

PHASE	TIME WHEN ISSUING THE PROCESSOR OPERATIONS		PROCESSOR ISSUING THE OPERATION	OPERATIONS ISSUED BY THE PROCESSORS (order is given)		LOAD/STORE OPERATIONS GENERATED BY THE PROCESSOR		ADDRESS	VALUE WRITTEN	PROCESS OR HOLD SIGNAL	BUS LOCK	BUS START TIME	BUS TRANSACTION	TRANSACTION COST	TIME WHEN THE PROCESSOR GETS THE VALUE (READ)		TRANS NO.	CACHE BLOCK ADDRESS	CACHE-0: STATE,TAG,VALUE	CACHE-1: STATE,TAG,VALUE	CACHE-15: STATE,TAG,VALUE	MEMORY		NOTES	EXERCISE 2 – EXAM 2010/01/20 (version 2.2)
	VALUE	VALUE READ																							
WARM-UP	0	15			R	0x120						0		0				0	I,0,0	I,0,0	S,0x120,0x0020	0x0020			
	0	0			R	0x108						0		0			1	S,0x108,0x0008	I,0,0	I,0,0	0x0008				
	0	15			R	0x108						0		0			1	S,0x108,0x0008	I,0,0	S,0x108,0x0008	0x0008				
	0	1			R	0x118						0		0			3	I,0,0	S,0x118,0x1118	I,0,0	0x0018				
	0	0			W	0x110						0		0			2	M 0x110,0x0030	I,0,0	I,0,0	0x0010				
	0	1			W	0x128						0		0			1	S,0x108,0x0008	M,0x128,0x0068	S,0x108,0x0008	0x0028				
TIMING	0	0	EXCH		R	0x100	-	0	1			0	BR	100	100	1	0	S,0x100,0x0000	I,0,0	I,0,0	0x0000	0	Block 0 of cache-0 was empty	P0 can now enter the Critical Section (writes are buffered)	
	0	0			W	0x100	1	0	0		100	I	15	2	0	M,0x100,0x0001	I,0,0	I,0,0	0x0000	-		SC0[100,1100]			
	0	1	EXCH		R	0x100	-	1	1		115	CC	70	185	3	0	S,0x100,0x0001	S,0x100,0x0001	I,0,0	0x0000	1				
	0	1			R	0x100	-	0	1		185	WB	10	4	0	S,0x100,0x0001	S,0x100,0x0001	I,0,0	0x0001	1					
	0	1			W	0x100	1	0	0		195	I	15	5	0	I,0,0	M,0x100,0x0001	I,0,0	0x0001	-					
	0	15	EXCH		R	0x100	-	1	1		210	CC	70	280	6	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1				
	0	15			R	0x100	-	0	1		280	WB	10	7	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1					
	0	15			W	0x100	1	0	0		290	I	15	8	0	I,0,0	I,0,0	M,0x100,0x0001	0x0001	-					
	210	1	EXCH		R	0x100	-	1	1		305	CC	70	375	9	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1	REPEAT.....			
	210	1			R	0x100	-	0	1		375	WB	10	10	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1					
	210	1			W	0x100	1	0	0		385	I	15	11	0	I,0,0	M,0x100,0x0001	I,0,0	0x0001	-					
	305	15	EXCH		R	0x100	-	1	1		400	CC	70	470	12	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1				
	305	15			R	0x100	-	0	1		470	WB	10	13	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1					
	305	15			W	0x100	1	0	0		480	I	15	14	0	I,0,0	I,0,0	M,0x100,0x0001	0x0001	-					
	400	1	EXCH		R	0x100	-	1	1		495	CC	70	565	15	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1				
	400	1			R	0x100	-	0	1		565	WB	10	16	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1					
	400	1			W	0x100	1	0	0		575	I	15	17	0	I,0,0	M,0x100,0x0001	I,0,0	0x0001	-					
	495	15	EXCH		R	0x100	-	1	1		590	CC	70	18	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1					
	495	15			R	0x100	-	0	1		660	WB	10	19	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1					
	495	15			W	0x100	1	0	0		670	I	15	20	0	I,0,0	I,0,0	M,0x100,0x0001	0x0001	-					
	590	1	EXCH		R	0x100	-	1	1		685	CC	70	755	21	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1				
	590	1			R	0x100	-	0	1		755	WB	10	22	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1					
	590	1			W	0x100	1	0	0		765	I	15	23	0	I,0,0	M,0x100,0x0001	I,0,0	0x0001	-					
	685	15	EXCH		R	0x100	-	1	1		780	CC	70	850	24	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1				
	685	15			R	0x100	-	0	1		850	WB	10	25	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1					
	685	15			W	0x100	1	0	0		860	I	15	26	0	I,0,0	I,0,0	M,0x100,0x0001	0x0001	-					
	780	1	EXCH		R	0x100	-	1	1		875	CC	70	945	27	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1				
	780	1			R	0x100	-	0	1		945	WB	10	28	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1					
	780	1			W	0x100	1	0	0		955	I	15	29	0	I,0,0	M,0x100,0x0001	I,0,0	0x0001	-					
	875	15	EXCH		R	0x100	-	1	1		970	CC	70	1040	30	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1				
	875	15			R	0x100	-	0	1		1040	WB	10	31	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1					
	875	15			W	0x100	1	0	0		1050	I	15	32	0	I,0,0	I,0,0	M,0x100,0x0001	0x0001	-					
	970	1	EXCH		R	0x100	-	1	1		1065	CC	70	1135	33	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1				
	970	1			R	0x100	-	0	1		1135	WB	10	34	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1		P0 has exited its CS at 1100			
	970	1			W	0x100	1	0	0		1145	I	15	35	0	I,0,0	M,0x100,0x0001	I,0,0	0x0001	-					
	1100	0	SW		W	0x100	0	1	1		1160	CC	70	1230	36	0	S,0x100,0x0001	S,0x100,0x0001	I,0,0	0x0001	-		P0 has issued an unlock		
	1100	0			W	0x100	-	0	0		1230	I	15	37	0	M,0x100,0x0000	I,0,0	I,0,0	0x0001	-					
	1230	1	EXCH		R	0x100	-	1	1		1245	CC	70	1315	38	0	S,0x100,0x0000	S,0x100,0x0000	I,0,0	0x0001	0	I follow always the order 0→1→15	P1 can now enter the Critical Section (writes are buffered)		
	1230	1			R	0x100	-	0	1		1315	WB	10	39	0	S,0x100,0x0000	S,0x100,0x0000	I,0,0	0x0000	0		SC1[1315,2315]			
	1230	1			W	0x100	1	0	0		1325	I	15	40	0	I,0,0	M,0x100,0x0001	I,0,0	0x0000	1					
	1340	15	EXCH		R	0x100	-	1	1		1340	CC	70	1410	41	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1				
	1340	15			R	0x100	-	0	1		1410	WB	10	42	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	1					
	1340	15			W	0x100	1	0	0		1420	I	15	43	0	I,0,0	I,0,0	M,0x100,0x0001	0x0001	-					
	1435	15	EXCH		R	0x100	-	1	0	-	-	-	0	-	-	0	I,0,0	I,0,0	M,0x100,0x0001	0x0001	1	P15 has the copy so it won't bother P0 and P1			
	1435	15			W	0x100	1	0	0	-	-	-	0	-	-	0	I,0,0	I,0,0	M,0x100,0x0001	0x0001	-				
	1436	15	EXCH		R	0x100	-	1	0	-	-	-	0	-	-	0	I,0,0	I,0,0	M,0x100,0x0001	0x0001	1	REPEAT UNTIL 2315	REPEATED.....		
	1436	15			W	0x100	1	0	0	-	-	-	0	-	-	0	I,0,0	I,0,0	M,0x100,0x0001	0x0001	-				
...																									
2315	1	SW		W	0x100	0	1	1		2315	CC	70	2385	44	0	I,0,0	S,0x100,0x0001	S,0x100,0x0001	0x0001	-		P1 has issued an unlock			
2315	1			W	0x100	-	0	0		2385	I	15	45	0	I,0,0	M,0x100,0x0000	I,0,0	0x0001	-						
2315	15	EXCH		R	0x100	-	1	1		2400	CC	70	2470	46	0	I,0,0	S,0x100,0x0000	S,0x100,0x0000	0x0001	0		P15 can now enter the Critical Section (writes are buffered)			
2315	15			R	0x100	-	0	1		2470	WB	10	47	0	I,0,0	S,0x100,0x0000	S,0x100,0x0000	0x0000	0		SC15[2470,3470]				
2315	15			W	0x100	1	0	0		2480	I	15	48	0	I,0,0	I,0,0	M,0x100,0x0001	0x0000	-						
...																									
3470	15	SW		W	0x100	0	1	1	-	-	-	0	-	-	0	I,0,0	I,0,0	M,0x100,0x0000	0x0000	-	Don't need to set any bus transaction	P15 has issued an unlock			