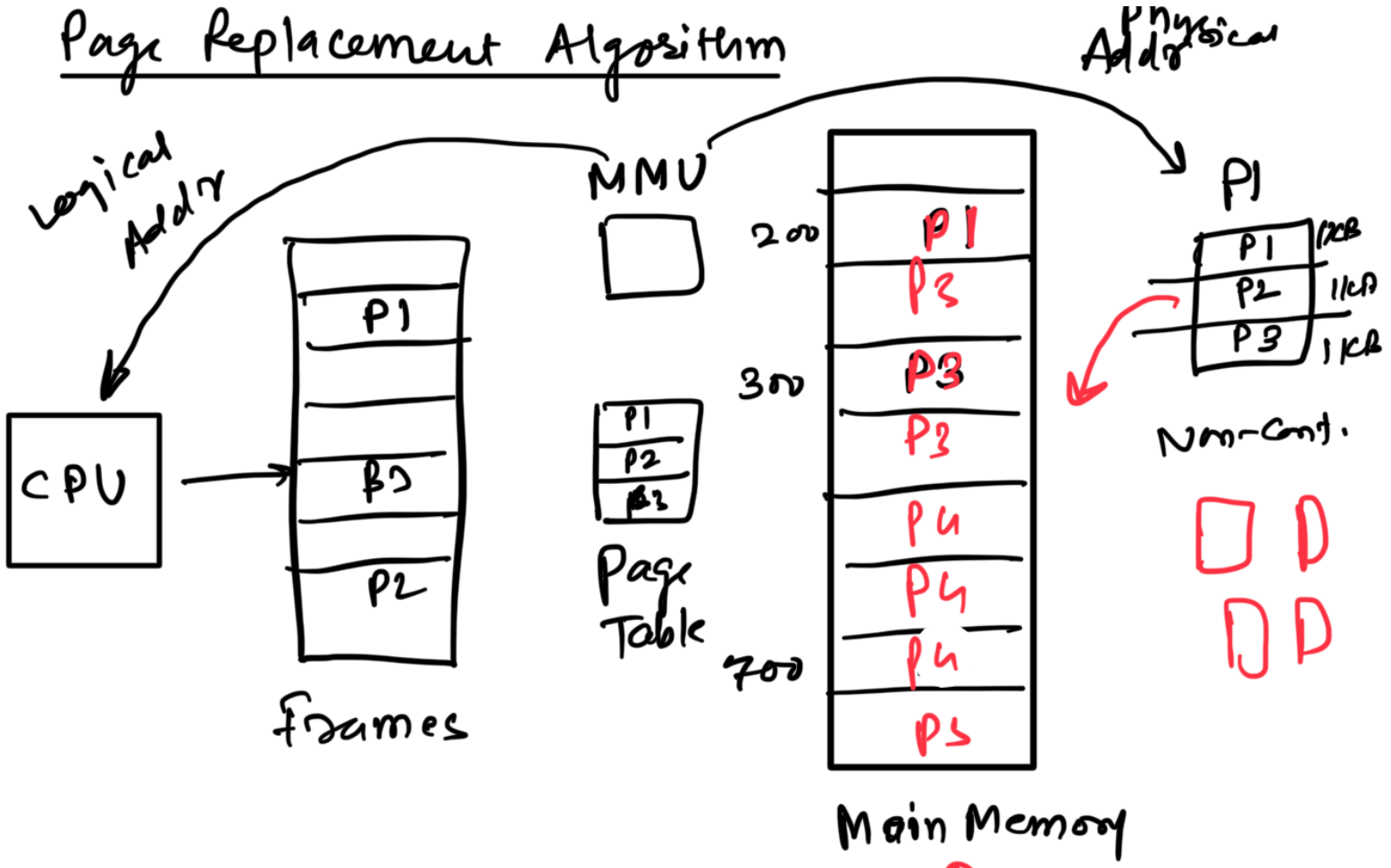
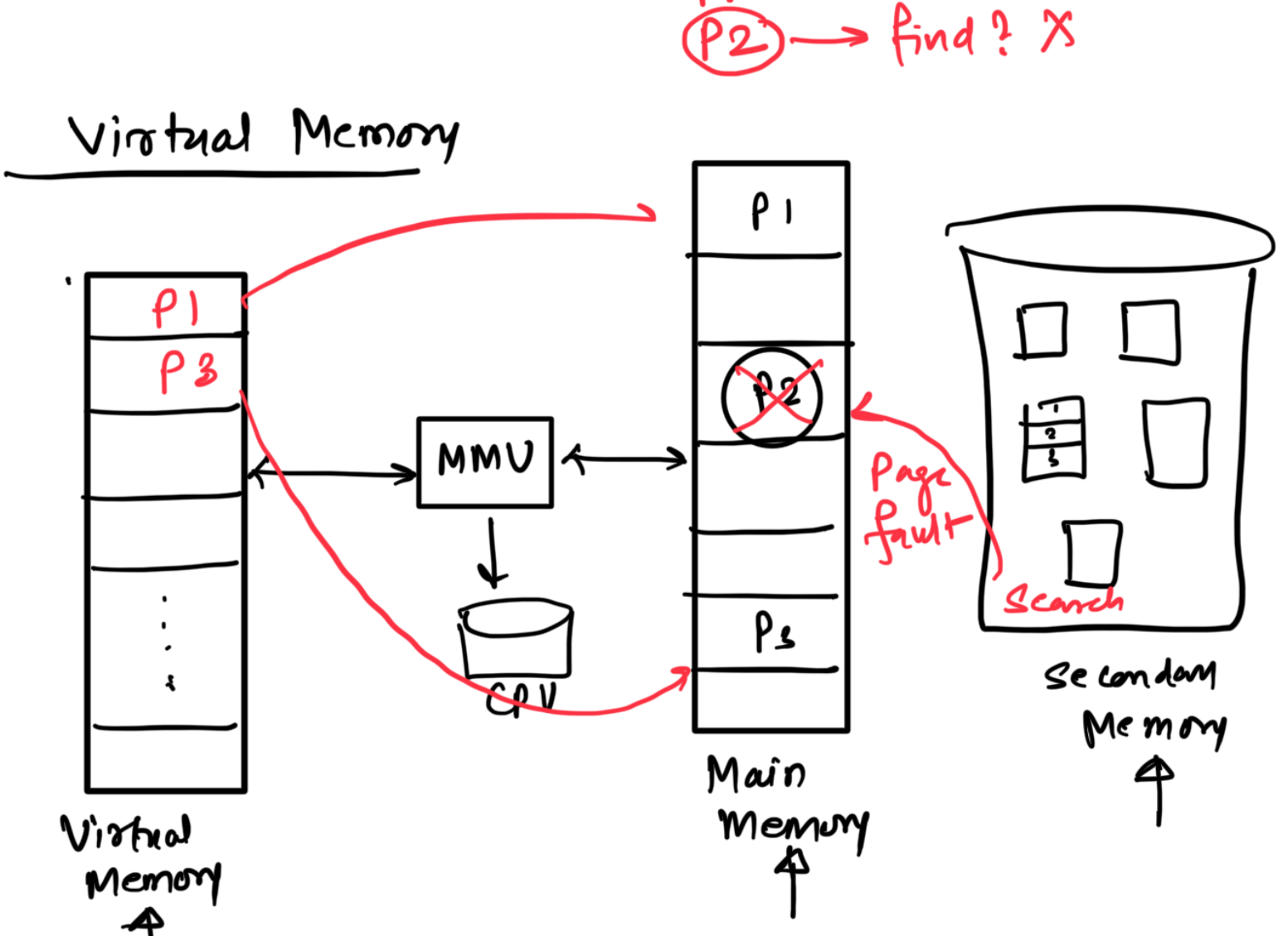
Page Replacement Algorithm



CPU → RQ proces → Execution → Ready

P1
P2 → find? X

Virtual Memory



Page Replacement Algo → FCFC
LRN
OPR

Page fault

1. Hit → found page in memory
2. Miss → not found page in memory

Q. → Use PR Algo & calculate Hit Ratio & Miss Ratio

Ex 1: Reference → 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0,

Process ⟶ 3, 1, 2, 0

Frame size → 3 First Come First Serve → 1

f3		1	1	1	1	0	0	0	3	3	3	3	2	2	
f2	0	0	0	0	3	3	3	2	2	2	2	1	1	1	
f1	7	7	7	2	2	2	2	4	4	4	0	0	0	0	0
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
				hit							Hit			Hit	

Page fault → Miss ⟶ = 12

Hit ⟶ = 3

$$\text{Hit Ratio} = \frac{\text{No. of hits}}{\text{No of Pages}} = \frac{3}{15} = 20\%$$

$$\text{Miss Ratio} = \frac{\text{No of Miss}}{\text{No of Pages}} = \frac{12}{15} = 80\%$$

OPR → Optimal Page Replacement

Criteria → Replace the page which is not used in longest dimension of time in future

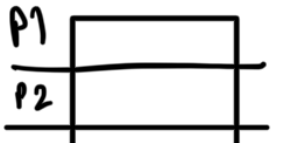
Reference → 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 1, 2, 0

frame → 4

f4				2	2	2	2	2	2	2	2	2	2	2	2
f3			1	1	1	1	1	4	4	4	4	4	4	1	1
f2		0	0	0	0	0	0	0	0	0	0	0	0	0	0
f1	7	7	7	7	7	3	3	3	3	3	3	3	3	3	3
					Hit		Hit		Hit	Hit	Hit	Hit	Hit		Hit

Miss Ratio = $\frac{7}{15} \times 100 =$

Hit Ratio = $\frac{8}{15} \times 100 =$



50%

P3

Page Table

0 – 3

LRU → Least Recently Used Algorithm

Replace the last recently used page in past

Reference → 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0,

1, 7, 0, 1

3

f4				2	2	2	2	2	2	2	2	2	2	2	2	2
f3			1	1	1	1	1	4	4	4	4	4	4	1	1	1
f2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
f1	7	7	7	7	7	3	3	3	3	3	3	3	3	3	3	3

Hit ⇒ 12/20

Miss = 8/20