

Pages are 4 KB big, so the offset is $\log_2(4\text{kb}) = 12$ bits. We ignore the last 12 bits and only need to worry about the initial 4 bits.

Initial Data Stream:

Address (Hex)	Address (Binary)	Result (H, M, PF)
0x0FFF	0b0000111111111111	M
0x7A28	0b0111101000101000	H
0x3DAD	0b0011110110101101	
0x3A98	0b0011101010011000	
0x1C19	0b0001110000011001	
0x1000	0b0001000000000000	
0x22D0	0b0010001011010000	

Initial TLB:

Valid	Tag	Physical Page #	LRU
1	11	12	2
1	7	4	3
1	3	6	4
0	4	9	1

Initial Page Table:

Index	Valid	Physical Page or On Disk
0	1	5
1	0	Disk
2	0	Disk
3	1	6
4	1	9
5	1	11
6	0	Disk
7	1	4
8	0	Disk
9	0	Disk
10	1	3
11	1	12

Address 0x0FFF: M; Not in TLB but in Page Table. Update TLB, page table remains the same.

Valid	Tag	Physical Page #	LRU
1	11	12	1
1	7	4	2
1	3	6	3
1	0	5	4

Address 0x7A28: H, Found in TLB. Update TLB, page table remains the same.

Valid	Tag	Physical Page #	LRU
1	11	12	1
1	7	4	4
1	3	6	2
1	0	5	3

Address 0x3DAD: H, Found in TLB. Update TLB, page table remains the same.

Valid	Tag	Physical Page #	LRU
1	11	12	1
1	7	4	3
1	3	6	4
1	0	5	2

Address 0x3A98: H, Found in TLB. TLB and page table remains the same.

Valid	Tag	Physical Page #	LRU
1	11	12	1
1	7	4	3
1	3	6	4
1	0	5	2

Address 0x1C19: PF, Not in TLB or Page Table. Update TLB and page table.

Valid	Tag	Physical Page #	LRU
1	1	13	4
1	7	4	2
1	3	6	3
1	0	5	1

Index	Valid	Physical Page or On Disk
0	1	5
1	1	13
2	0	Disk
3	1	6
4	1	9
5	1	11
6	0	Disk
7	1	4
8	0	Disk
9	0	Disk
10	1	3
11	1	12

Address 0x1000: H, Found in TLB. TLB and page table remains the same.

Address 0x22D0: PF, Not in TLB or Page Table. Update TLB and page table.

Valid	Tag	Physical Page #	LRU
1	1	13	3
1	7	4	1
1	3	6	2
1	2	14	4

Index	Valid	Physical Page or On Disk
0	1	5
1	1	13
2	1	14
3	1	6
4	1	9
5	1	11
6	0	Disk
7	1	4
8	0	Disk
9	0	Disk
10	1	3
11	1	12

Result:

Address (Hex)	Address (Binary)	Result (H, M, PF)
0x0FFF	0b0000111111111111	M
0x7A28	0b0111101000101000	H
0x3DAD	0b0011110110101101	H
0x3A98	0b0011101010011000	H
0x1C19	0b0001110000011001	PF
0x1000	0b0001000000000000	H
0x22D0	0b0010001011010000	PF

Valid	Tag	Physical Page #	LRU
1	1	13	3
1	7	4	1
1	3	6	2
1	2	14	4

Index	Valid	Physical Page or On Disk
0	1	5
1	1	13
2	1	14
3	1	6
4	1	9
5	1	11
6	0	Disk
7	1	4
8	0	Disk
9	0	Disk
10	1	3
11	1	12