

Sample Problem Using a Multiplexer (MUX)

Desired Truth Table

w	x	y	z	Q _{desired}
0	0	0	0	1
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

Truth Table for 74151

C	B	A	Q
0	0	0	D0
0	0	1	D1
0	1	0	D2
0	1	1	D3
1	0	0	D4
1	0	1	D5
1	1	0	D6
1	1	1	D7

Truth Tables for solution: Top and Bottom Half
 (w=0 is top half; w = 1 is bottom half)

w	C (x)	B (y)	A (z)	Q_{desired}	Q_{actual}
0	0	0	0	1	D_0
0	0	0	1	1	D_1
0	0	1	0	0	D_2
0	0	1	1	0	D_3
0	1	0	0	0	D_4
0	1	0	1	1	D_5
0	1	1	0	0	D_6
0	1	1	1	1	D_7

w	C (x)	B (y)	A (z)	Q_{desired}	Q_{actual}
1	0	0	0	1	D_0
1	0	0	1	0	D_1
1	0	1	0	0	D_2
1	0	1	1	0	D_3
1	1	0	0	1	D_4
1	1	0	1	1	D_5
1	1	1	0	1	D_6
1	1	1	1	0	D_7

Solution:

$D_0 = 1$	$D_4 = w$
$D_1 = \bar{w}$	$D_5 = 1$
$D_2 = 0$	$D_6 = w$
$D_3 = 0$	$D_7 = \bar{w}$