

Class Activity - Lecture 18 Solution

SOLUTIONS

(a)

LUT-1, L1.x			
A	B	E	$j = A B \sim E$
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

L1.x = { 1,0,1,1,1,1,1,1 }

(b)

M1.1 = { 0, 0 } M1.2 = { 0, 1 }

(c)

LUT-2, L2.x			
A	C	E	$k = (A\&C) E$
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

L2.x = { 0,1,0,1,0,1,1,1 }

M1.3 = { 0, 0 } M1.4 = { 1, 0 }

(d)

LUT-3, L3.x			
j	$\sim j$	F	if (F) X = j; else X = $\sim j$;
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

M2.1 = 0 M2.2 = 0 (doesn't really matter what you choose to link M2.2 to)

LUT-3, L3.x			
k	j	F	$Y \leq F k;$
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

M2.3 = 1 M2.4 = 0 (for this one it also doesn't matter than you link M2.4 to)

(e)

This one is pretty simple: M3.1 = 0 and M3.2 = 1

(f)

This is a matter of putting all the sequences together according to:

{ M1.1, M1.2, M1.3, M1.4, L1.x, L2.x, M2.1, M2.2, M2.3, M2.4, L3.x, L4.x, M3.1, M3.2 }

So we just substitute, and thus we have the bit sequence for programming this PLB:

{ 0,0,0,1,0,0,1,0, 1,0,1,1,1,1,1, 0,1,0,1,0,1,1,1, 0,0,1,0, 1,0,1,0,0,1,0,1, 0,1,0,1,1,1,1,1, 0,1 }

And that's it! Hope you succeeded in completing this exercise; if so you're probably fully configured as a nerdy digital engineering and ready to speak in 0s and 1s with your pals. Enjoy!