Combinational Logic Project 1

Lab 2 – ETY - Akmal Ramadhan – 2206081534 – PSD B

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Truth Table

W	X	Y	Z	O(W,X,Y,Z)
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
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	0
1	1	1	0	0
1	1	1	1	0

Sum of Minterms (SOM)

$$O(W,X,Y,Z) = \sum_{m} (1,2,3,4,6,8,12)$$

= m1 + m2 + m3 + m4 + m6 + m8 + m12

= W'X'Y'Z + W'X'YZ' + W'X'YZ + W'XY'Z' + W'XYZ' + WX'Y'Z' + WXY'Z'

Product of Maxterms (POM)

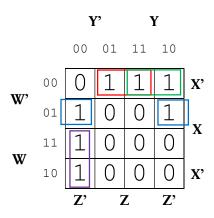
$$O(W, X, Y, Z) = \prod_{M} (0,5,7,9,10,11,13,14,15)$$

$$= M0 + M5 + M7 + M9 + M10 + M11 + M13 + M14 + M15$$

$$= (W + X + Y + Z)(W + X' + Y + Z')(W + X' + Y' + Z')(W' + X + Y + Z')(W' + X + Y' + Z')(W' + X' + Y' + Z')(W' + X' + Y' + Z')(W' + X' + Y' + Z')$$

Optimilization





 $O(W, X, Y, Z) = \frac{W'X'Z}{W'X'Y} + \frac{W'XZ'}{W'XZ'} + \frac{WY'Z'}{W'XZ'}$